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# CAPACITOR

## CATALOGUE & DATA BOOK

Aluminum Electrolytic Capacitors  
Film Capacitors  
Polymer Capacitors  
Super Capacitors











# JIANGHAI CAPACITOR CO.,LTD.



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### 1 Snap-in Type Aluminum Electrolytic Capacitor 焊片式铝电解电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(℃)	Load Life Time 耐负荷寿命	Page 页码
Snap-in/Lug 焊针式、焊片式电容器	General Purpose 一般用途	CD293 <sup>Updated</sup>	Standard, snap-in terminal, 85℃ 焊针式标准品, 85℃	Snap-in 焊针式	10~500	100~82000	-40[-25]~+85	85℃, 2000h	42
		CD294 <sup>Updated</sup>	Standard, snap-in terminal, 105℃ 焊针式标准品, 105℃	Snap-in 焊针式	16~550	100~47000	-40[-25]~+105	105℃, 2000h	45
		CD29C	Downsized, general 缩体, 一般品	Snap-in 焊针式	160~450	100~3900	-25~+105	105℃, 2000h	48
		CD29CS	Super Downsized 超级缩体	Snap-in 焊针式	400~450	220~820	-25~+105	105℃, 2000h	50
		CD29CT <sup>NEW</sup>	Ultra compact 极限缩体	Snap-in 焊针式	400~450	270~1500	-25~+105	105℃, 2000h	52
	High Reliability 高可靠性	CD295 <sup>Updated</sup>	Long life, downsized 长寿命, 缩体	Snap-in 焊针式	160~500	100~2200	-40[-25]~+85	85℃, 5000h	54
		CD295S	Long life, high current, bigger size 长寿命, 大纹波电流, 大尺寸品	Snap-in 焊针式	160~500	390~4700	-40[-25]~+85	85℃, 5000h	57
		CD296 <sup>Updated</sup>	Long life, downsized 长寿命, 缩体	Snap-in 焊针式	200~550	100~2200	-40[-25]~+105	105℃, 3000h	59
		CD296Q <sup>NEW</sup>	Automotive application 车载电子	Snap-in 焊针式	450~500	150~820	-40~+105	105℃, 3000h	61
		CD296L	Long life, high current, bigger size 长寿命, 大纹波电流, 大尺寸品	Snap-in 焊针式	350~500	390~3300	-40[-25]~+105	105℃, 3000h	63
		CD297 <sup>Updated</sup>	Long life, downsized 长寿命, 缩体	Snap-in 焊针式	25~550	100~27000	-40[-25]~+105	105℃, 5000h	65
		CD297S	High ripple current, high reliability, For solar inverter 大纹波电流, 高可靠性, 应用于太阳能逆变器	Snap-in 焊针式	160~550	100~3300	-40[-25]~+105	105℃, 5000h	68
		CD299 <sup>Updated</sup>	Longest life, high ripple current 特长寿命, 耐大纹波电流	Snap-in 焊针式	160~500	120~2200	-40[-25]~+105	105℃, 7000h	71
		CD29F	Suited for high speed charge and discharge 快速充放电应用	Snap-in 焊针式	350~450	150~820	-25~+105	105℃, 3000h	73
		CD29G	125℃, Snap-in 125℃, 牛角式	Snap-in 焊针式	25~63 400~450	220~18000	-40~125	125℃, 5000h	75
		CD29H <sup>Updated</sup>	Long life, higher ripple current 长寿命, 耐大纹波电流	Snap-in 焊针式	200~450	150~2200	-40~+105	105℃, 3000h	78
		CD29HD	Outstanding ripple current capability, long life 卓越的纹波电流能力, 长寿命	Snap-in 焊针式	200~450	220~3900	-40~+105	105℃, 3000h	80
		CD29HE <sup>NEW</sup>	Higher ripple current from CD29HD 比CD29HD更强的纹波电流能力	Snap-in 焊针式	400~450	220~820	-40~+105	105℃, 3000h	82
		CD29L <sup>Updated</sup>	Long life, high CV value 长寿命, 高CV值	Snap-in 焊针式	160~500	390~4700	-40[-25]~+85	85℃, 5000h	84
		CD29UH	Ultra High Voltage, high temperature 特高耐压, 耐高温	Snap-in 焊针式	575~600	56~390	-25~+105	105℃, 3000h	86
	Special Application 特殊用途	CD17	For photo flash 闪光灯用	Lug 焊片式	330、360	150~1500	-20~+55	55℃, 5000 times charging	88
		CD29NF	Corrosion-proof 耐腐应用	Snap-in 焊针式	350~450	120~680	-25~+105	105℃, 2000h	90



## 2 Screw Type Aluminum Electrolytic Capacitor 螺栓式铝电解电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(℃)	Load Life Time 耐负荷寿命	Page 页码
Screw Terminal 螺栓式电容器	For Inverter 变频器用	CD135	Standard, screw terminal, 85℃ 螺栓式标准品, 85℃	Screw 螺栓式	10~450	270~820000	-40(-25)~+85	85℃, 2000h	96
		CD136	Standard, screw terminal, 105℃ 螺栓式标准品, 105℃	Screw 螺栓式	25~450	220~330000	-40(-25)~+105	105℃, 2000h	99
		CD137	Long life, high reliability 长寿命, 高可靠性	Screw 螺栓式	400~550	1000~22000	-40~+85	85℃, 5000h	101
		CD137S	Low ESR, high reliability, extremely compact 低ESR, 高可靠性, 超级缩体	Screw 螺栓式	350~500	1000~22000	-40~+85	85℃, 5000h	103
		CD137U	Long life, high reliability, ultra compact 长寿命, 高可靠性, 超级缩体	Screw 螺栓式	400~450	1000~22000	-40~+85	85℃, 5000h	105
		CD138	Long life, high reliability 长寿命, 高可靠性	Screw 螺栓式	350~450	1000~18000	-40~+85	85℃, 5000h	107
		CD138S	Ultra long life, high reliability 特长寿命, 高可靠性	Screw 螺栓式	350~500	1500~12000	-40~+85	85℃, 10000h	109
		CD139	Long life, high reliability 长寿命, 高可靠性	Screw 螺栓式	350~450	1000~15000	-40~+105	105℃, 5000h	111
		CD139S	Long life, higher current, high reliability 长寿命, 大电流, 高可靠性	Screw 螺栓式	350~450	1000~15000	-40~+105	105℃, 5000h	113
		CDVT	Toroidal design, highest current, high reliability 中空铝壳, 特大电流, 高可靠性	Screw 螺栓式	350~500	680~10000	-40~+105	105℃, 5000h 85℃, 20000h	115
		CD13H	Up to 650V working voltage, high reliability 工作电压高达650伏, 高可靠性	Screw 螺栓式	600,650	1000~5600	-25~+85	85℃, 2000h	117
		CD13P	600V working voltage, long life 600V工作电压, 长寿命	Screw 螺栓式	600	1000~5600	-25~+85	85℃, 5000h	119
		CD13L	Ultra long life for inverter 变频器用, 特长寿命	Screw 螺栓式	350~450	1000~15000	-40~+85	85℃, 20000h	121
		Charge- Discharge	Higher current, suited for high frequency charge and discharge 充放电 大电流, 适合频繁充放电	Screw 螺栓式					123



## 3 Radial Type Aluminum Electrolytic Capacitor 引线式铝电解电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(℃)	Load Life Time 耐负荷寿命	Page 页码
Miniature 小型电容器	Low Profile 超小型	CD70H	7mm height 7毫米高	Radial 引线式	6.3~50	0.1~100	-55~+105	105℃, 1000h	128
	General Purpose 一般用途	CD71H	Bi-polarized, general, 105℃ 双极性-般品, 105℃	Radial 引线式	6.3~160	0.47~6800	-55~+105	105℃, 2000h	130
		CD110	Standard, radial type, 85℃ 引线式标准品, 85℃	Radial 引线式	6.3~500	0.1~22000	-40(25)~+85	85℃, 2000h	132
		CD110L	Long life, for TV power application 长寿命, 适用于电视电源	Radial 引线式	420~500	47~150	-25~+85	85℃, 8000h	135
		CD263 <small>Updated</small>	Standard, radial type, 105℃ 引线式标准品, 105℃	Radial 引线式	6.3~500	0.1~15000	-40(-25)~+105	105℃, 2000h	137
	High Reliability 高可靠性	CD261L	Super long life, high reliability, downsized 超长寿命, 高可靠性, 缩体	Radial 引线式	160~450	10~820	-40~+105	105℃, 12000h	140
		CD261X	Super long life, downsized, for input filtering 超长寿命, 缩体, 输入滤波用	Radial 引线式	160~500	1~220	-40~+105	105℃, 10000h	143
		CD264 <small>Updated</small>	long life, for input filtering 长寿命, 输入滤波用	Radial 引线式	160~500	1~220	-40(-25)~+105	105℃, 3000h	145
		CD266 <small>Updated</small>	long life, for input filtering 长寿命, 输入滤波用	Radial 引线式	160~500	1~220	-40(-25)~+105	105℃, 5000h	147
		CD26L <small>Updated</small>	Slim type, for input filtering 细长型, 输入滤波用	Radial 引线式	200~500	12~220	-25~+105	105℃, 2000h	149
		CD26H <small>Updated</small>	Slim type, long life, for input filtering 细长型, 长寿命, 输入滤波用	Radial 引线式	200~500	12~220	-25~+105	105℃, 5000h	151
		CD26HL <small>NEW</small>	Slim type, long life, for input filtering 细长型, 长寿命, 输入滤波用	Radial 引线式	450~500	12~39	-25~+105	105℃, 5000h	153
		CD26HS	Slim type, long life, ultra miniaturized 细长型, 长寿命, 超级缩体	Radial 引线式	400~450	33~220	-25~+105	105℃, 5000h	155
		CD11G	125℃, high ripple current, for ballast 125℃, 大纹波电流, 节能灯、电子整流器用	Radial 引线式	160~450	1~330	-40(-25)~+125	125℃, 2000h	157
		CD11GL	125℃, high ripple current, for ballast 125℃, 大纹波电流, 节能灯、电子整流器用	Radial 引线式	160~450	2.2~330	-40(-25)~+125	125℃, 5000h	159
		CD269L	125℃, for automotive and industrial power supply 125℃, 汽车电子, 工业电源	Radial 引线式	10~100	1~4700	-40~+125	125℃, 5000h	161
		High Frequency use 高频低阻	CD269H	135℃, for automotive, long life 135℃, 汽车用品, 长寿命	Radial 引线式	10~63	10~4700	-55~+135	135℃, 4000h
	CD281 <small>Updated</small>		Low impedance, long life, high reliability 低阻抗, 长寿命, 高可靠性	Radial 引线式	6.3~100	0.47~15000	-55~+105	105℃, 8000h	165
	CD281L <small>Updated</small>		Low impedance, long life, high reliability 低阻抗, 长寿命, 高可靠性	Radial 引线式	6.3~100	0.47~15000	-55~+105	105℃, 10000h	168
	CD282 <small>Updated</small>		Ultra low impedance 超低阻抗, 长寿命	Radial 引线式	6.3~100	6.8~18000	-40~+105	105℃, 6000h	171
	CD282L		Ultra low impedance, longest life 超低阻抗, 长寿命	Radial 引线式	6.3~100	6.8~18000	-40~+105	105℃, 10000h	175
	CD282X		Ultra low impedance, longest life, smaller size 超低阻抗, 长寿命, 缩体	Radial 引线式	6.3~100	1~15000	-40~+105	105℃, 10000h	179
	CD284		Ultra low impedance, long life 超低阻抗, 长寿命	Radial 引线式	6.3~100	5.6~6800	-40~+105	105℃, 5000h	182
	CD284L		Ultra low impedance, long life 超低阻抗, 长寿命	Radial 引线式	6.3~100	8.2~8200	-40~+105	105℃, 10000h	185
	CD285		Highest ripple current, long life 特大纹波电流, 长寿命	Radial 引线式	6.3~100	8.2~8200	-40~+105	105℃, 10000h	188
	CD286		Low impedance 低阻抗	Radial 引线式	6.3~100	5.6~18000	-55~+105	105℃, 2000h	191
	CD287		Low impedance, long life 低阻抗, 长寿命	Radial 引线式	6.3~100	0.47~15000	-55~+105	105℃, 5000h	194
	CD28L <small>Updated</small>		Low impedance, long life, downsized 低阻抗, 长寿命, 缩体	Radial 引线式	6.3~63	12~18000	-55~+105	105℃, 8000h	197
	Special Application 特殊用途	CD28XL	Long life, miniaturized, for LED drive 长寿命, 小尺寸, LED驱动用	Radial 引线式	10~100	0.47~330	-25~+105	105℃, 10000h	200
		CD117H	Low leakage current 低漏电流	Radial 引线式	6.3~100	0.1~10000	-40~+105	105℃, 2000h	202
		CD71A	For speaker network 音频网络用	Radial 引线式	50	1~100	-40~+85	85℃, 1000h	205
		CD71S	For horizontal deflection S型校正	Radial 引线式	50, 100	2.2~15	-55~+105	105℃, 1000h	207
		CD11A	For Hi-Fi audio 高保真音响	Radial 引线式	6.3~100	0.47~15000	-40~+85	85℃, 2000h	208
		CD171	For photo flash 闪光灯用	Radial 引线式	330	80~300	-20~+55	55℃, 5000 times charging	210



## 4 Axial/Crown Type Aluminum Electrolytic Capacitor 轴向/皇冠式铝电解电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(℃)	Load Life Time 耐负荷寿命	Page 页码
Axial/Crown 轴向/皇冠式电容器	Axial 轴向式	CDA220	Vibration resistant, very high ripple current 耐振动, 特大纹波	Axial 轴向式	25~63	250~4700	-40~+150	150℃, 2000h	213
		CDA225	Vibration resistant, extremely high ripple current, high CV 耐振动, 超大纹波, 高CV	Axial 轴向式	25~63	470~6300	-40~+125/150	150℃, 2000h	215
		CDA226	Vibration resistant, extremely high ripple current 耐振动, 超大纹波	Axial 轴向式	25~63	250~4700	-40~+150	150℃, 2000h	217
		<sup>[Updated]</sup> CDA227	Vibration resistant, extremely high ripple current, high CV, downsized 耐振动, 超大纹波, 高CV, 缩体	Axial 轴向式	25~63	780~11000	-40~+125/150	150℃, 2000h	219
		<sup>[Updated]</sup> CDA228	Vibration resistant, extremely high ripple current, downsized 耐振动, 超大纹波, 缩体	Axial 轴向式	25~63	520~7000	-40~+150	150℃, 2000h	221
		<sup>[Updated]</sup> CDA236	Vibration resistant, high temperature 耐振动, 耐高温	Axial 轴向式	25~40	250~2000	-40~+165	165℃, 1000h	223
	Crown 皇冠式	CDC220	Vibration resistant, very high ripple current 耐振动, 特大纹波	Crown 皇冠式	25~63	250~4700	-40~+150	150℃, 2000h	225
		CDC225	Vibration resistant, extremely high ripple current, high CV 耐振动, 超大纹波, 高CV	Crown 皇冠式	25~63	470~6300	-40~+125/150	150℃, 2000h	227
		CDC226	Vibration resistant, extremely high ripple current 耐振动, 超大纹波	Crown 皇冠式	25~63	250~4700	-40~+150	150℃, 2000h	229
		<sup>[Updated]</sup> CDC227	Vibration resistant, extremely high ripple current, high CV, downsized 耐振动, 超大纹波, 高CV, 缩体	Crown 皇冠式	25~63	780~11000	-40~+125/150	150℃, 2000h	231
		<sup>[Updated]</sup> CDC228	Vibration resistant, extremely high ripple current, downsized 耐振动, 超大纹波, 缩体	Crown 皇冠式	25~63	520~7000	-40~+150	150℃, 2000h	233
		<sup>[Updated]</sup> CDC236	Vibration resistant, high temperature 耐振动, 耐高温	Crown 皇冠式	25~40	250~2000	-40~+165	165℃, 1000h	235



## 5 Solid Polymer Aluminum Electrolytic Capacitor 固体高分子铝电解电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(°C)	Load Life Time 耐负荷寿命	Page 页码
Polymer Type 固体高分子电容器	Vertical, Dip type 圆柱形、直插式	HCN	Standard, low ESR 标准品, 低ESR	Radial 引线式	2.5~35	10~1500	-55~+105	105°C, 2000h	251
		<sup>Updated</sup> HEN	Ultra low ESR, large capacitance 特低ESR, 大容量	Radial 引线式	2.5~16	180~2700	-55~+105	105°C, 2000h	253
		HGN	High temperature, low ESR 耐高温, 低ESR	Radial 引线式	4~25	47~1200	-55~+125	125°C, 1000h	255
		HEL	Low ESL, ultra low ESR 低ESL, 特低ESR	Radial 引线式	2.5~16	100~1000	-55~+105	105°C, 2000h	257
		<sup>Updated</sup> HCS	Long life, Ultra low ESR 长寿命, 特低ESR	Radial 引线式	2.5~100	47~2700	-55~+105	105°C, 5000h	259
		<sup>Updated</sup> HPF	Higher voltage, large capacitance 高电压, 大容量	Radial 引线式	16~200	4.7~2700	-55~+105	105°C, 3000h	261
		<sup>Updated</sup> HPK	High Voltage, High Temperature 高电压, 耐高温	Radial 引线式	16~80	10~2200	-55~+125	125°C, 2000h	264
		HEG	Low ESR, large capacitance 低ESR, 大容量	Radial 引线式	16~63	150~2,200	-55~+105	105°C, 2000h	266
		<sup>NEW</sup> HET	Super Long Life, Low ESR 超长寿命, 低ESR	Radial 引线式	2.5~50	39~2700	-55~+105	105°C, 20000h	268
	Vertical, SMD type 圆柱形、贴片式	HVC	Standard, low ESR 标准品, 低ESR	SMD 贴片式	2.5~25	10~1500	-55~+105	105°C, 2000h	270
		HVM	Ultra low ESR, large capacitance 特低ESR, 大容量	SMD 贴片式	2.5~16	56~2700	-55~+105	105°C, 2000h	272
		HVG	High temperature, low ESR 耐高温, 低ESR	SMD 贴片式	2.5~20	22~560	-55~+125	125°C, 1000h	275
		HVS	Long life, low ESR 长寿命, 低ESR	SMD 贴片式	4~25	10~560	-55~+105	105°C, 5000h	277
		HVF	Higher voltage up to 200V, long life, ultra low ESR 电压高达200V, 长寿命, 特低ESR	SMD 贴片式	16~200	4.7~1200	-55~+105	105°C, 3000h	279
		HVK	High Voltage, High Temperature 高电压, 耐高温	SMD 贴片式	16~80	18~1000	-55~+125	125°C, 2000h	281
		<sup>NEW</sup> HVL	Super Long Life, Low ESR 超长寿命, 低ESR	SMD 贴片式	2.5~50	33~2,700	-55~+105	105°C, 20000h	283
	Flat, SMD 方形贴片式	<sup>Updated</sup> HPA	Flat, low ESR, low ESL 方形, 低ESR, 低ESL	Flat 贴片式	2~25	6.8~560	-55~+105	105°C, 2000h	285
		HPS	Low profile 低背化	Flat 贴片式	2~10	47~330	-55~105	105°C, 2000h	294
		HPE	85°C standard product 85°C 标准品	Flat 贴片式	4, 6.3	330~470	-55~85	85°C, 2000h	295
		HPG	125°C standard product 125°C 标准品	Flat 贴片式	2, 8~20	15~470	-55~125	125°C, 1000h	296



## 6 Conductive Polymer Hybrid Aluminum Electrolytic Capacitor 固液混合铝电解电容器

Series 型号			Feature 特性	Load Life Time 耐负荷寿命	Terminal Type 引出方式	Rated Voltage Range 标称电压 范围(V)	Nominal Capacitance Range 标称容量 范围(F)	Operating Temperature Range 工作温度 范围(℃)	Page 页码
Hybrid Type 固液混合电容器	Polymer DIP	PHLA	Standard, Low ESR 标准品, 低ESR	105℃ 5000h	Radial 引线式	25~80	33~390	-55~+105	310
		PHLB	Long life, Low ESR 长寿命, 低ESR	125℃ 4000h	Radial 引线式	25~80	33~470	-55~+125	312
		PHLD <small>NEW</small>	Large cap, High ripple current 大容量, 大纹波	125℃ 4000h	Radial 引线式	25~63	100~820	-55~+125	314
		PHLE <small>NEW</small>	Long life 长寿命	105℃ 10000h	Radial 引线式	25~80	33~390	-55~+105	316
		PHLF <small>NEW</small>	High temp, Low ESR 耐高温, 低ESR	135℃ 4000h	Radial 引线式	25~63	33~560	-55~+135	318
	Polymer SMD	PHVA	Standard, Low ESR 标准品, 低ESR	105℃ 5000h	Chip 贴片式	25~80	33~390	-55~+105	320
		PHVB	Long life, Low ESR 长寿命, 低ESR	125℃ 4000h	Chip 贴片式	25~80	33~470	-55~+125	322
		PHVD <small>NEW</small>	Large cap, High ripple current 大容量, 大纹波	125℃ 4000h	Chip 贴片式	25~63	100~560	-55~+125	324
		PHVE <small>NEW</small>	Long life 长寿命	105℃ 10000h	Chip 贴片式	25~80	33~390	-55~+105	326
		PHVF <small>NEW</small>	High temp, Low ESR 耐高温, 低ESR	135℃ 4000h	Chip 贴片式	25~63	33~560	-55~+135	328



## 7 Metallized Polypropylene Film Capacitor 金属化聚丙烯薄膜电容器

Series 型号	Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压范围(V)	Nominal Capacitance Range 标称容量范围(μF)	Operating Temperature Range 工作温度范围(°C)	Load Life Time 耐负荷寿命	Page 页码
CBB131	DC-Link capacitor(aluminum case) 直流滤波电容器 (铝外壳)	Screw 螺栓式	600~3600	100~4300	-40~+95	70 °C, 100000h	342
CBB131 小型化	DC-Link capacitor(aluminum case) 直流滤波电容器 (铝外壳)	Screw 螺栓式	600~1500	100~950	-40~+85	70 °C, 100000h	348
CBB132	DC-Link capacitor(plastic case, customized products) 直流滤波电容器 (圆柱形塑壳)	Lug 焊片式	600~1200	25~145	-40~+85	70 °C, 100000h	353
CBB133	DC-Link capacitor(metal case, customized products) 直流滤波电容器 (金属外壳, 定制品)	Screw 螺栓式	750~3000	1500~65000	-40~+70	70 °C, 100000h	356
CBB135	DC-Link capacitor(customized products) 直流滤波电容器 (定制品)	Lug 焊片式	450~1000	200~1500	-40~+105	10years/300000km	361
CBB136	DC-Link capacitor(plastic case) 直流滤波电容器 (塑料外壳)	Screw 螺栓式	600~1200	75~645	-40~+105	70 °C, 100000h	368
CBB138	DC-Link capacitor (for PCB) 直流滤波电容器 (用于PCB)	Lead 引线式	500~1200	5~120	-40~+105	70 °C, 100000h	371
CBB138 125°C 高温	DC-Link capacitor (for PCB, 125 °C) 直流滤波电容器 (用于PCB, 125 °C)	Lead 引线式	600~800	4~40	-40~+125	70 °C, 100000h	377
CBB161	Snubber capacitor for IGBT(lug terminals) IGBT吸收电容器 (接线片)	Lug 焊片式	700~2000	0.2~7.5	-40~+105	70 °C, 100000h	380
CBB162	Snubber capacitor for IGBT(for PCB) IGBT吸收电容器 (用于PCB)	Lead 引线式	630~2000	0.039~1.8	-40~+105	70 °C, 100000h	385
CBB162 125°C 高温	Snubber capacitor for IGBT(for PCB, 125 °C) IGBT吸收电容器 (用于PCB, 125 °C)	Lead 引线式	630~1000	0.1~1.2	-40~+125	70 °C, 100000h	390
CBB163	High voltage absorption capacitor 高压吸收电容器	Screw 螺栓式	1400~2500	0.05~2	-40~+85	70 °C, 100000h	393
CBB164	Plastic shell, high frequency applications 塑壳, 高频应用	Lead 引线式	1000~2000	0.00015~0.068	-40~+105	70 °C, 100000h	397
CBB165	Snubber capacitor for IGBT(lug terminals, down sized) IGBT吸收电容器 (接线片, 缩体)	Lug 焊片式	850~3000	0.4~8	-40~+105	70 °C, 100000h	401
CBB166	Plastic shell, IGBT absorption capacity 塑壳, IGBT吸收电容	Lead 引线式	850~2000	0.033~5.0	-40~+105	70 °C, 100000h	405
CBB167	Snubber capacitor for IGBT(axial-type) IGBT吸收电容器 (轴向)	Lead 引线式	850~2000	0.25~7.5	-40~+85	70 °C, 100000h	409
CBB168	Application of high voltage and high frequency pulse 高压高频脉冲应用	Screw 螺栓式	2.5KVdc~50KVdc 280Vac~20KVdc	0.01~100	-40~+85	70 °C, 100000h	413
CBB65	AC motor capacitor (aluminum case, anti-explosion) 交流电动机电容器 (铝外壳、防爆)	Lug 焊片式	250~450 Vac	2~100	-40~+70	70 °C, 30000h	417
CBB233	AC filter capacitor (customized) 交流滤波电容器 (定制)	定制	160~10K Vac	0.1~10000	-40~+85	70 °C, 100000h	421
CBB235	Three-phase AC filter capacitor (aluminum case) 三相交流滤波电容器 (铝外壳)	Line/Screw 螺旋式/压线式	230~850 Vac	3*20.3~3*335	-40~+85	70 °C, 100000h	425
CBB237	AC filter capacitor (aluminum case) 单相交流滤波电容器 (铝外壳)	Screw 螺栓式	250~850 Vac	10~600	-40~+85	70 °C, 100000h	429
CBB238	AC output filter capacitor(for PCB) 交流输出滤波电容器 (用于PCB)	Lead 引线式	160~450 Vac	0.47~50	-40~+105	70 °C, 100000h	434
CBB238 125°C 高温	AC output filter capacitor(for PCB, 125 °C) 交流输出滤波电容器 (用于PCB, 125 °C)	Lead 引线式	160~275 Vac	1~30	-40~+125	70 °C, 100000h	439
CBB267	Input and output filtering of AC circuit AC电路输入输出滤波	Lead 引线式	160~450 Vac	0.15~40	-40~+105	70 °C, 100000h	443
CBB311	Metallized polypropylene film interference suppression capacitor(class X1) 金属化聚丙烯薄膜抗干扰电容器 (X1类)	Lead 引线式	350~760 Vac	0.001~15	-40~+110	70 °C, 100000h	447
CBB312	Metallized polypropylene film interference suppression capacitor(class X2) 金属化聚丙烯薄膜抗干扰电容器 (X2类)	Lead 引线式	250 Vac 275 Vac 305 Vac	0.0047~46.0	-40~+110	70 °C, 100000h	453
CBB312 125°C 高温	Metallized polypropylene film interference suppression capacitor(class X2, 125 °C) 金属化聚丙烯薄膜抗干扰电容器 (X2类, 125 °C)	Lead 引线式	250~350 Vac	0.01~25	-40~+125	70 °C, 100000h	458
CBB322	Metallized polypropylene film interference suppression capacitor(class Y2) 金属化聚丙烯薄膜抗干扰电容器 (Y2类)	Lead 引线式	300/330 Vac	0.001~1.0	-40~+110	70 °C, 100000h	461
CBB21	Consumer capacitor plastic 消费类电容器塑壳	Lead 引线式	100~630	0.015~30	-40~+105	70 °C, 100000h	464
CBB22	Consumer capacitor plastic 消费类电容器塑壳	Lead 引线式	100~630	0.01~3.3	-40~+105	70 °C, 100000h	469
CBB23	Consumer capacitor (epoxy package) 消费类电容器 (环氧封装)	Lead 引线式	450~630	0.01~3.3	-40~+105	70 °C, 100000h	473
CBB24/CBB25	Consumer capacitor (epoxy package) 消费类电容器 (环氧封装)	Lead 引线式	450~520	0.047~2.2	-40~+105	70 °C, 100000h	477
CBB122	Pulse storage capacitor (cylinder type) 脉冲储能电容 (圆柱形)	Cord 软线	800~5000	50~3000	-40~+55	> 1000次	484
CBB123	Pulse storage capacitor(metal case, customized products) 脉冲储能电容 (金属外壳, 定制品)	Screw 螺栓式	1000~50000	1~120000	-40~+55	> 5000次	487
CBB129	Pulse equalizer capacitor thyristor protects absorption axial capacitor(axial-type) 脉冲均压压电容晶闸管保护吸收电容 (轴向)	Lead 引线式/焊片式	3000~100000	0.0001~10	-40~+55	55 °C, 100000h	490

Film Capacitors  
薄膜电容器



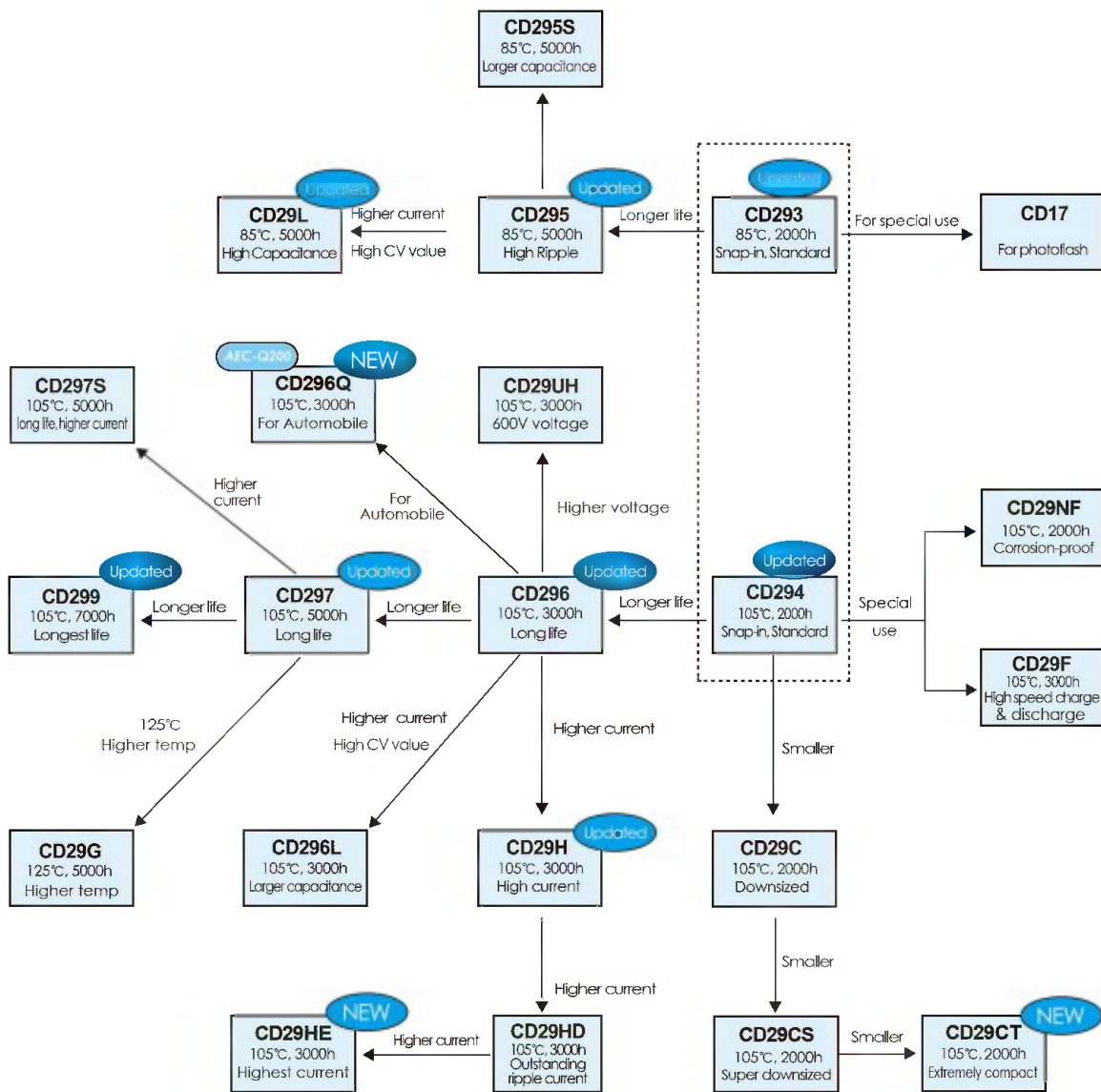
## 8 Super Capacitor 超级电容器

Series 型号			Feature 特性	Terminal Type 引出方式	Rated Voltage Range 标称电压 范围(V)	Nominal Capacitance Range 标称容量 范围(F)	Operating Temperature Range 工作温度 范围(℃)	Load Life 负荷寿命	Cycle Life 循环寿命 (Times)	Page 页码
Super Capacitors 超级电容器	EDLC 双电层电容器	SCV <span>Updated</span>	Standard product, for memory back-up 标准品, 用于后备记忆	Coin 扣式	5.5	0.22~1.5	-25~+70	70℃,1000h	-	505
		SVX <span>NEW</span>	Higher temperature,85℃ product 高温, 85℃ 品	Coin 扣式	3.6	0.22~1.5	-25~+85	85℃,1000h	-	507
		SVH <span>NEW</span>	Higher temperature,85℃ product 高温, 85℃ 品	Coin 扣式	5.5	0.1~1	-25~+85	85℃,1000h	-	509
		SVD <span>NEW</span>	Low temperature 耐低温	Coin 扣式	5.5	0.22~1.5	-40~+70	70℃,1000h	-	510
		SVY <span>NEW</span>	Wide temperature range 宽温度范围	Coin 扣式	3.6	0.22~1.5	-40~+85	85℃,1000h	-	512
		SVI	Wide temperature range 宽温度范围	Coin 扣式	5.5	0.1~1	-40~+85	85℃,1000h	-	514
		SRP	Standard product 标准品	Radial 引线式	2.7	0.5~180	-40~+70	70℃,1000h	500,000	515
		SRE	Higher Voltage product, 3V series 高压产品, 3V系列	Radial 引线式	3	1~180	-40~+65	65℃,1000h	500,000	517
		SRQ	Higher temperature, 85℃ product 高温, 85℃ 品	Radial 引线式	2.7	1~50	-40~+85	85℃,1000h	500,000	519
		SSP	Standard product 标准品	Snap-in/Lug 焊针式/焊片式	2.7	100~800	-40~+65	65℃,1500h	500,000	521
		SSE	Higher Voltage product, 3V series 高压产品, 3V系列	Snap-in/Lug 焊针式/焊片式	3	100~600	-40~+65	65℃,1000h	500,000	523
		SSL <span>Updated</span>	Lower ESR 低ESR	Snap-in/Lug/Welded Column 焊针式/焊片式/焊柱式	2.7	250~1200	-40~+65	65℃,1500h	500,000	525
		SGP	Lower ESR, wide temperature range 低ESR, 宽温	Screw 螺栓式	2.7	650~3400	-40~+65	65℃,1500h	1,000,00	527
		SGE	Higher Voltage product, 3V series 高压产品, 3V系列	Screw 螺栓式	3	650~3400	-40~+65	65℃,1000h	1,000,00	529
	Lithium Ion Capacitor 锂离子电容器	HBR <span>Updated</span>	Higher temperature, 85℃ product 高温, 85℃ 品	Radial 引线式	2.5~3.8	5~550	-15~+70/85(3.5V)	70℃(85℃/3.5V), 1000h	500,000	534
		HBRL <span>Updated</span>	Low ESR, low temperature 低内阻, 耐低温	Radial 引线式	2.5~3.8	5~550	-25~+70	70℃,1000h	250,000	536
		HBE <span>NEW</span>	High energy density 高能量密度	Radial 引线式	2.5~3.8	8~1400	-25~+70	70℃,1000h	250,000	538
		HAA	High power type 高功率型	Soft pack 软包式	2.5~4	1000~16000	-25~+55	55℃,1000h	50,000	540
		HAE	High energy type 高能量型	Soft pack 软包式	2.5~4	3000~20000	-25~+55	55℃,1000h	50,000	542
		HAH	Higher temperature, 65℃ product 高温, 65℃ 品	Soft pack 软包式	2.5~4	1000~16000	0~+65	65℃,1000h	50,000	544
		HGA <span>NEW</span>	High power type 高功率型	Screw/Welded Column 螺栓式/焊柱式	2.5~4	3000~32000	-25~+65	65℃,1000h	50,000	546
	Module 模组	SRM	Standard EDLC module, Double cells in series, for AMR 标准EDLC模组, 两单体串联, 用于智能三表	Module 模组式	5.5	0.22~50	-40~+70	70℃,1000h	500,000	548
		SRS	Higher voltage EDLC module,Double cells in series, for AMR 高电压EDLC模组, 两单体串联, 用于智能三表	Module 模组式	6	0.5~50	-40~+65	65℃,1000h	500,000	550
		SRO	Higher temperature EDLC module,Double cells in series,for AMR 高温EDLC模组, 两单体串联, 用于智能三表	Module 模组式	5.5	0.5~25	-40~+85	85℃,1000h	500,000	552
		SMRE, SMRP <span>NEW</span>	Standard EDLC module, for server backup power supply, smart three meters 标准EDLC模组, 单体多串联, 用于服务器后备电源、智能三表	Module 模组式	7.5~25	0.33~10	-40~+65	65℃,1000h	500,000	554
		SMSP	EDLC module, for FTU&DTU, Power grid backup supply, Automotive electronics EDLC模组, 用于FTU、DTU、电网后备电源、汽车电子	Module 模组式	12~800	7.5~180	-40~+65	65℃,1500h	500,000	555
		SSM	Standard EDLC module, for wind power system EDLC标准模组, 用于风力发电系统	Module 模组式	80~160	6~21.7	-40~+65	65℃,1500h	500,000	556
		SMGP <span>NEW</span>	DVR voltage sag power compensation system, Low temperature cold start power module DVR 电压暂降功率补偿, 低温冷启动电源模块	Module 模组式	16~48	165~500	-40~+65	65℃,1500h	500,000	557
		HMAA <span>Updated</span>	LiC module,high power,for AGV,power grid,elevator,rail transit etc. LiC模组, 高功率型, 用于AGV、电梯、电网、轨道交通等	Module 模组式	8~864	5~∞	-25~+55	55℃,1000h	50,000	558
		HMAE <span>Updated</span>	LiC module,high energy,for EV bus,rail transit etc. LiC模组, 高能量型, 用于电动巴士、轨道交通等	Module 模组式	8~864	5~∞	-25~+55	55℃,1000h	50,000	559
		HMGA <span>NEW</span>	LiC module, high power, for Wind power generation ,Energy recovery. LiC模组, 高功率型, 用于风力发电变桨、能量回收等	Module 模组式	8~864	5~∞	-25~+65	65℃,1000h	50,000	562



## Aluminum Electrolytic Capacitors

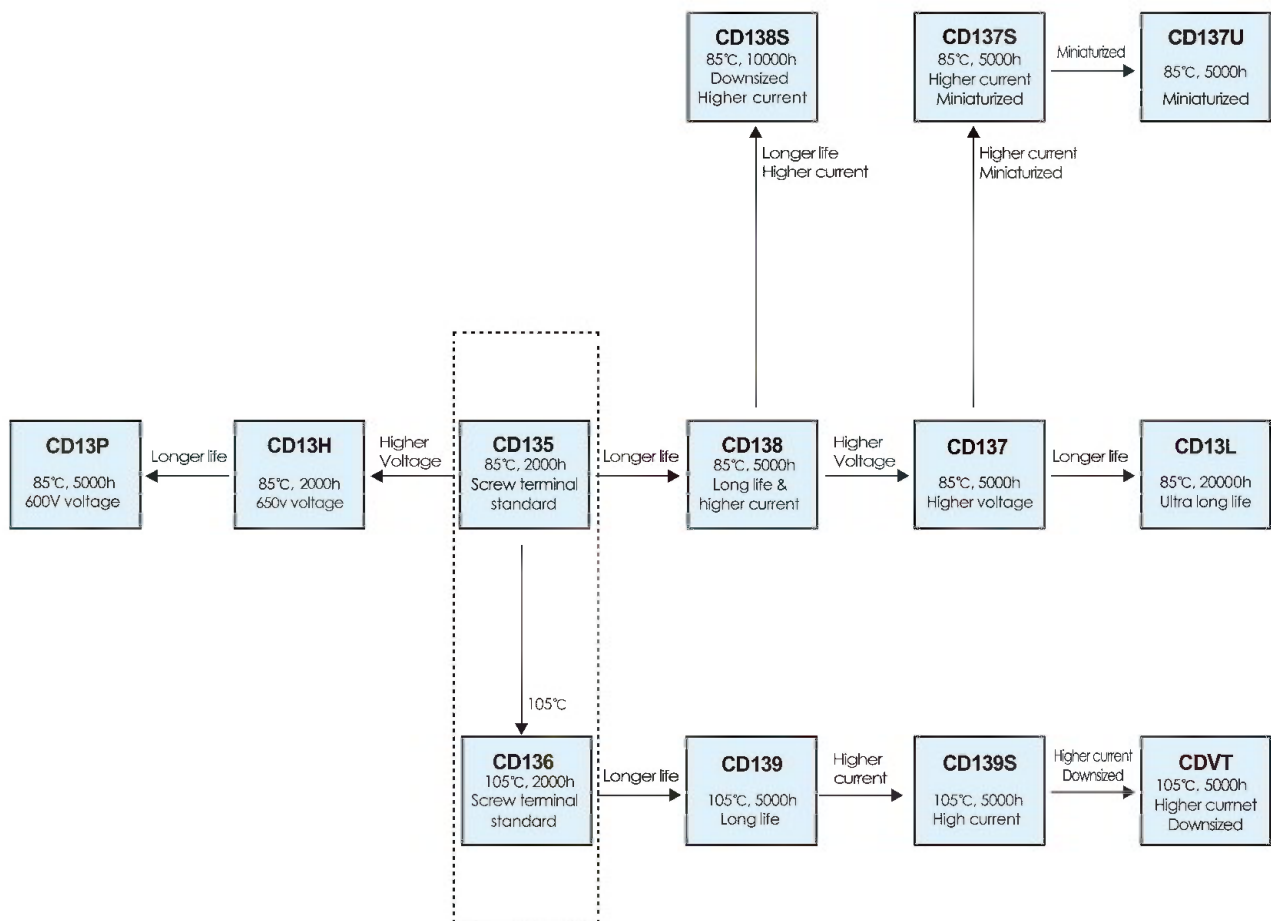
### ■ Snap-in





## Aluminum Electrolytic Capacitors

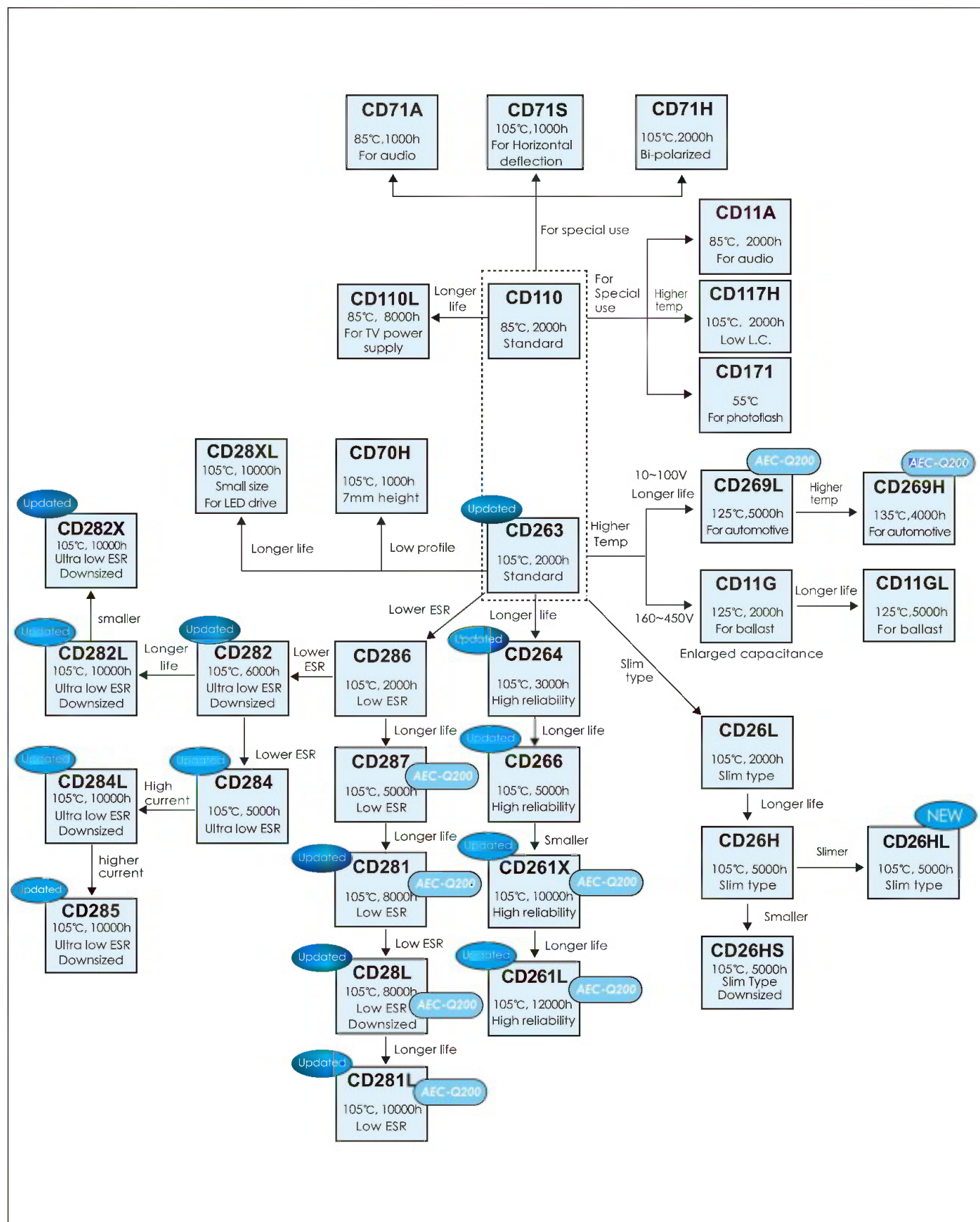
### ■ Screw Terminal





## Aluminum Electrolytic Capacitors

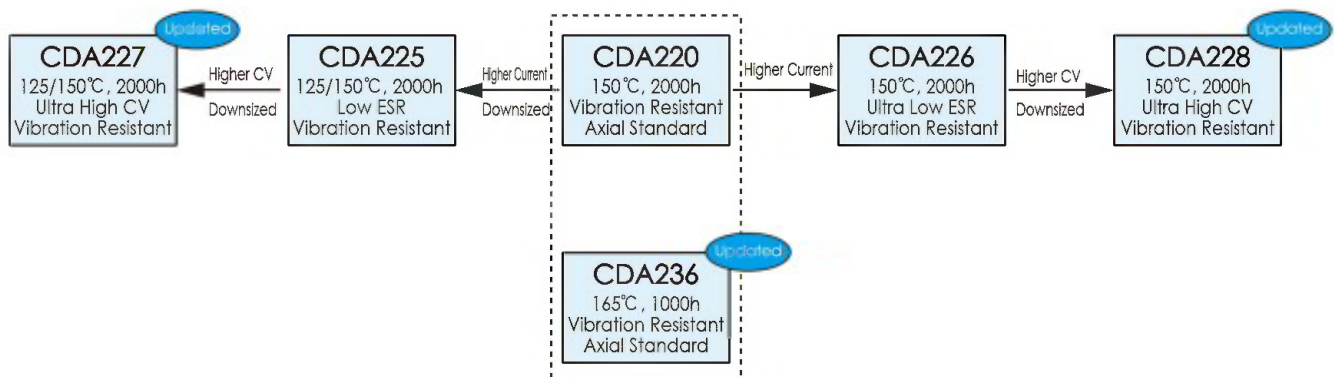
### ■ Miniature



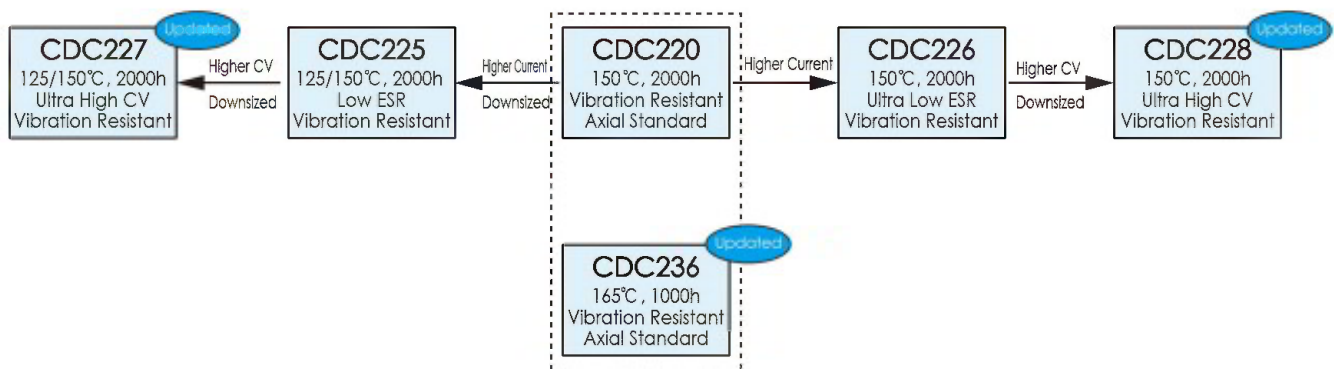


## Aluminum Electrolytic Capacitors

### ■ Axial Type



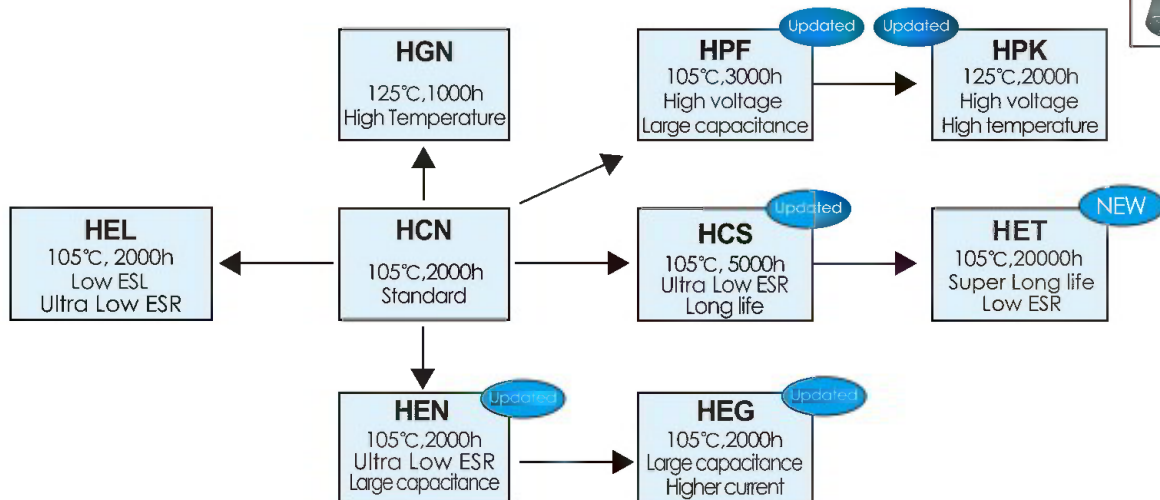
### ■ Crown Type



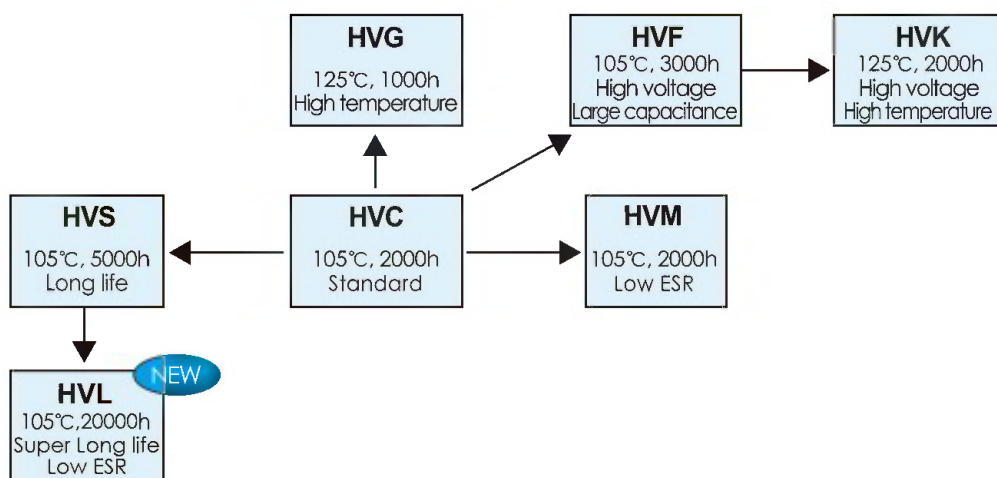


## Conductive Polymer Aluminum Solid Capacitors

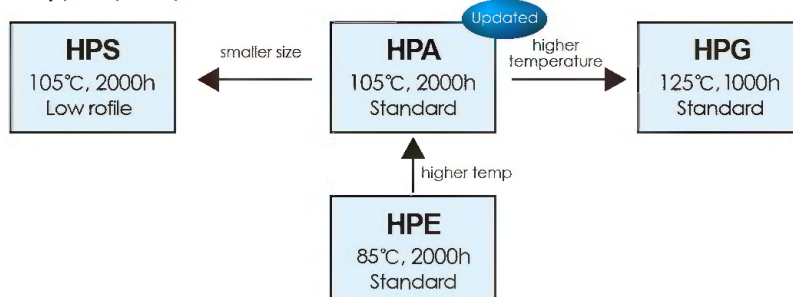
### ■ Radial Type



### ■ SMD Type (Vertical)



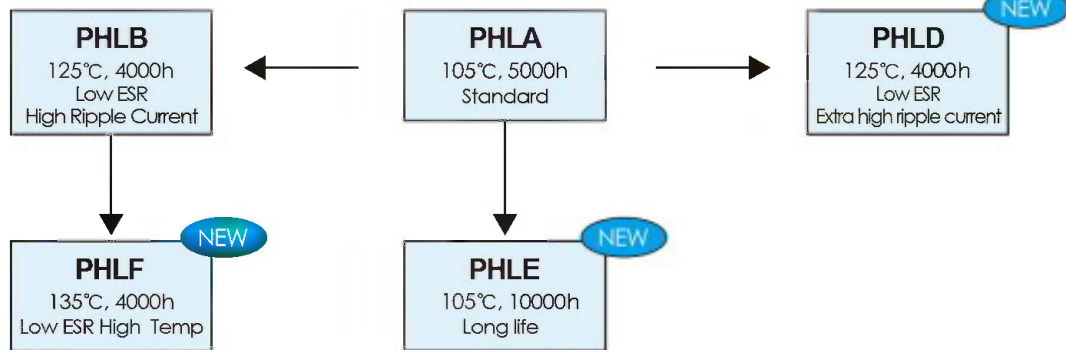
### ■ SMD Type (Flat)



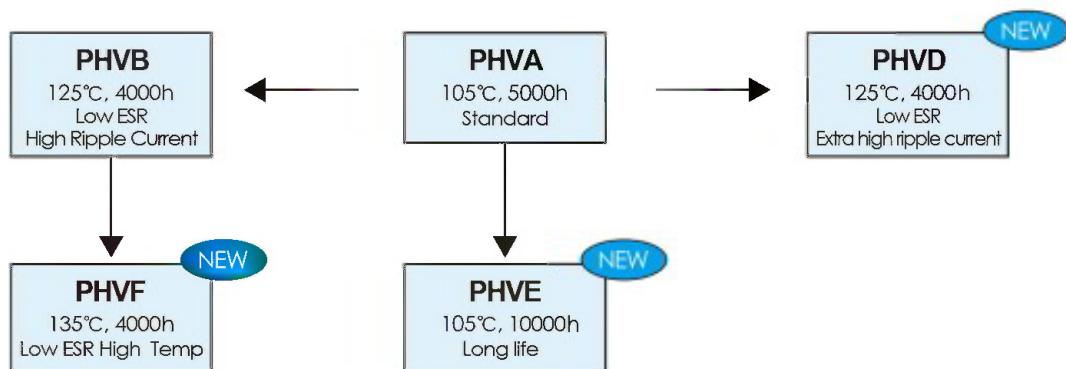


## Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

### ■ Radial Type



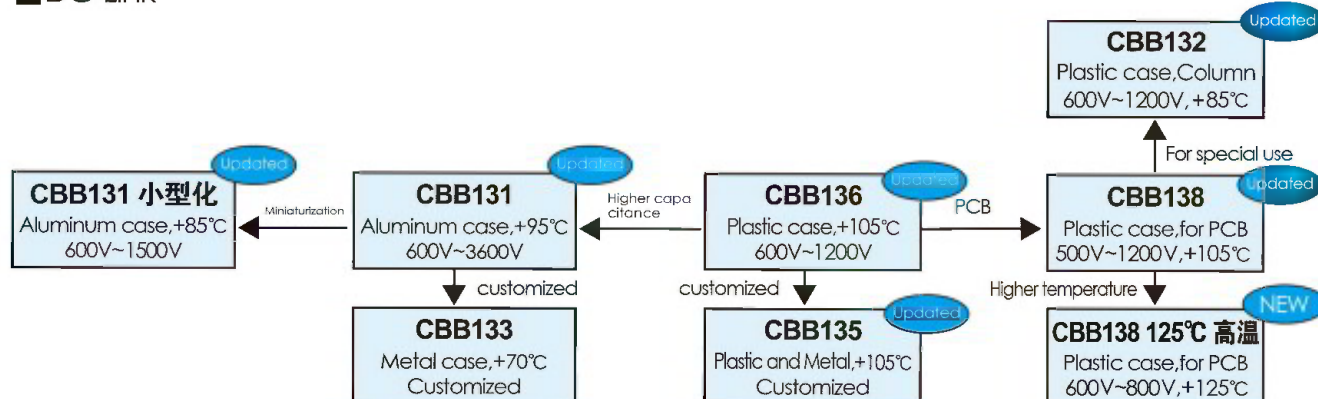
### ■ SMD Type (Vertical)



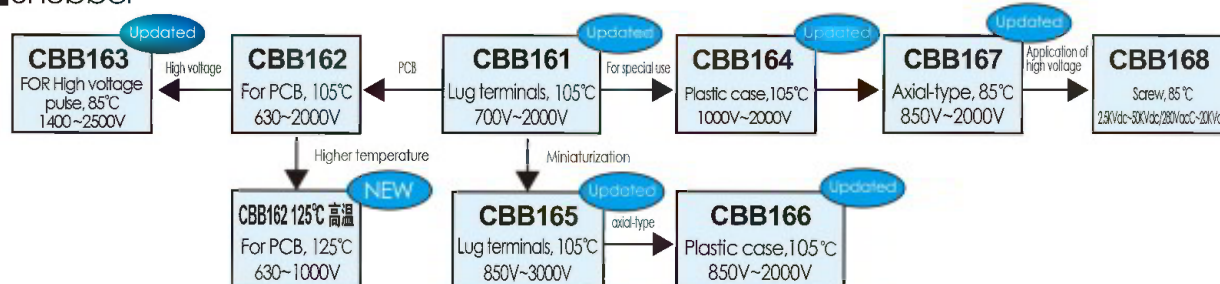


## Metallized polypropylene Film Capacitors

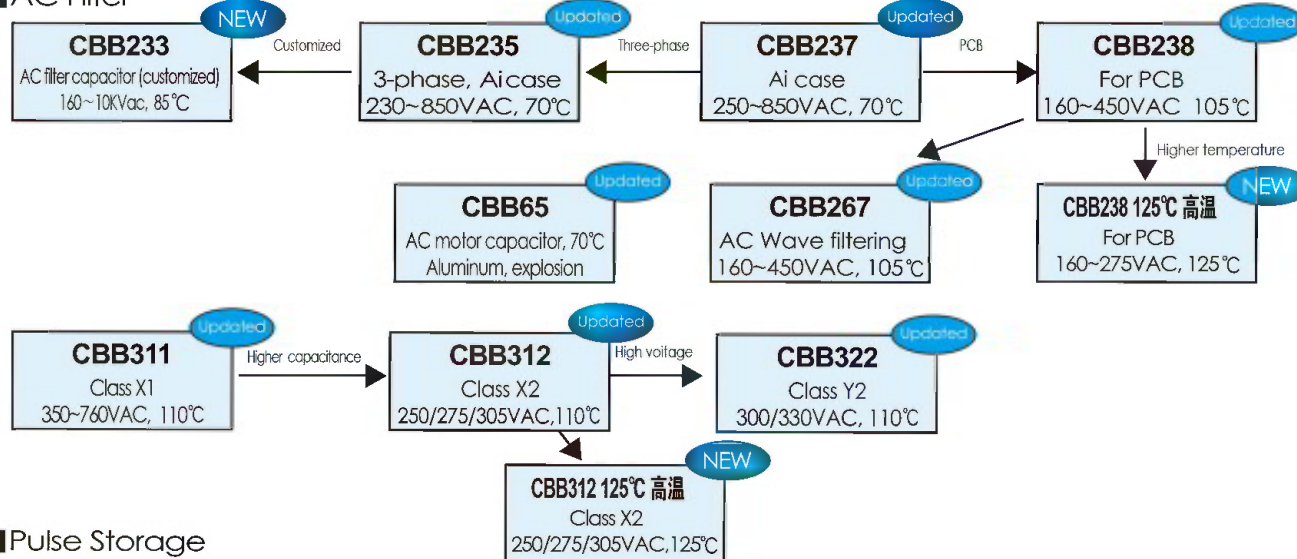
### ■ DC-Link



### ■ Snubber



### ■ AC Filter



### ■ Pulse Storage



### ■ Consumer capacitor

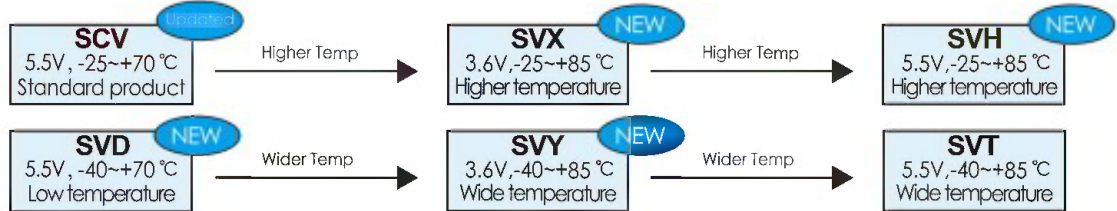




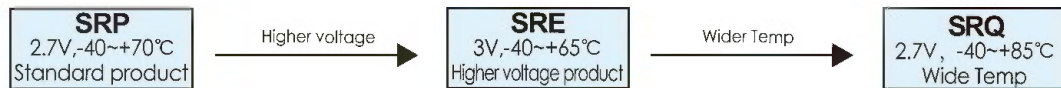
## Super Capacitors

### EDLC

#### ◆ Coin Type



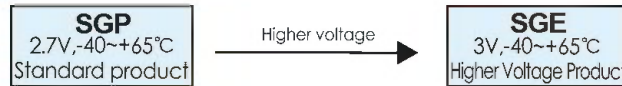
#### ◆ Radial Type



#### ◆ Snap-in/Lug/ Welded Column Type

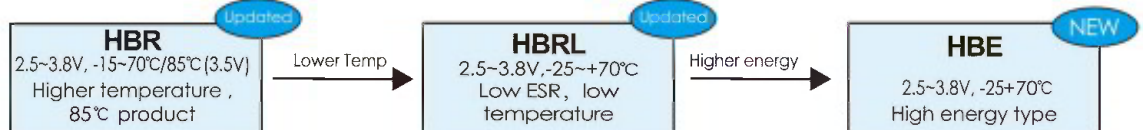


#### ◆ Screw Type

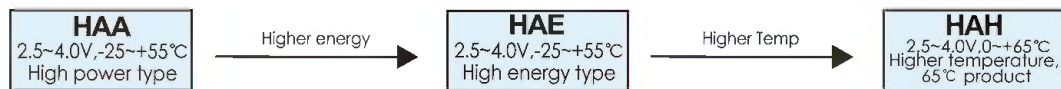


### LIC

#### ◆ Radial Type



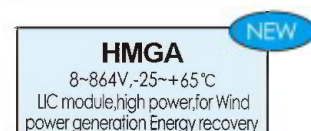
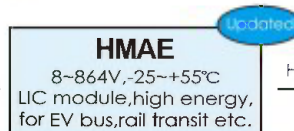
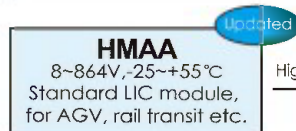
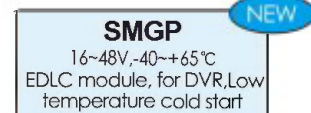
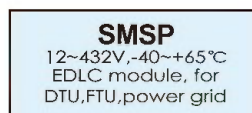
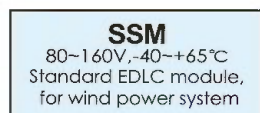
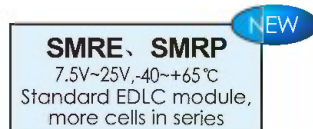
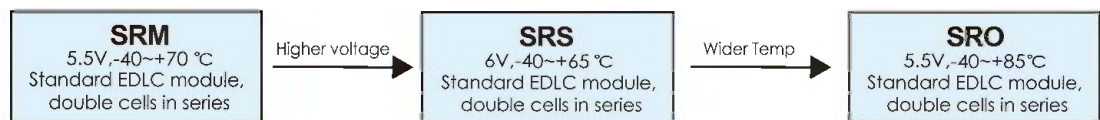
#### ◆ Laminating Type



#### ◆ Screw/Welded Column Type



### Module







## Aluminum Electrolytic Capacitors





## ■ TECHNICAL NOTES

### 1. General Description of Aluminum Electrolytic Capacitors

#### 1-1 Principle of Capacitor Construction

The principle construction of a parallel plate capacitor is shown in Fig. 1.

When a voltage  $V$  is applied between the conducting electrodes placed opposite to each other, a certain amount  $Q$  of electric charge proportional to the voltage can be stored on the surfaces of the dielectric. The proportional constant is called capacitance  $C$ , designating the ability of a capacitor to store energy in an electric field.

$$Q = C \cdot V$$

$Q$ : Charge (C)

$V$ : Voltage (V)

$C$ : Capacitance (F)

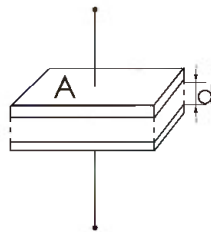


Fig. 1

The capacitance  $C$  of capacitor can be expressed by the following equation:

$$C = \epsilon_0 \cdot \epsilon_r \cdot A / d$$

$\epsilon_r$ : dielectric constant

$\epsilon_0$ : dielectric constant in vacuum ( $= 8.85 \times 10^{-12} \text{ F/m}$ )

$A$ : electrode area [ $\text{m}^2$ ]

$d$ : electrode distance [ $\text{m}$ ]

The dielectric constant of an aluminum oxide layer is 7 to 8. Larger capacitances can be obtained by enlarging the electrode area  $A$  or by reducing the distance  $d$ . Table 1 shows the dielectric constants of typical dielectrics used in capacitors. In many cases, capacitor names are related to their dielectric material used, for example, aluminum electrolytic capacitor, tantalum capacitor, etc.

Table 1

Dielectric	Dielectric Constant	Dielectric	Dielectric Constant
Aluminum oxide film	7 to 8	Porcelain (ceramic)	10 to 120
Mylar	3.2	Polypropylene	2.2
Mica	6 to 8	Tantalum oxide film	10 to 20

Aluminum electrolytic capacitors offer large volumetric capacitance values, because the anode electrode's surface is roughened by electrochemical etching, enlarging its area by factor of 20~100 compared to plain foil, and also because the dielectric layer is very thin (1.4 nm/V).

The schematic cross section of an aluminum electrolytic capacitor is shown in Fig. 2

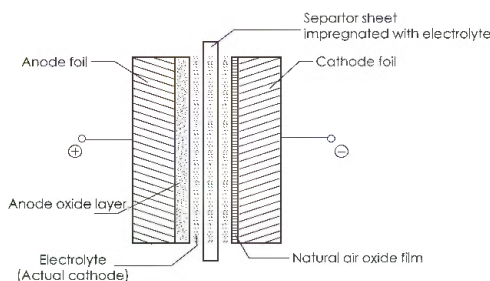


Fig. 2

### 1. 铝电解电容器的基本概要

#### 1-1. 电容器的结构原理

平行板电容器的基本结构原理可以用图1-1来描述。

当一个电压 $V$ 施加在彼此正对的两块导电极板两端时，与电压成正比的电荷量 $Q$ 将被储存在电介质的表面。这个用来标称电容器在电场中储能能力的比例常数被称作容量 $C$ 。

$$Q = CV$$

$Q$ : 电量 (C)

$V$ : 电压 (V)

$C$ : 电容量 (F)

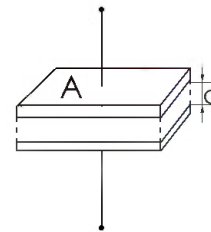


图 1

电容器的容量可以用以下公式来表示：

$$C = \epsilon_0 \cdot \epsilon_r \cdot A / d$$

$\epsilon_r$ : 电介常数

$\epsilon_0$ : 真空中的电介常数 ( $= 8.85 \times 10^{-12} \text{ F/m}$ )

$A$ : 极板面积 [ $\text{m}^2$ ]

$d$ : 极板距离 [ $\text{m}$ ]

铝氧化膜的相对介电常数为7~8，要想获得更大的电容，可以通过增加表面积 $A$ 或者减少其厚度 $d$ 来获得。

表1-1列出了电容器中常用的几种典型介质的相对介电常数，在很多情况下，电容器的命名通常是与介质所使用的材料相关的，例如：铝电解电容器、钽电容器等。

表 1

介质	相对介电常数	介质	相对介电常数
铝氧化膜	7 ~ 8	陶瓷	10 ~ 120
薄膜树脂	3.2	聚丙烯	2.2
云母	6 ~ 8	钽氧化膜	10 ~ 20

电容器的电极表面通过电化学腐蚀变得粗糙，从而使面积比光箔扩大了20~100倍，同时电介质层的厚度非常小（1.4纳米/伏），因此铝电解电容器可以提供非常大的体积容量。

图1-2是铝电解电容器的切面示意图。

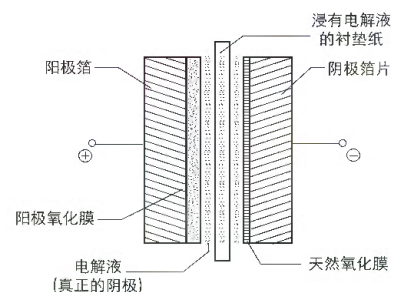


图 2



## 1-2 Equivalent Circuit of the Capacitor

The electrical equivalent circuit of the aluminum electrolytic capacitor is given in Fig.3

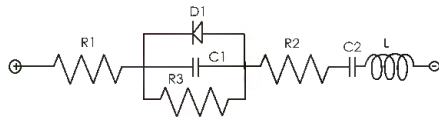


Fig. 3

- R1: Resistance of terminal and electrode
- R2: Resistance of anode oxide layer and electrolyte
- R3: Insulation resistance because of defective anodic oxide layer
- D1: Oxide semiconductor of anode foil
- C1: Capacitance of anode foil
- C2: Capacitance of cathode foil
- L: Inductance caused by terminals, electrodes, etc.

## 1-2 电容器的等效电路

电容器的等效电路图可由下图3表示

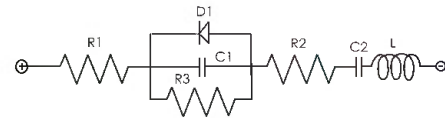
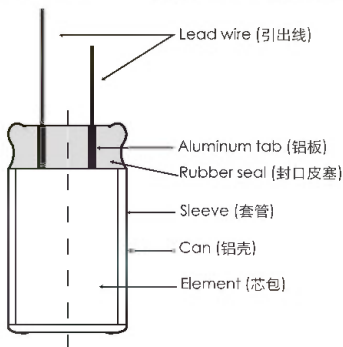


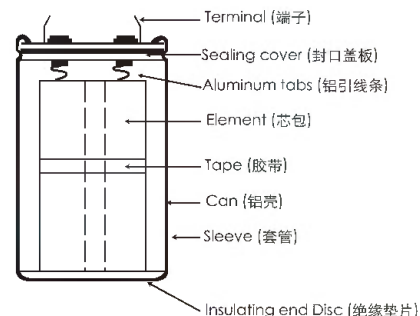
图 3

- R1: 电极和引出端子的电阻
- R2: 阳极氧化膜和电解质的电阻
- R3: 损坏的阳极氧化膜的绝缘电阻
- D1: 具有单向导电性的阳极氧化膜
- C1: 阳极箔的容量
- C2: 阴极箔的容量
- L: 电极及引线端子等所引起的等效电感量

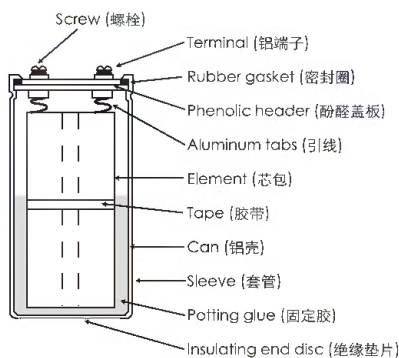
## 1-3 Structure of aluminum electrolytic capacitor



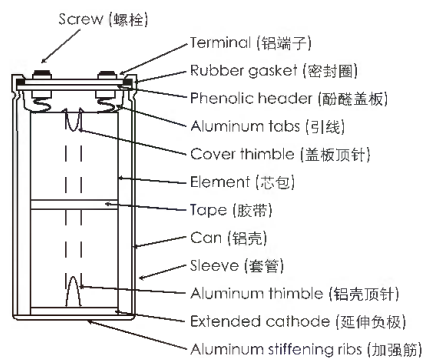
Radial Type (引线式)



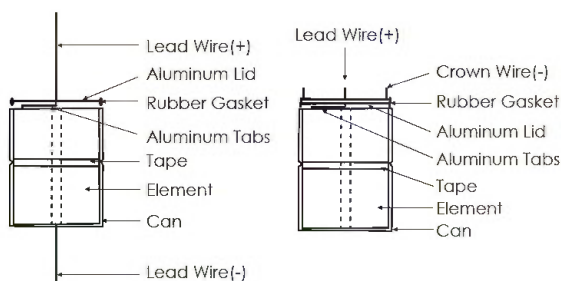
Snap-in Type (焊针式)



Screw Type-glue fixing (螺栓式-固定胶固定)

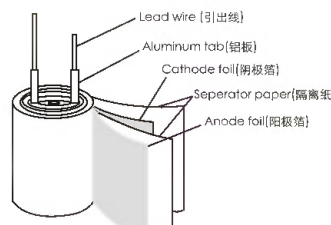


Screw Type-thimble fixing (螺栓式-顶针固定)

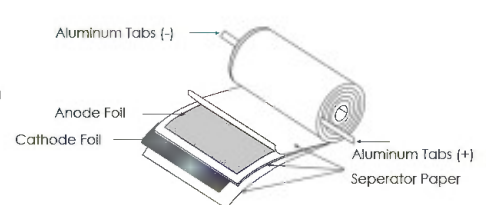


Axial Type (轴向式)

Crown Type (皇冠式)



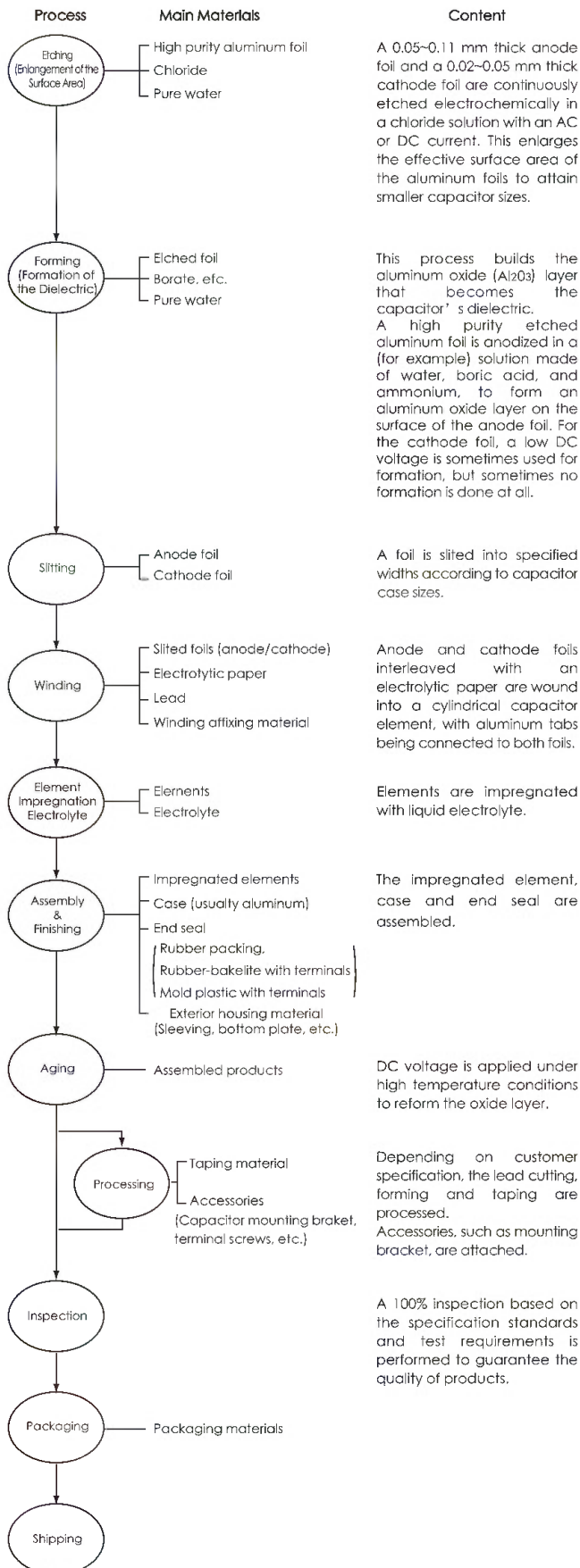
Construction of Element (芯包展开图)



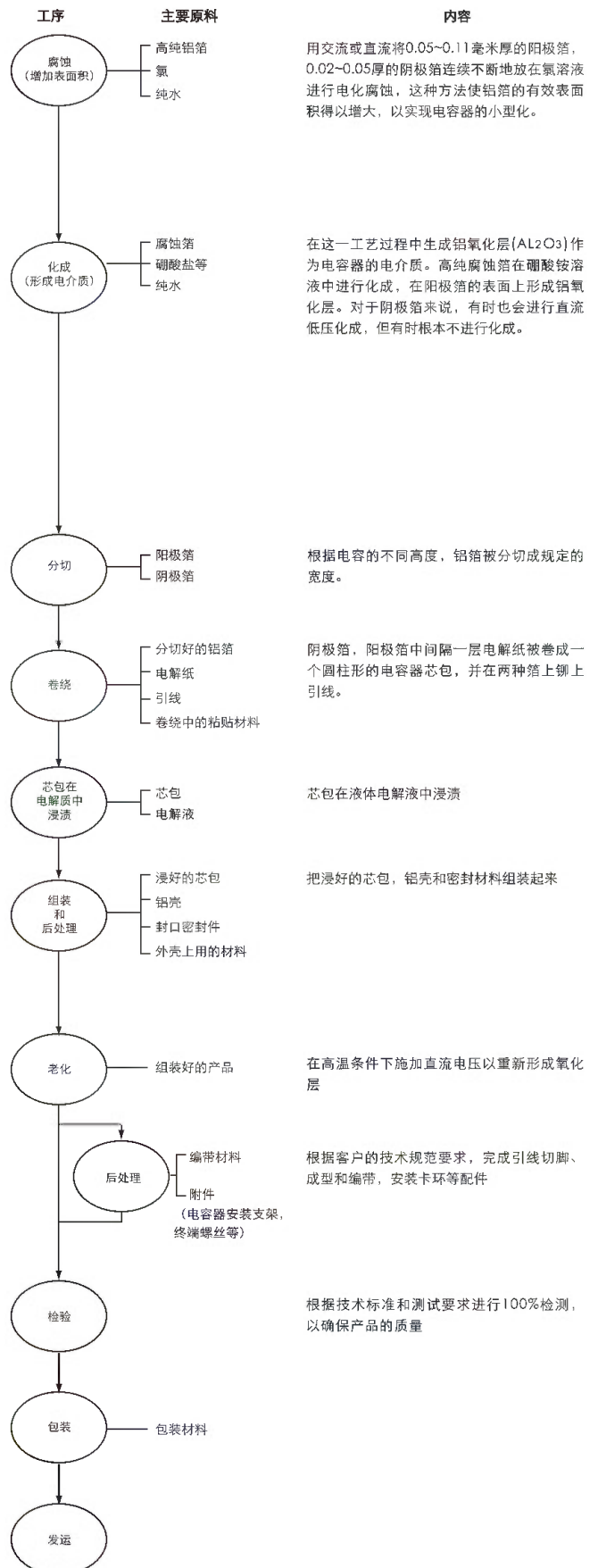
Structure of Element (轴向芯包展开图)



## 1-4 Manufacturing process of aluminum electrolytic capacitors



## 1-4 铝电解电容器制造流程





## 1-5 Basic parameters and terms

### 1-5-1 Capacitance:

The capacitance of the dielectric portion of the anode aluminum foil can be calculated with the following formula :

$$C_a = 8.855 \times 10^{-8} \frac{\epsilon \cdot A}{d} \quad (F)$$

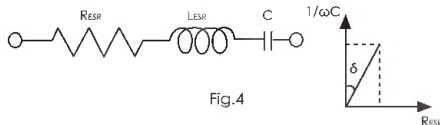
The cathode foil capacitance  $C_c$  depends on the dielectric properties of the oxide layer which was either deposited by a forming voltage or which grew naturally during storage (typically, the voltage proof of the cathode oxide layer is 1V or less). According to the construction of aluminum electrolytic capacitors,  $C_a$  and  $C_c$  are connected in series. Therefore, the total capacitance can be determined by the following formula:

$$C = \frac{C_a \times C_c}{C_a + C_c}$$

The standard capacitance tolerance is 20%(M); however, capacitors with a capacitance tolerance of 10%(K), etc. are also manufactured for special usage. The capacitance of aluminum electrolytic capacitors changes with temperature and frequency of measurement, so the standard has been set to a frequency of 120Hz and temperature of 20°C.

### 1-5-2 Dissipation factor (Tan $\delta$ )

The Tan  $\delta$  is the ratio of the resistive component ( $R_{ESR}$ ) to the capacitive reactance ( $1/\omega C$ ) in the equivalent series circuit.



$$\tan \delta = R_{ESR} / (1/\omega C) = \omega C R_{ESR}$$

where :  $R_{ESR} = ESR$  at 120Hz

$$\omega = 2\pi f$$

$$f = 120\text{Hz}$$

The Tan  $\delta$  shows higher values as a measuring frequency increases and a measuring temperature decrease.

### 1-5-3 Equivalent series resistance (ESR)

The equivalent series resistance (ESR) represents all of the ohmic losses of the capacitor. In the equivalent circuit, it is connected in series with the capacitance. The ESR originates from the ohmic resistances of the electrode foils, the electrolyte, the leads and each internal connection.

The ESR declines with increasing temperature, and also declines steadily with increasing frequency at low frequencies.

### 1-5-4 Impedance (Z):

The impedance is the resistance which opposes the flow of alternating current at a specific frequency. It is related to capacitance (C) and inductance (L) in terms of capacitive and inductive reactance, and also related to the ESR. It is expressed as follows:

$$Z = \sqrt{ESR^2 + (X_L - X_C)^2}$$

Where:  $X_C = 1/\omega C = 1/2\pi f C$

$$X_L = \omega L = 2\pi f L$$

## 1-5 基本参数和术语

### 1-5-1 电容量

阳极箔电介质部分的容量可以用下列公式进行计算:

$$C_a = 8.855 \times 10^{-8} \frac{\epsilon \cdot A}{d} \quad (F)$$

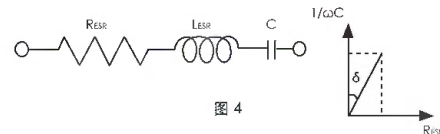
阴极箔的容量  $C_c$  决定于氧化膜介质的特性, 阴极箔的氧化膜可由电压化成生成, 或者储存期间自然生长而成 (通常阴极箔的氧化膜耐压小于 1V)。根据铝电解电容器的结构,  $C_a$  和  $C_c$  是串联在一起的, 因此, 电容器的总容量可用下列公式得出:

$$C = \frac{C_a \times C_c}{C_a + C_c}$$

标准的容量允许公差为  $\pm 20\%$  (M), 不过, 诸如公差为  $\pm 10\%$  (K) 等特殊用途的电容器也是可以生产的。铝电解电容器的容量会随测试温度和频率而变化, 因此, 设定测试的标准条件为 120Hz, 20°C。

### 1-5-2 损耗角正切 (Tan $\delta$ )

在等效电路中, 等效串联电阻 ESR 同容抗  $1/\omega C$  之比称之为 Tan  $\delta$ 。



$$\tan \delta = R_{ESR} / (1/\omega C) = \omega C R_{ESR}$$

其中:  $R_{ESR} = ESR$  (120 Hz)

$$\omega = 2\pi f$$

$$f = 120\text{Hz}$$

Tan  $\delta$  随着测量频率的增加而变大, 随测量温度的下降而增大。

### 1-5-3 等效串联电阻 (ESR)

等效串联电阻 (ESR) 是表征电容器全部欧姆损耗的量值。在等效电路中, 它与容量串联。等效串联电阻的欧姆电阻来自于电极箔、电解液、引线的电阻及它们之间的连接电阻。

ESR 随温度上升而下降, 在低频区也随频率的上升而降低。

### 1-5-4 阻抗 (Z) :

在特定的频率下, 阻碍交流电通过的电阻就是所谓的阻抗 (Z)。它与容量和电感所对应的容抗和感抗有关, 也与等效串联电阻 ESR 有关。具体表达式如下:

$$Z = \sqrt{ESR^2 + (X_L - X_C)^2}$$

其中:  $X_C = 1/\omega C = 1/2\pi f C$

$$X_L = \omega L = 2\pi f L$$



A typical impedance-versus-frequency curve is shown below. It takes on its minimum value at the self-resonant frequency, and the impedance is equal to the ESR at that frequency.

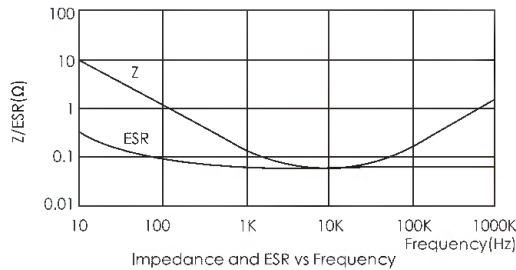


Fig.5

## 1-5-5 Leakage current:

Leakage Current is the DC current flowing through the capacitor with the rated voltage applied. The value of leakage current depends on the voltage applied, the charging period and capacitor temperature. The leakage current shows higher values as the temperature and voltage increase.

The leakage current value can be decreased by proper selection of materials and production methods; however, cannot be totally eliminated.

The specified leakage current value is measured after the rated voltage of the capacitor is applied at room temperature for a specified time period.

## 1-5-6 Ripple current

Ripple current is the alternating current flowing through a capacitor. This current causes an internal temperature rise due to power losses in the capacitor. The rated ripple current are specified for an expected temperature rise at rated temperature, under which the capacitor will operate normally during the whole lifetime period.

Generally, the 85°C type capacitors permit a temperature rise of 10°C and have a maximum permitted core temperature of 95°C. The 105°C type capacitors permit a temperature rise of 5°C and have a maximum core temperature of 110°C. Actual maximum permitted core temperatures vary by type and manufacturer.

When operating temperature decreases, the maximum permitted core temperature rises, in the other word, the rated ripple current could be increased when the actual operating temperature is less than the rated temperature. However, too much temperature rise will cause the capacitor to exceed its maximum permitted core temperature of each ambient temperature and fail quickly, operation close to the maximum permitted core temperature will dramatically shorten expected life. The following shows a guide limit of maximum core temperature rise ( $\Delta T$ ) at each ambient temperature for a 105°C maximum rated products.

Table 2

Ambient temperature $T_a$ (°C)	40	55	65	85	105
Guide limit of $\Delta T$ (°C)	30	30	25	15	5
Core temperature $T_a + \Delta T$	70	85	90	100	110

In most applications, there is more than one frequency for the ripple current. In this cases, the r.m.s. (root mean square) value of the ripple currents needs to be considered, because currents of all frequencies contribute to the self-heating:

$$I_a = \sqrt{\left(\frac{I_{f1}}{F_{f1}}\right)^2 + \left(\frac{I_{f2}}{F_{f2}}\right)^2 + \dots + \left(\frac{I_{fn}}{F_{fn}}\right)^2}$$

$I_a$ : r.m.s. value of the rated ripple currents

$I_{f1} \dots I_{fn}$ : r.m.s. values of ripple currents at frequencies  $f_1 \dots f_n$

$F_{f1} \dots F_{fn}$ : correction factor for the current at frequencies  $f_1 \dots f_n$

$F_{fi} = \sqrt{\frac{ESR(f_0)}{ESR(f_i)}}$  where  $f_0$  = reference frequency of the nominal

ripple current

The typical frequency multipliers are shown in the specification.

下图中标出的是典型的阻抗频率曲线。谐振频率点出现最小值，该频率点的阻抗与ESR值相等。

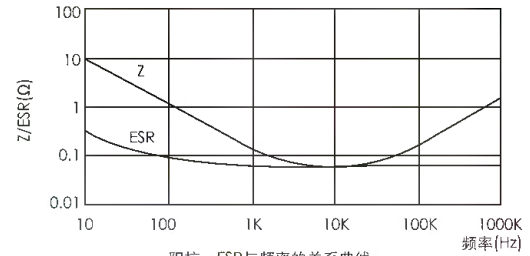


图5

## 1-5-5 漏电流:

漏电流即是在施加了电压后流经电容器的直流电流。电流值与施加的电压，充电时间和电容器的温度有关。温度升高、电压升高都会使漏电流增大。

漏电流的值可以通过合适的材料和生产方式来加以降低，但它不能被完全消除。

漏电流规格值是在室温条件下和规定的时间内对电容器施加了额定电压之后测得的。

## 1-5-6 纹波电流

纹波电流即是在电容器内流过的交流电流。由于电容器内的功率损耗，纹波电流会使电容器内部产生一个温升。为了使电容器在寿命周期内正常工作，每个电容器都规定了一个额定工作温度下的额定纹波电流，从而限制其内部温升。

通常85°C的电容器允许的最高温升为10°C，即芯包中心最高允许温度为95°C；105°C的产品，允许的最高温升为5°C，芯包中心最高允许温度可到110°C。不同种类电容和不同制造厂家，实际的允许纹波电流也有所不同。

当工作温度下降时，中心最大允许温升可以增大，也就是说，当实际工作温度小于额定温度时，电容器的额定纹波电流可以上升。然而，过大的温升会导致电容器内部温度超出各环境温度下的最大允许温度而快速失效，工作时的内部温度太接近最大允许温度将严重缩短电容器的预期寿命。下表给出了额定温度为105°C的产品在各环境温度下的最大允许温升 ( $\Delta T$ )。

表2

环境温度 $T_a$ (°C)	40	55	65	85	105
最大温升 $\Delta T$ (°C)	30	30	25	15	5
中心温度 $T_a + \Delta T$	70	85	90	100	110

在多数应用场合，纹波电流的频率不止一个。这种情况下，必须考虑纹波电流的均方根值，因为电容器的自身发热是由所有频率的纹波电流共同引起的：

$$I_a = \sqrt{\left(\frac{I_{f1}}{F_{f1}}\right)^2 + \left(\frac{I_{f2}}{F_{f2}}\right)^2 + \dots + \left(\frac{I_{fn}}{F_{fn}}\right)^2}$$

$I_a$ : 纹波电流的均方根值

$I_{f1} \dots I_{fn}$ : 在频率  $f_1 \dots f_n$  下的纹波电流均方根值

$F_{f1} \dots F_{fn}$ : 在频率  $f_1 \dots f_n$  时的纹波电流修正系数

$F_{fi} = \sqrt{\frac{ESR(f_0)}{ESR(f_i)}}$  此处  $f_0$  = 标称纹波电流的参考频率

典型频率的纹波电流修正系数已在具体规范中列出。



## 1-5-7 Rated Voltage

Rated voltage is the maximum peak voltage including ripple voltage that may be applied continuously between the terminals of the capacitor over the specified temperature range. When a ripple current is applied to the capacitor, the sum of the peak ripple voltage and the bias DC voltage should not exceed the rated voltage, namely

$U_P + U_B \leq U_R$ , where:

$U_P$ : peak ripple voltage

$U_B$ : bias DC voltage

$U_R$ : rated voltage

Capacitors with higher rated voltage could replace the lower rated voltage capacitors as long as case size and electrical performances are also compatible.

## 1-5-8 Recovery Voltage (Dielectric Absorption)

After charging and then discharging aluminum electrolytic capacitors, a voltage between the two terminals will appear after some time. This voltage may reach levels of 15 ~ 25% of the originally applied voltage and it is called recovery voltage. Its existence is related to the phenomenon of dielectric absorption.

Once the recovery voltage is present, sparks may scare the workers during assembly, and low-voltage components (CPU, memory, etc.) may be affected. Measures to prevent this are to discharge the accumulated electric charge by a resistor of about 100Ω to 1kΩ before usage, or to ship out the capacitors with short-circuited terminals, e.g. by covering them with an aluminum foil or a conductive plastic cover at the production stage. Please consult us for adequate procedures.

## 2. To calculate balance resistance when connecting in series

In order to use capacitors at higher voltages than rated voltage it is necessary to connect them in series. Due to differences in leakage currents between individual capacitors, parallel resistors for each capacitor may be required, cf. Fig6.

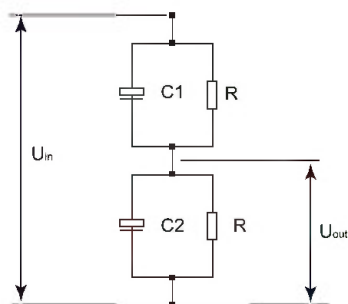


Fig.6

The current  $I_R$  through the resistor  $R$  must be larger than the leakage current in order to control the even split of the voltage. If we suppose the leakage current  $I_L$  to be 0.003CU (normally it is considerably less than this), and let  $I_R$  be five times larger than  $I_L$ , then the value of the balancing resistor  $R$  can be calculated by the following equation:

$$R = U_C / (5 \times I_L) = U_C / 0.015CU_C = 1 / 0.015C$$

(Unit: R—Ω;  $U_C$ —V; C—F)

Example: calculation of the value of the balancing resistor in case of connecting two CD\_293\_BZ, 400V, 330μF capacitors in series.

$$R = 1 / 0.015C = 1 / (0.015 \times 330 \times 10^{-6}) = 202K\Omega$$

## 1-5-7 额定电压:

额定电压是在整个温度范围内可以连续施加在电容器两个端子上的包括纹波电压在内的最高峰值电压。当电容器上施加纹波电流时,纹波电压峰值与偏置直流电压的叠加值应不大于电容器的额定电压,即

$U_P + U_B \leq U_R$ , 此处:

$U_P$ : 纹波电压峰值

$U_B$ : 偏置直流电压

$U_R$ : 额定电压

只要壳号电性能是一致的,那么额定电压较高的电容器均可代替额定电压较低的电容器。

## 1-5-8 再生电压 (介质吸收)

电容器充电后将电放掉,过一段时间端子间又会产生电压,电压值能够达到原先施加电压的15~25%,这个电压被称为再生电压,其存在与介质吸收现象有关。

一旦出现再生电压,产生的打火会惊吓到装配线的工人,低压部件(如CPU、内存等)可能会受到影响。预防的措施是在使用前用100 ~ 1KΩ的电阻将电容器上累积的电荷放掉,或者是在运输时把电容器端子短路起来,比如,生产时在电容器上覆盖一张铝箔或导电塑料盖。如需了解更多细节,请与我们联系。

## 2. 电容器串联均衡电阻计算:

为了在高于额定电压的更高电压下使用电容器,必须将其进行串联。由于每个电容器的漏电流不同,因此就需要在每个电容器上并联电阻。如图6。

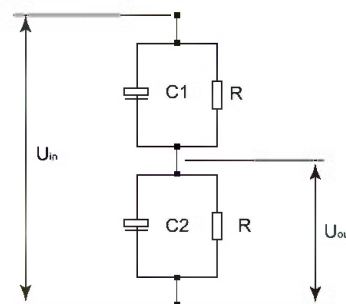


图6

流过电阻 $R$ 的电流 $I_R$ 必须远大于电容器的漏电流,以便控制电压的均等分布。假定流过电阻 $R$ 的电流为电容器漏电流的5倍,而电容器的稳定漏电流 $I_L$ 设定为0.003CU<sub>C</sub>(实际漏电流小于该值),则均压电阻的计算公式为:

$$R = U_C / (5 \times I_L) = U_C / 0.015CU_C = 1 / 0.015C$$

(单位: R—Ω;  $U_C$ —V; C—F)

例: 计算2只CD293 400V330μF 电容器串联时的均压电阻值。

$$R = 1 / 0.015C = 1 / (0.015 \times 330 \times 10^{-6}) = 202K\Omega$$



### 3. About the Life of an Aluminum electrolytic Capacitor

#### 3-1 Definition and the test conditions of the lifetime

Lifetime is the answer to the question “How long will the capacitor survive in my application?” The end of the lifetime is reached when certain parameters exceed pre-defined threshold values. It is common practice to allow a certain portion of species to be outside of the limits (outlier percentage). A deviation of certain parameters from pre-defined ranges does not mean a total loss of the capacitor’s function, but the design of the application should be done in a way to ensure to function properly even under these unfavorable conditions.

In addition to the more practically oriented “useful life” figure, Jianghai also publishes well-defined specifications of “load life” and “endurance” to increase the transparency for the end user. Shelf life test results are also provided to give an indication of the chemical stability of the electrolytic capacitors and to complete the full picture of each capacitor series (Table 3). When comparing lifetime data for capacitors from different manufacturers, please note that other definitions may apply – even if the same terms are used.

### 3. 铝电解电容器的寿命

#### 3-1 寿命的定义和测试条件

使用寿命是对下面这个问题的回答：“在我的应用过程中，电容器能保持多长时间不失效？”当某些参数超出了预先的规定值时，即可认为是达到了寿命的终点。但一般说来，实际使用时某些指标超标（某种比例的异常值）是允许的。也就是说，某一参数偏离了预先规定的范围，并不意味着电容器的功能已全部丧失，但是在根据应用要求进行设计时，必须要确保即使在电容器参数超标的不利条件下，设备也能正常工作。

除了较为实用的“使用寿命”数据外，江海还标出了明确的“负载寿命”和“耐久性”指标，以增加对最终用户的透明度。同时还提出了“储存寿命”的测试结果，以表明电解电容器的化学稳定性，并对每个系列的电容器作出了完整的描述（表3）。请注意，当与其他制造商进行寿命数据比较时，即使对于相同的名称，也应同时提供其具体的定义。

	Useful Life 使用寿命		Load Life 负载寿命	Endurance Test 耐久性测试	Shelf Life 储存寿命
Lifetime 寿命	7000h	> 200000h	5000h	5000h	1000h
Leakage Current 漏电流	Not more than specified value 不超过规定值		Not more than specified value 不超过规定值	Not more than specified value 不超过规定值	Not more than specified value 不超过规定值
Capacitance Change 容量变化	Within $\pm 30\%$ of initial value 初始值的 $\pm 30\%$ 以内		Within $\pm 20\%$ of initial value 初始值的 $\pm 20\%$ 以内	Within $\pm 20\%$ of initial value 初始值的 $\pm 20\%$ 以内	Within $\pm 20\%$ of initial value 初始值的 $\pm 20\%$ 以内
Dissipation Factor 损耗	Not more than $\pm 300\%$ of specified value 不超过规定值的 $\pm 300\%$		Not more than $\pm 200\%$ of specified value 不超过规定值的 $\pm 200\%$	Not more than $\pm 130\%$ of specified value 不超过规定值的 $\pm 200\%$	Not more than $\pm 200\%$ of specified value 不超过规定值的 $\pm 200\%$
Condition 条件: Applied Voltage 施加电压 Applied Current 施加电流 Applied Temperature 施加温度	Ur  Ir  105°C	Ur  $1.6 \times Ir$  40°C	Ur  Ir  105°C	Ur  Ir=0  105°C	Ur  Ir=0  105°C <div>After test: Ur to be applied for 30min, &gt;24h before measurement. 试验后施加电压 Ur 30分钟, 过 24 小 时后测试。</div>

Table 3: Full definition of test conditions and allowed ranges  
表3 测试条件和允许范围的完整定义

Definitions and terms that are used by Jianghai to describe the lifetime:

#### 1) Useful life

The useful life test procedure comes close to the actual operating conditions in the application; in addition to the d.c. bias voltage and the presence of the upper category temperature, a ripple voltage is superimposed that causes additional thermal stress by self-heating. The test is terminated when 1% of the items under test are outside of the specified parameter limits.

#### 2) Load Life

The load life test has similar test conditions like the useful life test, but the acceptance criteria are stricter than for the useful life test. Additionally, all of the items have to fulfill the test criteria.

江海描述电容器寿命所用的定义和条件:

#### 1) 使用寿命:

使用寿命的测试步骤与应用中的实际操作条件相似: 除了直流偏压和上限温度之外, 还叠加了一个纹波电压, 由于自身发热, 这个电压会引起额外的热应力。当有1%的被测产品的指标参数超过极限值时, 该测试终止。

#### 2) 负载寿命

负载寿命测试的条件与使用寿命的测试条件相仿, 但接受标准比使用寿命测试更为苛刻。另外, 所有被测产品均应达到测试标准。



### 3) Endurance

The method for conducting an endurance test is described in the IEC60384-4 standard: the capacitors are operated at their rated voltage and at their upper category temperature and the time course of their electrical parameters (capacitance, ESR, leakage current) is observed until certain thresholds are exceeded. All of the items under test have to fulfill the test criteria.

### 4) Shelf Life

A good indicator to assess the chemical stability of electrolytic capacitors is the "shelf life". As opposed to the regular storage of capacitors at moderate temperatures, the shelf life test is a demanding accelerated life test that subjects the test specimens for a pre-defined period to their upper category temperature without any voltage applied. Without any voltage applied, the capacitor cannot benefit from any self-healing during the test – this particular feature makes the shelf life test quite tough. Vital parameters like leakage current, capacitance, and dissipation factor must stay within predefined limits after the test. A high numerical value of the shelf life is a good indicator for chemical stability, high purity of the materials and an advanced production quality.

### 3-2 lifetime Estimation of the Aluminum electrolytic capacitor

#### 3-2-1 Self-heating of the aluminum electrolytic capacitor during operation.

During operation, the ripple current flowing through the aluminum electrolytic capacitor will generate heat due to the series equivalent resistance (ESR) of the capacitor. The generated heat will be:

$$P = I^2 R \dots \dots \dots (1)$$

Where I: Ripple current (Arms)

R: ESR ( $\Omega$ )

The heat will cause a core temperature rise of the capacitor as below:

$$\Delta T = \frac{I^2 \cdot R}{A \cdot H} \dots \dots \dots (2)$$

Where  $\Delta T$ : Temperature increase in the capacitor core (deg.)

I: Ripple current (Arms)

R: ESR ( $\Omega$ )

A: Surface area of the capacitor ( $\text{cm}^2$ )

H: Radiation coefficient (Approx.  $1.5 \sim 2.0 \times 10^{-3} \text{W/cm}^2 \times ^\circ\text{C}$ )

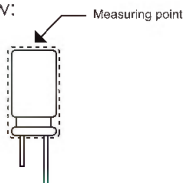
The above equation (2) shows that the temperature of a capacitor increase in proportion to the square of the applied ripple current and ESR, and in inverse proportion to the surface area. Therefore, the amount of the ripple current determines the heat generation, which affects the life. The value of permissible  $\Delta T$  varies depending on the capacitor types and operating conditions. The usage is generally desirable as  $\Delta T$  remains less than  $10^\circ\text{C}$  for  $85^\circ\text{C}$  products and  $5^\circ\text{C}$  for  $105^\circ\text{C}$  products and higher temperature products at their rated temperature.

In practice, since it is not so easy to measure the core temperature for the small size capacitors, the measurement of the surface temperature at the can bottom provides a good approximation of the core temperature value for radial and snap-in capacitors with can sizes up to 35 mm in diameter. The factors given below in table 4 can be used to estimate the core temperature rise based on the surface temperature rise.

Case diameter	~10	12.5~16	18	22	25	30	35
Core/Surface	1.1	1.2	1.25	1.3	1.4	1.6	1.65

Table 4: core temperature rise multipliers for various can diameters

The measuring point for temperature increase due to ripple current is shown below:



### 3) 耐久性测试

进行耐久性测试的方法已在IEC60384-4标准中做了描述。对所有电容器施加额定电压，并置于上限温度中。在整个测试时段中观察它们的电参数（容量、ESR、漏电流）情况，直至某些参数超出极限值。所有被测试电容器均应达到测试标准。

### 4) 储存寿命

用来评估电解电容器化学稳定性的最好办法就是进行储存寿命测试。与在常温下进行常规储存不一样的是，这种储存寿命测试是一种要求很高的加速寿命测试方法；在不加电压的情况下，将测试样品在上限温度条件下放置规定的时间。不加电压，电容器在测试过程中也就无法得到自愈——所以，这一特点使储存寿命测试变得十分严酷。测试后诸如漏电流、容量、损耗等关键参数均必须保持在规定的极限范围内。储存寿命时间长则表明了电容器有较好的化学稳定性、材料的纯度高、生产技术先进。

### 3-2 铝电解电容器的寿命估算

#### 3-2-1. 铝电解电容器工作时的自身发热

在工作时，由于电容器内部存在内阻（ESR），流过的纹波电流会引起电容器的发热。产生的热量可由下式计算

$$P = I^2 R \dots \dots \dots (1)$$

I: 纹波电流 (Arms)

R: 等效串联电阻 ( $\Omega$ )

$$\Delta T = \frac{I^2 \cdot R}{A \cdot H} \dots \dots \dots (2)$$

发热会引起电容器中心的升温，表示如下：

其中， $\Delta T$ : 电容器中心的升温 ( $^\circ\text{C}$ )

I: 纹波电流 (Arms)

R: ESR ( $\Omega$ )

A: 电容器的表面积 ( $\text{cm}^2$ )

H: 散热系数 ( $1.5 \sim 2.0 \times 10^{-3} \text{W/cm}^2 \times ^\circ\text{C}$ )

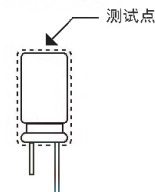
上面公式 (2) 显示电容器的温度上升与纹波电流的平方以及等效串联电阻ESR成正比，与电容器的表面积及散热系数成反比，因此，纹波电流的大小决定着产生热量的大小，从而影响其使用寿命，电容器的类型及使用条件决定了可允许的 $\Delta T$ 值的大小，一般情况下， $85^\circ\text{C}$ 产品， $\Delta T \leq 10^\circ\text{C}$ 。 $105^\circ\text{C}$ 或更高温度产品 $\Delta T \leq 5^\circ\text{C}$ 。

实际应用中，由于测试小尺寸电容器的中心温度并不是很容易，因此引线式电容器和35mm以下的Snap-in电容器，中心的升温可以通过测试电容器底部升温来近似得到。下表4可以用来根据表面升温估算中心升温。

直径	~10	12.5~16	18	22	25	30	35
中心温升/表面温升	1.1	1.2	1.25	1.3	1.4	1.6	1.65

表-4 不同直径电容器中心温升系数

下图表示纹波电流引起的温升的测量点





For larger can sizes snap-in and screw type capacitors, to get more accurate results, a direct measurement of the core temperature by means of a thermocouple is recommended.

Jianghai supplies capacitors with pre-mounted thermocouple for evaluation purposes on request.

### 3-2-2 Estimation calculation of lifetime

3-2-2-1 The life expectancy formula considering the capacitor core temperature and the applied voltage will be:

$$L = L_0 \times 2^{\left(\frac{T_{\max} - T_h}{10}\right)} \times \left(\frac{U_R}{U_A}\right)^n \dots\dots\dots (3)$$

Wherein,  $L_0$ : Life at the rated temperature with the rated ripple current (h)

$T_{\max}$ : Permissible Maximum hot-spot temperature (°C)

$T_h$ : Actual hot-spot temperature (°C)

$U_R$ : Rated voltage (V)

$U_A$ : Actual applied voltage (V)

$n$ : exponent

For small size radial type capacitors  $n=0$ ; for medium and large size capacitors,  $n=2.5$ , the actual working voltage is defined as:

$$0.6 U_R \leq U_A \leq U_R$$

Operating voltage below  $0.6U_R$  is considered to be  $0.6U_R$  in the calculation.

3-2-2-2 The life expectancy formula considering the ambient temperature, the ripple current and applied voltage will be:

$$L = L_0 \times 2^{\left(\frac{T_0 - T}{10}\right)} \times K^{[1 - \left(\frac{l}{l_0}\right)^2]} \times \frac{\Delta T_0}{10} \times \left(\frac{U_R}{U_A}\right)^n \dots\dots\dots (4)$$

Where in,

$L_0$ : Life at the rated temperature with the rated ripple current (h)

$T_0$ : Rated ambient temperature (°C)

$T$ : Actual ambient temperature (°C)

$K$ : Ripple acceleration factor

( $K=2$ , if within allowable ripple current<sup>(1)</sup>;  $K=4$ , if exceeding allowable ripple current)

$l_0$ : Rated ripple current at the rated ambient temperature (Arms)

$l$ : Actual applied ripple current<sup>(2)</sup> (Arms)

$\Delta T_0$ : Temperature rise at capacitor core at rated temperature (°C)

$U_R$ : Rated voltage (V)

$U_A$ : Actual voltage (V)

$n$ : Exponent of voltage coefficient

Rated voltage  $U_R \leq 120V$ ,  $n=0$ ;

Rated voltage  $U_R \geq 160V^{(3)}$ ,  $n=2.5$

Actual voltage is defined as:  $0.6U_R \leq U_A \leq U_R$ , operating voltage below  $0.6U_R$  is considered to be  $0.6U_R$  in the calculation.

Note: 1. The allowable ripple current is related to ambient temperature, please contact us for the allowable ripple current range;  
2. The frequency of the actual ripple current should be consistent with that of rated ripple current.;  
3. Exponent  $n$  (0 or 2.5) for radial type is related to its case size. please contact us for the details.

3-2-2-3 The life expectancy formula of Axial&Crown aluminum electrolytic capacitors

$$L = L_0 \times 2^{\left(\frac{T_0 - T}{C}\right)} \dots\dots\dots (5)$$

Wherein,  $L$ : Theoretical lifetime at actual operating temperature

$L_0$ : Lifetime at rated operating temperature

$T$ : Actual operating temperature

$T_0$ : Rated operating temperature

$C$ : Temperature acceleration factor, experienced value is 10~12

Expected lifetime is a statistical value calculated on the basis of the experience and on theoretical evaluations. The above formula is only considered as a theoretical reference. Please consult our technical department in case that there is some doubts during calculation or further information about the specific products need to be acquired.

The life expectancy formula shall in principle be applied to the temperature range between the ambient temperature of +40°C and maximum allowable working temperature. The expected life time shall be about fifteen years at maximum as a guide in terms of deterioration of the sealant.

对大尺寸的snap-in和screw电容器, 为了使测试结果更精确, 建议使用热电偶直接测量中心温度。

江海可以根据客户的要求提供预埋好热电偶的电容器用于产品评估测试。

### 3-2-2 寿命估算

3-2-2-1 基于电容器中心温度和施加的工作电压的寿命计算公式:

$$L = L_0 \times 2^{\left(\frac{T_{\max} - T_h}{10}\right)} \times \left(\frac{U_R}{U_A}\right)^n \dots\dots\dots (3)$$

其中,  $L_0$ : 额定温度和额定纹波电流下的寿命

$T_{\max}$ : 中心最大允许温度(°C)

$T_h$ : 实际中心温度(°C)

$U_R$ : 额定电压 (V)

$\Delta U_A$ : 实际工作电压 (V)

$n$ : 电压系数

对小尺寸引线式电容器,  $n=0$ ; 对中等尺寸和大尺寸电容器,

$n=2.5$ 实际工作电压规定如下:

$$0.6 U_R \leq U_A \leq U_R$$

工作电压小于 $0.6U_R$ 时, 计算时取 $0.6U_R$ 。

3-2-2-2 考虑环境温度、纹波电流和工作电压的寿命计算:

$$L = L_0 \times 2^{\left(\frac{T_0 - T}{10}\right)} \times K^{[1 - \left(\frac{l}{l_0}\right)^2]} \times \frac{\Delta T_0}{10} \times \left(\frac{U_R}{U_A}\right)^n \dots\dots\dots (4)$$

其中,  $L_0$ : 额定温度和额定纹波电流下的寿命 (h)

$T_0$ : 额定环境温度 (°C)

$T$ : 实际环境温度 (°C)

$K$ : 纹波电流加速系数

(纹波电流在允许范围<sup>(1)</sup>内:  $K=2$ ; 纹波电流超出允许范围:  $K=4$ )

$l_0$ : 额定工作温度下的额定纹波电流 (Arms)

$l$ : 实际施加的纹波电流<sup>(2)</sup> (Arms)

$\Delta T_0$ : 额定工作温度下电容器中心温升 (°C)

$U_R$ : 额定工作电压 (V)

$U_A$ : 实际工作电压 (V)

$n$ : 电压系数

额定电压  $U_R \leq 120V$ ,  $n=0$ ;

额定电压  $U_R \geq 160V^{(3)}$ ,  $n=2.5$

实际工作电压规定如下 $0.6U_R \leq U_A \leq U_R$ , 工作电压小于 $0.6U_R$ 时, 计算时取 $0.6U_R$

注: 1. 纹波电流允许范围和环境温度有关, 对于不同环境下的允许值, 请与我们联系;  
2. 实际纹波电流的频率须与额定纹波电流的频率保持一致;  
3. 对于引线式产品, 指数 $n$  (0或2.5)和尺寸相关。 $n=2.5$ 适用的尺寸范围请与我们联系。

3-2-2-3 轴向/皇冠铝电解电容器寿命计算公式

$$L = L_0 \times 2^{\left(\frac{T_0 - T}{C}\right)} \dots\dots\dots (5)$$

其中,  $L$ : 实际工作温度下的理论寿命

$L_0$ : 额定工作温度下的工作寿命

$T$ : 实际工作温度

$T_0$ : 额定工作温度

$C$ : 温度加速系数,  $C$ 值一般取10~12

预期寿命是基于经验和理论而计算出的一个统计值, 以上公式仅是一个理论参考。如果在计算中存在疑问或想了解更多关于具体产品的信息, 请咨询我们的技术部门。

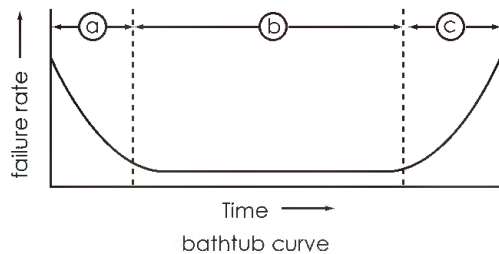
寿命的推算公式, 原则上适用于周围环境温度为+40°C到最高工作温度范围内, 但从封口材料老化这个角度考虑, 实际的预期寿命原则上最大为15年。



## 4. Reliability

### 4-1 The bathtub curve:

Aluminum electrolytic capacitors feature failure rates shown by the following bathtub curve.



#### A Infant failure period

This is a period during which failures are caused by deficiencies in design, structure, manufacturing process or severe misapplications. Such failures occur soon after the components are exposed to circuit conditions. In aluminum electrolytic capacitors, these failures are either corrected through aging process reforming or repairing a damaged oxide layer, or found by the aging process, removed by the sorting process, and thus do not reach the field.

Infant failures due to capacitor misapplication such as inappropriate ambient conditions, over-voltage, reverse voltage or excessive ripple current can be avoided with proper circuit design and installation.

#### B Useful life period

This is a random failure period during which the failure rate is the lowest. These failures are not related to operating time but to application conditions. During this period, non-solid aluminum electrolytic capacitors show a slow decrease in capacitance and a slow increase in  $\tan\delta$  and ESR, which are caused by a small loss of electrolyte, and feature fewer catastrophic failures than semiconductors and solid tantalum capacitors.

#### C wear-out failure period

This is a period during which the properties of a component extremely deteriorate, and the failure rate increases with time. Non-solid aluminum electrolytic capacitors end their useful life during this period.

### 4-2. Failure types:

The two types of failures are classified as catastrophic failures and wear-out failures as follows,

#### ① Catastrophic failure

Like a short circuit or open circuit failure, this is a failures mode which destroys the function of the capacitor.

#### ② Wear-out failure

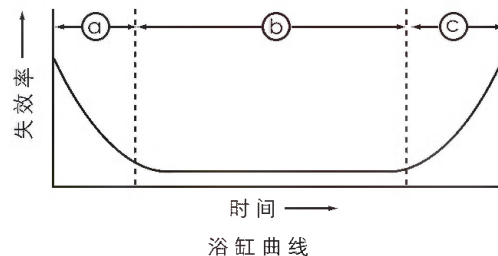
This is a failure mode resulted by the gradual deterioration of the capacitor electrical parameters. The criteria for judging the failures varies with application and design factors.

Capacitance decrease and  $\tan\delta$  increase are caused by the loss of electrolyte in the wear-out failure period. This is due primarily to loss of electrolyte by diffusion (as vapor) through the sealing material. Gas molecules can diffuse out through the material of the end seal. If the electrolyte vapor pressure within the capacitor is increased, by high temperatures for example, the diffusion rate is increased. Swelling of the seal material by electrolyte vapor pressure may also occur at elevated temperature. This swelling may further enhance diffusion and mechanically weaken the seal.

## 4. 可靠性

### 4-1 浴缸曲线

铝电解电容器的失效率特征可以用下图的浴缸曲线来描述



#### A 早期失效期

早期失效阶段是由于在设计、结构、制造工艺中存在缺陷或由于严重的使用不当而造成产品失效的阶段。这种失效在元件通电后不久就会被发现。在铝电解电容器中，这种失效要么通过老化过程中对损坏的氧化膜重新化成或修补得以避免，要么在老化过程中被发现，在测试分选时被剔除，因此不会进入使用领域。

由于使用环境不当、过电压、施加反向电压或纹波电流过大等使用不当引起的早期失效，可以通过适当的电路设计和安装方法加以避免。

#### B 使用寿命期

这是一个随机的失效阶段，通常该阶段的失效概率很低。这种失效与工作环境有关，与工作时间关系不大。在此阶段，非固体电解质电容器表现为容量缓慢下降，损耗和ESR逐渐上升，这是由于电解液量逐渐减少引起的，很少会出现半导体和固体钽电容器那种致命性的失效。

#### C 耗损失效期

该阶段，元件的性能急剧恶化，失效率随时间而上升。非固体铝电解电容器在此阶段结束其使用寿命。

### 4-2. 失效类型:

失效的类型分为两种，致命性失效和耗损性失效。

#### ① 致命性失效

诸如短路和开路失效，这种失效模式破坏了电容器的使用功能

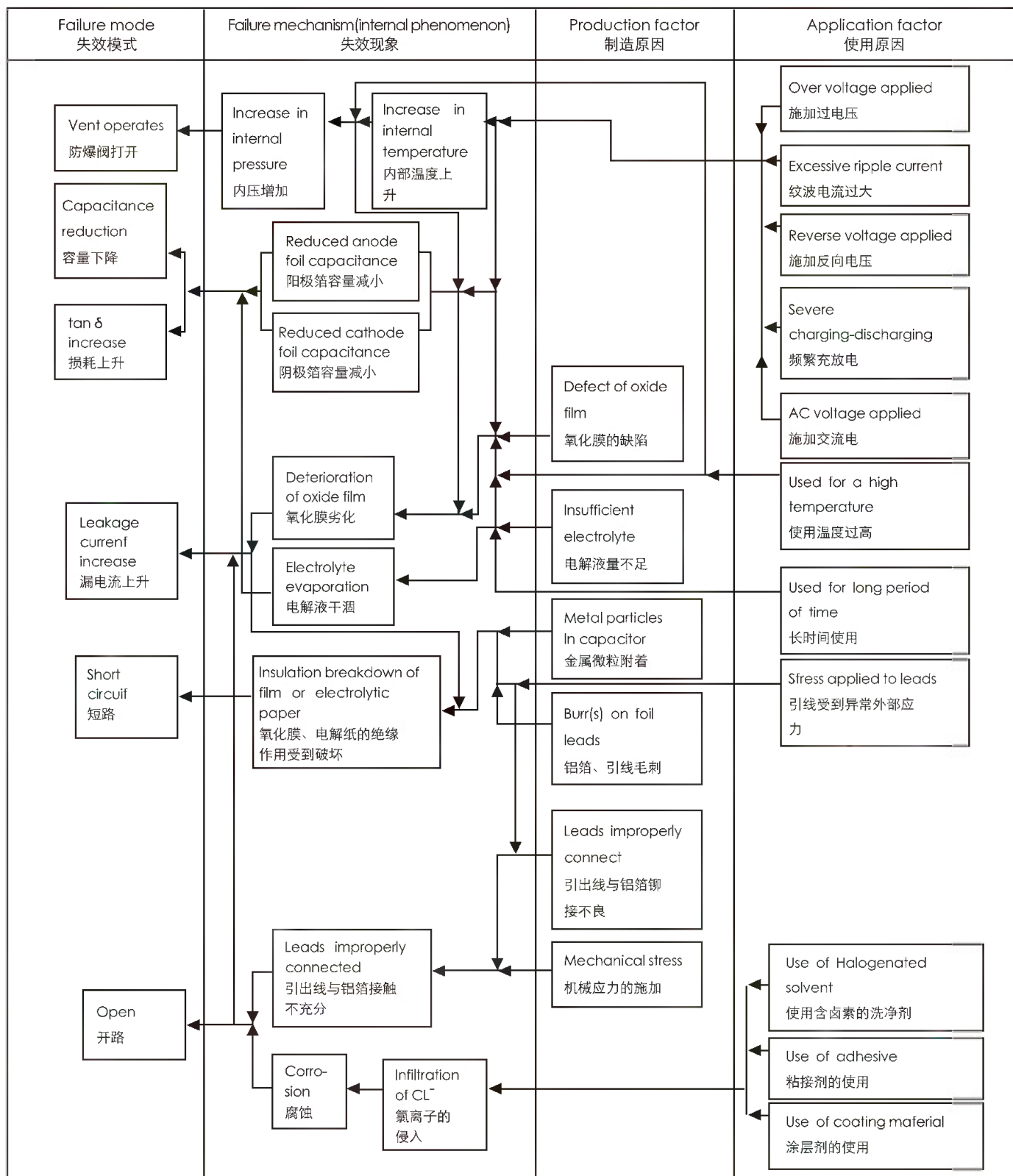
#### ② 耗损性失效

这是一种由于电容器电参数逐渐恶化而造成的失效，判断失效的标准也随应用和设计参数的不同而改变。

耗损失效阶段，由于电解液的减少，容量下降，损耗角正切上升。这是由于电解液以蒸汽形式从封口材料散失而造成的，气体分子能够穿过封口材料而散失，如果由于高温等原因使电容器内部蒸汽压力上升，则扩散的速度也会上升。温度上升造成的电解液蒸汽压力也会导致封口材料的膨胀，这种膨胀可能进一步加强电解液的渗透，同时削弱密封作用。



## 4-3 Typical failure modes and factors of aluminum electrolytic capacitors 铝电解电容器失效模式及原因分析



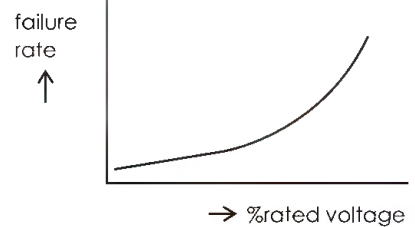
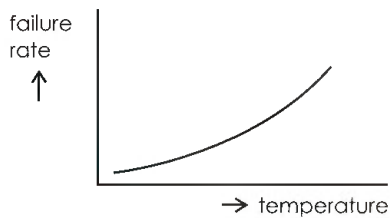
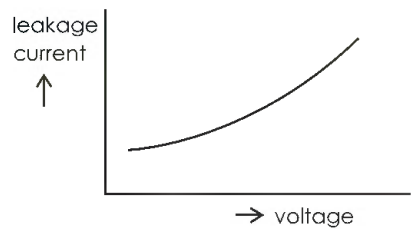
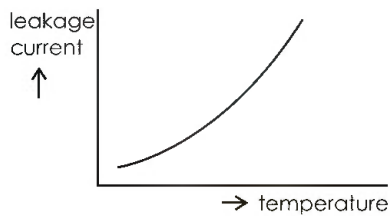
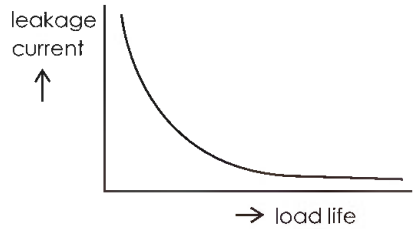
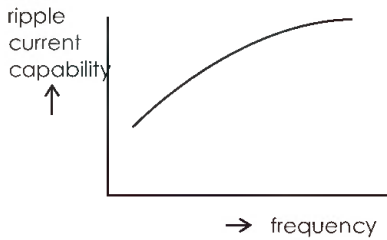
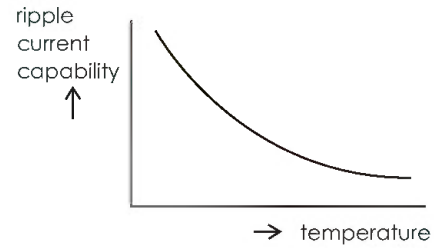
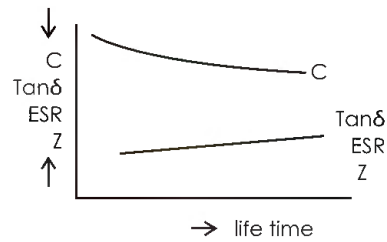
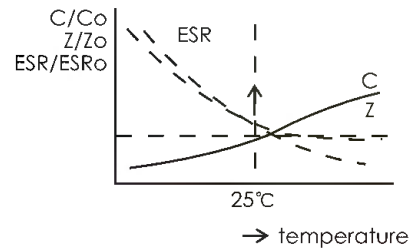
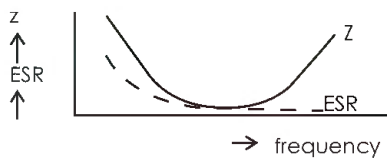
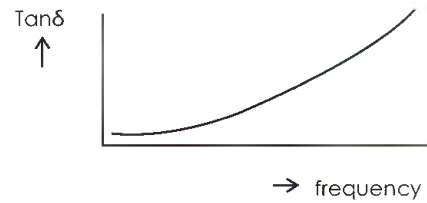
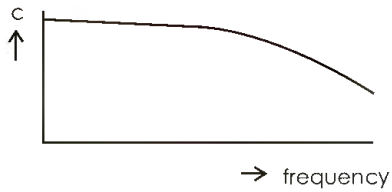


## 5. Electrical behaviour

### 电气特性

Characteristics of electrical capacitors vary with temperature, time, and applied voltage.

电容器的电气特性与温度，时间，以及印加电压的关系





## 6. Application Guidelines

### 6-1. Circuit Design

(1) Please make sure the application and mounting conditions to which the capacitor will be exposed are within the conditions specified in the catalog or alternate product specification (Referred as to specification here after).

(2) Operating temperature and applied ripple current shall be within the specification.

The capacitor shall not be used in an ambient temperature which exceeds the operating temperature specified in the specification.

Do not apply excessive current which exceeds the allowable ripple current.

(3) Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit.

(4) Aluminum electrolytic capacitors are polarized. Make sure that no reverse voltage or AC voltage is applied to the capacitors. Please use bi-polar capacitors for a circuit that can possibly see reversed polarity.

Note: Even bi-polar capacitors can not be used for AC voltage application.

(5) For a circuit that repeats rapid charging/discharging of electricity, an appropriate capacitor that is capable of enduring such a condition must be used. Welding machines and photoflash are a few examples of products that contain such a circuit. In addition, rapid charging/discharging may be repeated in control circuits for servomotors, in which the circuit voltage fluctuates substantially.

For appropriate choice of capacitors for circuit that repeat rapid charging/discharging, please consult us.

(6) Make sure that no excess voltage (that is, higher than the rated voltage) is applied to the capacitor. Please pay attention so that the peak voltage, which is DC voltage overlapped by ripple current, will not exceed the rated voltage.

In the case where more than 2 aluminum electrolytic capacitors are used in series, please make sure that applied voltage on each capacitor will be lower than rated voltage and the voltage will be applied to each capacitor equally using a balancing resistor in parallel with the capacitors.

(7) Outer sleeve of the capacitor is not guaranteed as an electrical insulator. Do not use a standard sleeve on a capacitor in applications that require the electrical insulation. When the application requires special insulation, please contact us for details.

(8) Capacitors may fail if they are used under the following conditions:

① Environmental (climatic) conditions

(a) Being exposed to water, high temperature & high humidity atmosphere, or condensation of moisture.

## 6. 铝电解电容器应用指南:

### 6-1. 电路设计

(1) 首先, 请确定电容器的使用和安装条件必须符合样本所供选择的产品规格中所规定的条件;

(2) 工作温度和施加的纹波电流必须符合规范中的要求。

① 电容器使用时的环境温度不能超过产品规格中规定的工作温度

② 施加的纹波电流不得超过允许值

(3) 在设计电路时, 必须选择符合其使用寿命要求的合适的电容器

(4) 铝电解电容器是有极性的, 因此要确保不对电容器施加反向电压或交流电压, 在可能会出现反向电压的场合, 建议使用双极性电容器。

注意: 即使是双极性电容器, 也不能应用在交流电压的场合。

(5) 对于需要反复充放电的电路而言, 那就必须使用能承受这种工作环境的合适电容器。电焊机、闪光灯等设备就是如此。此外, 在伺服电机等控制电路中, 也会出现反复的快速充放电, 电路中的电压波动很大。如果需选择具有快速充放电要求的电容器, 请与我们联系。

(6) 确保电容器不能在过压状态下工作 (即高于额定电压)

① 请注意峰值电压, 即由直流电压叠加纹波电流的电压, 不能超过额定电压;

② 在要串联使用2个以上电容器的场合, 施加在每一个电容器上的电压要低于额定电压, 并用均衡电阻与每个电容器并联, 使电压平均地施加到每个电容器上。

(7) 电容器外面的套管不能保证做绝缘之用, 所以在需要将其作为电绝缘的应用场合, 这些电容器不能使用一般标准的套管。假如你的应用场合需要特殊绝缘的话, 请与我们联系了解详细情况。

(8) 在下列条件下使用的电容器很可能会导致失效

① 环境条件

a. 接触水, 高温高湿度气候, 或易产生冷凝水的地方;



(b) Being exposed to oil or an atmosphere that is filled with particles of oil.

(c) Being exposed to salty water or an atmosphere that is filled with particles of salt.

(d) In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonia, etc.)

(e) Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation

(f) Being exposed to acidic or alkaline solutions

② Under severe conditions where vibration and/or mechanical shock exceed the applicable ranges of the specifications.

(9) When designing a P.C. board, please pay attention to the following:

① Have the hole spacing on the P.C. board match the lead spacing of the capacitor.

② There should not be any circuit pattern or circuit wire above the capacitor pressure relief vent.

③ Unless otherwise specified, the following clearance distances need to be kept above the pressure relief safety vent to ensure its proper operation.

Case Diameter	Clearance Required
6.3~16mm	2mm or more
18~35mm	3mm or more
40mm or more	5mm or more

④ In case the vent side is placed toward P.C. board (such as end seal vented parts), make a corresponding hole on the P.C. board to release the gas if vent is operated. The hole should be made to match the capacitor vent position.

⑤ Screw terminal capacitors must be installed with their end seal side facing up. When you install a screw terminal capacitor in a horizontal position, the positive terminal must be in the upper position.

(10) The main chemical solution of the electrolyte and the separator paper used in the capacitors are combustible. The electrolyte is electrically conductive. When it comes in contact with the P.C. board, there is a possibility of pattern corrosion or short circuit between the circuit pattern which could result in smoking or catching fire.

Do not locate any circuit pattern beneath the capacitor end seal.

(11) Do not design a circuit board with heat generating components placed near an aluminum electrolytic capacitor or on the reverse side of P.C. board under the capacitor.

(12) Electrical characteristics may vary depending on changes in temperature and frequency. Please consider this variation when you design circuits.

(13) When you mount capacitors on the double-sided P.C. boards, do not place capacitors on circuit patterns, otherwise it may cause short circuit on the PCB.

(14) The torque applied on the terminal screws or brackets screws shall be within the range given in the specifications.

(15) When you install more than 2 capacitors in parallel, consider the balance of current flowing through the capacitors. Especially if solid conductive polymer aluminum electrolytic capacitor and a standard aluminum electrolytic capacitor are connected in parallel, special care must be taken.

b. 接触油，或充满油气的地方；

c. 接触盐水，或充满盐尘的地方；

d. 含有有毒气体的场合（如盐酸、硫酸、硝酸、氯、溴、甲基溴、氨等）；

e. 直接暴露在有阳光、臭氧、紫外线或辐射的环境中；

f. 接触酸碱溶液。

② 在震动或机械冲击超过指标规定范围的那些恶劣环境下

(9) 当在设计印刷线路板时，请注意下列事项：

① 电路板上的开孔间距必须与电容器引线的间距相匹配；

② 在电容器的防爆阀上方，不应有任何电路走线图形或导线；

③ 除非另有规定，否则防爆上方应留出下列间隙：

外壳直径	须留间隙
Φ6.3~16mm	≥2mm
Φ18~35mm	≥3mm
Φ40或40mm以上	≥5mm

④ 如果防爆阀是朝着印刷线路板方向的（例如防爆阀在盖板上的电容器），则要在线路板上相应的开一个孔，可使阀打开后的气体排出。

这个孔必须对准电容器防爆的位置。

⑤ 安装螺丝终端电容器时，必须将装盖板的面朝上。当水平方向安装螺丝终端电容器时，必须将正极终端放在上面。

(10) 电解液中使用的化学溶液和电容器中的电解纸都是易燃品，而且电解液是导电的，一旦它与电路板接触，就有可能造成电路板上的走线图形腐蚀，或走线图形之间的短路，最终导致冒烟或起火。

因此，不要在电容器密封位置下方布置任何线路图案。

(11) 在设计线路板时，不要将发热元件布置在靠近电解电容器的地方，也不要在线路板反面电容器的位置安装发热元件；

(12) 温度和频率变化时，电容器的电性能也会变化，所以在设计电路时请考虑这些变化因素；

(13) 当在双面线路板上安装电容器时，不要安装在电路图案上，否则可能会造出线路板的短路；

(14) 施加在终端螺丝或支架螺丝的力矩应符合规格书上规定的值；

(15) 当你并联安装2个以上电容器时，要考虑流经电容器的电流的平衡，特别是当并联固体聚合物铝电解电容器和标准的铝电解电容器时，要给予这方面特别的考虑；



## 6-2. Mounting

(1) Once a capacitor has been assembled in the set and power applied, even if a capacitor is discharged, an electric potential(recovery voltage) may exist between the terminals.

(2) Electric potential between positive and negative terminal may exist as a result of returned electromotive force, so please discharge the capacitor using a 1 k resistor.

(3) Please confirm ratings before installing capacitors on the P.C. board.

(4) Please confirm polarity before installing capacitors on the P.C. board.

(5) Do not drop capacitors on the floor, nor use a capacitor that was dropped.

(6) Do not damage the capacitor while installing.

(7) Please confirm that the lead spacing of the capacitor matches the hole spacing of the P.C. board prior to installation.

(8) Snap-in type capacitor should be installed tightly to the P.C. board (allow no gap between the P.C. board and bottom of the capacitor).

(9) Please pay attention that the clinch force is not too strong when capacitors are placed and fixed by an automatic insertion machine.

(10) Please pay attention to that the mechanical shock to the capacitor by suction nozzle of the automatic insertion machine or automatic mounter, or by product checker, or by centering mechanism.

(11) Hand soldering.

① Soldering condition shall be confirmed to be within the specification.

② If it is necessary that the leads must be formed due to a mismatch of the lead space to hole space on the board, bend the lead prior to soldering without applying too much stress to the capacitor.

③ If you need to remove parts which were soldered, please melt the solder enough so that stress is not applied to lead.

④ Please pay attention so that solder iron does not touch any portion of capacitor body.

(12) Flow soldering (Wave solder)

① Aluminum capacitor body must not be submerged into the solder bath. Aluminum capacitors must be mounted on the "top side" of the P.C. board and only allow the bottom side of the P.C. board to come in contact with the solder.

② Soldering condition must be confirmed to be within specification.

Solder temperature:  $260 \pm 5^{\circ}\text{C}$ , Immersing lead time:  $10 \pm 1$  second, Thickness of P.C. board : 1.6mm.

③ Please avoid having flux adhere to any portion except the terminal.

④ Please avoid contact between other components and the aluminum capacitor.

## 6-2. 安装

(1) 一旦电容器装上机器, 并接通电源, 即使电容器已放过电, 但是在两个终端之间仍存在一个电位差 (再生电压);

(2) 正极和负极之间的电位差也可能是由返回的电动势所造成的, 所以一定要用一只1K电阻实施放电;

(3) 在把电容器装上电路板之前, 请首先确认一下其额定值;

(4) 在把电容器装上电路板前, 请对极性进行确认;

(5) 不要让电容器掉落到地板上, 也不能使用掉到地板上的电容器;

(6) 安装时千万不能损坏电容器;

(7) 安装之前确认一下电容器引线间距是否与线路板的孔距相匹配;

(8) 焊片式电容器要紧靠线路板安装 (电容器的底部和线路板之间不留间隙);

(9) 当用自动插件机安装和固定电容器时, 请注意夹持力不能太大;

(10) 请注意由自动插件机或产品检查仪或中心定位机所产生的振动对电容器的影响;

(11) 手工焊接

① 焊接条件必须符合规范的要求;

② 如果由于引线间距和线路板上的孔距不匹配需要引线成型的话, 则必须在焊接前弯好引线, 而不能对电容器施加太多的应力;

③ 如需要拆下焊好的电容器, 则要让焊锡充分熔化, 使引线不受任何应力;

④ 请注意不能让烙铁接触电容器本体;

(12) 波峰焊

① 电容器本体不能浸入锡缸, 铝电解电容器必须装在线路板的上面, 只允许线路板的反面与焊锡接触;

② 焊接条件必须符合规格书规定的指标值:

焊锡温度小于  $260 \pm 5^{\circ}\text{C}$ , 引线浸没时间小于  $10 \pm 1$  秒, 线路板厚度小于 1.6mm

③ 除了终端外, 其他部分均不能沾上助焊剂

④ 要防止电容器与其他元器件接触



## (13) Reflow soldering (SMD only)

① Soldering condition must be confirmed to be within specification.

Pre-heating : Less than 150°C, 90 seconds max. Max. temperature at capacitor top during reflow : 230°C

The duration for over 200°C temperature at capacitor top: 20 seconds max.

The duration from the pre-heat temperature to peak temperature of reflow varies due to changes of the peak temperature.

② The number of reflow time for SMT aluminum electrolytic capacitors shall be one time. If this type of capacitor has to be inevitably subjected to the reflow twice, enough cooling time between the first and second reflow (at least more than 30 minutes) shall be taken to avoid consecutive reflow. Please contact us if you have questions.

## (14) Soldering flux, Cleaning agents, Conformal coating&fixing glue

Ionic halides and non-ionic halides are both harmful to the capacitors. When either of these halides infiltrate the capacitor, it causes a chemical reaction that is quite harmful to the capacitors. Use soldering flux, cleaning agents, conformal coating & fixing glue that does not contain any halides. In addition, sulfur is also discovered to be harmful to the capacitor, so avoid using soldering flux, cleaning agents, conformal coating&fixing glue containing sulfur.

(15) Do not tilt lay down or twist the capacitor body after the capacitors are soldered to the P.C. board.

(16) Do not carry the P.C. board by grasping the soldered capacitor.

(17) Please do not allow anything to touch the capacitor after soldering. If P.C. board are stored in a stack, please make sure P.C. board or the other components do not touch the capacitor.

The capacitors shall not be effected by any radiated heat from the soldered P.C. board or other components after soldering.

## 6-3. In the equipment

(1) Do not directly touch terminal by hand.

(2) Do not short between terminals with conductor, nor spill conductible liquid such as alkaline or acidic solution on or near the capacitor.

(3) Please make sure that the ambient conditions where the set is installed will be free from spilling water or oil, direct sunlight, ultraviolet rays, radiation, poisonous gases, vibration or mechanical shock.

## 6-4. Maintenance Inspection

Please periodically inspect the aluminum capacitors that are installed in industrial equipment. The following items should be checked:

① Appearance : Remarkable abnormality such as vent operation, leaking electrolyte etc.

② Electrical characteristic: Capacitance, dielectric loss tangent, leakage current, and items specified in the specification.

## (13) 回流焊 (适用于SMD)

① 焊接条件必须符合规格书规定的指标值:

预热: 小于150°C, 最多90秒; 回流过程中电容器顶部的最高温度为230°C, 在电容器顶部超过200°C的时间最多为20秒; 从预热温度到回流峰值温度的时间随峰值温度的改变而变化。

② 表面贴装用铝电解电容器能承受的回流焊次数是一次, 如果这种电容器一定要进行第二次回流焊的话, 那么在第一次和第二次回流焊之间要有足够的冷却时间 (至少30分钟以上), 不能连续进行回流。如有问题请与我们联系。

## (14) 助焊剂、清洗剂、三防漆和固定胶

离子态的和非离子态的卤素成分对电容器都是有害的。当任何一种卤素物质渗透到电容器内部, 就会发生对电容器极为有害的化学反应。因此, 请使用不含任何卤素的焊剂、清洗剂、三防漆和固定胶。此外, 硫对于电容器也是有害的, 请避免使用含有硫成分的焊剂、清洗剂、三防漆和固定胶。

(15) 电容器焊到线路板上之后, 不要将电容器倾倒或扭曲。

(16) 拿线路板时, 不要抓住焊好的电容器。

(17) 不要让焊好的电容器碰到其他任何东西。如果要将线路板堆放储存的话, 要确保线路板或其他元件不要碰到电容器。电容器不能受焊好的线路板或其他焊好的元器件的热辐射影响。

## 6-3. 设备中

(1) 不要用手直接接触电容器的终端

(2) 不要用导体在两个终端之间进行短路, 也不能把诸如酸碱溶液等导电液体泼近或泼到电容器上。

(3) 要确保安装设备的环境条件要远离水、油、阳光的直接照射, 紫外线、辐射、有毒气体、振动或机械冲击。

## 6-4. 保养检查

请定期检查安装在工业设备中的铝电解电容器必须检查下列内容

① 外观: 是否有明显的异常, 如防爆阀打开, 漏液等;

② 电性能: 容量,  $\tan\delta$ 、漏电流和规范中规定的项目



#### 6-5. In an Emergency

(1) If you see smoke due to operation of safety vent, turn off the main switch or pull out the plug from the outlet.

(2) Do not bring your face near the capacitor when the pressure relief vent operates. The gasses emitted from that are over 100°C.

If the gas gets into your eyes, please flush your eyes immediately in pure water.

If you breathe the gas, immediately wash out your mouth and throat with water.

Do not ingest electrolyte. If your skin is exposed to electrolyte, please wash it away using soap and water.

#### 6-6. Storage

(1) It is recommended to store capacitors at ambient temperatures from 5°C to 35°C and at relative humidity of 75% or below.

(2) The leakage current of the electrolytic capacitor tends to increase after long time storage, it is suggested to reconfirm the leakage current before use them in case the capacitors are stored for more than 1 year. If necessary, voltage treatment could be performed by connecting a 1KΩ resistor to reduce the leakage current.

(3) Confirm that the environment does not have any of the following conditions:

①Where the capacitors may have the possibility to get water, salt or oil spill.

②The atmosphere is filled with hazardous gases (e.g. hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonia, etc.)

③Where the capacitors are exposed to ultraviolet or radioactive rays.

#### 6-7. Use at high altitude

If the capacitors are used at high altitude, such as at mountainous regions or on an aircraft, the air pressure outside the capacitor decreases and causes a difference between the internal pressure and external pressure. However, this low atmospheric pressure is no problem for the capacitor up to an altitude about 10000 meters. Another condition should be noticed is that the ambient temperature decreases with increased altitude, please check the operation of the electronic equipment at such low temperature.

#### 6-8. Disposal

Take either of the following methods in disposing of capacitors.

Make a hole or crush the capacitors (to prevent explosion) before incineration at approved facility.

If incineration is not applicable, hand them over to a professional industrial waste disposal company to dispose according to local laws.

#### 6-5. 在紧急情况下

(1) 如果你看到防爆阀打开后冒出的烟雾, 请立即关掉电源, 将插头从插座上拔下。

(2) 当防爆阀打开时, 不要将脸凑近电容器, 因为从里面散发出来的气体温度可达100°C以上, 如果气体冲进你眼睛的话, 请立即用纯水冲洗眼睛。

如果吸入这种气体的话, 请马上用水清洗眼睛和喉咙。请不要咽下电解液, 如果皮肤接触到了电解液, 请用水和肥皂将它洗净。

#### 6-6. 储存

(1) 建议将电容器储存在5°C~35°C 和相对湿度小于75%的环境中。

(2) 长期储存后电解电容器的漏电流会趋于上升, 因此电容器储存超过1年后使用时建议再次确认其漏电流。必要时可用1KΩ的电阻对其进行电压处理来降低漏电流。

(3) 确认储存环境中不会出现下列情况:

①电容器可能接触到水、盐或油污的环境;

②空气中含有毒酸气 (如硫化氢、硫酸、亚硝酸、氯、溴、甲基溴等)

③电容器暴露于紫外线或放射性射线环境中。

#### 6-7. 高空使用

如果电容器在高空使用, 比如高原地区或飞机上, 外部的空气压力下降, 会导致电容器内外产生压力差。不过, 在10000米以下的高度, 这种外部的低压对电容器来说是没有问题的。另一个应该引起注意的情况是, 随着高度的上升, 外部环境的温度将下降, 请检查这种低温情况下电子设备的工作是否正常。

#### 6-8. 废弃处理

电容器的废弃处理可采用下列任何一种方法进行:

将电容器壳体上打孔或将其压碎 (防止爆炸) 后由合格的工厂进行焚烧。

如果焚烧不可行的话, 请将电容器交给专业的工业废品处理厂按当地法律规定进行处理。





## Snap-in/Lug Aluminum Electrolytic Capacitors





## Part Number System for Snap in/Lug

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21																																																																		
E	C	S		I	C	B	W	8	2	2	M		V	N	2	2	0	0	2	5	V	*																																																																
Capacitor Type Code	Terminal Type Code		Rated Voltage Code (V)		Series Code		Capacitance Code (μF)		Capacitance Tolerance Code(%)		Lead Form Code		Dimension Code						Sleeve Code		Customer Special Requirements Code																																																																	
EC= Electrolytic Capacitor	Snap in	S	10	1A	CD293	BZ	0.1	0R1	+20	A	LA	22×25			220025			PET	E																																																																			
			16	1C	CD294	BW	0.22	R22	-8		LB	25×35			250035			PVC	V																																																																			
			18-20	1D	CD295	BC	0.33	R33	+20		LP	30×30			300030																																																																							
			25	1E	CD295S	BS	0.47	R47	-3		VN	35×50			350050																																																																							
	Lug	L	35	1V	CD296	KC	1	010	+30	F	SA																																																																											
			40	1G	CD296Q	QK	2.2	2R2	0		SB																																																																											
			50	1H	CD296L	FL	3.3	3R3	+20	H	LI																																																																											
			63	1J	CD297	BB	4.7	4R7	-5		VA																																																																											
			80	1K	CD297S	SF	10	100	+10	K	VB																																																																											
			100	2A	CD299	PG	22	220	-10		HD																																																																											
			110	A2	CD29C	QC	33	330	+15	L	FT																																																																											
			120	2B	CD29CS	DS	47	470	-15		RW																																																																											
			125	1B	CD29CT	QT	68	680	+20	M	LW																																																																											
			140	B2	CD29F	CF	82	820	-20		PC																																																																											
			160	2C	CD29G	BA	100	101	+30	Q	HX																																																																											
			180	2K	CD29H	QH	120	121	-10		PD																																																																											
			200	2D	CD29HD	QF	150	151	+20	R	PE																																																																											
			220	2T	CD29HE	QR	180	181	0		HG																																																																											
			230	E2	CD29L	QL	220	221	+50	S	PW																																																																											
			250	2E	CD29UH	UT	330	331	-20																																																																													
			275	2I	CD17	HS	470	471	+50	T																																																																												
			280	L2	CD29NF	NF	560	561	-10																																																																													
			300	2L					680	681	+75																																																							U																				
			315	2F					820	821	-10																																																																											
			330	2U					1000	102	+20																																																							V																				
			350	2V					1500	152	-10																																																																											
			360	2N					2200	222	+100																																																							P																				
			385	2J					4700	472	0																																																																											
400	2G	5600	562																																																																																			
415	2P	6800	682																																																																																			
420	2X	10000	103																																																																																			
450	2W	22000	223																																																																																			
470	2M	33000	333																																																																																			
475	2Q	68000	683																																																																																			
500	2H																																																																																					
550	2Y																																																																																					
575	2Z																																																																																					
600	2S																																																																																					
630	J2																																																																																					

Note1:

- 1.The number from 14<sup>th</sup> to 16<sup>th</sup> defines the diameter of capacitor.
- 2.The 14<sup>th</sup> number is the tenth digit.
- 3.The 15<sup>th</sup> number is the single digit.
- 4.The 16<sup>th</sup> number is on the right of the floatpoint.

Note2:

- 1.The number from 17<sup>th</sup> to 19<sup>th</sup> defines the high of capacitor.
- 2.The 17<sup>th</sup> number is the hundredth digit.
- 3.The 18<sup>th</sup> number is the tenth digit.
- 4.The 19<sup>th</sup> number is the single digit.

For example :

CD296 16V6800μF ±20% VN 22\*25 PVC

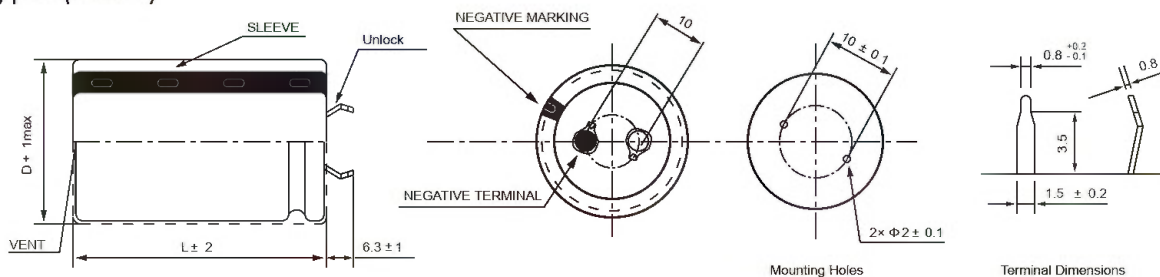
Code: ECS1CKC682MVN220025V



## Snap-in Terminal Code

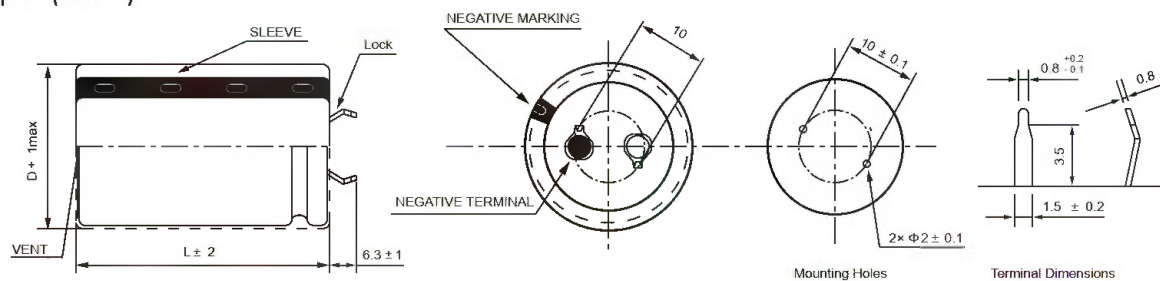
### VN-type (N6P2)

Unit:mm



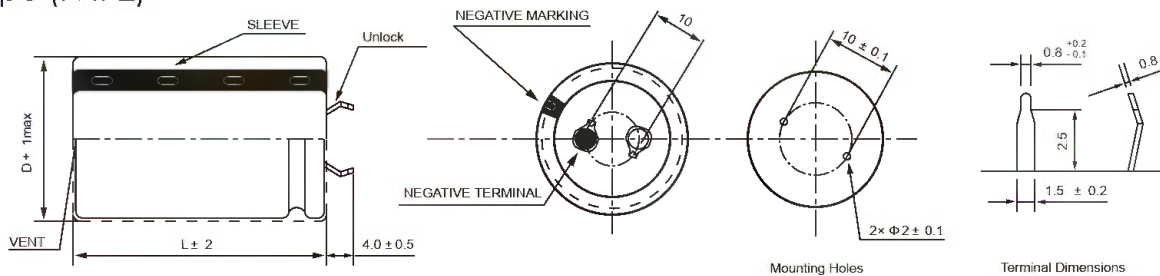
### LP-type (T6P2)

Unit:mm



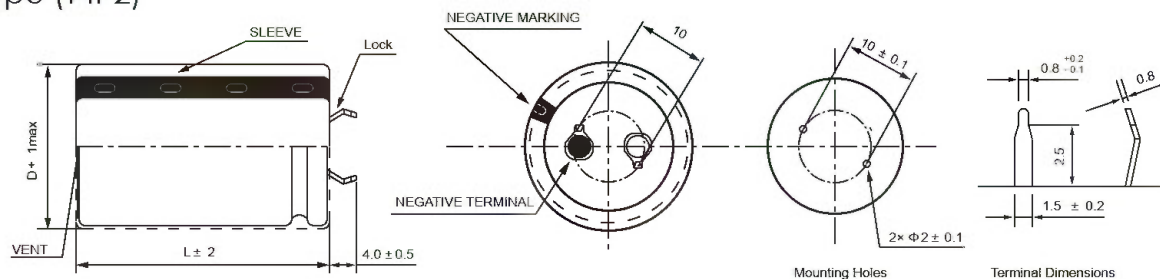
### LB-type (N4P2)

Unit:mm



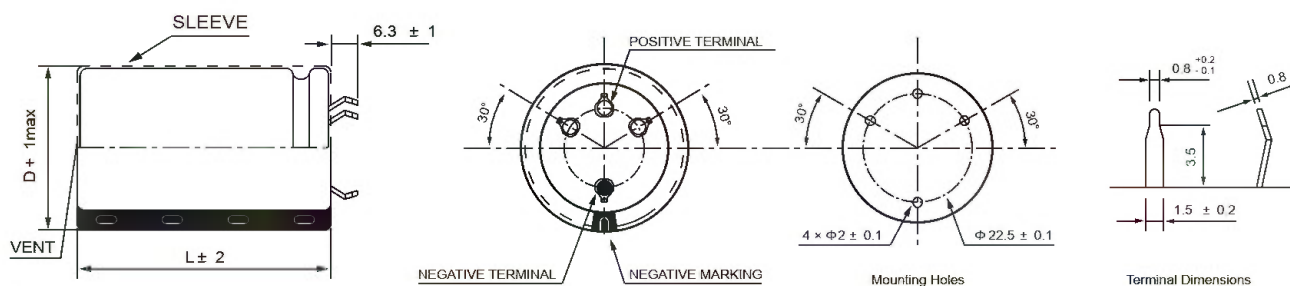
### LA-type (T4P2)

Unit:mm



### VA-Type D≥35mm (T6P4)

Unit:mm





## Snap-in Terminal Code

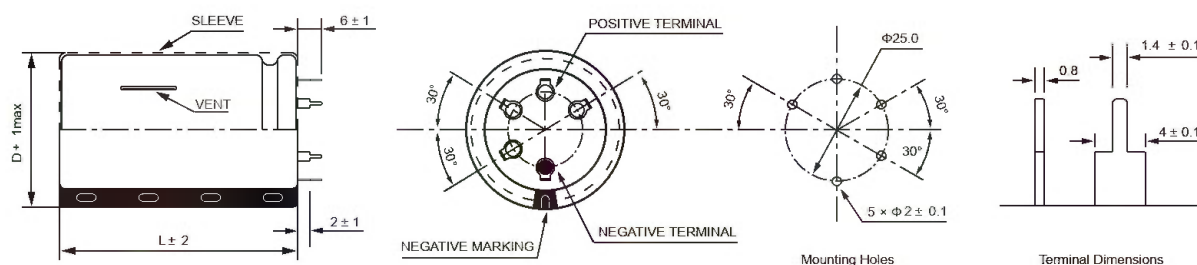
VB-Type $D \geq 35\text{mm}$ (T4P4)	Unit:mm		
LI-Type $D=30,35,40\text{mm}$	Unit:mm		
SA-Type(T4P3)	Unit:mm		
LW-Type $D=22\sim 25\text{mm}$	Unit:mm		
RW-Type $D=22\sim 25\text{mm}$	Unit:mm		



## Snap-in Terminal Code

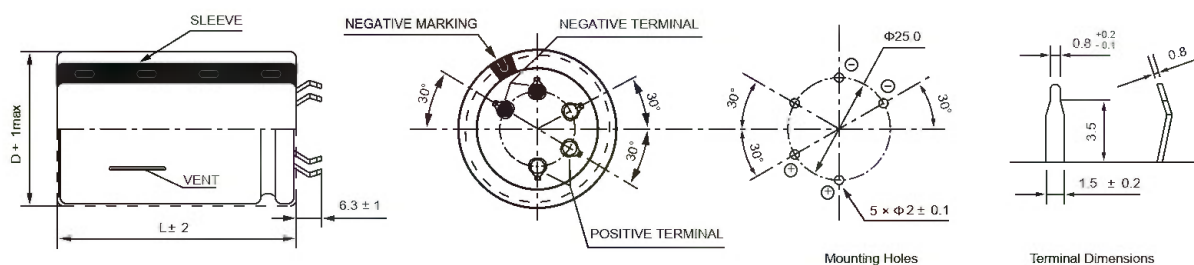
PD-Type  $D \geq 40\text{mm}$  (S6P5)

Unit:mm



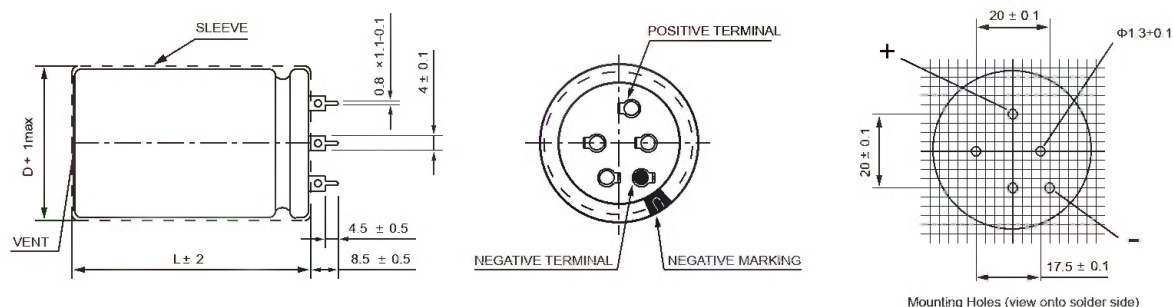
PW-Type  $D=45, 50\text{mm}$  (T6P5)

Unit:mm



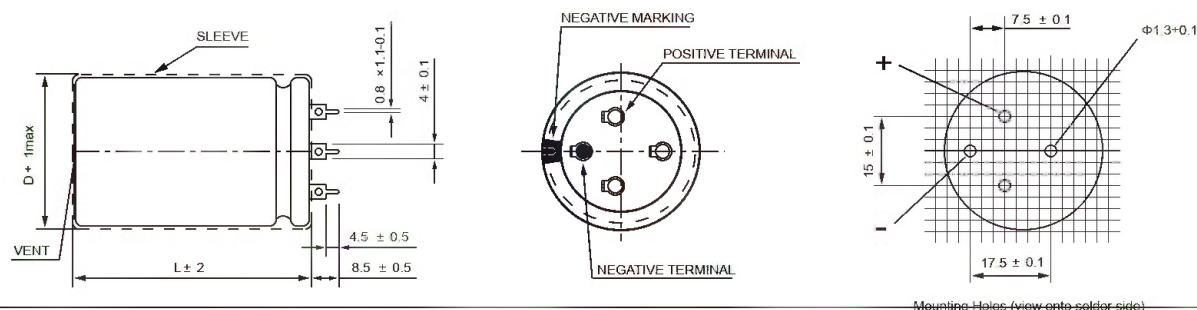
PC-Type  $D=40\text{mm}$  (S4P5)

Unit:mm

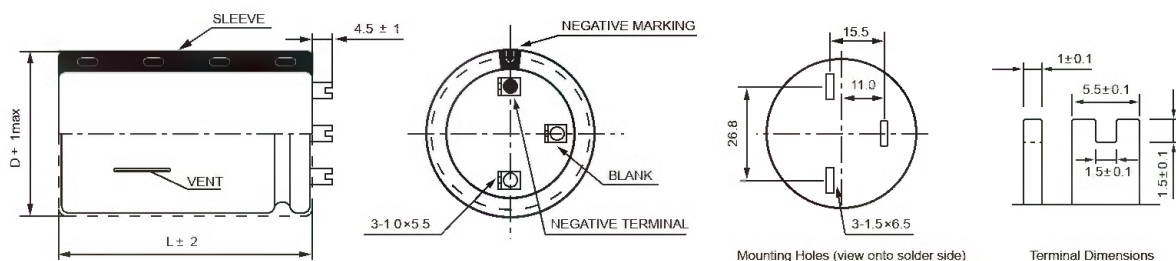


PE-Type  $D=35\text{mm}$  (S4P4)

Unit:mm



SB-Type  $D=51\text{mm}$





## Snap-in Terminal Code

FT-Type

Terminal Dimensions

Unit:mm

D	P	A	H
Φ25~35	10.0	4.7	11
Φ40,45	14.0	5.5	13
Φ50	20.0	5.5	13

HD-Type

Terminal Dimensions

Unit:mm

D	P	A	H
Φ25~35	10.0	4.7	11
Φ40,45	14.0	5.5	13
Φ50	20.0	5.5	13

HX-Type

Terminal Dimensions

D	P
Φ22~30	8.0
Φ35	10.0

HG-Type

Terminal Dimensions

D	P	A	H	t
Φ25~30	10.0	4.0	14	0.5
Φ35	12.0	5.0	14	0.8



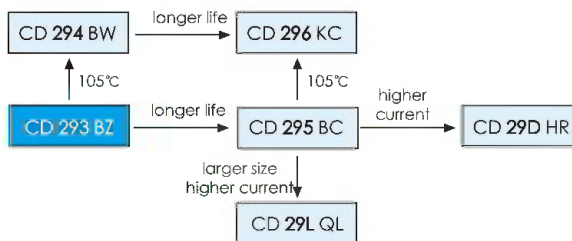
# CD 293 BZ SERIES



SNAP-IN/LUG

2000h at 85°C

■ Standard 85°C

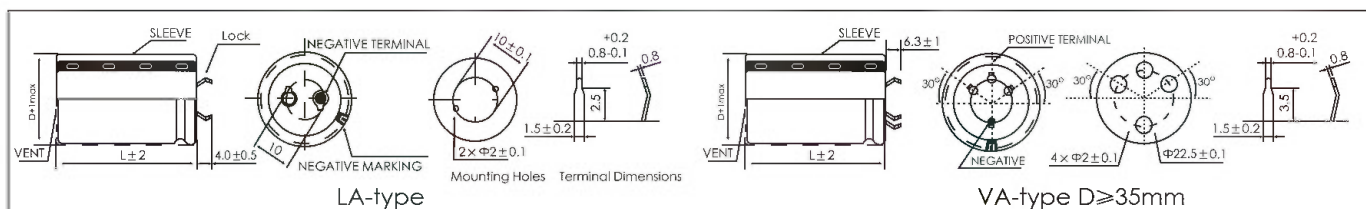


Items	Characteristics								
Operating Temperature Range (°C)	-40 ~ +85				-25 ~ +85				
Voltage Range (V)	10 ~ 400				420 ~ 500				
Capacitance Range (μF)	100 ~ 82000								
Capacitance Tolerance (20°C, 120Hz)	± 20%								
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF)    V: Rated Voltage (V)								
Dissipation Factor (20°C, 120Hz)	<div>Rated Voltage (V) Cap (μF)</div>	10~16	25	35~50	63	80~100	<div>Rated Voltage (V) Φ (mm)</div>	160~200	250~500
	≤ 2700	-	-	0.20	0.15	0.15	22 ~ 30	0.10	0.15
	3300 ~ 4700	-	0.35	0.25	0.20	0.15			
	5600 ~ 6800	0.40	0.35	0.30	0.20	0.20	35 ~ 40	0.12	0.15
	≥ 8200	0.40	0.35	0.35	0.25	0.25			
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	10	10~35	50~100	160~200	250~400	420~500		
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	5	4	3		4			
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	18	15	10	6	8	-		

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	> 65000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 15% of initial value	Within ± 20% of initial value	Within ± 15% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 150% of specified value	Not more than 200% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm





## Ratings for CD 293 BZ Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
10 (13) 1A	18000	30	24	3.6	25X30	ECS1ABZ183M□□250030
	22000	25	20	4	22X40	ECS1ABZ223M□□220040
		25	20	4.1	25X35	ECS1ABZ223M□□250035
	33000	17	13	4.6	25X40	ECS1ABZ333M□□250040
		17	13	4.8	30X30	ECS1ABZ333M□□300030
	39000	14	10.9	5.2	25X45	ECS1ABZ393M□□250045
		14	10.9	5.3	30X35	ECS1ABZ393M□□300035
	47000	12	9.1	6	30X40	ECS1ABZ473M□□300040
		12	9.1	6	35X30	ECS1ABZ473M□□350030
	56000	9.5	7.6	6.8	35X35	ECS1ABZ563M□□350035
16 (20) 1C	68000	7.9	6.3	7.7	35X40	ECS1ABZ683M□□350040
	82000	6.5	5.2	8.7	35X45	ECS1ABZ823M□□350045
	15000	36	29	3.3	22X40	ECS1CBZ153M□□220040
		36	29	3.3	25X30	ECS1CBZ153M□□250030
	18000	30	24	3.8	22X45	ECS1CBZ183M□□220045
		30	24	3.7	25X35	ECS1CBZ183M□□250035
	22000	25	20	4.2	25X40	ECS1CBZ223M□□250040
		25	20	4.2	30X30	ECS1CBZ223M□□300030
	27000	20	16	5	25X45	ECS1CBZ273M□□250045
		20	16	5	30X35	ECS1CBZ273M□□300035
25 (32) 1E	33000	17	13	5.6	35X30	ECS1CBZ333M□□350030
	39000	14	11	6.3	35X35	ECS1CBZ393M□□350035
	47000	12	9.1	7.2	35X40	ECS1CBZ473M□□350040
	56000	9.5	7.6	8	35X45	ECS1CBZ563M□□350045
	10000	47	38	2.9	22X40	ECS1EBZ103M□□220040
		47	38	2.8	25X30	ECS1EBZ103M□□250030
	12000	39	31	3.2	25X35	ECS1EBZ123M□□250035
		39	31	3.4	30X30	ECS1EBZ123M□□300030
	15000	31	25	3.7	25X40	ECS1EBZ153M□□250040
		31	25	3.9	35X25	ECS1EBZ153M□□350025
35 (44) 1V	18000	26	21	4.2	30X35	ECS1EBZ183M□□300035
		26	21	4.4	35X30	ECS1EBZ183M□□350030
	22000	22	17	5	35X35	ECS1EBZ223M□□350035
	33000	15	12	6.5	35X40	ECS1EBZ333M□□350040
	39000	12	10	7.5	35X45	ECS1EBZ393M□□350045
	47000	10	8	8.8	35X50	ECS1EBZ473M□□350050
	5600	72	57	2.3	22X35	ECS1VBZ562M□□220035
		72	57	2.3	25X30	ECS1VBZ562M□□250030
	6800	59	47	2.9	22X40	ECS1VBZ682M□□220040
		59	47	2.6	25X35	ECS1VBZ682M□□250035
50 (63) 1H	8200	57	46	2.8	25X40	ECS1VBZ822M□□250040
		57	46	2.8	30X30	ECS1VBZ822M□□300030
	10000	47	38	3.2	30X35	ECS1VBZ103M□□300035
		47	38	2.8	35X20	ECS1VBZ103M□□350020
	12000	39	31	3.6	35X30	ECS1VBZ123M□□350030
	15000	31	25	4.1	35X35	ECS1VBZ153M□□350035
	18000	26	21	4.7	35X40	ECS1VBZ183M□□350040
	22000	22	17	5.3	35X45	ECS1VBZ223M□□350045
	27000	18	14	7	35X50	ECS1VBZ273M□□350050
	2200	120	97	1.7	22X25	ECS1HBZ222M□□220025
63 (79) 1J	3900	86	69	2.1	25X30	ECS1HBZ392M□□250030
		71	57	2.4	22X40	ECS1HBZ472M□□220040
	4700	71	57	2.4	25X35	ECS1HBZ472M□□250035
		72	57	2.5	25X40	ECS1HBZ562M□□250040
	5600	72	57	2.5	30X30	ECS1HBZ562M□□300030
	6800	59	47	2.8	25X45	ECS1HBZ682M□□250045
		59	47	2.8	30X35	ECS1HBZ682M□□300035
	8200	57	46	3	30X40	ECS1HBZ822M□□300040
		57	46	3	35X30	ECS1HBZ822M□□350030
	10000	47	38	3.4	35X35	ECS1HBZ103M□□350035
80 (100) 1K	12000	39	31	3.8	35X40	ECS1HBZ123M□□350040
	15000	31	25	4.5	35X50	ECS1HBZ153M□□350050
	2700	74	59	2.3	25X30	ECS1JBZ272M□□250030
	3300	81	65	2.3	22X40	ECS1JBZ332M□□220040
		81	65	2.3	25X35	ECS1JBZ332M□□250035
	3900	69	55	2.6	25X40	ECS1JBZ392M□□250040
		69	55	2.6	30X30	ECS1JBZ392M□□300030
	4700	56	45	3	25X45	ECS1JBZ472M□□250045
		56	45	3	30X30	ECS1JBZ472M□□300030
	5600	48	38	3.3	35X30	ECS1JBZ562M□□350030
315 (365) 2F	6800	40	32	3.7	35X35	ECS1JBZ682M□□350035
	8200	41	33	3.8	35X40	ECS1JBZ822M□□350040
	10000	34	27	4.3	35X45	ECS1JBZ103M□□350045
	12000	28	23	4.8	35X50	ECS1JBZ123M□□350050
	1800	111	89	1.9	25X30	ECS1KBZ182M□□250030
		91	73	2.2	25X35	ECS1KBZ222M□□250035
	2200	91	73	2.2	30X25	ECS1KBZ222M□□300025
	2700	74	59	2.5	25X40	ECS1KBZ272M□□250040
		74	59	2.5	30X30	ECS1KBZ272M□□300030
	3300	61	49	2.8	25X45	ECS1KBZ332M□□250045
350 (400) 2V	3900	61	49	2.8	30X35	ECS1KBZ332M□□300035
		52	41	3.1	25X50	ECS1KBZ392M□□250050
		52	41	3.2	35X30	ECS1KBZ392M□□350030
	4700	43	34	3.6	35X35	ECS1KBZ472M□□350035
	5600	48	38	3.8	35X40	ECS1KBZ562M□□350040
	680	196	157	2.2	25X40	ECS2CBZ681M□□250040
		196	157	2.3	30X30	ECS2CBZ681M□□300030
	820	162	130	2.6	30X35	ECS2CBZ821M□□300035
		162	130	2.5	30X30	ECS2CBZ821M□□300030
	1000	133	107	2.8	30X35	ECS2CBZ102M□□300035

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
80 (100) 1K	6800	40	32	4.1	35X45	ECS1KBZ682M□□350045
	8200	41	33	4.7	35X50	ECS1KBZ822M□□350050
	10000	34	27	5.2	35X50	ECS1KBZ103M□□350050
	12000	28	23	5.8	35X55	ECS1KBZ123M□□350055
100 (125) 2A	1200	166	133	1.6	25X30	ECS2ABZ122M□□250030
	1500	133	107	1.8	22X40	ECS2ABZ152M□□220040
		133	107	1.7	25X35	ECS2ABZ152M□□250035
	1800	111	89	2	25X40	ECS2ABZ182M□□250040
		111	89	2.1	30X30	ECS2ABZ182M□□300030
	2200	91	73	2.3	30X35	ECS2ABZ222M□□300035
		91	73	2.5	35X30	ECS2ABZ222M□□350030
	2700	74	59	2.6	25X50	ECS2ABZ272M□□250050
		74	59	2.7	30X40	ECS2ABZ272M□□300040
	3300	61	49	3.1	35X35	ECS2ABZ332M□□350035
	3900	52	41	3.4	35X40	ECS2ABZ392M□□350040
	4700	43	34	4	35X50	ECS2ABZ472M□□350050
160 (200) 2C	470	283	226	1.6	25X30	ECS2CBZ471M□□250030
	560	237	190	1.9	22X35	ECS2CBZ561M□□220035
		237	190	1.9	25X30	ECS2CBZ561M□□250030
	680	196	157	2.1	22X40	ECS2CBZ681M□□220040
		196	157	2.2	25X35	ECS2CBZ681M□□250035
	820	162	130	2.4	25X40	ECS2CBZ821M□□250040
		162	130	2.5	30X30	ECS2CBZ821M□□300030
	1000	133	107	2.8	30X35	ECS2CBZ102M□□300035
		160	128	2.7	35X30	ECS2CBZ102M□□350030
	1200	133	107	3	35X35	ECS2CBZ122M□□350035
	1500	107	85	3.5	35X40	ECS2CBZ152M□□350040
	1800	89	71	3.9	35X45	ECS2CBZ182M□□350045
2200	73	58	4.5	35X50	ECS2CBZ222M□□350050	
180 (225) 2K	680	196	157	2.2	25X40	ECS2KBZ681M□□250040
		196	157	2.3	30X30	ECS2KBZ681M□□300030
	820	162	130	2.6	30X35	ECS2KBZ821M□□300035
		195	156	2.5	35X30	ECS2KBZ821M□□350030
	1000	133	107	2.9	25X50	ECS2KBZ102M□□250050
		133	107	2.9	30X40	ECS2KBZ102M□□300040
	1200	133	107	3.1	35X35	ECS2KBZ122M□□350035
	1500	107	85	3.6	35X45	ECS2KBZ152M□□350045
	1800	89	71	4.1	35X50	ECS2KBZ182M□□350050
	200 (250) 2D	390	341	273	1.6	25X30
470		283	226	1.7	22X35	ECS2DBZ471M□□220035
		283	226	1.9	30X25	ECS2DBZ471M□□300025
560		237	190	2	25X35	ECS2DBZ561M□□250035
		237	190	2.1	30X30	ECS2DBZ561M□□300030
680		196	157	2.3	25X40	ECS2DBZ681M□□250040
		196	157	2.4	30X35	ECS2DBZ681M□□300035
820		162	130	2.7	30X40	ECS2DBZ821M□□300040
		195	156	2.5	35X30	ECS2DBZ821M□□350030
1000		160	128	2.8	35X35	ECS2DBZ102M□□350035
1200		133	107	3.2	35X40	ECS2DBZ122M□□350040
1500		107	85	3.8	35X50	ECS2DBZ152M□□350050
250 (300) 2E	330	603	483	1.4	22X40	ECS2EBZ331M□□220040
		603	483	1.4	25X30	ECS2EBZ331M□□250030
	390	511	409	1.6	22X45	ECS2EBZ391M□□220045
		511	409	1.6	25X35	ECS2EBZ391M□□250035
	470	424	339	1.8	25X40	ECS2EBZ471M□□250040
		424	339	1.8	30X30	ECS2EBZ471M□□300030
	560	356	285	2	25X45	ECS2EBZ561M□□250045
		356	285	2	30X35	ECS2EBZ561M□□300035
	680	293	235	2.3	30X40	ECS2EBZ681M□□300040
		293	235	2.3	35X30	ECS2EBZ681M□□350030
	820	243	195	2.4	25X40	ECS2EBZ821M□□250040
		243	195	2.6	30X45	ECS2EBZ821M□□300045
1000	199	160	3	35X40	ECS2EBZ821M□□350035	
1200	166	133	3.4	35X45	ECS2EBZ122M□□350045	
315 (365) 2F	180	1106	885	0.96	25X30	ECS2FBZ181M□□250030
	220	905	724	1.1	22X40	ECS2FBZ221M□□220040
		905	724	1.1	25X35	ECS2FBZ221M□□250035
	270	737	590	1.2	22X45	ECS2FBZ271M□□220045
		737	590	1.3	25X40	ECS2FBZ271M□□250040
	330	737	590	1.3	30X30	ECS2FBZ271M□□300030
		603	483	1.4	25X45	ECS2FBZ331M□□250045
	390	603	483	1.4	30X35	ECS2FBZ331M□□300035
		511	409	1.6	30X40	ECS2FBZ391M□□300040
	470	511	409	1.6	35X30	ECS2FBZ391M□□350030
		424	339	1.8	30X45	ECS2FBZ471M□□300045
	560	424	339	1.8	35X35	ECS2FBZ471M□□350035
680	356	285	2	30X50	ECS2FBZ561M□□300050	
150	356	285	2	35X40	ECS2FBZ561M□□350040	
293	293	235	2.3	35X45	ECS2FBZ681M□□350045	
350 (400) 2V	150	1327	1062	0.94	25X30	ECS2VBZ151M□□250030
180	1106	885	1.1	22X40	ECS2VBZ181M□□220040	
		1106	885	1.1	30X25	ECS2VBZ181M□□300025
	220	905	724	1.2	25X35	ECS2VBZ221M□□250035
		905	724	1.2	30X30	ECS2VBZ221M□□300030



# CD 293 BZ SERIES



## Ratings for CD 293 BZ Series

SNAP-IN/LUG

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
350 (400) 2V	270	737	590	1.4	25X45	ECS2VBZ271M□□250045	
		737	590	1.4	30X35	ECS2VBZ271M□□300035	
	330	603	483	1.6	25X50	ECS2VBZ331M□□250050	
		603	483	1.6	35X30	ECS2VBZ331M□□350030	
	390	511	409	1.7	30X40	ECS2VBZ391M□□300040	
		511	409	1.8	35X35	ECS2VBZ391M□□350035	
	470	424	339	2	30X45	ECS2VBZ471M□□300045	
		424	339	2	35X40	ECS2VBZ471M□□350040	
	560	356	285	2.3	35X45	ECS2VBZ561M□□350045	
		680	293	535	2.6	35X50	ECS2VBZ681M□□350050
	820	243	195	2.8	35X60	ECS2VBZ821M□□350060	
		150	1327	1062	0.89	25X30	ECS2GBZ151M□□250030
	180	1106	885	1	22X40	ECS2GBZ181M□□220040	
		1106	885	1	25X30	ECS2GBZ181M□□250030	
	220	905	724	1.1	22X45	ECS2GBZ221M□□220045	
		905	724	1.2	25X40	ECS2GBZ221M□□250040	
	400 (450) 2G	270	737	590	1.3	25X45	ECS2GBZ271M□□250045
			737	590	1.5	30X30	ECS2GBZ271M□□300030
330		603	483	1.6	22X50	ECS2GBZ331M□□220050	
		603	483	1.6	25X45	ECS2GBZ331M□□250045	
390		603	483	1.7	30X35	ECS2GBZ391M□□300035	
		511	409	1.8	25X45	ECS2GBZ391M□□250045	
511		409	1.8	35X30	ECS2GBZ391M□□350030		
		511	409	1.9	30X40	ECS2GBZ391M□□300040	
470		424	339	2.1	35X35	ECS2GBZ471M□□350035	
		560	356	285	2.3	35X40	ECS2GBZ561M□□350040
680		293	235	2.7	35X45	ECS2GBZ681M□□350045	
		820	242	194	3.1	35X50	ECS2GBZ821M□□350050
1000		133	107	3.7	35X60	ECS2GBZ102M□□350060	
		1200	166	89	4.2	40X60	ECS2GBZ122M□□400060
1500		133	71	5	40X70	ECS2GBZ152M□□400070	
		1800	111	59	5.8	40X80	ECS2GBZ182M□□400080
420 (470) 2X		120	1658	1327	0.82	25X30	ECS2XBZ121M□□250030
			150	1327	1062	0.96	25X30
	180	1106	885	1.1	25X35	ECS2XBZ181M□□250035	
		1106	885	1.2	30X30	ECS2XBZ181M□□300030	
	220	905	724	1.2	25X40	ECS2XBZ221M□□250040	
		905	724	1.3	30X30	ECS2XBZ221M□□300030	
	270	737	590	1.3	25X45	ECS2XBZ271M□□250045	
		737	590	1.4	30X30	ECS2XBZ271M□□300030	
	330	603	483	1.7	30X40	ECS2XBZ331M□□300040	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
420 (470) 2X	390	511	409	1.8	30X45	ECS2XBZ391M□□300045
		511	409	1.9	35X35	ECS2XBZ391M□□350035
	470	424	339	2.0	30X45	ECS2XBZ471M□□300045
		424	339	2.2	35X40	ECS2XBZ471M□□350040
	560	356	285	2.4	35X45	ECS2XBZ561M□□350045
	680	293	235	2.8	35X50	ECS2XBZ681M□□350050
	820	242	194	3.2	35X60	ECS2XBZ821M□□350060
	1000	133	107	4	40X60	ECS2XBZ102M□□400060
450 (500) 2W	120	1658	1327	0.83	25X30	ECS2WBZ121M□□250030
		1327	1062	0.95	22X45	ECS2WBZ151M□□220045
	150	1327	1062	0.95	25X35	ECS2WBZ151M□□250045
		1106	885	1.1	25X40	ECS2WBZ181M□□250040
	180	1106	885	1.1	30X30	ECS2WBZ181M□□300030
		905	724	1.2	22X50	ECS2WBZ221M□□220050
	220	905	724	1.2	25X40	ECS2WBZ221M□□250040
		905	724	1.2	30X30	ECS2WBZ221M□□300030
	270	737	590	1.4	30X30	ECS2WBZ271M□□300030
	330	603	480	1.6	30X40	ECS2WBZ331M□□300040
	390	511	409	1.7	30X40	ECS2WBZ391M□□300040
		511	409	1.8	35X35	ECS2WBZ391M□□350035
	470	424	339	2.1	30X45	ECS2WBZ471M□□300045
	560	356	285	2.3	35X45	ECS2WBZ561M□□350045
	680	293	235	2.7	35X50	ECS2WBZ681M□□350050
	820	242	194	3.2	35X60	ECS2WBZ821M□□350060
	1000	133	107	4.2	35X70	ECS2WBZ102M□□350070
	1200	166	89	4.4	40X70	ECS2WBZ122M□□400070
1500	133	71	5.2	40X80	ECS2WBZ152M□□400080	
1800	111	59	6.3	40X100	ECS2WBZ182M□□400100	
500 (550) 2H	100	1990	1592	0.75	25X30	ECS2HBZ101M□□250030
		120	1658	1327	0.83	25X30
	150	1327	1062	0.95	30X30	ECS2HBZ151M□□300030
		1106	885	1.1	25X40	ECS2HBZ181M□□250040
	180	1106	885	1.1	30X30	ECS2HBZ181M□□300030
		905	724	1.3	25X45	ECS2HBZ221M□□250045
	220	905	724	1.3	30X35	ECS2HBZ221M□□300035
		737	590	1.5	30X40	ECS2HBZ271M□□300040
	330	603	483	1.6	35X35	ECS2HBZ331M□□350035
	390	511	409	1.9	35X40	ECS2HBZ391M□□350040
	470	424	339	2.2	35X45	ECS2HBZ471M□□350045
	560	356	285	2.4	35X50	ECS2HBZ561M□□350050
	680	293	235	2.7	35X50	ECS2HBZ681M□□350050

Customer products are available on request.

## Frequency Coefficient

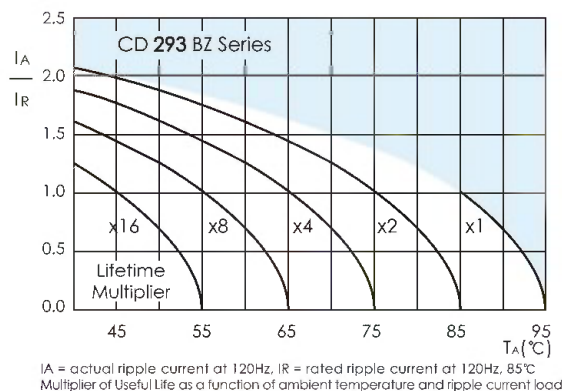
Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
Voltage (V)						
≤ 50	0.88	1.00	1.07	1.15	1.15	1.15
63 ~ 100	0.80	1.00	1.17	1.32	1.45	1.50
≥ 160	0.80	1.00	1.16	1.30	1.41	1.43

## Temperature Coefficient

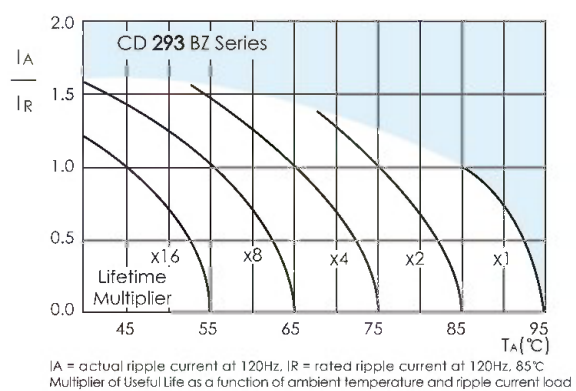
Temperature(°C)	+40	+55	+70	+85
Rated Voltage(V)				
< 160	2.1	1.8	1.5	1.0
≥ 160	1.7	1.5	1.3	1.0

## Lifetime Diagram

Lifetime Diagram U<sub>R</sub> < 160V



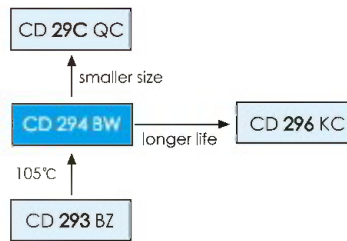
Lifetime Diagram U<sub>R</sub> ≥ 160V





2000h at 105°C

- Standard 105°C
- General Industry



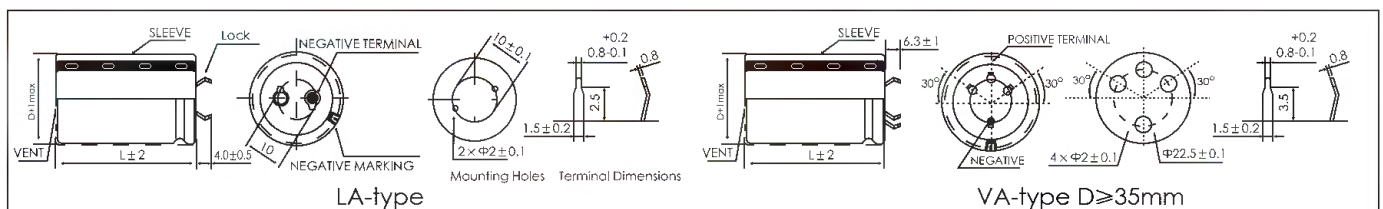
SNAP-IN/LUG

Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	16 ~ 100	160 ~ 550
Capacitance Range (µF)	100 ~ 47000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (µA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (µF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	16 25 35 50 63~100 160~400 420~550
	Tan δ (max)	0.50 0.40 0.35 0.30 0.20 0.15 0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	16~100 160~200 250~550
	$Z_{-25°C} / Z_{+20°C}$	4
	$Z_{-40°C} / Z_{+20°C}$	15 -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	>180000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥ 50kHz
Voltage (V)						
≤ 100	0.95	1.00	1.07	1.13	1.19	1.20
160 ~ 250	0.87	1.00	1.17	1.32	1.45	1.50
≥ 315	0.80	1.00	1.16	1.30	1.41	1.43

## Temperature Coefficient

Temperature (°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.00



# CD 294 BW SERIES



## Ratings for CD 294 BW Series

SNAP-IN/LUG

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
16 (20) 1C	12000	55	39	2.3	25 x 30	ECS1CBW123M□□250030
	15000	44	31	2.68	25 x 35	ECS1CBW153M□□250035
	18000	37	26	3.04	25 x 40	ECS1CBW183M□□250040
		37	26	3	30 x 30	ECS1CBW183M□□300030
	22000	30	21	3.4	25 x 45	ECS1CBW223M□□250045
		30	21	3.39	30 x 35	ECS1CBW223M□□300035
	27000	25	17	3.83	30 x 40	ECS1CBW273M□□300040
		25	17	3.74	35 x 30	ECS1CBW273M□□350030
	33000	20	14	4.3	30 x 45	ECS1CBW333M□□300045
		20	14	4.24	35 x 35	ECS1CBW333M□□350035
	39000	17	12	4.74	30 x 50	ECS1CBW393M□□300050
		17	12	4.72	35 x 40	ECS1CBW393M□□350040
25 (32) 1E	47000	14	10	5.27	35 x 45	ECS1CBW473M□□350045
	8200	65	45	2.16	25 x 30	ECS1EBW822M□□250030
	10000	53	37	2.44	25 x 35	ECS1EBW103M□□250035
	12000	44	31	2.74	25 x 40	ECS1EBW123M□□250040
		44	31	2.7	30 x 30	ECS1EBW123M□□300030
	15000	35	25	3.15	25 x 45	ECS1EBW153M□□250045
		35	25	3.13	30 x 35	ECS1EBW153M□□300035
	18000	30	21	3.54	25 x 50	ECS1EBW183M□□250050
		30	21	3.54	30 x 40	ECS1EBW183M□□300040
	22000	24	17	4.24	30 x 45	ECS1EBW223M□□300045
		24	17	3.96	35 x 35	ECS1EBW223M□□350035
	27000	20	14	4.75	35 x 45	ECS1EBW273M□□350045
35 (44) 1V	33000	16	11	5.39	35 x 50	ECS1EBW333M□□350050
	5600	83	58	2.04	25 x 30	ECS1VBW562M□□250030
	6800	68	48	2.31	25 x 35	ECS1VBW682M□□250035
		57	40	2.6	25 x 40	ECS1VBW822M□□250040
	8200	57	40	2.56	30 x 30	ECS1VBW822M□□300030
	10000	46	33	2.92	25 x 45	ECS1VBW103M□□250045
		46	33	2.92	30 x 35	ECS1VBW103M□□300035
	12000	39	27	3.28	30 x 40	ECS1VBW123M□□300040
		39	27	3.2	35 x 30	ECS1VBW123M□□350030
	15000	31	22	3.74	30 x 45	ECS1VBW153M□□300045
		31	22	3.69	35 x 35	ECS1VBW153M□□350035
	18000	26	18	4.16	35 x 40	ECS1VBW183M□□350040
50 (63) 1H	22000	21	15	4.92	35 x 50	ECS1VBW223M□□350050
	3300	121	84	2	25 x 25	ECS1HBW332M□□250025
	3900	102	72	2.28	25 x 30	ECS1HBW392M□□250030
	4700	85	59	2.58	25 x 30	ECS1HBW472M□□250030
	5600	71	50	2.81	25 x 35	ECS1HBW562M□□250035
	6800	59	41	3.37	25 x 40	ECS1HBW682M□□250040
		59	41	3.39	30 x 35	ECS1HBW682M□□300035
	8200	49	34	3.71	30 x 40	ECS1HBW822M□□300040
		49	34	3.66	35 x 35	ECS1HBW822M□□350035
	10000	40	28	4.09	30 x 45	ECS1HBW103M□□300045
		40	28	4.07	35 x 40	ECS1HBW103M□□350040
	12000	33	23	4.5	35 x 45	ECS1HBW123M□□350045
63 (79) 1J	2200	121	84	1.75	25 x 30	ECS1JBW222M□□250030
	2700	98	69	1.99	25 x 35	ECS1JBW272M□□250035
	3300	80	56	2.27	25 x 40	ECS1JBW332M□□250040
		80	56	2.24	30 x 30	ECS1JBW332M□□300030
	3900	68	48	2.54	25 x 45	ECS1JBW392M□□250045
		68	48	2.55	30 x 35	ECS1JBW392M□□300035
	4700	57	40	2.88	25 x 50	ECS1JBW472M□□250050
		57	40	2.9	30 x 40	ECS1JBW472M□□300040
	5600	47	33	3.28	30 x 45	ECS1JBW562M□□300045
		47	33	3.24	35 x 35	ECS1JBW562M□□350035
	6800	39	27	3.73	30 x 50	ECS1JBW682M□□350050
		39	27	3.71	35 x 40	ECS1JBW682M□□350040
80 (100) 1K	8200	32	23	4.16	35 x 45	ECS1JBW822M□□350045
	10000	27	19	4.69	35 x 50	ECS1JBW103M□□350050
	1500	177	124	1.62	25 x 30	ECS1KBW152M□□250030
	1800	147	103	1.81	25 x 30	ECS1KBW182M□□250030
	2200	121	84	2.09	22 x 45	ECS1KBW222M□□220045
		121	84	2.01	25 x 35	ECS1KBW222M□□250035
	2700	98	69	2.43	30 x 35	ECS1KBW272M□□300035
	3300	80	56	2.78	30 x 40	ECS1KBW332M□□300040
	3900	68	48	3.12	30 x 45	ECS1KBW392M□□300045
	4700	57	40	3.5	35 x 40	ECS1KBW472M□□350040
	5600	47	33	3.87	35 x 45	ECS1KBW562M□□350045
	6800	39	27	4.19	35 x 50	ECS1KBW682M□□350050
100 (125) 2A	1000	265	186	1.56	25 x 30	ECS2ABW102M□□250030
	1200	221	155	1.76	25 x 35	ECS2ABW122M□□250035
	1500	177	124	2.03	25 x 40	ECS2ABW152M□□250040
		177	124	2	30 x 30	ECS2ABW152M□□300030
	1800	147	103	2.28	25 x 45	ECS2ABW182M□□250045
		147	103	2.27	30 x 35	ECS2ABW182M□□300035
	2200	121	84	2.57	25 x 50	ECS2ABW222M□□250050
		121	84	2.59	30 x 40	ECS2ABW222M□□300040
	2700	98	69	2.94	30 x 45	ECS2ABW272M□□300045
	3300	80	56	3.32	30 x 50	ECS2ABW332M□□300050
		80	56	3.31	35 x 40	ECS2ABW332M□□350040
	3900	68	48	3.69	35 x 45	ECS2ABW392M□□350045
350 (400) 2V	4700	57	40	4.14	35 x 50	ECS2ABW472M□□350050

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
160 (200) 2C	560	355	249	1.62	22×40	ECS2CBW561M□□220040	
		355	249	1.73	25×30	ECS2CBW561M□□250030	
	680	293	205	1.7	22×45	ECS2CBW681M□□220045	
		293	205	1.81	25×35	ECS2CBW681M□□250035	
	820	243	170	1.98	25×40	ECS2CBW821M□□250040	
		243	170	1.98	30×30	ECS2CBW821M□□300030	
	1000	199	139	2.04	25×45	ECS2CBW102M□□250045	
		199	139	2.14	30×35	ECS2CBW102M□□300035	
	1200	166	116	2.12	25×50	ECS2CBW122M□□250050	
		166	116	2.22	30×40	ECS2CBW122M□□300040	
	1500	133	93	2.46	30×45	ECS2CBW152M□□300045	
		133	93	2.53	35×35	ECS2CBW152M□□350035	
	1800	111	77	2.98	35×45	ECS2CBW182M□□350045	
	2200	91	63	3.1	35×50	ECS2CBW222M□□350050	
	2700	74	51	3.77	35×55	ECS2CBW272M□□350055	
	3300	60	42	4.33	35×60	ECS2CBW332M□□350060	
	470	424	296	1.5	22×35	ECS2KBW471M□□220035	
		424	296	1.62	25×30	ECS2KBW471M□□250030	
	180 (225) 2K	560	355	249	1.62	22×40	ECS2KBW561M□□220040
			355	249	1.69	25×35	ECS2KBW561M□□250035
680		293	205	1.72	25×40	ECS2KBW681M□□250040	
		293	205	1.74	30×30	ECS2KBW681M□□300030	
820		243	170	1.78	25×45	ECS2KBW821M□□250045	
		243	170	1.85	30×35	ECS2KBW821M□□300035	
1000		199	139	1.91	25×50	ECS2KBW102M□□220050	
		199	139	2.01	30×40	ECS2KBW102M□□300040	
1200		166	116	2.19	30×45	ECS2KBW122M□□300045	
1500		133	93	2.36	30×50	ECS2KBW152M□□300050	
1800		111	77	2.67	35×45	ECS2KBW182M□□350045	
2200		91	63	3.27	35×50	ECS2KBW222M□□350050	
2700		74	52	3.92	35×60	ECS2KBW272M□□350060	
200 (250) 2D		470	424	296	1.47	25×30	ECS2DBW471M□□250030
			424	296	1.56	30×25	ECS2DBW471M□□300025
		560	355	249	1.58	25×35	ECS2DBW561M□□250035
	355		249	1.65	30×30	ECS2DBW561M□□300030	
	680	293	205	1.8	25×40	ECS2DBW681M□□250040	
		293	205	1.82	30×30	ECS2DBW681M□□300030	
	820	243	170	1.99	30×35	ECS2DBW821M□□300035	
		199	139	2.17	22×50	ECS2DBW102M□□220050	
	1000	199	139	2.21	30×40	ECS2DBW102M□□300040	
		166	116	2.22	25×45	ECS2DBW122M□□250045	
	1200	166	116	2.28	30×40	ECS2DBW122M□□300040	
		133	93	2.59	30×50	ECS2DBW152M□□300050	
	1500	133	93	2.64	35×40	ECS2DBW152M□□350040	
		1800	111	77	2.7	35×45	ECS2DBW182M□□350045
	2200	91	63	3.23	35×50	ECS2DBW222M□□350050	
	250 (300) 2E	330	603	422	1.2	22×40	ECS2EBW331M□□220040
603			422	1.3	25×30	ECS2EBW331M□□250030	
390		510	357	1.41	25×35	ECS2EBW391M□□250035	
		424	296	1.52	25×40	ECS2EBW471M□□250040	
470		424	296	1.56	30×30	ECS2EBW471M□□300030	
		355	249	1.59	25×45	ECS2EBW561M□□250045	
560		355	249	1.61	30×30	ECS2EBW561M□□300030	
		293	205	1.66	25×50	ECS2EBW681M□□250050	
680		293	205	1.76	30×35	ECS2EBW681M□□300035	
		243	170	1.83	30×40	ECS2EBW821M□□300040	
820		243	170	1.82	35×35	ECS2EBW821M□□350035	
		199	139	1.87	30×50	ECS2EBW102M□□300050	
1000		199	139	1.99	35×40	ECS2EBW102M□□350040	
		1200	166	116	2.1	35×45	ECS2EBW122M□□350045
1500		133	93	2.7	35×50	ECS2EBW152M□□350050	
1800		111	77	2.9	35×55	ECS2EBW182M□□350055	
	111	77	2.92	35×60	ECS2EBW182M□□350060		
315 (365) 2F	180	1106	608	0.78	22×40	ECS2FBW181M□□220040	
		1106	608	0.85	25×25	ECS2FBW181M□□250025	
	220	905	498	0.91	22×45	ECS2FBW221M□□220045	
		905	498	0.94	25×30	ECS2FBW221M□□250030	
	270	737	406	1	25×35	ECS2FBW271M□□250035	
		737	406	0.98	30×25	ECS2FBW271M□□300025	
	330	603	332	1.13	30×30	ECS2FBW331M□□300030	
		510	281	1.20	30×35	ECS2FBW391M□□300035	
	390	424	233	1.28	30×35	ECS2FBW471M□□300035	
		355	196	1.46	30×40	ECS2FBW561M□□300040	
	560	293	161	1.85	30×45	ECS2FBW681M□□300045	
		293	161	1.88	35×35	ECS2FBW681M□□350035	
	680	242	133	2.1	30×50	ECS2FBW821M□□300050	
		242	133	2.15	35×40	ECS2FBW821M□□350040	
	820	199	109	2.42	30×55	ECS2FBW102M□□300055	
		199	109	2.47	35×45	ECS2FBW102M□□350045	
1000	166	91	2.6	35×50	ECS2FBW122M□□350050		
350 (400) 2V	150	1327	730	0.82	25×30	ECS2VBW151M□□250030	
	180	1106	608	0.89	25×35	ECS2VBW181M□□250035	
	220	905	498	0.97	25×40	ECS2VBW221M□□250040	
		905	498	0.98	30×30	ECS2VBW221M□□300030	
	270	737	406	1.01	25×45	ECS2VBW271M□□250045	



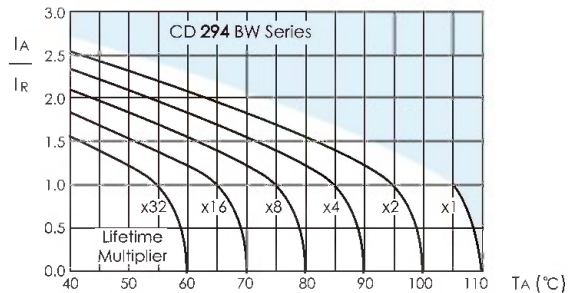
## Ratings for CD 294 BW Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	270	737	406	1.05	30 x 30	ECS2VBW271M□□300030
	330	603	332	1.16	25 x 45	ECS2VBW331M□□250045
		603	332	1.19	30 x 40	ECS2VBW331M□□300040
	390	510	281	1.26	25 x 45	ECS2VBW391M□□250045
		510	281	1.29	30 x 40	ECS2VBW391M□□300040
	470	424	233	1.35	30 x 50	ECS2VBW471M□□300050
		424	233	1.41	35 x 40	ECS2VBW471M□□350040
	560	355	196	1.47	30 x 50	ECS2VBW561M□□300050
		355	196	1.51	35 x 50	ECS2VBW561M□□350050
	680	293	161	1.92	30 x 55	ECS2VBW681M□□300055
		293	161	1.97	35 x 50	ECS2VBW681M□□350050
	820	242	133	2.25	35 x 60	ECS2VBW821M□□350060
400 (450) 2G	120	1659	863	0.64	22 x 30	ECS2GBW121M□□220030
		1659	863	0.7	25 x 25	ECS2GBW121M□□250025
	150	1327	690	0.73	25 x 30	ECS2GBW151M□□250030
		1327	690	0.75	30 x 25	ECS2GBW151M□□300025
	180	1106	575	0.82	25 x 35	ECS2GBW181M□□250035
		1106	575	0.85	30 x 25	ECS2GBW181M□□300025
	220	905	471	0.87	25 x 40	ECS2GBW221M□□250040
		905	471	0.96	30 x 30	ECS2GBW221M□□300030
	270	737	383	0.94	22 x 40	ECS2GBW271M□□220040
		737	383	0.99	30 x 35	ECS2GBW271M□□300035
	330	603	314	1.08	25 x 50	ECS2GBW331M□□250050
		603	314	1.11	30 x 40	ECS2GBW331M□□300040
420 (470) 2X	390	510	265	1.13	25 x 60	ECS2GBW391M□□250060
		510	265	1.15	30 x 45	ECS2GBW391M□□300045
	470	424	220	1.28	30 x 50	ECS2GBW471M□□300050
		424	220	1.31	35 x 35	ECS2GBW471M□□350035
	560	355	185	1.5	30 x 50	ECS2GBW561M□□300050
		355	185	1.65	35 x 40	ECS2GBW561M□□350040
	680	293	153	1.9	35 x 50	ECS2GBW681M□□350050
	820	242	126	2.1	35 x 50	ECS2GBW821M□□350050
		242	126	2.2	35 x 60	ECS2GBW821M□□350060
	1000	199	109	2.5	30 x 70	ECS2GBW102M□□300070
		199	109	2.6	35 x 60	ECS2GBW102M□□350060
450 (500) 2W	120	2212	1106	0.72	25 x 30	ECS2XBW121M□□250030
	150	1769	885	0.8	25 x 30	ECS2XBW151M□□250030
	180	1474	737	0.85	30 x 30	ECS2XBW181M□□300030
	220	1206	603	0.96	30 x 30	ECS2XBW221M□□300030
	270	983	492	1.06	30 x 35	ECS2XBW271M□□300035
	330	804	402	1.14	30 x 40	ECS2XBW331M□□300040
		804	402	1.2	35 x 30	ECS2XBW331M□□350030
	390	681	340	1.25	30 x 45	ECS2XBW391M□□300045
	470	565	282	1.28	30 x 50	ECS2XBW471M□□300050
		565	282	1.31	35 x 40	ECS2XBW471M□□350040
	560	473	237	1.45	30 x 50	ECS2XBW561M□□300050
		473	237	1.5	35 x 45	ECS2XBW561M□□350045
500 (550) 2H	680	391	196	1.9	35 x 50	ECS2XBW681M□□350050
	820	324	162	2.2	35 x 60	ECS2XBW821M□□350060
	1000	265	139	2.6	35 x 65	ECS2XBW102M□□350065
	120	2212	1106	0.73	22 x 35	ECS2WBW121M□□220035
	150	1769	885	0.82	25 x 30	ECS2WBW151M□□250030
	180	1474	737	0.86	30 x 30	ECS2WBW181M□□300030
	220	1206	603	0.94	22 x 50	ECS2WBW221M□□220050
		1206	603	0.95	30 x 30	ECS2WBW221M□□300030
	270	983	492	1.11	30 x 30	ECS2WBW271M□□300030
		983	492	1.15	30 x 35	ECS2WBW271M□□300035
	330	804	402	1.25	30 x 40	ECS2WBW331M□□300040
		804	402	1.26	35 x 30	ECS2WBW331M□□350030
550 (600) 2Y	390	681	340	1.31	30 x 40	ECS2WBW391M□□300040
		681	340	1.36	35 x 35	ECS2WBW391M□□350035
	470	565	282	1.5	30 x 45	ECS2WBW471M□□300045
		565	282	1.55	35 x 45	ECS2WBW471M□□350045
	560	473	237	1.5	35 x 50	ECS2WBW471M□□350050
		473	237	1.65	30 x 50	ECS2WBW561M□□300050
		473	237	1.7	35 x 50	ECS2WBW561M□□350050
	680	391	196	1.95	35 x 50	ECS2WBW681M□□350050
		391	196	2	35 x 60	ECS2WBW681M□□350060
	820	324	162	2.15	35 x 60	ECS2WBW821M□□350060
		324	162	2.2	35 x 65	ECS2WBW821M□□350065
	1000	265	139	2.6	35 x 70	ECS2WBW102M□□350070
500 (550) 2H	100	2654	1327	0.67	22 x 35	ECS2HBW101M□□220035
	120	2212	1106	0.77	22 x 50	ECS2HBW121M□□220050
		2212	1106	0.81	25 x 35	ECS2HBW121M□□250035
	150	1769	885	0.85	25 x 40	ECS2HBW151M□□250040
		1769	885	0.88	30 x 30	ECS2HBW151M□□300030
	180	1474	737	1.01	25 x 50	ECS2HBW181M□□250050
		1474	737	1.06	30 x 35	ECS2HBW181M□□300035
	220	1206	603	1.12	30 x 35	ECS2HBW221M□□300035
		1206	603	1.17	35 x 30	ECS2HBW221M□□350030
	270	983	492	1.29	30 x 40	ECS2HBW271M□□300040
		983	492	1.34	35 x 35	ECS2HBW271M□□350035
	330	804	402	1.4	35 x 45	ECS2HBW331M□□350045

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
500 (550) 2H	390	681	340	1.6	35 x 50	ECS2HBW391M□□350050
	470	565	282	1.8	35 x 50	ECS2HBW471M□□350050
		565	282	1.8	35 x 60	ECS2HBW471M□□350060
	560	473	237	1.9	35 x 60	ECS2HBW561M□□350060
	680	391	196	2.2	35 x 70	ECS2HBW681M□□350070
550 (600) 2Y	150	1769	885	0.86	30 x 35	ECS2YBW151M□□300035
	180	1474	737	1.06	30 x 40	ECS2YBW181M□□300040
		1474	737	1.11	35 x 30	ECS2YBW181M□□350030
	220	1206	603	1.18	30 x 50	ECS2YBW221M□□300050
		1206	603	1.23	35 x 35	ECS2YBW221M□□350035
	270	983	492	1.31	35 x 45	ECS2YBW271M□□350045
	330	804	402	1.5	35 x 50	ECS2YBW331M□□350050
	390	681	340	1.67	35 x 60	ECS2YBW391M□□350060
	470	565	282	1.9	35 x 60	ECS2YBW471M□□350060
	560	473	237	2.1	35 x 80	ECS2YBW561M□□350080

Customer products are available on request.

## Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



# CD 29C QC SERIES



SNAP-IN/LUG

2000h at 105°C

- Load life 2000 hours at 105°C
- High ripple current
- Downsized from CD294
- PCB Mounting
- General industrial electronics

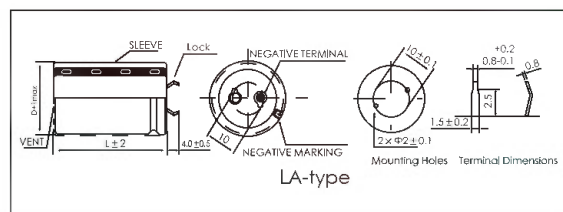


Items	Characteristics				
Operating Temperature Range (°C)	-40 ~ +105		-25 ~ +105		
Voltage Range (V)	200 ~ 250		400 ~ 450		
Capacitance Range (μF)	180 ~ 2700				
Capacitance Tolerance (20°C, 120Hz)	± 20%				
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF)    V: Rated Voltage (V)				
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	200	250	400	450
	Tan δ (max)	0.15			0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200	250	400	450
	Impedance Ratio	$\frac{Z_{-25^{\circ}\text{C}}}{Z_{+20^{\circ}\text{C}}}$	4		8
		$\frac{Z_{-40^{\circ}\text{C}}}{Z_{+20^{\circ}\text{C}}}$	12		-

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	≥ 180000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

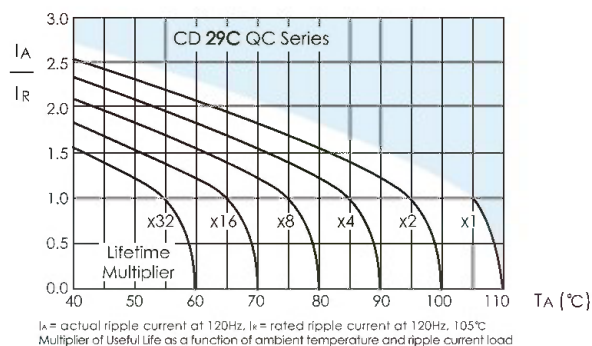
mm



## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0

## Lifetime Diagram



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥ 50kHz
Voltage (V)						
200 ~ 250	0.80	1.00	1.17	1.32	1.45	1.50
400 ~ 450	0.80	1.00	1.16	1.30	1.41	1.43



## Ratings for CD 29C QC Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
200 (250) 2D	560	355	248	1.48	25 x 30	ECS2DQC561M□□250030
		292	204	1.62	22 x 40	ECS2DQC681M□□220040
	680	292	204	1.60	25 x 30	ECS2DQC681M□□250030
		292	204	1.60	30 x 25	ECS2DQC681M□□300025
	820	242	169	1.75	22 x 45	ECS2DQC821M□□220045
		242	169	1.75	25 x 35	ECS2DQC821M□□250035
		242	169	1.75	30 x 30	ECS2DQC821M□□300030
	1000	199	139	2.04	22 x 50	ECS2DQC102M□□220050
		199	139	2.04	25 x 40	ECS2DQC102M□□250040
		199	139	2.04	30 x 35	ECS2DQC102M□□300035
		199	139	2.04	35 x 25	ECS2DQC102M□□350025
	1200	165	116	2.30	25 x 45	ECS2DQC122M□□250045
		165	116	2.30	30 x 35	ECS2DQC122M□□300035
	1500	132	92	2.57	30 x 40	ECS2DQC152M□□300040
		132	92	2.57	35 x 30	ECS2DQC152M□□350030
	1800	110	77	2.68	30 x 50	ECS2DQC182M□□300050
		110	77	2.68	35 x 35	ECS2DQC182M□□350035
	2200	90	63	2.92	35 x 45	ECS2DQC222M□□350045
	2700	73	51	3.30	35 x 50	ECS2DQC272M□□350050
250 (300) 2E	470	423	296	1.56	22 x 40	ECS2EQC471M□□220040
		423	296	1.56	25 x 30	ECS2EQC471M□□250030
	560	355	248	1.74	22 x 45	ECS2EQC561M□□220045
		355	248	1.74	25 x 35	ECS2EQC561M□□250035
	680	292	204	1.92	22 x 50	ECS2EQC681M□□220050
		292	204	1.92	25 x 40	ECS2EQC681M□□250040
		292	204	1.92	30 x 30	ECS2EQC681M□□300030
	820	242	169	2.13	25 x 45	ECS2EQC821M□□250045
		242	169	2.13	30 x 35	ECS2EQC821M□□300035
	1000	199	139	2.40	25 x 50	ECS2EQC102M□□250050
		199	139	2.40	30 x 40	ECS2EQC102M□□300040
		199	139	2.40	35 x 30	ECS2EQC102M□□350030
	1200	165	116	2.55	30 x 40	ECS2EQC122M□□300040
		132	92	2.73	30 x 50	ECS2EQC152M□□300050
	1500	132	92	2.73	35 x 40	ECS2EQC152M□□350040
	1800	110	77	2.82	35 x 45	ECS2EQC182M□□350045
	2200	90	63	2.95	35 x 50	ECS2EQC222M□□350050

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	220	904	633	0.87	25 x 30	ECS2GQC221M□□250030
		737	516	0.93	22 x 40	ECS2GQC271M□□220040
	270	737	516	1.05	25 x 35	ECS2GQC271M□□250035
		737	516	1.02	30 x 25	ECS2GQC271M□□300025
	330	603	422	1.16	22 x 50	ECS2GQC331M□□220050
		603	422	1.14	25 x 40	ECS2GQC331M□□250040
		603	422	1.14	30 x 30	ECS2GQC331M□□300030
		603	422	1.13	35 x 25	ECS2GQC331M□□350025
	390	510	357	1.45	25 x 45	ECS2GQC391M□□250045
		510	357	1.47	30 x 35	ECS2GQC391M□□300035
		510	357	1.50	35 x 30	ECS2GQC391M□□350030
	470	423	296	1.54	25 x 50	ECS2GQC471M□□250050
		423	296	1.61	30 x 40	ECS2GQC471M□□300040
		423	296	1.50	35 x 30	ECS2GQC471M□□350030
	560	355	248	1.70	30 x 45	ECS2GQC561M□□300045
		355	248	1.67	35 x 35	ECS2GQC561M□□350035
	680	292	204	1.82	30 x 50	ECS2GQC681M□□300050
		292	204	1.87	35 x 40	ECS2GQC681M□□350040
	820	242	169	2.08	35 x 45	ECS2GQC821M□□350045
		242	169	2.14	30 x 60	ECS2GQC821M□□300060
450 (500) 2W	180	1474	774	0.79	25 x 30	ECS2WQC181M□□250030
	220	1206	633	0.85	22 x 45	ECS2WQC221M□□220045
		1206	633	0.87	25 x 35	ECS2WQC221M□□250035
		1206	633	0.89	30 x 30	ECS2WQC221M□□300030
	270	983	516	1.00	22 x 50	ECS2WQC271M□□220050
		983	516	1.10	25 x 40	ECS2WQC271M□□250040
		983	516	1.01	30 x 30	ECS2WQC271M□□300030
		983	516	1.00	35 x 25	ECS2WQC271M□□350025
	330	804	422	1.28	25 x 50	ECS2WQC331M□□250050
		804	422	1.31	30 x 35	ECS2WQC331M□□300035
		804	422	1.25	35 x 30	ECS2WQC331M□□350030
	390	680	357	1.41	30 x 40	ECS2WQC391M□□300040
		680	357	1.45	35 x 35	ECS2WQC391M□□350035
	470	565	296	1.61	35 x 40	ECS2WQC471M□□350040
		565	296	1.52	30 x 45	ECS2WQC471M□□300045
	560	474	248	1.75	35 x 45	ECS2WQC561M□□350045
	680	390	204	1.93	35 x 50	ECS2WQC681M□□350050

Customer products are available on request.



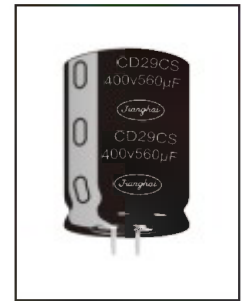
# CD 29CS DS SERIES



SNAP-IN/LUG

2000h at 105°C

- Load life 2000 hours at 105°C
- High ripple current
- Downsized from CD29C

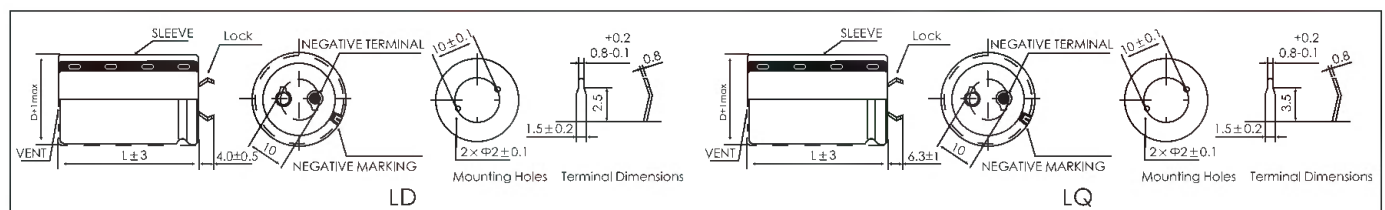


Items	Characteristics			
Operating Temperature Range (°C)	-25 ~ +105			
Rated Voltage Range (V)	400 ~ 450			
Capacitance Range (μF)	220 ~ 820			
Capacitance Tolerance (20°C, 120Hz)	±20%			
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is Smaller. C:Nominal Capacitance(μF) V:Rated Voltage(V)			
Dissipation Factor (20°C, 120Hz)	Rated Voltage (v)	400	420	450
	tan δ (max)	0.15	0.20	
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (v)	400	420	450
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	8		

	Useful Life		Load Life	Endurance Test	Shelf Life
Life Time	4000h	≥180000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C <div>After test: <math>U_R</math> to be applied for 30min &gt;24h before measurement</div>

## Dimensions

mm



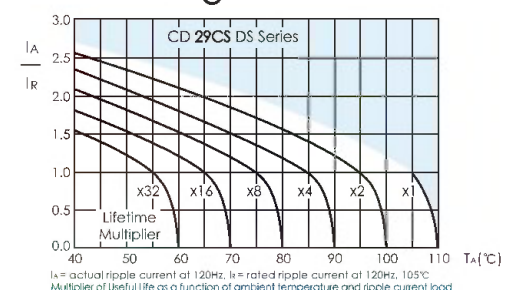
## Frequency Coefficient

Voltage(V)	Frequency(Hz)	50/60	120	300	1K	10K	≥50K
400~450		0.8	1	1.16	1.30	1.41	1.43

## Temperature Coefficient

Temperature (°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0

## Lifetime Diagram





## Ratings for CD 29CS DS Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	270	737	383	1.43	25x30	ECS2GDS271M □□ 250030
	330	603	314	1.77	22x45	ECS2GDS331M □□ 220045
	330	603	314	1.65	25x35	ECS2GDS331M □□ 250035
	390	510	265	1.97	22x50	ECS2GDS391M □□ 220050
	390	510	265	1.85	25x40	ECS2GDS391M □□ 250040
	390	510	265	1.65	30x30	ECS2GDS391M □□ 300030
	470	424	220	2.07	25x45	ECS2GDS471M □□ 250045
	470	424	220	1.89	30x35	ECS2GDS471M □□ 300035
	560	355	185	2.12	30x40	ECS2GDS561M □□ 300040
	680	293	153	2.00	30x45	ECS2GDS681M □□ 300045
420 (470) 2X	820	242	126	2.48	30x50	ECS2GDS821M □□ 300050
	270	983	472	1.27	22x40	ECS2XDS271M □□ 220040
	270	983	472	1.28	25x30	ECS2XDS271M □□ 250030
	270	983	472	1.28	30x25	ECS2XDS271M □□ 300025
	330	804	402	1.44	22x45	ECS2XDS331M □□ 220045
	330	804	402	1.48	25x35	ECS2XDS331M □□ 250035
	390	681	340	1.63	22x55	ECS2XDS391M □□ 220055
	390	681	340	1.64	25x40	ECS2XDS391M □□ 250040
	390	681	340	1.55	30x30	ECS2XDS391M □□ 300030
	470	565	282	1.86	25x50	ECS2XDS471M □□ 250050
	470	565	282	1.74	30x35	ECS2XDS471M □□ 300035
	560	472	237	2.09	25x55	ECS2XDS561M □□ 250055
	560	472	237	1.96	30x40	ECS2XDS561M □□ 300040
	680	391	196	2.25	30x50	ECS2XDS681M □□ 300050
450 (500) 2W	820	324	162	2.52	30x55	ECS2XDS821M □□ 300055
	220	1206	603	1.16	25x30	ECS2WDS221M □□ 250030
	270	983	492	1.30	22x45	ECS2WDS271M □□ 220045
	270	983	492	1.34	25x35	ECS2WDS271M □□ 250035
	270	983	492	1.28	30x25	ECS2WDS271M □□ 300025
	330	804	402	1.47	22x50	ECS2WDS331M □□ 220050
	330	804	402	1.51	25x40	ECS2WDS331M □□ 250040
	330	804	402	1.43	30x30	ECS2WDS331M □□ 300030
	390	681	340	1.63	22x55	ECS2WDS391M □□ 220055
	390	681	340	1.67	25x45	ECS2WDS391M □□ 250045
	390	681	340	1.59	30x35	ECS2WDS391M □□ 300035
	470	565	283	1.91	25x55	ECS2WDS471M □□ 250055
	470	565	283	1.79	30x40	ECS2WDS471M □□ 300040
	560	473	237	2.13	25x60	ECS2WDS561M □□ 250060
	560	473	237	2.01	30x45	ECS2WDS561M □□ 300045
	680	391	196	2.25	30x50	ECS2WDS681M □□ 300050
	820	324	162	2.56	30x60	ECS2WDS821M □□ 300060

Customer products are available on request.



# CD 29CT QT SERIES



SNAP-IN/LUG

2000h at 105°C

- Extremely high CV, ultra compact
- Servo drivers, 5G power supply, etc.
- High capacitance achieved by new foil technology



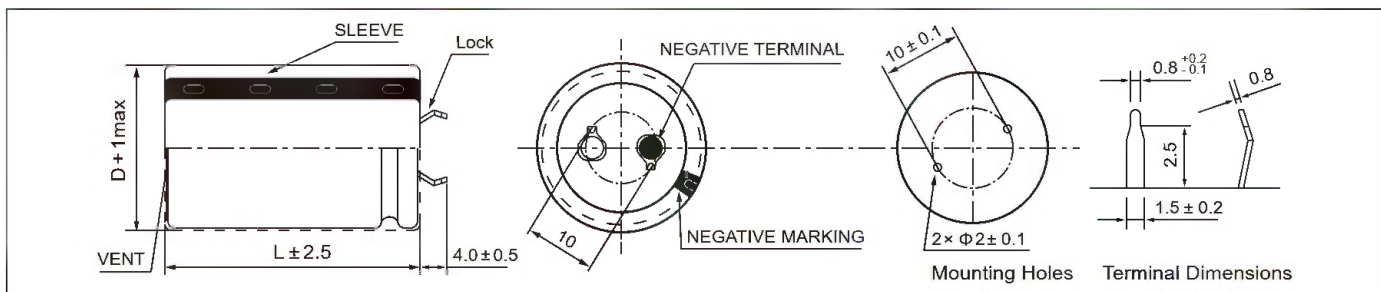
Items	Characteristics	
Operating Temperature Range(°C)	-25 ~ +105	
Voltage Range (V)	400 ~ 450	
Capacitance Range(μF)	220 ~ 1500	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	$I_L = 0.01C_R U_R$ (μA) or 1.5mA, whichever is smaller. ( $C_R$ : Nominal Capacitance, in μF)	
Dissipation Factor (20°C, 120Hz)	≤0.20	
Stability at Low Temperature (Impedance Ratio at 120Hz)	UR (V)	400~450
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	8

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	3000h	≥ 15000h	2000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition:	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ 105°C	105°C

\*Shelf Life test:  $U_R$  to be applied for 60min, >24h before measurement

## Dimensions

mm



## Ripple Current Coefficient

Frequency (Hz)	50	120	300	1k	10k	50k
Rated Voltage (V)						
400~450	0.80	1.00	1.16	1.30	1.41	1.43

Ambient Temp(°C)	40	55	70	85	105
Coefficient	2.7	2.5	2.1	1.7	1.0

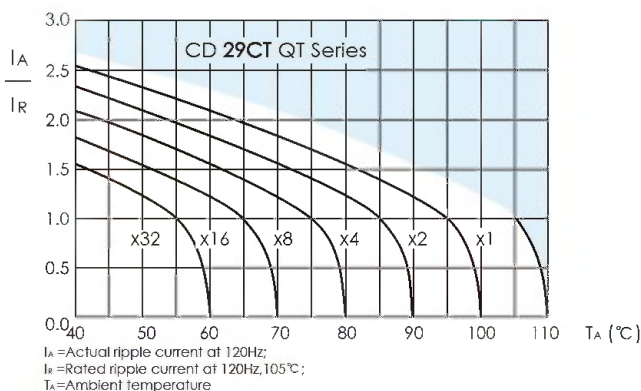


## Ratings for CD 29CT QT Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	240	884	442	1.00	25×25	ECS2GQT241M □□ 250025
	310	692	346	1.19	25×30	ECS2GQT311M □□ 250030
	390	558	279	1.31	25×35	ECS2GQT391M □□ 250035
	470	468	234	1.51	25×40	ECS2GQT471M □□ 250040
	480	468	234	1.48	30×30	ECS2GQT481M □□ 300030
	540	412	206	1.66	25×45	ECS2GQT541M □□ 250045
	600	374	187	1.70	30×35	ECS2GQT601M □□ 300035
	620	358	179	1.83	25×50	ECS2GQT621M □□ 250050
	700	322	161	1.89	30×40	ECS2GQT701M □□ 300040
	800	284	142	1.93	35×35	ECS2GQT801M □□ 350035
	820	274	137	2.08	30×45	ECS2GQT821M □□ 300045
	950	240	120	2.29	30×50	ECS2GQT951M □□ 300050
	950	240	120	2.22	35×40	ECS2GQT951M □□ 350040
	1050	216	108	2.40	30×55	ECS2GQT1A2M □□ 300055
	1100	206	103	2.45	35×45	ECS2GQT112M □□ 350045
	1200	192	96	2.56	30×60	ECS2GQT122M □□ 300060
	1250	184	92	2.58	35×50	ECS2GQT1C2M □□ 350050
	1350	172	86	2.64	35×55	ECS2GQT1D2M □□ 350055
450 (500) 2W	1500	156	78	2.80	35×60	ECS2GQT152M □□ 350060
	220	1108	554	1.10	25×25	ECS2WQT221M □□ 250025
	270	914	457	1.26	25×30	ECS2WQT271M □□ 250030
	330	758	379	1.46	25×35	ECS2WQT331M □□ 250035
	410	616	308	1.57	25×40	ECS2WQT411M □□ 250040
	410	632	316	1.56	30×30	ECS2WQT411M □□ 300030
	470	544	272	1.73	25×45	ECS2WQT471M □□ 250045
	510	508	254	1.81	30×35	ECS2WQT511M □□ 300035
	530	482	241	1.93	25×50	ECS2WQT531M □□ 250050
	600	432	216	2.00	30×40	ECS2WQT601M □□ 300040
	680	384	192	2.03	35×35	ECS2WQT681M □□ 350035
	700	370	185	2.13	30×45	ECS2WQT701M □□ 300045
	800	328	164	2.42	30×50	ECS2WQT801M □□ 300050
	800	328	164	2.26	35×40	ECS2WQT801M □□ 350040
	900	290	145	2.62	30×55	ECS2WQT901M □□ 300055
	930	282	141	2.67	35×45	ECS2WQT931M □□ 350045
	1000	264	132	2.81	30×60	ECS2WQT102M □□ 300060
	1050	252	126	2.84	35×50	ECS2WQT1A2M □□ 350050
	1200	222	111	2.96	35×55	ECS2WQT122M □□ 350055
	1300	208	104	3.05	35×60	ECS2WQT132M □□ 350060

Customer products are available on request.

## Lifetime Diagram





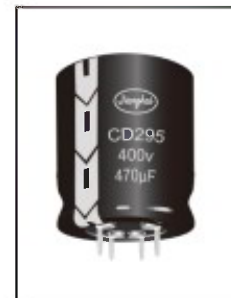
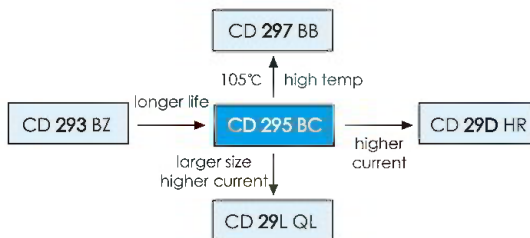
# CD 295 BC SERIES



SNAP-IN/LUG

5000h at 85°C

- Long Life at 85°C
- High Ripple Current
- Long Life General Industrial Electronics

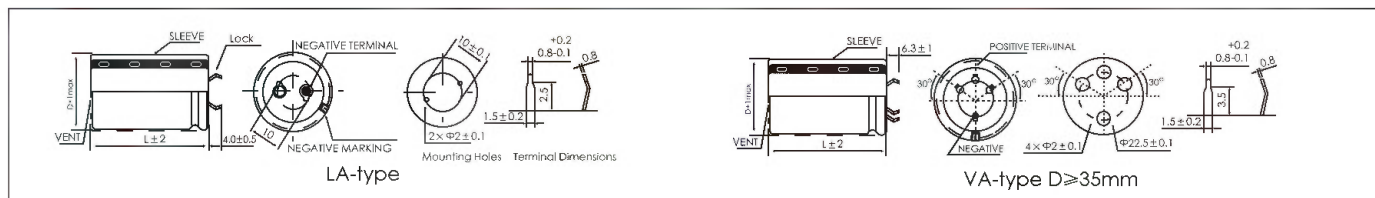


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +85	-25 ~ +85
Voltage Range (V)	160 ~ 400	420 ~ 500
Capacitance Range (μF)	100 ~ 2200	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	0.15	
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160~200      250~400      420~500
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3      4
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	6      8      -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	>100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Voltage (V)	Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
≥ 160		0.80	1.00	1.16	1.30	1.41	1.43

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	
Rated Voltage(V)	≥ 160	1.7	1.5	1.3	1.0



## Ratings for CD 295 BC Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
160 (200) 2C	220	905	633	1	22×25	ECS2CBC221M□□220025	
	270	737	516	1.1	22×25	ECS2CBC271M□□220025	
	330	603	422	1.3	22×25	ECS2CBC331M□□220025	
	390	510	357	1.5	22×30	ECS2CBC391M□□220030	
	510	357	1.5	25×25	ECS2CBC391M□□250025		
	470	424	297	1.7	25×25	ECS2CBC471M□□250025	
	560	355	249	1.9	22×35	ECS2CBC561M□□220035	
	355	249	1.9	25×30	ECS2CBC561M□□250030		
	680	293	205	2.1	22×40	ECS2CBC681M□□220040	
	293	205	2.2	25×35	ECS2CBC681M□□250035		
	820	243	170	2.4	25×40	ECS2CBC821M□□250040	
	243	170	2.5	30×30	ECS2CBC821M□□300030		
	1000	199	139	2.7	25×45	ECS2CBC102M□□250045	
	199	139	2.8	30×35	ECS2CBC102M□□300035		
	199	139	2.7	35×30	ECS2CBC102M□□350030		
	1200	166	116	3.1	25×50	ECS2CBC122M□□250050	
	166	116	3.2	30×40	ECS2CBC122M□□300040		
	166	116	3	35×35	ECS2CBC122M□□350035		
	1500	133	93	3.7	30×45	ECS2CBC152M□□300045	
	133	93	3.5	35×40	ECS2CBC152M□□350040		
	1800	111	77	3.9	35×45	ECS2CBC182M□□350045	
	2200	91	63	4.5	35×50	ECS2CBC222M□□350050	
	180 (225) 2K	270	737	516	1.2	22×25	ECS2KBC271M□□220025
		330	603	422	1.4	22×30	ECS2KBC331M□□220030
390		510	357	1.5	25×25	ECS2KBC391M□□250025	
424		296	1.7	22×35	ECS2KBC471M□□220035		
424		296	1.7	25×30	ECS2KBC471M□□250030		
424		296	1.8	30×25	ECS2KBC471M□□300025		
560		355	249	1.9	22×40	ECS2KBC561M□□220040	
355		249	2	25×35	ECS2KBC561M□□250035		
680		293	205	2.2	25×40	ECS2KBC681M□□250040	
293		205	2.3	30×30	ECS2KBC681M□□300030		
820		243	170	2.5	25×45	ECS2KBC821M□□250045	
243		170	2.6	30×35	ECS2KBC821M□□300035		
243		170	2.5	35×30	ECS2KBC821M□□350030		
1000		199	139	2.9	25×50	ECS2KBC102M□□250050	
199		139	2.9	30×40	ECS2KBC102M□□300040		
1200		166	116	3.3	30×45	ECS2KBC122M□□300045	
166		116	3.1	35×35	ECS2KBC122M□□350035		
1500		133	93	3.6	35×45	ECS2KBC152M□□350045	
1800		111	77	4.1	35×50	ECS2KBC182M□□350050	
200 (250) 2D		220	905	633	1.1	22×25	ECS2DBC221M□□220025
		270	737	516	1.2	22×25	ECS2DBC271M□□220025
		330	603	422	1.4	22×30	ECS2DBC331M□□220030
		603	422	1.4	25×25	ECS2DBC331M□□250025	
		390	510	357	1.6	22×35	ECS2DBC391M□□220035
	510	357	1.6	25×30	ECS2DBC391M□□250030		
	470	424	296	1.8	22×40	ECS2DBC471M□□220040	
	424	296	1.9	30×25	ECS2DBC471M□□300025		
	560	355	249	2	25×35	ECS2DBC561M□□250035	
	355	249	2.1	30×30	ECS2DBC561M□□300030		
	680	293	205	2.3	25×40	ECS2DBC681M□□250040	
	293	205	2.4	30×35	ECS2DBC681M□□300035		
	820	243	170	2.6	25×50	ECS2DBC821M□□250050	
	243	170	2.7	30×40	ECS2DBC821M□□300040		
	243	170	2.5	35×30	ECS2DBC821M□□350030		
	1000	199	139	3.1	30×45	ECS2DBC102M□□300045	
	199	139	2.8	35×35	ECS2DBC102M□□350035		
	1200	166	116	3.4	30×50	ECS2DBC122M□□300050	
	166	116	3.2	35×40	ECS2DBC122M□□350040		
	1500	133	93	3.8	35×50	ECS2DBC152M□□350050	
	250 (300) 2E	330	603	422	1.4	22×40	ECS2EBC331M□□220040
		603	422	1.4	25×30	ECS2EBC331M□□250030	
		390	510	357	1.6	22×45	ECS2EBC391M□□220045
		510	357	1.6	25×35	ECS2EBC391M□□250035	
470		424	296	1.8	25×40	ECS2EBC471M□□250040	
424		296	1.8	30×30	ECS2EBC471M□□300030		
560		355	249	2	25×45	ECS2EBC561M□□250045	
355		249	2	30×35	ECS2EBC561M□□300035		
680		293	205	2.3	30×40	ECS2EBC681M□□300040	
293		205	2.4	35×30	ECS2EBC681M□□350030		
820		243	170	2.6	30×45	ECS2EBC821M□□300045	
243		170	2.6	35×35	ECS2EBC821M□□350035		
1000		199	139	3	35×40	ECS2EBC102M□□350040	
1200		166	116	3.4	35×45	ECS2EBC122M□□350045	
315 (365) 2F		180	1106	774	0.96	22×35	ECS2FBC181M□□220035
		1106	774	0.96	25×30	ECS2FBC181M□□250030	
		220	905	633	1.1	22×40	ECS2FBC221M□□220040
		905	633	1.1	25×35	ECS2FBC221M□□250035	
		270	737	516	1.3	25×40	ECS2FBC271M□□250040
		737	516	1.3	30×30	ECS2FBC271M□□300030	
		330	603	422	1.4	25×45	ECS2FBC331M□□250045
		603	422	1.4	30×35	ECS2FBC331M□□300035	
		510	357	1.6	25×50	ECS2FBC391M□□250050	
		510	357	1.6	30×40	ECS2FBC391M□□300040	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
315 (365) 2F	390	510	357	1.6	35×30	ECS2FBC391M□□350030	
	470	424	296	1.8	30×45	ECS2FBC471M□□300045	
		424	296	1.8	35×35	ECS2FBC471M□□350035	
	560	355	249	2	30×50	ECS2FBC561M□□300050	
		355	249	2	35×40	ECS2FBC561M□□350040	
	680	293	205	2.3	35×45	ECS2FBC681M□□350045	
350 (400) 2V	150	1327	929	0.94	22×35	ECS2VBC151M□□220035	
		1327	929	0.94	25×30	ECS2VBC151M□□250030	
	180	1106	774	1.1	22×40	ECS2VBC181M□□220040	
		1106	774	1.1	30×25	ECS2VBC181M□□300025	
		905	633	1.2	22×45	ECS2VBC221M□□220045	
	220	905	633	1.2	25×35	ECS2VBC221M□□250035	
		905	633	1.2	30×30	ECS2VBC221M□□300030	
		737	516	1.4	25×45	ECS2VBC271M□□250045	
	270	737	516	1.4	30×35	ECS2VBC271M□□300035	
		330	603	422	1.6	25×50	ECS2VBC331M□□250050
	603		422	1.6	35×30	ECS2VBC331M□□350030	
	390	510	357	1.7	30×40	ECS2VBC391M□□300040	
		510	357	1.8	35×35	ECS2VBC391M□□350035	
		424	296	2	30×45	ECS2VBC471M□□300045	
	470	424	296	2	35×40	ECS2VBC471M□□350040	
		560	355	249	2.3	35×45	ECS2VBC561M□□350045
		680	293	205	2.6	35×50	ECS2VBC681M□□350050
	400 (450) 2G	150	1327	929	0.9	22×35	ECS2GBC151M□□220035
			1327	929	0.89	25×30	ECS2GBC151M□□250030
		180	1106	774	1	22×40	ECS2GBC181M□□220040
			1106	774	1	25×35	ECS2GBC181M□□250035
			1106	774	1.1	30×25	ECS2GBC181M□□300025
		220	905	633	1.2	25×40	ECS2GBC221M□□250040
			905	633	1.2	30×30	ECS2GBC221M□□300030
737			516	1.3	25×45	ECS2GBC271M□□250045	
270		737	516	1.4	30×35	ECS2GBC271M□□300035	
		330	603	422	1.6	30×40	ECS2GBC331M□□300040
603			422	1.7	35×30	ECS2GBC331M□□350030	
390		510	357	1.8	30×45	ECS2GBC391M□□300045	
		510	357	1.8	35×35	ECS2GBC391M□□350035	
		470	424	296	2.1	30×50	ECS2GBC471M□□300050
560		355	249	2.3	30×55	ECS2GBC561M□□300055	
		680	293	235	2.7	35×50	ECS2GBC681M□□350050
		820	242	194	3.1	35×55	ECS2GBC821M□□350055
1000		199	139	3.8	35×65	ECS2GBC102M□□350065	
420 (470) 2X		120	1659	863	0.8	22×35	ECS2XBC121M□□220035
			1659	863	0.81	25×30	ECS2XBC121M□□250030
			1327	690	0.92	22×35	ECS2XBC151M□□220035
		150	1327	690	0.93	25×30	ECS2XBC151M□□250030
			1106	575	1.1	25×35	ECS2XBC181M□□250035
			220	905	471	1.2	25×40
	905	471		1.3	30×30	ECS2XBC221M□□300030	
	737	383		1.3	25×45	ECS2XBC271M□□250045	
	270	737	383	1.4	30×35	ECS2XBC271M□□300035	
		330	603	314	1.6	30×40	ECS2XBC331M□□300040
	390		510	265	1.9	30×45	ECS2XBC391M□□300045
	470	424	220	2.1	30×50	ECS2XBC471M□□300050	
		424	220	2.2	35×40	ECS2XBC471M□□350040	
		560	355	185	2.4	35×45	ECS2XBC561M□□350045
	680	293	153	2.8	35×50	ECS2XBC681M□□350050	
	820	242	126	3.2	35×55	ECS2XBC821M□□350055	
	450 (500) 2W	120	1659	1161	0.8	22×35	ECS2WBC121M□□220035
			1659	1161	0.83	25×30	ECS2WBC121M□□250030
			1327	929	0.95	22×40	ECS2WBC151M□□220040
		150	1327	929	0.95	25×35	ECS2WBC151M□□250035
			1106	774	1.1	25×35	ECS2WBC181M□□250035
			1106	774	1.1	30×25	ECS2WBC181M□□300025
		220	905	633	1.2	25×40	ECS2WBC221M□□250040
			905	633	1.3	30×30	ECS2WBC221M□□300030
737			516	1.4	30×35	ECS2WBC271M□□300035	
270		737	516	1.5	35×30	ECS2WBC271M□□350030	
		330	603	423	1.7	30×40	ECS2WBC331M□□300040
603			423	1.8	35×30	ECS2WBC331M□□350030	
390		510	357	1.9	35×35	ECS2WBC391M□□350035	
470		424	296	2.2	35×40	ECS2WBC471M□□350040	
560		356	285	2.4	35×45	ECS2WBC561M□□350045	
680		293	235	2.8	35×50	ECS2WBC681M□□350050	
820		242	194	3.2	35×60	ECS2WBC821M□□350060	
1000		199	139	3.9	35×70	ECS2WBC102M□□350070	
500 (550) 2H		100	1990	1592	0.9	25×30	ECS2HBC101M□□250030
		120	1658	1327	1	25×35	ECS2HBC121M□□250035
		150	1327	1062	1.2	25×35	ECS2HBC151M□□250035
			1327	1062	1.2	30×30	ECS2HBC151M□□300030
			1106	885	1.4	30×30	ECS2HBC181M□□300030
		220	905	724	1.6	30×35	ECS2HBC221M□□300035
	737		590	1.8	30×40	ECS2HBC271M□□300040	
	737		590	1.7	35×30	ECS2HBC271M□□350030	
	330	603	483	2	30×45	ECS2HBC331M□□300045	
		603	483	1.9	35×35	ECS2HBC331M□□350035	

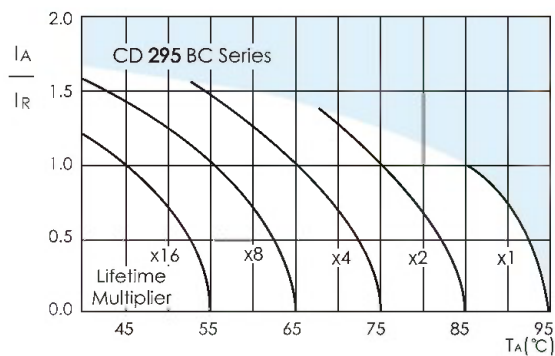


## Ratings for CD 295 BC Series

$U_R$ (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
500 (550) 2H	390	511	409	2.3	35 x 40	ECS2HBC391M□□350040
	470	424	339	2.4	30 x 50	ECS2HBC471M□□300050
	470	424	339	2.5	35 x 45	ECS2HBC471M□□350045
	560	356	285	2.8	35 x 50	ECS2HBC561M□□350050
	680	293	235	3.2	35 x 55	ECS2HBC681M□□350055
	820	242	194	3.5	35 x 60	ECS2HBC821M□□350060

Customer products are available on request.

## Lifetime Diagram

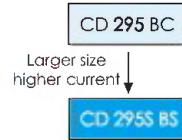


$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



5000h at 85°C

- Larger Size Components
- Long Useful Life
- High Ripple Current
- Industrial Power Supplies
- Voltage derating ( $0.93 \times V_R$ ) enables 105°C operation



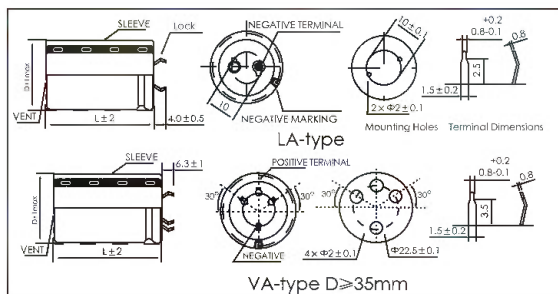
SNAP-IN/LUG

Items	Characteristics			
Operating Temperature Range (°C)	-40 ~ +85	-25 ~ +85		
Voltage Range (V)	160 ~ 400	450 ~ 500		
Capacitance Range (μF)	390 ~ 4700			
Capacitance Tolerance (20°C, 120Hz)	± 20%			
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)			
Dissipation Factor (20°C, 120Hz)	WV (V)	160~500		
	Tan δ	0.15		
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160~200	250~400	450~500
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3	4	
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	6	8	-

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	12000h	>100000h	5000h	7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

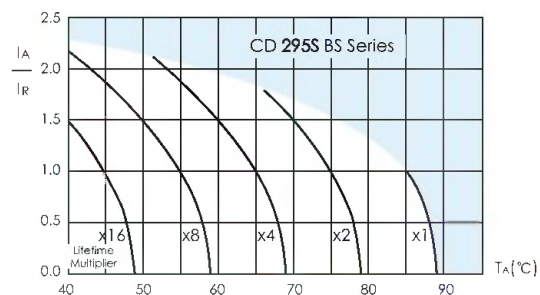
mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
Factor	0.8	1.0	1.16	1.3	1.41	1.45

## Lifetime Diagram



$I_R$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85
Factor	2.3	2.1	1.75	1.0



# CD 295S BS SERIES



SNAP-IN/LUG

## Ratings for CD 295S BS Series

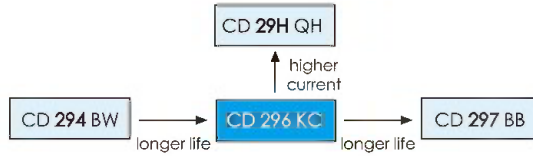
U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	2200	91	63	4.9	35 × 45	ECS2CBS222M□□350045
	2700	74	52	5.3	35 × 50	ECS2CBS272M□□350050
	3300	60	42	5.5	35 × 70	ECS2CBS332M□□350070
		60	42	5.5	40 × 60	ECS2CBS332M□□400060
	3900	51	36	5.9	35 × 80	ECS2CBS392M□□350080
	4700	42	30	7.3	40 × 80	ECS2CBS472M□□400080
200 (250) 2D	1500	133	93	4.3	35 × 40	ECS2DBS152M□□350040
	1800	111	77	4.7	35 × 45	ECS2DBS182M□□350045
	2200	91	63	5.4	35 × 50	ECS2DBS222M□□350050
		91	63	5.4	40 × 40	ECS2DBS222M□□400040
	2700	74	52	5.9	35 × 60	ECS2DBS272M□□350060
		74	52	5.9	40 × 50	ECS2DBS272M□□400050
	3300	60	42	6.5	35 × 80	ECS2DBS332M□□350080
		60	42	6.5	40 × 60	ECS2DBS332M□□400060
	3900	51	36	7.0	40 × 80	ECS2DBS392M□□400080
	4700	42	30	9.2	40 × 90	ECS2DBS472M□□400090
250 (300) 2E	1000	199	139	3.7	35 × 40	ECS2EBS102M□□350040
	1200	166	116	3.8	35 × 45	ECS2EBS122M□□350045
	1500	133	93	4.4	35 × 50	ECS2EBS152M□□350050
		133	93	4.5	40 × 40	ECS2EBS152M□□400040
	1800	111	77	5.0	35 × 70	ECS2EBS182M□□350070
		111	77	5.0	40 × 50	ECS2EBS182M□□400050
	2200	91	63	5.4	35 × 70	ECS2EBS222M□□350070
	2700	74	52	6.9	40 × 80	ECS2EBS272M□□400080
350 (400) 2V	680	293	205	3.6	35 × 45	ECS2VBS681M□□350045
		293	205	3.6	40 × 40	ECS2VBS681M□□400040
	820	243	170	4.5	35 × 60	ECS2VBS821M□□350060
		243	170	4.5	40 × 50	ECS2VBS821M□□400050
	1000	199	139	5.2	35 × 70	ECS2VBS102M□□350070
		199	139	4.9	40 × 60	ECS2VBS102M□□400060
	1200	166	116	5.5	35 × 80	ECS2VBS122M□□350080
		166	116	5.6	40 × 70	ECS2VBS122M□□400070
	1500	133	93	6.5	40 × 80	ECS2VBS152M□□400080
		133	93	6.2	45 × 70	ECS2VBS152M□□450070
	1800	111	77	7.9	40 × 100	ECS2VBS182M□□400100
		111	77	7.1	45 × 70	ECS2VBS182M□□450070
	2200	91	63	8.7	40 × 100	ECS2VBS222M□□400100
400 (450) 2G	560	355	249	3.2	35 × 50	ECS2GBS561M□□350050
		355	249	2.8	40 × 40	ECS2GBS561M□□400040
	680	293	205	3.7	35 × 60	ECS2GBS681M□□350060
		293	205	3.8	40 × 50	ECS2GBS681M□□400050
	820	243	170	4.2	35 × 60	ECS2GBS821M□□350060
		243	170	4.1	40 × 50	ECS2GBS821M□□400050
	1000	199	139	4.9	35 × 70	ECS2GBS102M□□350070
		199	139	4.8	40 × 60	ECS2GBS102M□□400060
		199	139	4.6	45 × 50	ECS2GBS102M□□450050
	1200	166	116	5.8	35 × 80	ECS2GBS122M□□350080
		166	116	5.5	40 × 70	ECS2GBS122M□□400070
		133	93	6.9	40 × 80	ECS2GBS152M□□400080
	1500	133	93	6.6	45 × 70	ECS2GBS152M□□450070
		133	93	6.8	45 × 80	ECS2GBS152M□□450080
	1800	111	77	7.9	40 × 90	ECS2GBS182M□□400090
		111	77	7.3	45 × 80	ECS2GBS182M□□450080
450 (500) 2W	470	424	296	3.0	35 × 50	ECS2WBS471M□□350050
		424	296	3.0	40 × 40	ECS2WBS471M□□400040
	560	355	249	3.1	35 × 50	ECS2WBS561M□□350050
		355	249	3.3	35 × 60	ECS2WBS561M□□350060
		355	249	3.4	40 × 50	ECS2WBS561M□□450050
	680	293	205	3.5	35 × 60	ECS2WBS681M□□350060
		293	205	3.8	35 × 70	ECS2WBS681M□□350070
		293	205	3.8	40 × 60	ECS2WBS681M□□400060
	820	243	170	4.6	35 × 80	ECS2WBS821M□□350080
		243	170	4.4	40 × 60	ECS2WBS821M□□400060
	1000	199	139	5.7	35 × 80	ECS2WBS102M□□350080
		199	139	5.2	40 × 60	ECS2WBS102M□□400060
	1200	166	116	5.9	40 × 70	ECS2WBS122M□□400070
		166	116	6.2	45 × 70	ECS2WBS122M□□450070
500 (550) 2H	1500	133	93	7.3	40 × 100	ECS2WBS152M□□400100
		133	93	7.0	45 × 80	ECS2WBS152M□□450080
	1800	111	77	7.9	45 × 100	ECS2WBS182M□□450100
	390	510	357	1.9	35 × 50	ECS2HBS391M□□350050
	470	424	296	2.3	35 × 60	ECS2HBS471M□□350060
	560	355	249	2.5	35 × 60	ECS2HBS561M□□350060
		355	249	2.7	40 × 60	ECS2HBS561M□□400060
	680	293	205	3.1	35 × 80	ECS2HBS681M□□350080
		293	205	2.8	40 × 70	ECS2HBS681M□□400070
	820	243	170	3.4	35 × 90	ECS2HBS821M□□350090
		243	170	3.3	40 × 70	ECS2HBS821M□□400070
	1000	199	139	3.9	40 × 80	ECS2HBS102M□□400080
		199	139	3.9	45 × 70	ECS2HBS102M□□450070
	1200	166	116	4.3	40 × 90	ECS2HBS122M□□400090
	1500	133	93	4.8	45 × 100	ECS2HBS152M□□450100

Customer products are available on request.



3000h at 105°C

- Long Life at High Temperature
- High Ripple Current
- Professional Power Supplies



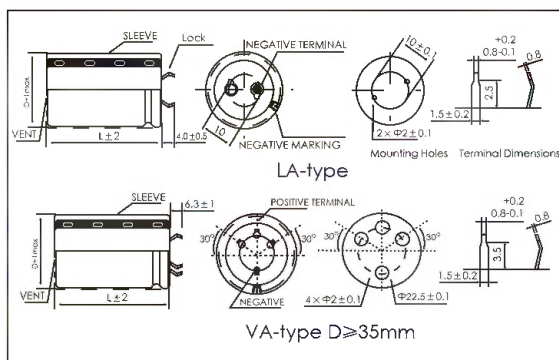
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Items	Characteristics		
Operating Temperature Range (°C)	-25 ~ +105		
Voltage Range (V)	200 ~ 550		
Capacitance Range (µF)	100 ~ 2200		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (µA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (µF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	200~400	420~550
	Tan δ (max)	0.15	0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200~550	
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	5000h	>200000h	3000h	4000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 × I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	After test: U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

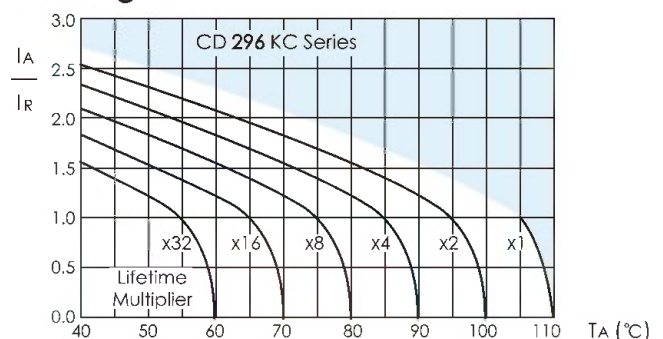
mm



## Frequency Coefficient

Frequency Voltage (V)	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
200 ~ 250	0.87	1.00	1.17	1.32	1.45	1.50
≥ 315	0.80	1.00	1.16	1.30	1.41	1.43

## Lifetime Diagram



I<sub>A</sub> = actual ripple current at 120Hz, I<sub>R</sub> = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.00



# CD 296 KC SERIES



SNAP-IN/LUG

## Ratings for CD 296 KC Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
200 (250) 2D	470	424	296	1.47	25 x 30	ECS2DKC471M□□250030
		424	296	1.56	30 x 25	ECS2DKC471M□□300025
	560	355	249	1.6	25 x 35	ECS2DKC561M□□250035
		355	249	1.65	30 x 30	ECS2DKC561M□□300030
	680	293	205	1.8	25 x 40	ECS2DKC681M□□250040
		293	205	1.82	30 x 30	ECS2DKC681M□□300030
	820	243	170	1.99	30 x 35	ECS2DKC821M□□300035
		199	139	2.17	22 x 50	ECS2DKC102M□□220050
	1000	199	139	2.21	30 x 40	ECS2DKC102M□□300040
		166	116	2.28	25 x 45	ECS2DKC122M□□250045
	1200	166	116	2.32	30 x 40	ECS2DKC122M□□300040
		133	93	2.59	30 x 50	ECS2DKC152M□□300050
	1500	133	93	2.59	35 x 40	ECS2DKC152M□□350040
		111	77	2.7	35 x 45	ECS2DKC182M□□350045
	2200	91	63	3.23	35 x 50	ECS2DKC222M□□350050
250 (300) 2E	330	603	422	1.2	22 x 40	ECS2EKC331M□□220040
		603	422	1.3	25 x 30	ECS2EKC331M□□250030
	390	510	357	1.42	25 x 35	ECS2EKC391M□□250035
		424	296	1.47	25 x 40	ECS2EKC471M□□250040
	470	424	296	1.51	30 x 30	ECS2EKC471M□□300030
		355	249	1.59	25 x 45	ECS2EKC561M□□250045
	560	355	249	1.61	30 x 30	ECS2EKC561M□□300030
		293	205	1.66	25 x 50	ECS2EKC681M□□250050
	680	293	205	1.76	30 x 35	ECS2EKC681M□□300035
		243	170	1.83	30 x 40	ECS2EKC821M□□300040
	820	243	170	1.82	35 x 35	ECS2EKC821M□□350035
		199	139	1.87	30 x 50	ECS2EKC102M□□300050
	1000	199	139	1.99	35 x 40	ECS2EKC102M□□350040
		166	116	2.1	35 x 45	ECS2EKC122M□□350045
	1500	133	93	2.7	35 x 50	ECS2EKC152M□□350050
		111	77	2.9	35 x 55	ECS2EKC182M□□350055
315 (365) 2F	180	1106	608	0.78	22 x 40	ECS2FKC181M□□220040
		1106	608	0.85	25 x 25	ECS2FKC181M□□250025
	220	905	498	0.91	22 x 45	ECS2FKC221M□□220045
		905	498	0.94	25 x 30	ECS2FKC221M□□250030
	270	737	406	1	25 x 35	ECS2FKC271M□□250035
		737	406	0.98	30 x 25	ECS2FKC271M□□300025
	330	603	332	1.13	30 x 30	ECS2FKC331M□□300030
		510	281	1.2	30 x 35	ECS2FKC391M□□300035
	390	510	281	1.2	30 x 35	ECS2FKC391M□□300035
		424	233	1.28	30 x 35	ECS2FKC471M□□300035
	560	355	196	1.46	30 x 40	ECS2FKC561M□□300040
		293	161	1.85	30 x 45	ECS2FKC681M□□300045
	680	293	161	1.88	35 x 35	ECS2FKC681M□□350035
		242	133	2.1	30 x 50	ECS2FKC821M□□300050
	820	242	133	2.15	35 x 40	ECS2FKC821M□□350040
		199	109	2.42	30 x 55	ECS2FKC102M□□300055
400 (450) 2G	120	1659	863	0.66	22 x 30	ECS2GKC121M□□220030
		1659	863	0.68	25 x 25	ECS2GKC121M□□250025
	150	1327	690	0.73	25 x 30	ECS2GKC151M□□250030
		1327	690	0.75	30 x 25	ECS2GKC151M□□300025
	180	1106	575	0.78	22 x 35	ECS2GKC181M□□220035
		1106	575	0.83	30 x 30	ECS2GKC181M□□300030
	220	905	471	0.87	25 x 40	ECS2GKC221M□□250040
		905	471	0.96	30 x 30	ECS2GKC221M□□300030
	270	737	383	0.94	22 x 50	ECS2GKC271M□□220050
		737	383	0.95	30 x 35	ECS2GKC271M□□300035
	330	603	314	1.11	25 x 50	ECS2GKC331M□□250050
		603	314	1.06	30 x 35	ECS2GKC331M□□300035
	390	603	314	1.09	35 x 30	ECS2GKC331M□□350030
		510	265	1.15	30 x 40	ECS2GKC391M□□300040
	470	510	265	1.26	35 x 35	ECS2GKC391M□□350035
		424	220	1.28	30 x 50	ECS2GKC471M□□300050
450 (500) 2W	560	424	220	1.31	35 x 40	ECS2GKC471M□□350040
		355	185	1.5	30 x 50	ECS2GKC561M□□300050
	680	355	185	1.65	35 x 45	ECS2GKC561M□□350045
		293	153	1.9	35 x 50	ECS2GKC681M□□350050
	820	242	126	2.2	35 x 60	ECS2GKC821M□□350060
		199	109	2.5	30 x 70	ECS2GKC102M□□300070
	1000	199	109	2.6	35 x 65	ECS2GKC102M□□350065
		2212	1106	0.73	25 x 25	ECS2WKC121M□□250025
	150	1769	885	0.82	25 x 30	ECS2WKC151M□□250030
		1474	737	0.86	30 x 30	ECS2WKC181M□□300030
	180	1206	603	0.94	25 x 45	ECS2WKC221M□□250045
		1206	603	0.95	30 x 30	ECS2WKC221M□□300030
	270	983	492	1.11	30 x 30	ECS2WKC271M□□300030
		983	492	1.15	30 x 35	ECS2WKC271M□□300035
	330	804	402	1.25	30 x 40	ECS2WKC331M□□300040
		804	402	1.26	35 x 30	ECS2WKC331M□□350030
450 (500) 2W	390	681	340	1.31	30 x 40	ECS2WKC391M□□300040
		681	340	1.35	30 x 45	ECS2WKC391M□□300045
	470	681	340	1.36	35 x 35	ECS2WKC391M□□350035
		565	282	1.5	30 x 50	ECS2WKC471M□□300050

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	470	565	282	1.55	35 x 45	ECS2WKC471M□□350045
	560	473	237	1.65	30 x 50	ECS2WKC561M□□300050
		473	237	1.7	35 x 50	ECS2WKC561M□□350050
	680	391	196	1.95	35 x 50	ECS2WKC681M□□350050
		391	196	2	35 x 60	ECS2WKC681M□□350060
	820	324	162	2.15	35 x 60	ECS2WKC821M□□350060
		324	162	2.2	35 x 65	ECS2WKC821M□□350065
	1000	265	139	2.6	35 x 70	ECS2WKC102M□□350070
	100	2654	1327	0.67	22 x 35	ECS2HKC101M□□220035
	120	2212	1106	0.77	22 x 50	ECS2HKC121M□□220050
2212		1106	0.81	25 x 35	ECS2HKC121M□□250035	
500 (550) 2H	150	1769	885	0.82	25 x 40	ECS2HKC151M□□250040
		1769	885	0.85	30 x 30	ECS2HKC151M□□300030
	180	1474	737	0.98	25 x 50	ECS2HKC181M□□250050
		1474	737	1.01	30 x 35	ECS2HKC181M□□300035
	220	1206	603	1.12	30 x 35	ECS2HKC221M□□300035
		1206	603	1.18	35 x 30	ECS2HKC221M□□350030
	270	983	492	1.25	30 x 40	ECS2HKC271M□□300040
		983	492	1.29	35 x 35	ECS2HKC271M□□350035
	330	804	402	1.36	35 x 45	ECS2HKC331M□□350045
	390	681	340	1.54	35 x 50	ECS2HKC391M□□350050
	470	565	282	1.69	35 x 60	ECS2HKC471M□□350060
	560	473	237	1.9	35 x 65	ECS2HKC561M□□350065
	680	391	196	2.2	35 x 70	ECS2HKC681M□□350070
	150	1769	885	0.86	30 x 35	ECS2YKC151M□□300035
	550 (600) 2Y	180	1474	737	1.06	30 x 40
1474			737	1.11	35 x 30	ECS2YKC181M□□350030
220		1206	603	1.18	30 x 50	ECS2YKC221M□□300050
		1206	603	1.23	35 x 35	ECS2YKC221M□□350035
270		983	492	1.31	35 x 45	ECS2YKC271M□□350045
330		804	402	1.5	35 x 50	ECS2YKC331M□□350050
390		681	340	1.67	35 x 60	ECS2YKC391M□□350060
470		565	282	1.9	35 x 60	ECS2YKC471M□□350060
		565	282	1.95	35 x 70	ECS2YKC471M□□350070
560		473	237	2.1	35 x 80	ECS2YKC561M□□350080

Customer products are available on request.



3000h at 105°C

- Automotive application
- High reliability
- Load Life of 3000h at 105°C
- Qualification based on AEC-Q200 Rev E standard



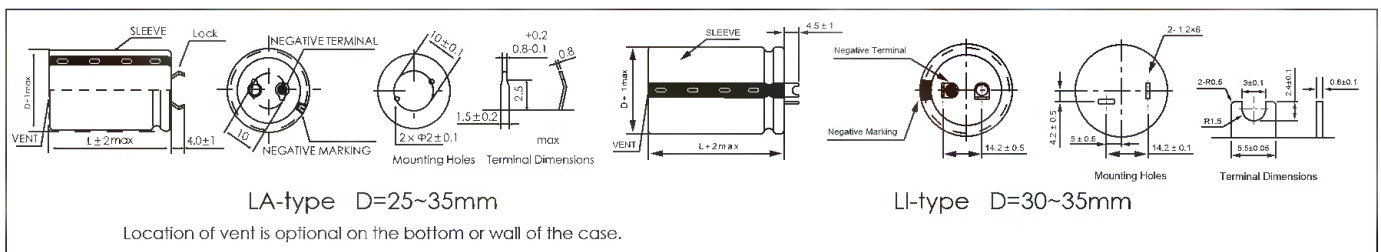
SNAP-IN/LUG

Items	Characteristics						
Operating Temperature Range (°C)	-40 ~ +105						
Voltage Range (V)	450 ~ 500						
Capacitance Range (μF)	180 ~ 820						
Capacitance Tolerance (20°C, 120Hz)	± 20%						
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage $I_{tr}$ is not more than 0.01 CV or 1.5mA, whichever is smaller C:Nominal Capacitance(μF) V:Rated Voltage(V)						
Dissipation Factor (20°C, 120Hz)	≤0.20						
Stability at Low Temperature (Impedance Ratio at 120Hz)	<table border="1"> <tr> <th>Rated Voltage(V)</th><th>450~500</th></tr> <tr> <td><math>Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}</math></td><td>4</td></tr> <tr> <td><math>Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}</math></td><td>15</td></tr> </table>	Rated Voltage(V)	450~500	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	15
Rated Voltage(V)	450~500						
$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4						
$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	15						
Vibration	<p>Conditions:  Frequency range: 10~2000Hz  Acceleration: 5g max  Sweep rate: 10 to 2000Hz to 10Hz 20min each cycle  Duration: 4 hours in each of X Y Z directions (total of 12 hours)  Fixation: Capacitor body shall be clamped rigidly to the work surface</p> <p>After test, following specifications shall be satisfied:  Leakage current: not more than specified value  Capacitance change: within ±5% of initial value  Dissipation factor: not more than specified value</p>						

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	5000h	≥ 200000h	3000h	4000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	105°C  Voltage treatment: After test: $U_R$ to be applied for 30min, > 16h before measurement

## Dimensions

mm





## Frequency coefficient

Frequency (Hz)	50/60	120	300	1k	10k	≥50k
Factor	0.77	1.00	1.16	1.30	1.41	1.43

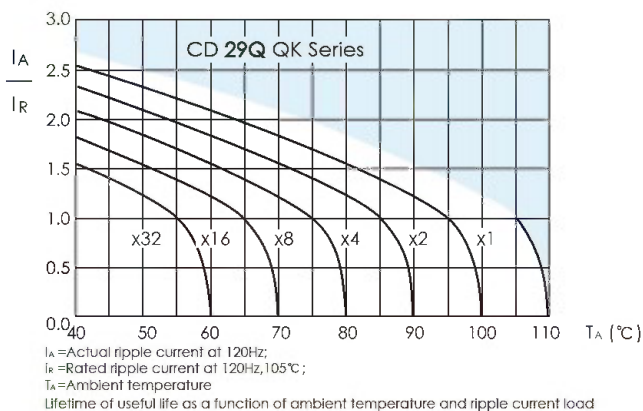
Temperature( °C)	+40	+55	+70	+85	+105
coefficient	2.7	2.5	2.1	1.7	1.0

## Ratings for CD CD296Q QK Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	220	964	482	1.22	25×35	ECS2WQK221M□□250035
	220	964	482	1.15	30×25	ECS2WQK221M□□300025
	270	786	393	1.39	25×40	ECS2WQK271M□□250040
	270	786	393	1.32	30×30	ECS2WQK271M□□300030
	330	640	320	1.40	25×45	ECS2WQK331M□□250045
	330	640	320	1.43	30×35	ECS2WQK331M□□300035
	330	640	320	1.41	35×30	ECS2WQK331M□□350030
	390	544	272	1.67	25×50	ECS2WQK391M□□250050
	390	544	272	1.68	30×40	ECS2WQK391M□□300040
	390	544	272	1.65	35×30	ECS2WQK391M□□350030
	390	544	272	1.80	35×35	ECS2WQK391M□□350035
	470	440	220	1.95	30×45	ECS2WQK471M□□300045
	470	440	220	1.95	35×40	ECS2WQK471M□□350040
	560	380	190	2.28	30×50	ECS2WQK561M□□300050
	560	380	190	2.25	35×45	ECS2WQK561M□□350045
	680	320	160	2.63	30×60	ECS2WQK681M□□300060
	680	320	160	2.50	35×50	ECS2WQK681M□□350050
	820	260	130	2.86	35×60	ECS2WQK821M□□350060
500 (550) 2H	180	958	479	1.18	25×45	ECS2HQB181M□□250045
	180	958	479	1.11	30×30	ECS2HQB181M□□300030
	220	820	410	1.33	25×50	ECS2HQB221M□□250050
	220	820	410	1.28	30×40	ECS2HQB221M□□300040
	270	688	344	1.44	30×40	ECS2HQB271M□□300040
	270	688	344	1.34	35×30	ECS2HQB271M□□350030
	330	563	281	1.47	30×50	ECS2HQB331M□□300050
	330	563	281	1.57	35×40	ECS2HQB331M□□350040
	390	476	238	1.85	30×55	ECS2HQB391M□□300055
	390	476	238	1.78	35×50	ECS2HQB391M□□350050
	470	395	198	2.10	35×55	ECS2HQB471M□□350055

Customer products are available on request.

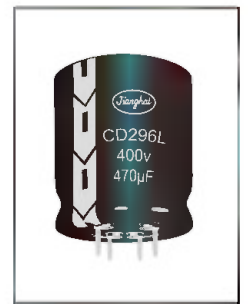
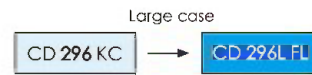
## Lifetime Diagram





3000h at 105°C

- Long Life at High Temperature
- High Ripple Current
- Suit for high frequency regenerative voltage for AC servomotor, general inverter.



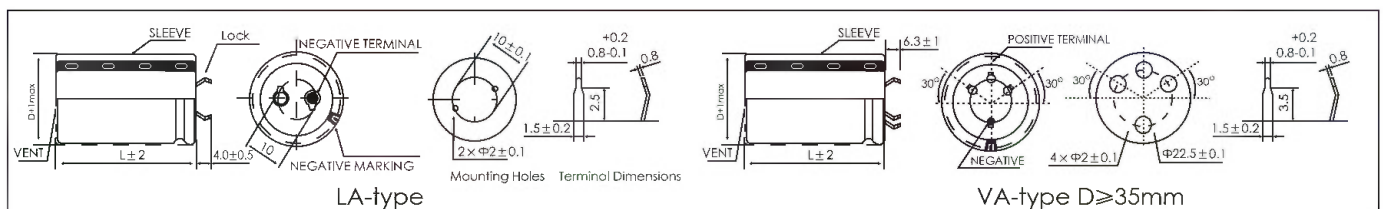
SNAP-IN/LUG

Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105	
Voltage Range (V)	350 ~ 420	450 ~ 500	
Capacitance Range (μF)	390 ~ 3300		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01 CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	WV (V)	350~500	
	Tan δ	0.15	
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	350~420	450~500
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4	7
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	7	-

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	>200000h	3000h	4000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
Factor	0.8	1.0	1.16	1.3	1.41	1.43

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Factor	3.0	2.8	2.5	2.0	1.0



# CD 296L FL SERIES



SNAP-IN/LUG

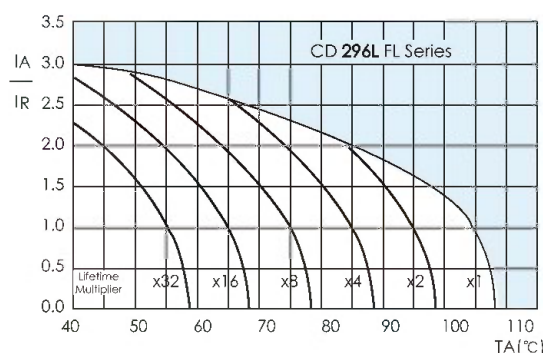
## Ratings for CD 296L FL Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	560	355	178	2.30	30 x 55	ECS2VFL561M□□300055
		355	178	2.33	35 x 40	ECS2VFL561M□□350040
	680	293	146	2.73	35 x 50	ECS2VFL681M□□350050
		293	146	2.68	40 x 40	ECS2VFL681M□□400040
	820	243	121	2.99	35 x 60	ECS2VFL821M□□350060
		243	121	3.05	40 x 45	ECS2VFL821M□□400045
		243	121	2.85	45 x 40	ECS2VFL821M□□450040
	1000	199	100	3.50	35 x 65	ECS2VFL102M□□350065
		199	100	3.37	40 x 55	ECS2VFL102M□□400055
		199	100	3.06	45 x 45	ECS2VFL102M□□450045
	1200	166	83	3.81	35 x 75	ECS2VFL122M□□350075
		166	83	3.81	40 x 65	ECS2VFL122M□□400065
		166	83	3.47	45 x 50	ECS2VFL122M□□450050
	1500	133	66	4.62	40 x 80	ECS2VFL152M□□400080
		133	66	4.27	45 x 65	ECS2VFL152M□□450065
	1800	111	55	5.43	40 x 95	ECS2VFL182M□□400095
		111	55	5.10	45 x 75	ECS2VFL182M□□450075
	2200	90	45	5.86	45 x 90	ECS2VFL222M□□450090
		90	45	5.86	50 x 75	ECS2VFL222M□□500075
	2700	74	37	6.77	45 x 100	ECS2VFL272M□□450100
		74	37	6.77	50 x 90	ECS2VFL272M□□500090
	3300	60	30	6.77	50 x 105	ECS2VFL332M□□500105
400 (450) 2G	470	423	169	2.11	35 x 45	ECS2GFL471M□□350045
		423	169	2.14	40 x 40	ECS2GFL471M□□400040
	560	355	142	2.48	35 x 50	ECS2GFL561M□□350050
		355	142	2.43	40 x 45	ECS2GFL561M□□400045
		355	142	2.35	45 x 40	ECS2GFL561M□□450040
	680	293	117	2.73	35 x 60	ECS2GFL681M□□350060
		293	117	2.78	40 x 50	ECS2GFL681M□□400050
		293	117	2.59	45 x 40	ECS2GFL681M□□450040
	820	243	97	3.17	35 x 65	ECS2GFL821M□□350065
		243	97	3.05	40 x 55	ECS2GFL821M□□400055
		243	97	2.90	45 x 45	ECS2GFL821M□□450045
	1000	199	80	3.48	35 x 80	ECS2GFL102M□□350080
		199	80	3.48	40 x 65	ECS2GFL102M□□400065
		199	80	3.17	45 x 55	ECS2GFL102M□□450055
	1200	166	66	4.13	35 x 90	ECS2GFL122M□□350090
		166	66	4.13	40 x 80	ECS2GFL122M□□400080
		166	66	4.00	45 x 60	ECS2GFL122M□□450060
	1500	133	53	4.39	40 x 90	ECS2GFL152M□□400090
		133	53	4.39	45 x 75	ECS2GFL152M□□450075
		133	53	4.39	50 x 70	ECS2GFL152M□□500070
	1800	111	44	5.30	45 x 90	ECS2GFL182M□□450090
		111	44	5.30	50 x 80	ECS2GFL182M□□500080
	2200	90	36	5.90	50 x 90	ECS2GFL222M□□500090
	2700	74	29	6.50	50 x 105	ECS2GFL272M□□500105
420 (470) 2X	390	510	203	1.92	35 x 40	ECS2xFL391M□□350040
		510	203	1.95	40 x 35	ECS2xFL391M□□400035
	470	423	169	2.27	35 x 45	ECS2xFL471M□□350045
		423	169	2.23	40 x 40	ECS2xFL471M□□400040
	560	355	142	2.56	35 x 50	ECS2xFL561M□□350050
		355	142	2.52	40 x 45	ECS2xFL561M□□400045
		355	142	2.35	45 x 40	ECS2xFL561M□□450040
	680	293	117	2.81	35 x 60	ECS2xFL681M□□350060
		293	117	2.78	40 x 50	ECS2xFL681M□□400050
		293	117	2.52	45 x 45	ECS2xFL681M□□450045
	820	243	97	3.26	35 x 70	ECS2xFL821M□□350070
		243	97	3.05	40 x 60	ECS2xFL821M□□400060
		243	97	2.87	45 x 50	ECS2xFL821M□□450050
	1000	199	80	3.67	35 x 80	ECS2xFL102M□□350080
		199	80	3.67	40 x 70	ECS2xFL102M□□400070
		199	80	3.38	45 x 60	ECS2xFL102M□□450060
	1200	166	66	4.33	40 x 80	ECS2xFL122M□□400080
		166	66	3.92	45 x 65	ECS2xFL122M□□450065
	1500	133	53	4.62	45 x 80	ECS2xFL152M□□450080
		133	53	4.62	50 x 75	ECS2xFL152M□□500075
	1800	111	44	5.42	45 x 95	ECS2xFL182M□□450095
		111	44	5.42	50 x 85	ECS2xFL182M□□500085
	2200	90	36	6.00	50 x 100	ECS2xFL222M□□500100

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	390	510	225	2.00	35 x 40	ECS2WFL391M□□350040
		423	186	2.27	35 x 45	ECS2WFL471M□□350045
	470	423	186	2.23	40 x 40	ECS2WFL471M□□400040
		423	186	2.15	45 x 35	ECS2WFL471M□□450035
	560	355	156	2.47	35 x 55	ECS2WFL561M□□350055
		355	186	2.52	40 x 50	ECS2WFL561M□□400050
		355	186	2.35	45 x 40	ECS2WFL561M□□450040
	680	293	129	2.89	35 x 65	ECS2WFL681M□□350065
		293	129	2.78	40 x 60	ECS2WFL681M□□400060
		293	129	2.61	45 x 50	ECS2WFL681M□□450050
	820	243	107	3.24	35 x 75	ECS2WFL821M□□350075
		243	107	3.24	40 x 65	ECS2WFL821M□□400065
		243	107	3.10	45 x 50	ECS2WFL821M□□450050
	1000	199	88	3.77	35 x 90	ECS2WFL102M□□350090
		199	88	3.77	40 x 80	ECS2WFL102M□□400080
		199	88	3.68	45 x 65	ECS2WFL102M□□450065
	1200	166	73	4.43	40 x 95	ECS2WFL122M□□400095
		166	73	4.23	45 x 75	ECS2WFL122M□□450075
		166	73	4.23	50 x 65	ECS2WFL122M□□500065
	1500	133	58	4.84	40 x 100	ECS2WFL152M□□400100
		133	58	4.84	45 x 90	ECS2WFL152M□□450090
		133	58	4.84	50 x 80	ECS2WFL152M□□500080
	1800	111	49	5.30	45 x 105	ECS2WFL182M□□450105
		111	49	5.30	50 x 95	ECS2WFL182M□□500095
500 (550) 2H	390	510	225	1.80	35 x 50	ECS2HFL391M□□350050
		510	225	1.80	40 x 45	ECS2HFL391M□□400045
	470	423	186	2.00	35 x 55	ECS2HFL471M□□350055
		423	186	2.00	40 x 50	ECS2HFL471M□□400050
	560	423	186	2.00	45 x 40	ECS2HFL471M□□450040
		355	156	2.25	35 x 65	ECS2HFL561M□□350065
		355	156	2.25	40 x 55	ECS2HFL561M□□400055
	680	355	156	2.25	45 x 50	ECS2HFL561M□□450050
		293	129	2.60	35 x 75	ECS2HFL681M□□350075
		293	129	2.60	40 x 70	ECS2HFL681M□□400070
	820	293	129	2.60	45 x 55	ECS2HFL681M□□450055
		243	107	2.85	40 x 75	ECS2HFL821M□□400075
		243	107	2.85	45 x 60	ECS2HFL821M□□450060
	1000	199	88	3.30	40 x 90	ECS2HFL102M□□400090
		199	88	3.30	45 x 75	ECS2HFL102M□□450075
		166	73	4.00	40 x 100	ECS2HFL122M□□400100
	1200	166	73	4.00	45 x 85	ECS2HFL122M□□450085
		166	73	4.00	50 x 80	ECS2HFL122M□□500080
	1500	133	58	4.45	45 x 100	ECS2HFL152M□□450100
		133	58	4.45	50 x 95	ECS2HFL152M□□500095
	1800	111	49	4.85	50 x 105	ECS2HFL152M□□500105

Customer products are available on request.

## Lifetime Diagram

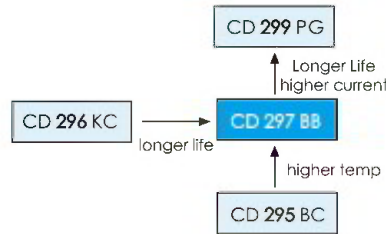


IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



5000h at 105°C

- Extended Lifetime at 105°C
- High Ripple Current
- High Professional Switch Mode Power Supplies
- Frequency Converters



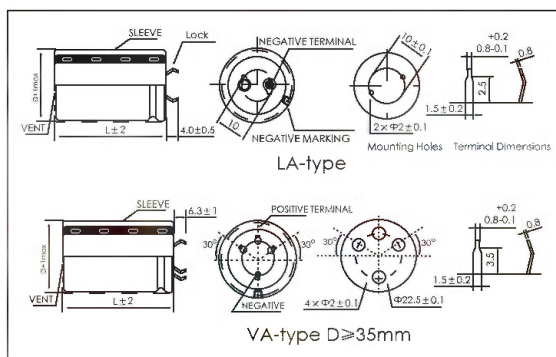
SNAP-IN/LUG

Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	25 ~ 100	160 ~ 550
Capacitance Range (μF)	100 ~ 27000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	25 35 50 63 80 100 160~400 450~550
	Tan δ (max)	0.45 0.40 0.35 0.30 0.25 0.20 0.15 0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	25~100 160~250 315~550
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4 3 8
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	15 - -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	7000h	>200000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.6 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min $I_R = 0$ >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	500Hz	1kHz	10kHz	≥40kHz
Rated Voltage (V)						
25 ~ 100	0.90	1.00	1.10	1.15	1.15	1.15
160 ~ 250	0.80	1.00	1.20	1.30	1.45	1.50
≥315	0.80	1.00	1.20	1.30	1.42	1.45

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0



# CD 297 BB SERIES



## Ratings for CD 297 BB Series

SNAP-IN/LUG

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
25 (32) 1E	8200	73	51	2.18	25×35	ECS1EBB822M□□250035	
		73	51	2.19	30×25	ECS1EBB822M□□300025	
		60	42	2.56	22×50	ECS1EBB103M□□220050	
	10000	60	42	2.53	25×40	ECS1EBB103M□□250040	
		60	42	2.38	30×30	ECS1EBB103M□□300030	
		50	35	2.79	25×45	ECS1EBB123M□□250045	
	12000	50	35	2.70	30×35	ECS1EBB123M□□300035	
		50	35	2.76	35×30	ECS1EBB123M□□350030	
		15000	40	28	3.13	30×40	ECS1EBB153M□□300040
	18000	33	23	3.52	30×45	ECS1EBB183M□□300045	
		33	23	3.50	35×35	ECS1EBB183M□□350035	
		22000	27	19	3.92	30×50	ECS1EBB223M□□300050
35 (44) 1V	6800	78	55	2.49	22×50	ECS1VBB682M□□220050	
		78	55	2.45	25×40	ECS1VBB682M□□250040	
		78	55	2.28	30×30	ECS1VBB682M□□300030	
	8200	65	45	2.80	25×45	ECS1VBB822M□□250045	
		65	45	2.69	30×30	ECS1VBB822M□□300030	
		53	37	3.04	30×40	ECS1VBB103M□□300040	
	10000	53	37	2.78	35×30	ECS1VBB103M□□350030	
		44	31	3.38	30×45	ECS1VBB123M□□300045	
		44	31	3.30	35×35	ECS1VBB123M□□350035	
	15000	35	25	3.98	30×45	ECS1VBB153M□□300045	
	18000	30	21	4.40	35×45	ECS1VBB183M□□350045	
	50 (63) 1H	3900	119	83	2.20	25×35	ECS1HBB392M□□250035
119			83	2.19	30×30	ECS1HBB392M□□300030	
99			69	2.43	25×40	ECS1HBB472M□□250040	
4700		83	58	2.72	25×45	ECS1HBB562M□□250045	
		83	58	2.58	30×35	ECS1HBB562M□□300035	
		83	58	2.35	35×30	ECS1HBB562M□□350030	
5600		68	48	3.01	30×40	ECS1HBB682M□□300040	
		68	48	2.91	35×35	ECS1HBB682M□□350035	
		8200	57	40	3.63	30×50	ECS1HBB822M□□300050
10000		57	40	3.36	35×40	ECS1HBB822M□□350040	
		46	33	3.79	35×45	ECS1HBB103M□□350045	
		12000	39	27	4.06	35×50	ECS1HBB123M□□350050
63 (79) 1J	2700	147	103	2.10	22×45	ECS1JBB272M□□220045	
		147	103	2.03	25×35	ECS1JBB272M□□250035	
		147	103	2.01	30×30	ECS1JBB272M□□300030	
	3300	121	84	2.33	25×40	ECS1JBB332M□□250040	
		102	72	2.58	25×45	ECS1JBB392M□□250045	
		102	72	2.46	30×35	ECS1JBB392M□□300035	
	3900	102	72	2.31	35×30	ECS1JBB392M□□350030	
		85	59	2.82	30×40	ECS1JBB472M□□300040	
		85	59	2.77	35×35	ECS1JBB472M□□350035	
	5600	71	50	3.22	30×45	ECS1JBB562M□□300045	
		71	50	3.20	35×40	ECS1JBB562M□□350040	
		6800	59	41	3.61	35×45	ECS1JBB682M□□350045
80 (100) 1K	8200	49	34	3.94	35×50	ECS1JBB822M□□350050	
		1500	221	155	1.70	22×40	ECS1KBB152M□□220040
		2200	151	106	2.22	25×45	ECS1KBB222M□□250045
	2700	151	106	2.02	30×30	ECS1KBB222M□□300030	
		123	86	2.50	30×35	ECS1KBB272M□□300035	
		123	86	2.45	35×30	ECS1KBB272M□□350030	
	3300	101	70	2.69	30×40	ECS1KBB332M□□300040	
		101	70	2.60	35×35	ECS1KBB332M□□350035	
		85	60	2.94	30×45	ECS1KBB392M□□300045	
	3900	85	60	3.00	35×40	ECS1KBB392M□□350040	
		4700	71	49	3.44	35×45	ECS1KBB472M□□350045
		5600	59	42	3.72	35×50	ECS1KBB562M□□350050
100 (125) 2A	6800	51	36	3.93	35×60	ECS1KBB682M□□350060	
		1200	221	155	1.76	25×35	ECS2ABB122M□□250035
		221	155	1.76	30×30	ECS2ABB122M□□300030	
	1500	177	124	2.00	22×50	ECS2ABB152M□□220050	
		177	124	2.03	25×40	ECS2ABB152M□□250040	
		147	103	2.29	25×45	ECS2ABB182M□□250045	
	1800	147	103	2.19	30×35	ECS2ABB182M□□300035	
		147	103	2.15	35×30	ECS2ABB182M□□350030	
		121	84	2.52	30×40	ECS2ABB222M□□300040	
	2200	121	84	2.48	35×35	ECS2ABB222M□□350035	
		98	69	2.86	30×45	ECS2ABB272M□□300045	
		98	69	2.87	35×40	ECS2ABB272M□□350040	
160 (200) 2C	3300	80	56	3.25	35×45	ECS2ABB332M□□350045	
		3900	68	48	3.56	35×50	ECS2ABB392M□□350050
		4700	56	39	3.72	35×50	ECS2ABB472M□□350050
	560	355	249	1.26	22×45	ECS2CBB561M□□220045	
		293	205	1.44	22×45	ECS2CBB681M□□220045	
		293	205	1.43	25×40	ECS2CBB681M□□250040	
	680	293	205	1.50	30×35	ECS2CBB681M□□300035	
		243	170	1.63	25×45	ECS2CBB821M□□250045	
		243	170	1.66	30×40	ECS2CBB821M□□300040	
	1000	199	139	1.89	30×45	ECS2CBB102M□□300045	
		199	139	1.89	35×35	ECS2CBB102M□□350035	
		1200	166	116	2.16	30×50	ECS2CBB122M□□300050

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
160 (200) 2C	1200	166	116	2.23	35×40	ECS2CBB122M□□350040	
	1500	133	93	2.61	35×45	ECS2CBB152M□□350045	
	1800	111	77	2.97	35×50	ECS2CBB182M□□350050	
	2200	90	62	3.22	30×55	ECS2CBB222M□□300055	
	3300	61	42	3.51	35×60	ECS2CBB332M□□350060	
200 (250) 2D	470	424	296	1.17	22×45	ECS2DBB471M□□220045	
		424	296	1.22	25×40	ECS2DBB471M□□250040	
		424	296	1.17	30×30	ECS2DBB471M□□300030	
	560	355	249	1.39	25×45	ECS2DBB561M□□250045	
		355	249	1.38	30×35	ECS2DBB561M□□300035	
		293	205	1.58	25×50	ECS2DBB681M□□250050	
	680	293	205	1.61	30×40	ECS2DBB681M□□300040	
		293	205	1.49	35×30	ECS2DBB681M□□350030	
		243	170	1.85	30×45	ECS2DBB821M□□300045	
	820	243	170	1.75	35×35	ECS2DBB821M□□350035	
		1000	199	139	2.11	30×50	ECS2DBB102M□□300050
			199	139	2.07	35×40	ECS2DBB102M□□350040
	1200		166	116	2.38	30×50	ECS2DBB122M□□300050
	250 (300) 2E	330	133	93	2.76	35×50	ECS2DBB152M□□350050
			603	422	1.01	22×45	ECS2EBB331M□□220045
603			422	1.00	30×30	ECS2EBB331M□□300030	
390		510	357	1.13	22×50	ECS2EBB391M□□220050	
		510	357	1.13	25×40	ECS2EBB391M□□250040	
		510	357	1.15	30×35	ECS2EBB391M□□300035	
470		424	296	1.29	25×45	ECS2EBB471M□□250045	
		424	296	1.24	35×30	ECS2EBB471M□□350030	
		355	249	1.45	25×50	ECS2EBB561M□□250050	
560		355	249	1.48	30×40	ECS2EBB561M□□300040	
		355	249	1.49	35×35	ECS2EBB561M□□350035	
		293	205	1.71	30×45	ECS2EBB681M□□300045	
680		293	205	1.74	35×40	ECS2EBB681M□□350040	
		820	243	1.70	30×50	ECS2EBB821M□□300050	
		1000	199	1.39	2.20	35×45	ECS2EBB102M□□350045
315 (365) 2F	1200	166	111	2.45	35×45	ECS2EBB122M□□350045	
	220	1206	844	0.72	22×30	ECS2FBB221M□□220030	
	270	983	688	0.81	25×30	ECS2FBB271M□□250030	
	330	804	563	0.90	30×25	ECS2FBB331M□□300025	
	390	681	476	1.04	22×45	ECS2FBB391M□□220045	
		681	476	1.05	25×35	ECS2FBB391M□□250035	
		565	395	1.15	30×30	ECS2FBB471M□□300030	
	560	474	332	1.34	25×50	ECS2FBB561M□□250050	
		390	274	1.72	30×50	ECS2FBB681M□□300050	
		390	274	1.78	35×40	ECS2FBB681M□□350040	
	820	324	227	1.95	30×50	ECS2FBB821M□□300050	
		1000	268	186	2.35	35×45	ECS2FBB102M□□350045
		1200	224	157	2.70	35×50	ECS2FBB122M□□350050
	1500	178	125	3.15	35×60	ECS2FBB152M□□350060	
		178	120	3.46	35×75	ECS2FBB152M□□350075	
400 (450) 2G		150	1769	1239	0.65	25×30	ECS2GBB151M□□250030
	220	1206	844	0.79	22×50	ECS2GBB221M□□220050	
		1206	844	0.85	25×35	ECS2GBB221M□□250035	
		1206	844	0.89	35×20	ECS2GBB221M□□350020	
	270	983	688	0.96	35×25	ECS2GBB271M□□350025	
		804	563	1.07	30×35	ECS2GBB331M□□300035	
		804	563	1.12	30×50	ECS2GBB331M□□300050	
	330	804	563	1.18	35×30	ECS2GBB331M□□350030	
		681	476	1.21	30×35	ECS2GBB391M□□300035	
		681	476	1.27	30×50	ECS2GBB391M□□300050	
	470	565	395	1.31	30×50	ECS2GBB471M□□300050	
		565	395	1.33	35×50	ECS2GBB471M□□350050	
		476	333	1.49	30×50	ECS2GBB561M□□300050	
	560	476	333	1.53	35×50	ECS2GBB561M□□350050	
		395	276	1.82	30×50	ECS2GBB681M□□300050	
395		276	1.88	30×55	ECS2GBB681M□□300055		
450 (500) 2W	820	328	228	2.16	35×55	ECS2GBB821M□□350055	
	1000	270	188	2.57	35×60	ECS2GBB102M□□350060	
		265	182	2.82	35×75	ECS2GBB102M□□350075	
		1200	223	155	3.28	35×75	ECS2GBB122M□□350075
	120	2212	1548	0.58	22×30	ECS2WBB121M□□220030	
	150	1769	1239	0.66	22×35	ECS2WBB151M□□220035	
		1769	1239	0.68	25×40	ECS2WBB151M□□250040	
		1474	1032	0.74	25×45	ECS2WBB181M□□250045	
	180	1474	1032	0.77	30×30	ECS2WBB181M□□300030	
		1206	844	0.88	30×30	ECS2WBB221M□□300030	
		270	983	688	0.99	25×50	ECS2WBB271M□□250050
	983		688	1.01	30×30	ECS2WBB271M□□300030	
	330		804	563	1.12	30×35	ECS2WBB331M□□300035
		804	563	1.15	35×30	ECS2WBB331M□□350030	
		681	476	1.26	30×40	ECS2WBB391M□□300040	
390	681	476	1.28	35×35	ECS2WBB391M□□350035		
	565	394	1.47	35×40	ECS2WBB471M□□350040		
	470	565	394	1.50	35×45	ECS2WBB471M□□350045	
476		333	1.68	35×50	ECS2WBB561M□□350050		
560		395	276	1.92	35×50	ECS2WBB681M□□350050	
	395	276	1.97	35×60	ECS2WBB681M□□350060		

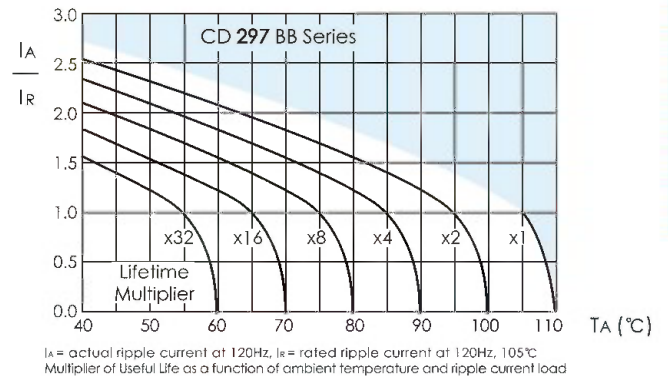


## Ratings for CD 297 BB Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	820	328	228	2.18	35 x 60	ECS2WBB821M□□350060
	1000	270	182	2.56	35 x 70	ECS2WBB102M□□350070
	1000	270	182	2.66	35 x 75	ECS2GBB102M□□350075
500 (550) 2H	100	2654	1327	0.67	25 x 30	ECS2HBB101M□□250030
	120	2212	1106	0.77	25 x 30	ECS2HBB121M□□250030
	180	1474	737	0.98	25 x 50	ECS2HBB181M□□250050
	220	1206	603	1.12	30 x 35	ECS2HBB221M□□300035
	270	983	492	1.25	30 x 50	ECS2HBB271M□□300050
	330	804	402	1.36	35 x 45	ECS2HBB331M□□350045
	390	681	340	1.54	35 x 50	ECS2HBB391M□□350050
	470	565	282	1.69	35 x 60	ECS2HBB471M□□350060
	560	476	238	1.86	35 x 60	ECS2HBB561M□□350060
	680	395	198	2.17	35 x 70	ECS2HBB681M□□350070
550 (600) 2Y	150	1769	885	0.92	30 x 35	ECS2YBB151M□□300035
	180	1474	737	1.03	30 x 40	ECS2YBB181M□□300040
	220	1026	603	1.15	30 x 50	ECS2YBB221M□□300050
	270	983	492	1.30	35 x 45	ECS2YBB271M□□350045
	330	804	402	1.48	35 x 55	ECS2YBB331M□□350055
	390	681	340	1.65	35 x 60	ECS2YBB391M□□350060
	470	565	282	1.90	35 x 60	ECS2YBB471M□□350060
	470	565	282	1.92	35 x 70	ECS2YBB471M□□350070
	560	473	237	2.05	35 x 80	ECS2YBB561M□□350080
	680	390	196	2.39	40 x 75	ECS2YBB568M□□400075

Customer products are available on request.

## Lifetime Diagram





# CD 297S SF SERIES



SNAP-IN/LUG

5000h at 105°C

- Long Life, high reliability
- High Ripple Current
- Solar inverter
- RoHS
- Excellent airtightness, adoption of special sealing process
- Longer useful life

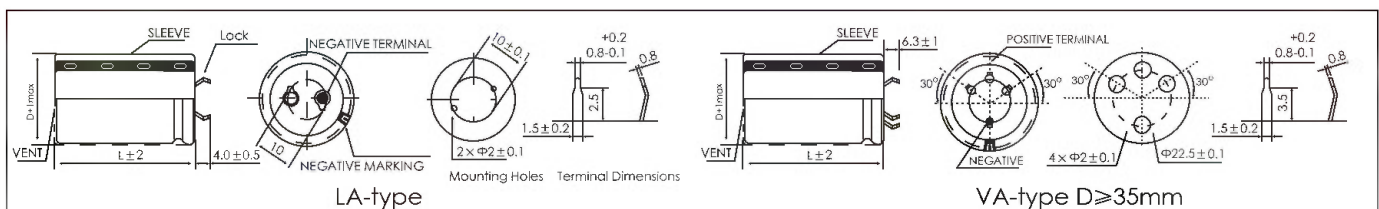


Items	Characteristics			
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105		
Voltage Range (V)	160 ~ 420	450 ~ 550		
Capacitance Range (μF)	100 ~ 3300			
Capacitance Tolerance (20°C, 120Hz)	± 20%			
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF)    V: Rated Voltage (V)			
Dissipation Factor (20°C, 120Hz)	WV (V)	160~420	450~500	550
	Tan δ	0.15	0.20	0.25
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160~250	315~420	450~550
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4	7	10
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	8	12	-

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	10000h	>250000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement $U_R = 0$ $I_R = 0$ 105°C

## Dimensions

mm



## Frequency Coefficient

Frequency(Hz)		50/60	120	300	1K	10K	≥50K
Factor	160 ~ 250V	0.80	1.00	1.17	1.32	1.45	1.50
	315~550V	0.80	1.00	1.16	1.30	1.41	1.43

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Factor	3.0	2.8	2.5	2.0	1.0



## Ratings for CD 297S SF Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	1000	199	119	2.4	22 x 40	ECS2CSF102M□□220040
		199	119	2.4	25 x 35	ECS2CSF102M□□250035
		199	119	2.5	30 x 25	ECS2CSF102M□□300025
	1200	166	100	2.8	25 x 40	ECS2CSF122M□□250040
		166	100	2.8	30 x 30	ECS2CSF122M□□300030
		166	100	2.8	35 x 25	ECS2CSF122M□□350025
	1500	133	80	3.1	25 x 45	ECS2CSF152M□□250045
		133	80	3.1	25 x 50	ECS2CSF152M□□250050
		133	80	3.2	30 x 35	ECS2CSF152M□□300035
	1800	111	66	3.6	25 x 50	ECS2CSF182M□□250050
		111	66	3.6	30 x 40	ECS2CSF182M□□300040
		111	66	3.5	35 x 30	ECS2CSF182M□□350030
	2200	90	54	4.1	30 x 45	ECS2CSF222M□□300045
		90	54	4.1	30 x 50	ECS2CSF222M□□300050
		90	54	4.0	35 x 35	ECS2CSF222M□□350035
	2700	74	44	4.6	35 x 40	ECS2CSF272M□□350040
		74	44	4.8	35 x 45	ECS2CSF272M□□350045
		3300	60	5.4	35 x 50	ECS2CSF332M□□350050
200 (250) 2D	680	293	176	1.9	22 x 40	ECS2DSF681M□□220040
		293	176	1.9	25 x 30	ECS2DSF681M□□250030
		293	176	1.9	30 x 25	ECS2DSF681M□□300025
	820	243	146	2.2	22 x 45	ECS2DSF821M□□220045
		243	146	2.2	25 x 35	ECS2DSF821M□□250035
		199	119	2.5	25 x 40	ECS2DSF102M□□250040
	1000	199	119	2.5	30 x 30	ECS2DSF102M□□300030
		199	119	2.7	35 x 25	ECS2DSF102M□□350025
		199	119	2.7	35 x 30	ECS2DSF102M□□350030
	1200	166	100	2.7	25 x 45	ECS2DSF122M□□250045
		166	100	2.8	30 x 35	ECS2DSF122M□□300035
		166	100	2.8	30 x 50	ECS2DSF122M□□300050
	1500	133	80	3.0	35 x 30	ECS2DSF122M□□350030
		133	80	3.3	30 x 40	ECS2DSF152M□□300040
		133	80	3.3	30 x 45	ECS2DSF152M□□300045
	1800	111	66	3.4	35 x 35	ECS2DSF152M□□350035
		111	66	3.7	30 x 50	ECS2DSF182M□□300050
		111	66	3.8	35 x 40	ECS2DSF182M□□350040
	2200	90	54	3.8	35 x 45	ECS2DSF182M□□350045
		90	54	4.3	35 x 45	ECS2DSF222M□□350045
		90	54	4.3	35 x 50	ECS2DSF222M□□350050
	2700	74	44	4.9	35 x 50	ECS2DSF272M□□350050
250 (300) 2E	470	423	254	1.6	22 x 40	ECS2ESF471M□□220040
		423	254	1.6	25 x 30	ECS2ESF471M□□250030
		355	213	1.8	22 x 45	ECS2ESF561M□□220045
	560	355	213	1.8	25 x 35	ECS2ESF561M□□250035
		355	213	1.8	30 x 25	ECS2ESF561M□□300025
		293	176	2.0	25 x 40	ECS2ESF681M□□250040
	680	293	176	2.1	30 x 30	ECS2ESF681M□□300030
		293	176	2.2	35 x 25	ECS2ESF681M□□350025
		243	146	2.3	25 x 45	ECS2ESF821M□□250045
	820	243	146	2.4	30 x 35	ECS2ESF821M□□300035
		243	146	2.5	35 x 30	ECS2ESF821M□□350030
		199	119	2.7	30 x 40	ECS2ESF102M□□300040
	1200	166	100	3.0	30 x 45	ECS2ESF122M□□300045
		166	100	3.0	35 x 35	ECS2ESF122M□□350035
		166	100	3.2	35 x 40	ECS2ESF122M□□350040
	1500	133	80	3.6	35 x 45	ECS2ESF152M□□350045
		1800	111	4.0	35 x 50	ECS2ESF182M□□350050
315 (365) 2F	330	603	362	1.4	22 x 40	ECS2FSF331M□□220040
		510	306	1.6	22 x 45	ECS2FSF391M□□220045
		510	306	1.6	22 x 50	ECS2FSF391M□□220050
	390	510	306	1.6	25 x 35	ECS2FSF391M□□250035
		423	254	1.8	25 x 40	ECS2FSF471M□□250040
		423	254	1.8	30 x 30	ECS2FSF471M□□300030
	470	423	254	1.8	35 x 25	ECS2FSF471M□□350025
		355	213	2.0	25 x 50	ECS2FSF561M□□250050
		355	213	1.9	30 x 35	ECS2FSF561M□□300035
	560	355	213	2.0	35 x 30	ECS2FSF561M□□350030
		293	176	2.2	30 x 40	ECS2FSF681M□□300040
		293	176	2.3	30 x 45	ECS2FSF681M□□300045
	680	293	176	2.2	35 x 35	ECS2FSF681M□□350035
		293	176	2.2	35 x 35	ECS2FSF681M□□350035
		293	176	2.2	35 x 35	ECS2FSF681M□□350035

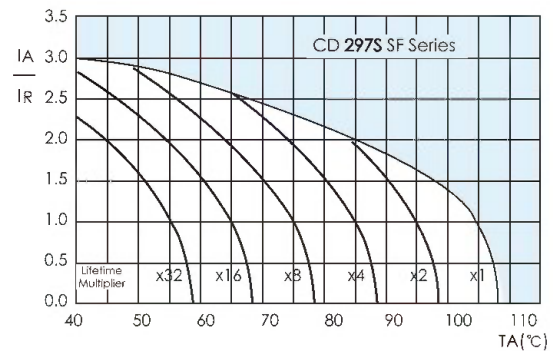
U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-	
315 (365) 2F	820	243	146	2.5	30 x 50	ECS2FSF821M□□300050	
		243	146	2.6	35 x 40	ECS2FSF821M□□350040	
	1000	199	119	2.9	35 x 45	ECS2FSF102M□□350045	
	1200	166	100	3.3	35 x 50	ECS2FSF122M□□350050	
		166	100	3.3	35 x 55	ECS2FSF122M□□350055	
350 (400) 2V	220	905	543	1.0	22 x 40	ECS2VSF221M□□220040	
		905	543	1.0	25 x 30	ECS2VSF221M□□250030	
		905	543	1.0	30 x 25	ECS2VSF221M□□300025	
	270	737	442	1.3	22 x 45	ECS2VSF271M□□220045	
		737	442	1.3	22 x 50	ECS2VSF271M□□220050	
		737	442	1.3	25 x 35	ECS2VSF271M□□250035	
	330	737	442	1.3	30 x 30	ECS2VSF271M□□300030	
		603	362	1.4	22 x 50	ECS2VSF331M□□220050	
		603	362	1.4	25 x 40	ECS2VSF331M□□250040	
	390	603	362	1.4	30 x 30	ECS2VSF331M□□300030	
		510	306	1.6	25 x 40	ECS2VSF391M□□250040	
		510	306	1.6	25 x 45	ECS2VSF391M□□250045	
	470	510	306	1.6	30 x 35	ECS2VSF391M□□300035	
		423	254	1.8	25 x 45	ECS2VSF471M□□250045	
		423	254	1.8	30 x 35	ECS2VSF471M□□300035	
	560	423	254	1.8	35 x 35	ECS2VSF471M□□350035	
		355	213	2.0	30 x 45	ECS2VSF561M□□300045	
		355	213	2.0	35 x 35	ECS2VSF561M□□350035	
	680	293	176	2.4	30 x 50	ECS2VSF681M□□300050	
		293	176	2.4	35 x 40	ECS2VSF681M□□350040	
		243	146	2.6	35 x 45	ECS2VSF821M□□350045	
	820	243	146	2.6	35 x 50	ECS2VSF821M□□350050	
		1000	199	119	2.8	35 x 50	ECS2VSF102M□□350050
		400 (450) 2G	220	905	483	1.1	22 x 40
	905			483	1.1	25 x 30	ECS2GSF221M□□250030
	905			483	1.2	30 x 25	ECS2GSF221M□□300025
	270		737	393	1.3	22 x 50	ECS2GSF271M□□220050
			737	393	1.3	25 x 35	ECS2GSF271M□□250035
			737	393	1.3	30 x 30	ECS2GSF271M□□300030
	330		603	322	1.5	25 x 40	ECS2GSF331M□□250040
			603	322	1.4	30 x 30	ECS2GSF331M□□300030
			603	322	1.5	35 x 25	ECS2GSF331M□□350025
	390		510	272	1.6	25 x 45	ECS2GSF391M□□250045
			510	357	1.6	30 x 35	ECS2GSF391M□□300035
			510	272	1.7	35 x 30	ECS2GSF391M□□350030
470	423		226	1.8	30 x 45	ECS2GSF471M□□300045	
	423		226	1.9	35 x 35	ECS2GSF471M□□350035	
	355		190	2.1	30 x 50	ECS2GSF561M□□300050	
560	355		190	2.1	35 x 40	ECS2GSF561M□□350040	
	293		156	2.4	35 x 45	ECS2GSF681M□□350045	
	243		170	2.7	35 x 50	ECS2GSF821M□□350050	
1000	199		106	3.2	35 x 60	ECS2GSF102M□□350060	
1200	166	88	3.7	35 x 70	ECS2GSF122M□□350070		
420 (470) 2X	180	1106	627	1.0	22 x 40	ECS2XSF181M□□220040	
		1106	627	1.0	25 x 30	ECS2XSF181M□□250030	
		1106	627	1.1	30 x 25	ECS2XSF181M□□300025	
	220	905	513	1.2	22 x 45	ECS2XSF221M□□220045	
		905	513	1.2	22 x 50	ECS2XSF221M□□220050	
		905	513	1.2	25 x 35	ECS2XSF221M□□250035	
	270	905	513	1.2	30 x 30	ECS2XSF221M□□300030	
		737	418	1.3	25 x 40	ECS2XSF271M□□250040	
		737	418	1.3	30 x 30	ECS2XSF271M□□300030	
	330	737	418	1.4	35 x 25	ECS2XSF271M□□350025	
		603	342	1.5	25 x 50	ECS2XSF331M□□250050	
		603	342	1.5	30 x 35	ECS2XSF331M□□300035	
	390	603	342	1.6	35 x 30	ECS2XSF331M□□350030	
		510	289	1.7	30 x 40	ECS2XSF391M□□300040	
		510	289	1.7	35 x 30	ECS2XSF391M□□350030	
	470	510	289	1.7	35 x 35	ECS2XSF391M□□350035	
		423	240	1.9	30 x 50	ECS2XSF471M□□300050	
		423	240	2.0	35 x 40	ECS2XSF471M□□350040	
	560	355	201	2.2	35 x 40	ECS2XSF561M□□350040	
	680	293	166	2.5	35 x 50	ECS2XSF681M□□350050	
	820	243	138	3.0	35 x 55	ECS2XSF821M□□350055	
	1000	199	113	3.4	35 x 65	ECS2XSF102M□□350065	
	1200	166	94	3.8	35 x 75	ECS2XSF122M□□350075	



## Ratings for CD 297S SF Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20℃, 120Hz	Typ ESR 20℃, 120Hz	Rated Ripple Current 105℃, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	150	1769	708	0.9	22 × 40	ECS2WSF151M□□220040
		1769	708	0.9	25 × 30	ECS2WSF151M□□250030
	180	1474	590	1.1	22 × 45	ECS2WSF181M□□220045
		1474	590	1.1	25 × 35	ECS2WSF181M□□250035
		1474	590	1.1	30 × 25	ECS2WSF181M□□300025
	220	1206	483	1.2	22 × 50	ECS2WSF221M□□220050
		1206	483	1.2	25 × 40	ECS2WSF221M□□250040
		1206	483	1.2	30 × 30	ECS2WSF221M□□300030
	270	983	393	1.3	25 × 45	ECS2WSF271M□□250045
		983	393	1.3	30 × 35	ECS2WSF271M□□300035
		983	393	1.4	35 × 30	ECS2WSF271M□□350030
	330	804	322	1.5	30 × 40	ECS2WSF331M□□300040
		680	272	1.7	30 × 45	ECS2WSF391M□□300045
	390	680	272	1.7	35 × 35	ECS2WSF391M□□350035
		680	272	1.7	35 × 40	ECS2WSF391M□□350040
		565	226	2.0	35 × 40	ECS2WSF471M□□350040
	470	565	226	2.0	35 × 45	ECS2WSF471M□□350045
		565	226	2.0	35 × 50	ECS2WSF471M□□350050
		560	474	190	2.2	35 × 50
	680	390	156	2.6	35 × 55	ECS2WSF681M□□350055
		390	156	2.6	35 × 60	ECS2WSF681M□□350060
		820	324	129	3.0	35 × 65
	1000	265	106	3.4	35 × 75	ECS2WSF102M□□350075
		265	106	3.4	40 × 65	ECS2WSF102M□□400065
	1200	221	88	3.7	40 × 75	ECS2WSF122M□□400075
500 (550) 2H	100	2654	1062	0.8	25 × 30	ECS2HSF101M□□250030
	120	2212	885	0.9	25 × 35	ECS2HSF121M□□250035
		2212	885	0.9	30 × 30	ECS2HSF121M□□300030
	150	1769	708	1.0	30 × 30	ECS2HSF151M□□300030
	180	1474	590	1.2	30 × 35	ECS2HSF181M□□300035
		1206	483	1.3	25 × 50	ECS2HSF221M□□250050
	220	1206	483	1.3	30 × 40	ECS2HSF221M□□300040
		1206	483	1.2	35 × 35	ECS2HSF221M□□350035
		983	393	1.5	30 × 50	ECS2HSF271M□□300050
	270	983	393	1.5	35 × 40	ECS2HSF271M□□350040
		804	322	1.6	35 × 45	ECS2HSF331M□□350045
	390	680	272	1.8	35 × 50	ECS2HSF391M□□350050
		565	226	2.0	35 × 55	ECS2HSF471M□□350055
	470	565	226	2.0	35 × 60	ECS2HSF471M□□350060
		474	190	2.2	35 × 65	ECS2HSF561M□□350065
	560	474	190	2.2	40 × 50	ECS2HSF561M□□400050
		390	156	2.4	35 × 70	ECS2HSF681M□□350070
	680	390	156	2.4	40 × 60	ECS2HSF681M□□400060
		820	324	129	2.6	40 × 70
	1000	265	106	2.8	45 × 70	ECS2HSF102M□□450070
	1200	221	88	3.2	45 × 80	ECS2HSF122M□□450080
550 (600) 2Y	270	1229	590	1.3	35 × 50	ECS2YSF271M□□350050
	330	1005	483	1.4	35 × 60	ECS2YSF331M□□350060
		851	408	1.6	35 × 65	ECS2YSF391M□□350065
	470	706	339	1.8	35 × 70	ECS2YSF471M□□350070
		706	339	1.8	40 × 65	ECS2YSF471M□□400065
	560	592	284	2.0	35 × 80	ECS2YSF561M□□350080
		592	284	2.0	40 × 70	ECS2YSF561M□□400070
	680	488	234	2.3	40 × 80	ECS2YSF681M□□400080
		488	234	2.3	45 × 70	ECS2YSF681M□□450070

## Lifetime Diagram

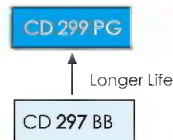


Customer products are available on request.



7000h at 105°C

- Extended Lifetime at 105°C
- High Ripple Current
- High Professional Industrial Power Supplies



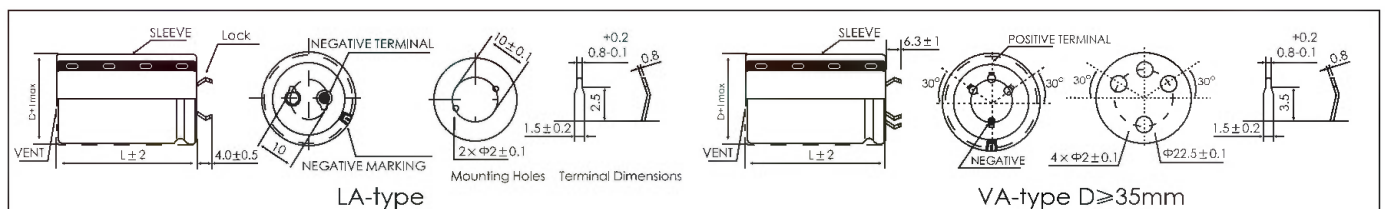
SNAP-IN/LUG

Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	160 ~ 250	315 ~ 500
Capacitance Range (µF)	120 ~ 2200	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (µA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (µF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160    180    200    250    315    400    450~500
	Tan δ (max)	0.15    0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	≤ 250    315 ~ 500
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3    8
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	12    -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	9000h	>200000h	7000h	7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 50°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min $I_R = 0$ >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	>40kHz
Rated Voltage (V)						
160 ~ 250	0.80	1.00	1.17	1.30	1.45	1.50
≥ 315	0.80	1.00	1.16	1.30	1.43	1.45

## Temperature Coefficient

Temperature (°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0



# CD 299 PG SERIES



## Ratings for CD 299 PG Series

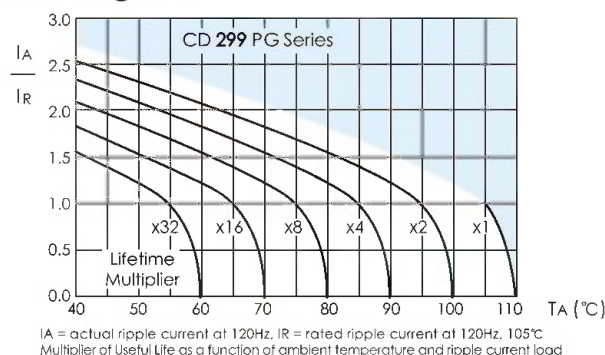
SNAP-IN/LUG

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	560	355	249	1.5	22 x 40	ECS2CPG561M□□220040
		355	249	1.5	30 x 25	ECS2CPG561M□□300025
	680	293	205	1.7	22 x 45	ECS2CPG681M□□220045
		293	205	1.7	25 x 35	ECS2CPG681M□□250035
	820	293	205	1.7	30 x 30	ECS2CPG681M□□300030
		243	170	2	25 x 40	ECS2CPG821M□□250040
	1000	199	139	2.2	25 x 45	ECS2CPG102M□□250045
		199	139	2.2	30 x 35	ECS2CPG102M□□300035
	1200	166	116	2.3	25 x 50	ECS2CPG122M□□250050
		166	116	2.3	30 x 40	ECS2CPG122M□□300040
	1500	166	116	2.3	35 x 35	ECS2CPG122M□□350035
		133	93	2.5	30 x 45	ECS2CPG152M□□300045
	1800	133	93	2.5	35 x 40	ECS2CPG152M□□350040
		111	77	2.7	30 x 50	ECS2CPG182M□□300050
	2200	111	77	2.7	35 x 45	ECS2CPG182M□□350045
		91	63	2.9	35 x 50	ECS2CPG222M□□350050
180 (225) 2K	560	355	249	1.5	22 x 40	ECS2KPG561M□□220040
		355	249	1.5	25 x 35	ECS2KPG561M□□250035
	680	293	205	1.7	22 x 50	ECS2KPG681M□□220050
		293	205	1.7	25 x 40	ECS2KPG681M□□250040
	820	293	205	1.7	30 x 30	ECS2KPG681M□□300030
		243	170	2	25 x 45	ECS2KPG821M□□250045
	1000	243	170	2	30 x 35	ECS2KPG821M□□300035
		243	170	2	35 x 30	ECS2KPG821M□□350030
	1200	199	139	2.2	30 x 40	ECS2KPG102M□□300040
		166	116	2.3	30 x 45	ECS2KPG122M□□300045
	1500	166	116	2.2	35 x 35	ECS2KPG122M□□350035
		133	93	2.5	30 x 50	ECS2KPG152M□□300050
	1800	133	93	2.5	35 x 40	ECS2KPG152M□□350040
		111	77	2.7	35 x 45	ECS2KPG182M□□350045
	2200	91	63	2.9	35 x 50	ECS2KPG222M□□350050
200 (250) 2D	470	424	296	1.4	22 x 40	ECS2DPG471M□□220040
		424	296	1.4	25 x 35	ECS2DPG471M□□250035
	560	424	296	1.4	30 x 30	ECS2DPG471M□□300030
		355	249	1.5	22 x 45	ECS2DPG561M□□220045
	680	293	205	1.7	25 x 40	ECS2DPG681M□□250040
		293	205	1.7	30 x 35	ECS2DPG681M□□300035
	820	243	170	2	25 x 50	ECS2DPG821M□□250050
		243	170	2	30 x 40	ECS2DPG821M□□300040
	1000	243	170	2	35 x 30	ECS2DPG821M□□350030
		199	139	2.2	30 x 45	ECS2DPG102M□□300045
	1200	199	139	2.2	35 x 35	ECS2DPG102M□□350035
		166	116	2.3	30 x 50	ECS2DPG122M□□300050
	1500	166	116	2.3	35 x 40	ECS2DPG122M□□350040
		133	93	2.5	35 x 50	ECS2DPG152M□□350050
250 (300) 2E	330	603	422	1.2	22 x 40	ECS2EPG331M□□220040
		603	422	1.2	25 x 35	ECS2EPG331M□□250035
	390	510	357	1.3	22 x 45	ECS2EPG391M□□220045
		510	357	1.3	25 x 40	ECS2EPG391M□□250040
	470	510	357	1.3	30 x 30	ECS2EPG391M□□300030
		424	296	1.4	25 x 45	ECS2EPG471M□□250045
	560	424	296	1.4	30 x 35	ECS2EPG471M□□300035
		424	296	1.4	35 x 30	ECS2EPG471M□□350030
	680	355	249	1.5	25 x 50	ECS2EPG561M□□250050
		293	205	1.7	30 x 45	ECS2EPG681M□□300045
	820	293	205	1.7	35 x 35	ECS2EPG681M□□350035
		243	170	2	30 x 50	ECS2EPG821M□□300050
	1000	243	170	2	35 x 40	ECS2EPG821M□□350040
		199	139	2.2	35 x 45	ECS2EPG102M□□350045
	1200	166	116	2.3	35 x 50	ECS2EPG122M□□350050
315 (365) 2F	220	905	498	1	22 x 45	ECS2FPG221M□□220045
		905	498	1	25 x 40	ECS2FPG221M□□250040
	270	905	498	1	30 x 30	ECS2FPG221M□□300030
		737	406	1.1	25 x 45	ECS2FPG271M□□250045
	330	737	406	1.1	30 x 35	ECS2FPG271M□□300035
		737	406	1.1	35 x 30	ECS2FPG271M□□350030
	390	603	332	1.2	25 x 50	ECS2FPG331M□□250050
		603	332	1.2	30 x 40	ECS2FPG331M□□300040
	470	510	281	1.3	30 x 45	ECS2FPG391M□□300045
		510	281	1.3	35 x 35	ECS2FPG391M□□350035
	560	424	233	1.4	30 x 50	ECS2FPG471M□□300050
		424	233	1.4	35 x 40	ECS2FPG471M□□350040
	680	355	196	1.5	35 x 45	ECS2FPG561M□□350045
		293	161	1.7	35 x 50	ECS2FPG681M□□350050
400 (450) 2G	120	1659	912	0.62	22 x 40	ECS2GPG121M□□220030
		1659	912	0.64	25 x 35	ECS2GPG121M□□250025
	150	1327	730	0.69	22 x 50	ECS2GPG151M□□220040
		1327	730	0.69	25 x 40	ECS2GPG151M□□250030
	180	1106	608	0.72	25 x 45	ECS2GPG181M□□250035
		1106	608	0.78	30 x 35	ECS2GPG181M□□300030
	220	905	498	0.83	25 x 50	ECS2GPG221M□□250040
		905	498	0.81	30 x 40	ECS2GPG221M□□300030
	270	737	406	0.89	30 x 35	ECS2GPG271M□□300035
		737	406	0.82	35 x 25	ECS2GPG271M□□350025
	330	603	332	1.07	30 x 40	ECS2GPG331M□□300040

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	330	603	332	1.02	35 x 30	ECS2GPG331M□□350030
		510	281	1.18	35 x 35	ECS2GPG391M□□350035
	390	510	281	1.21	30 x 45	ECS2GPG391M□□300045
		424	233	1.23	30 x 50	ECS2GPG471M□□300050
	470	424	233	1.22	35 x 40	ECS2GPG471M□□350040
		356	196	1.5	30 x 55	ECS2GPG561M□□300055
	560	356	196	1.5	35 x 45	ECS2GPG561M□□350045
		680	293	1.79	35 x 50	ECS2GPG681M□□350050
	820	243	134	2.07	35 x 55	ECS2GPG821M□□350055
		2212	995	0.69	25 x 30	ECS2WPG121M□□250030
450 (500) 2W	120	1769	796	0.77	25 x 35	ECS2WPG151M□□250035
		1769	796	0.73	30 x 25	ECS2WPG151M□□300025
	150	1474	664	0.83	25 x 40	ECS2WPG181M□□250040
		1474	664	0.81	30 x 30	ECS2WPG181M□□300030
	180	1206	543	0.96	30 x 35	ECS2WPG221M□□300035
		1206	543	0.89	35 x 25	ECS2WPG221M□□350025
	220	983	442	1.09	30 x 40	ECS2WPG271M□□300040
		983	442	1.04	35 x 30	ECS2WPG271M□□350030
	270	804	362	1.21	30 x 45	ECS2WPG331M□□300045
		804	362	1.18	35 x 35	ECS2WPG331M□□350035
500 (550) 2H	390	680	306	1.24	30 x 50	ECS2WPG391M□□300050
		680	306	1.23	35 x 40	ECS2WPG391M□□350040
	470	565	254	1.41	30 x 55	ECS2WPG471M□□300055
		565	254	1.41	35 x 45	ECS2WPG471M□□350045
	560	474	213	1.58	30 x 60	ECS2WPG561M□□300060
		474	213	1.6	35 x 50	ECS2WPG561M□□350050
	680	390	176	1.83	35 x 55	ECS2WPG681M□□350055
		324	146	2.07	35 x 60	ECS2WPG821M□□350060
	820	2212	1106	0.72	22 x 50	ECS2HPG121M□□220050
		2212	1106	0.68	25 x 40	ECS2HPG121M□□250040

Customer products are available on request.

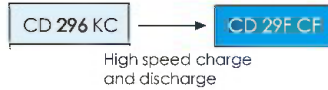
## Lifetime Diagram





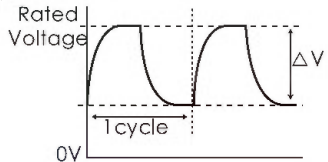
3000h at 105°C

- Long Life at High Temperature
- High Ripple Current
- Suit for high frequency regenerative voltage for AC servomotor, general inverter.



SNAP-IN/LUG

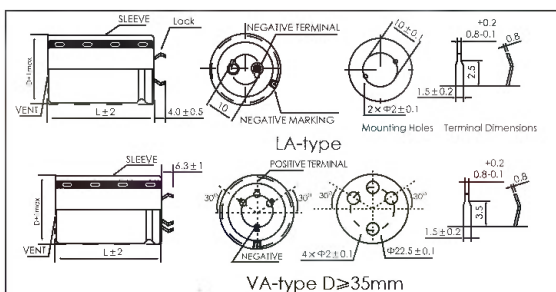
Items	Characteristics			
Operating Temperature Range (°C)	-25 ~ +105			
Voltage Range (V)	350 ~ 450			
Capacitance Range (μF)	150 ~ 820			
Capacitance Tolerance (20°C, 120Hz)	± 20%			
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)			
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	350	400	450
	Tan δ (max)	0.15		
Charge and discharge	After an application of charge and discharge with the voltage waveform shown below, for 50million times (charge and discharge voltage difference ΔV=rated voltage×0.35,cycle 3Hz) at 15~35°C, the capacitor shall meet the following specifications.			
	Capacitance Change	Within ±20% of initial value		
	Tan δ	200% or less of initial specified value		
	Leakage Current	Initial specified value or less		
	Appearance	There shall be found to no remarkable abnormality on the capacitor		
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	350	400	450
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	8		



	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	≥ 200000h	3000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 × I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency(Hz)	50/60	120	300	1K	10K	≥ 50K
Factor	0.80	1.00	1.16	1.30	1.41	1.45

## Temperature Coefficient

Temperature(°C)	40	55	70	85	105
Factor	2.7	2.5	2.1	1.7	1.0

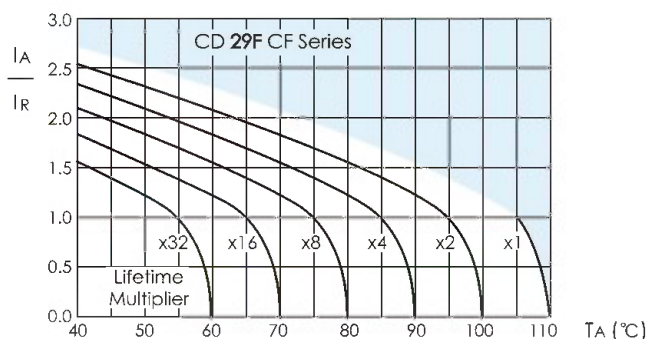


## Ratings for CD 29F CF Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
350 (400) 2V	220	905	332	1.05	22 × 40	ECS2VCF221M□□220040
		905	332	1.05	25 × 35	ECS2VCF221M□□250035
		905	332	1.05	30 × 30	ECS2VCF221M□□300030
	270	737	270	1.10	22 × 45	ECS2VCF271M□□220045
		737	270	1.10	25 × 40	ECS2VCF271M□□250040
		737	270	1.10	30 × 30	ECS2VCF271M□□300030
	330	603	221	1.21	22 × 50	ECS2VCF331M□□220050
		603	221	1.21	25 × 45	ECS2VCF331M□□250045
		603	221	1.21	30 × 40	ECS2VCF331M□□300040
	390	510	177	1.32	25 × 50	ECS2VCF391M□□250050
		510	177	1.32	30 × 45	ECS2VCF391M□□300045
		510	177	1.32	35 × 35	ECS2VCF391M□□350035
	470	423	147	1.40	30 × 45	ECS2VCF471M□□300045
		423	147	1.40	35 × 40	ECS2VCF471M□□350040
	560	355	123	1.50	30 × 50	ECS2VCF561M□□300050
		355	123	1.50	35 × 45	ECS2VCF561M□□350045
	680	293	101	1.72	35 × 45	ECS2VCF681M□□350045
400 (450) 2G	220	905	332	1.05	22 × 45	ECS2GCF221M□□220045
		905	332	1.05	25 × 40	ECS2GCF221M□□250040
		737	270	1.22	22 × 50	ECS2GCF271M□□220050
	270	737	270	1.22	25 × 45	ECS2GCF271M□□250045
		737	270	1.22	30 × 40	ECS2GCF271M□□300040
		603	201	1.45	25 × 50	ECS2GCF331M□□250050
	330	603	201	1.45	30 × 40	ECS2GCF331M□□300040
		510	170	1.55	30 × 45	ECS2GCF391M□□300045
	390	510	170	1.55	35 × 40	ECS2GCF391M□□350040
		423	136	1.75	30 × 50	ECS2GCF471M□□300050
	470	423	136	1.75	35 × 45	ECS2GCF471M□□350045
		355	114	1.92	35 × 45	ECS2GCF561M□□350045
	680	293	88	2.12	35 × 50	ECS2GCF681M□□350050
450 (500) 2W	150	1327	487	0.79	22 × 40	ECS2WCF151M□□220040
	180	1106	405	0.88	22 × 45	ECS2WCF181M□□220045
		1106	405	0.88	25 × 40	ECS2WCF181M□□250040
	220	905	332	1.04	25 × 45	ECS2WCF221M□□250045
		905	332	1.04	30 × 40	ECS2WCF221M□□300040
	270	737	270	1.25	25 × 50	ECS2WCF271M□□250050
		737	270	1.25	30 × 45	ECS2WCF271M□□300045
	330	603	201	1.37	30 × 45	ECS2WCF331M□□300045
	390	510	170	1.60	35 × 40	ECS2WCF391M□□350040
	470	423	136	1.80	30 × 50	ECS2WCF471M□□300050
		423	136	1.80	35 × 45	ECS2WCF471M□□350045
	560	355	114	2.00	35 × 50	ECS2WCF561M□□350050

Customer products are available on request.

## Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



25V~63V: 5000h at 125°C  
400V~450V: 3000h at 125°C

- Long Life at High Temperature
- High Ripple Current
- Professional Power Supplies



SNAP-IN/LUG

Items	Characteristics						
Operating Temperature Range (°C)	-40 ~ +125				-25 ~ +125		
Voltage Range (V)	25 ~ 63				400、450		
Capacitance Range (μF)	56 ~ 18000						
Capacitance Tolerance (20°C, 120Hz)	± 20%						
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)						
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	25	35	50	63	400	450
	Tan δ (max)	0.20	0.15	0.10	0.10	0.20	
Resistance to vibrations	Condition1 : Snap-in type with 3 terminals, the capacitor shall be clamped by its body. Frequency range: 10-2000Hz Amplitude: 0.75mm Acceleration max: 10g Duration: 3x2 hours Condition2: Frequency range: 10-55Hz Amplitude: 0.75mm Duration: 3x4hours						

	Useful Life		Load Life	Endurance Test	Shelf Life		
Lifetime	25~63v: 10000h 400~450v: 5000h	≥300000h	25~63v: 5000h 400~450v: 3000h	25~63v: 5000h 400~450v: 2000h	1000h	25~63v: 4000h	25~63v: 10years
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value		
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value		
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value		
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 125°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 60°C	U <sub>R</sub> I <sub>R</sub> 125°C	U <sub>R</sub> I <sub>R</sub> = 0 125°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 125°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 40°C
After test: U <sub>R</sub> to be applied for 30min, >24h before measurement							

## Frequency Coefficient

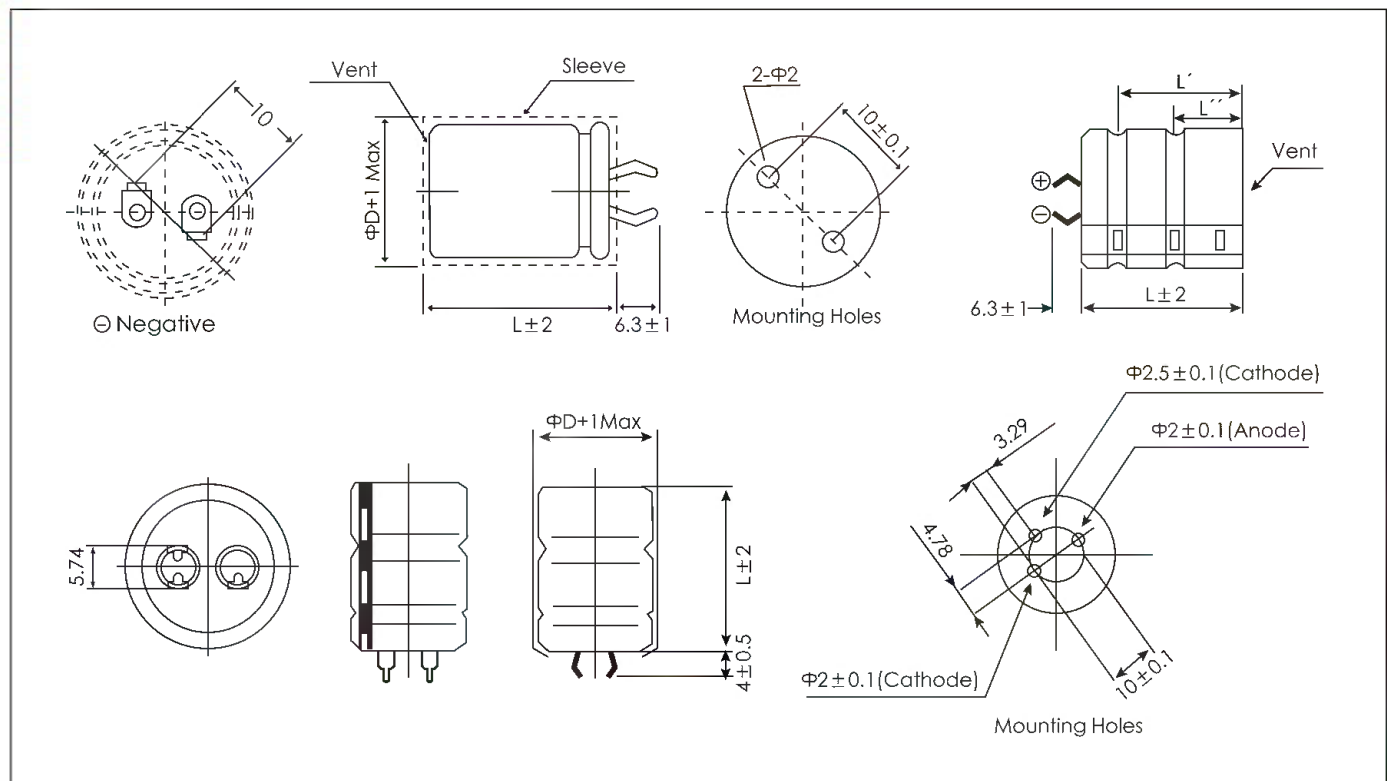
Frequency (Hz)	50/60	120	300	1K	≥10K
25~63v	0.56	0.7	0.83	0.92	1.00
400、450v	0.85	1.0	1.16	1.30	1.41

## Temperature Coefficient

Temperature(°C)	+60	+85	+105	+125
25~450v	2.3	2.0	1.7	1.0



## Dimensions



## Ratings for CD 29G BA Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max ESR 20°C, 10kHz	Rated Ripple Current 125°C, 10kHz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
25 (32) 1E	3900	34	32	4.5	25 × 35	ECS1EBA392M□□250035
	5600	27	23	5.3	25 × 40	ECS1EBA562M□□250040
	6800	19	15	6.9	25 × 40	ECS1EBA682M□□250040
	10000	14	12	8.8	25 × 50	ECS1EBA103M□□250050
	12000	12	11	9.6	30 × 50	ECS1EBA123M□□300050
	18000	11	10	9.7	35 × 50	ECS1EBA183M□□350050
35 (44) 1V	2200	45	32	4.5	25 × 35	ECS1VBA222M□□250035
	3300	31	24	5.0	22 × 40	ECS1VBA332M□□220040
	3900	22	15	7.0	25 × 40	ECS1VBA392M□□250040
	5600	16	11	9.1	25 × 50	ECS1VBA562M□□250050
	6800	14	11	9.5	30 × 50	ECS1VBA682M□□300050
	10000	12	10	10.1	35 × 50	ECS1VBA103M□□350050
50 (63) 1H	1000	70	40	4.0	25 × 35	ECS1HBA102M□□250035
	1800	37	24	5.0	25 × 35	ECS1HBA182M□□250035
	2700	24	15	6.9	25 × 40	ECS1HBA272M□□250040
	3900	18	12	8.8	25 × 50	ECS1HBA392M□□250050
	5600	15	11	9.8	30 × 50	ECS1HBA562M□□300050
	6800	13	11	9.9	35 × 50	ECS1HBA682M□□350050
63 (79) 1J	1000	60	40	3.0	25 × 35	ECS1JBA102M□□250035
	1500	39	23	4.9	25 × 35	ECS1JBA152M□□250035
	2200	26	15	6.9	25 × 40	ECS1JBA222M□□250040
	2700	21	12	8.8	25 × 50	ECS1JBA272M□□250050
	3900	16	11	9.5	30 × 50	ECS1JBA392M□□300050
	5600	13	11	9.8	35 × 50	ECS1JBA562M□□350050

Customer products are available on request.



## Ratings for CD 29G BA Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 125°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	270	983	688	1.23	30x30	ECS2GBA271M □ □ 300030
	330	804	676	1.43	30x35	ECS2GBA331M □ □ 300035
		804	676	1.49	35x30	ECS2GBA331M □ □ 350030
	390	680	476	1.60	30x40	ECS2GBA391M □ □ 300030
		680	476	1.65	30x45	ECS2GBA391M □ □ 300045
		680	476	1.64	35x35	ECS2GBA391M □ □ 350035
	470	565	316	1.82	30x50	ECS2GBA471M □ □ 300050
		565	316	1.83	35x40	ECS2GBA471M □ □ 350040
	560	474	221	2.05	30x55	ECS2GBA561M □ □ 300055
		474	221	2.12	30x60	ECS2GBA561M □ □ 300060
		474	221	2.15	35x45	ECS2GBA561M □ □ 350045
	680	390	273	2.35	35x50	ECS2GBA681M □ □ 350050
		390	273	2.43	35x55	ECS2GBA681M □ □ 350055
	820	324	227	2.68	35x60	ECS2GBA821M □ □ 350060
	220	1206	844	1.11	30x30	ECS2WBA221M □ □ 300030
450 (500) 2W	270	983	688	1.28	30x35	ECS2WBA271M □ □ 300035
		983	688	1.32	30x40	ECS2WBA271M □ □ 300040
		983	688	1.33	35x30	ECS2WBA271M □ □ 350030
	330	804	563	1.48	25x60	ECS2WBA331M □ □ 250060
		804	563	1.49	30x45	ECS2WBA331M □ □ 300045
		804	563	1.52	35x35	ECS2WBA331M □ □ 350035
	390	680	476	1.67	30x50	ECS2WBA391M □ □ 300050
		680	476	1.73	35x40	ECS2WBA391M □ □ 350040
		680	476	1.73	35x40	ECS2WBA391M □ □ 350040
	470	565	395	2.20	28x60	ECS2WBA471M □ □ 280060
		565	395	2.22	30x60	ECS2WBA471M □ □ 300060
		565	395	1.95	35x45	ECS2WBA471M □ □ 350045
	560	474	332	2.35	35x50	ECS2WBA561M □ □ 350050
		474	332	2.38	35x55	ECS2WBA561M □ □ 350055
	680	390	273	2.45	35x60	ECS2WBA681M □ □ 350060

Customer products are available on request.



# CD 29H QH SERIES



SNAP-IN/LUG

3000h at 105°C

- Long Useful Life
- Highest Ripple Current
- Industrial Power Supplies and Inverters

CD 29H QH

↑ highest current

CD 296 KC

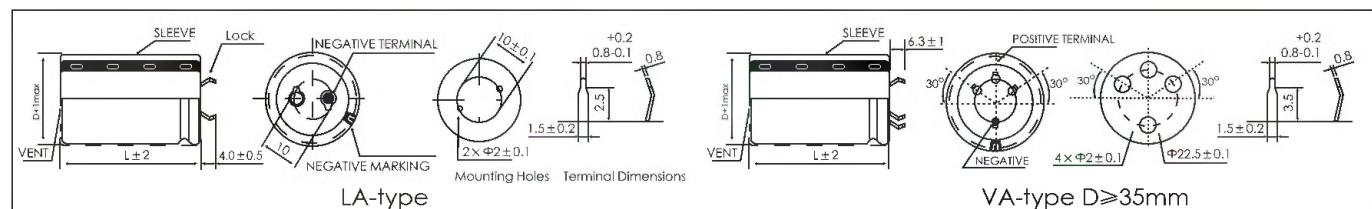


Items	Characteristics			
Operating Temperature Range (°C)	-40 ~ +105			
Voltage Range (V)	200 ~ 450			
Capacitance Range (μF)	150 ~ 2200			
Capacitance Tolerance (20°C, 120Hz)	± 20%			
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01 CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)			
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	200	250	350
	Tan δ (max)	0.15		0.12
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200 ~ 450		
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4		
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8		

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	5000h	>100000h	3000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 50°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	After test: U <sub>R</sub> to be applied for 30min >24h before measurement U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥ 50kHz
Coefficient	0.80	1.00	1.16	1.30	1.41	1.45

## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0



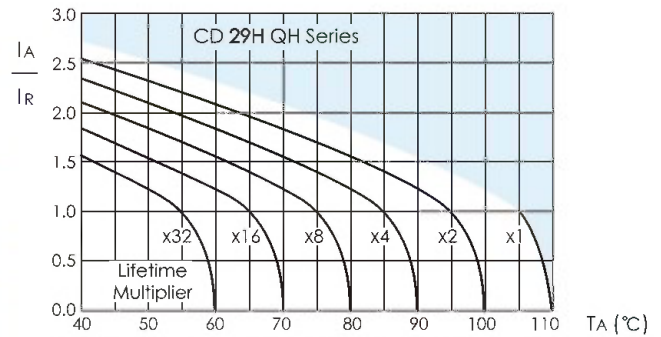
## Ratings for CD 29H QH Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
200 (250) 2D	470	424	260	1.53	22 × 35	ECS2DQH471M□□320035
	560	355	220	1.65	25 × 35	ECS2DQH561M□□250035
	680	293	180	1.92	25 × 40	ECS2DQH681M□□250040
	820	243	150	2.1	30 × 30	ECS2DQH821M□□300035
	1000	199	120	2.4	30 × 40	ECS2DQH102M□□300040
		199	120	2.4	35 × 35	ECS2DQH102M□□350035
	1200	166	100	2.71	30 × 40	ECS2DQH122M□□300040
	1500	133	80	3.13	25 × 50	ECS2DQH152M□□250050
	1800	111	68	3.9	30 × 50	ECS2DQH182M□□300050
	2200	91	56	4.5	35 × 50	ECS2DQH222M□□350050
250 (300) 2E	330	603	380	1.23	22 × 35	ECS2EQH331M□□220035
		603	380	1.35	25 × 30	ECS2EQH331M□□250030
	470	424	268	1.52	25 × 35	ECS2EQH471M□□250035
		424	268	1.65	30 × 30	ECS2EQH471M□□300030
	560	355	225	1.85	25 × 45	ECS2EQH561M□□250045
	680	293	185	2.2	25 × 50	ECS2EQH681M□□250050
		293	185	2.18	30 × 35	ECS2EQH681M□□300035
	820	243	153	2.25	30 × 35	ECS2EQH821M□□300035
	1000	199	125	2.9	30 × 50	ECS2EQH102M□□300050
		199	125	2.9	35 × 40	ECS2EQH102M□□350040
400 (450) 2G	150	1062	575	0.85	22 × 40	ECS2GQH151M□□220040
		1062	575	0.85	25 × 35	ECS2GQH151M□□250035
	180	885	479	1	22 × 50	ECS2GQH181M□□220050
		885	479	1	25 × 40	ECS2GQH181M□□250040
	220	724	292	1.2	25 × 45	ECS2GQH221M□□250045
		724	292	1.15	30 × 25	ECS2GQH221M□□300025
	270	590	319	1.25	22 × 50	ECS2GQH271M□□220050
		590	319	1.35	35 × 30	ECS2GQH271M□□350030
	330	483	260	1.44	25 × 45	ECS2GQH331M□□250045
		483	260	1.35	30 × 30	ECS2GQH331M□□300030
	390	408	220	1.72	25 × 50	ECS2GQH391M□□250050
		408	220	1.8	35 × 40	ECS2GQH391M□□350040
	470	339	183	2	30 × 50	ECS2GQH471M□□300050
		339	183	2.1	35 × 45	ECS2GQH471M□□350045
	560	284	154	1.98	35 × 35	ECS2GQH561M□□350035
		284	154	2.2	35 × 45	ECS2WQH561M□□350045
	680	234	127	2.58	35 × 55	ECS2GQH681M□□350055
		234	127	2.58	35 × 55	ECS2WQH681M□□350055
	820	194	105	2.84	35 × 60	ECS2WQH821M□□350060
450 (500) 2W	150	1062	530	0.84	22 × 35	ECS2WQH151M□□220035
		1062	530	0.84	25 × 30	ECS2WQH151M□□250030
		1062	530	0.88	30 × 25	ECS2WQH151M□□300035
	180	885	440	0.88	25 × 30	ECS2WQH181M□□250030
		885	440	0.92	30 × 25	ECS2WQH181M□□300025
	220	724	360	1.1	25 × 40	ECS2WQH221M□□250040
		724	360	1.1	30 × 30	ECS2WQH221M□□300030
	270	590	295	1.36	30 × 30	ECS2WQH271M□□300030
		590	295	1.41	30 × 35	ECS2WQH271M□□300035
	330	483	240	1.44	30 × 30	ECS2WQH331M□□300030
		483	240	1.49	30 × 35	ECS2WQH331M□□300035
		483	240	1.65	35 × 40	ECS2WQH331M□□350040
	390	408	205	1.67	25 × 50	ECS2WQH391M□□250050
		408	205	1.55	30 × 35	ECS2WQH391M□□300035
		408	205	1.6	35 × 30	ECS2WQH391M□□350030
	470	339	170	1.92	30 × 45	ECS2WQH471M□□300045
		339	170	2.1	35 × 40	ECS2WQH471M□□350040

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
450 (500) 2W	470	339	170	2.2	35 × 50	ECS2WQH471M□□350050
	560	284	142	2.1	30 × 50	ECS2WQH561M□□300050
	560	284	142	2.3	35 × 45	ECS2WQH561M□□350045
	680	234	116	2.5	35 × 50	ECS2WQH681M□□350050
	820	195	95	2.72	30 × 60	ECS2WQH821M□□300060
	820	195	97	3	35 × 60	ECS2WQH821M□□350060

Customer products are available on request.

## Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



# CD 29HD QF SERIES



SNAP-IN/LUG

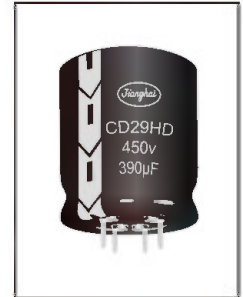
3000h at 105°C

- Long Life at High Temperature
- Outstanding ripple current
- Special structure design , extremely improved performance at high frequencies

CD 29HD QF

↑ highest ripple

CD 29H QH

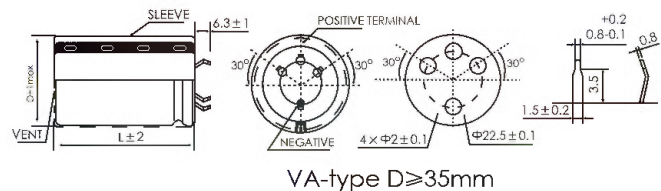
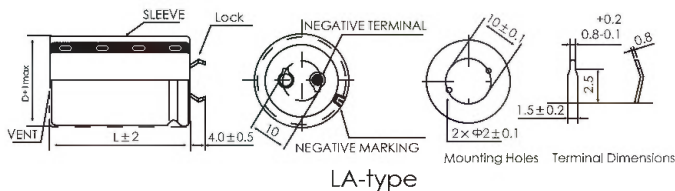


Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +105		
Voltage Range (V)	200 ~ 450		
Capacitance Range (μF)	220 ~ 3900		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	200~400	450
	Tan δ (max)	0.15	0.2
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200~400	450
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3	7
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	7	12

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	8000h	>200000h	3000h	4000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Coefficient	3.0	2.8	2.5	2.0	1.0

## Frequency Coefficient

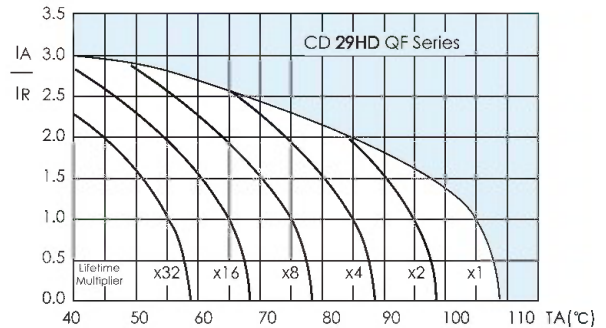
Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
200V~350V	0.80	1.00	1.35	1.50	1.59	1.60
400V	0.80	1.00	1.35	1.60	1.72	1.72
450V	0.80	1.00	1.32	1.50	1.62	1.63



## Ratings for CD 29HD QF Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
200 (250) 2D	1000	199	80	3.20	30 x 35	ECS2DQF102M□□300035
	1200	166	66	3.70	30 x 40	ECS2DQF122M□□300040
	1500	133	53	4.36	30 x 50	ECS2DQF152M□□300050
		133	53	4.32	35 x 40	ECS2DQF152M□□350040
		111	48	4.58	30 x 55	ECS2DQF182M□□300055
	1800	111	48	4.67	35 x 45	ECS2DQF182M□□350045
		111	48	4.35	40 x 35	ECS2DQF182M□□400035
		90	42	5.46	35 x 50	ECS2DQF222M□□350050
	2200	90	42	5.38	40 x 40	ECS2DQF222M□□400040
		74	34	5.95	35 x 55	ECS2DQF272M□□350055
	2700	74	34	6.05	40 x 50	ECS2DQF272M□□400055
		60	30	6.41	35 x 65	ECS2DQF332M□□350065
	3300	60	30	6.52	40 x 55	ECS2DQF332M□□400055
		51	26	7.15	40 x 65	ECS2DQF392M□□400065
	3900	51	26	7.15	40 x 65	ECS2DQF392M□□400065
250 (300) 2E	680	293	117	2.65	30 x 35	ECS2EQF681M□□300035
	820	243	97	3.00	30 x 40	ECS2EQF821M□□300040
		243	97	3.05	35 x 35	ECS2EQF821M□□350035
	1000	199	80	3.56	30 x 50	ECS2EQF102M□□300050
		199	80	3.52	35 x 40	ECS2EQF102M□□350040
	1200	166	66	3.93	30 x 55	ECS2EQF122M□□300055
		166	66	3.87	35 x 45	ECS2EQF122M□□350045
	1500	133	62	4.30	30 x 60	ECS2EQF152M□□300060
		133	62	4.38	35 x 50	ECS2EQF152M□□350050
	1800	111	55	4.70	35 x 55	ECS2EQF182M□□350055
		111	55	4.85	40 x 45	ECS2EQF182M□□400045
	2200	90	45	5.15	35 x 65	ECS2EQF222M□□350065
		90	45	5.35	40 x 50	ECS2EQF222M□□400050
	2700	74	37	5.92	40 x 60	ECS2EQF272M□□400060
	330	603	241	2.12	30 x 35	ECS2VQF331M□□300035
	390	510	204	2.36	30 x 40	ECS2VQF391M□□300040
350 (400) 2V	470	423	169	2.60	30 x 45	ECS2VQF471M□□300045
		423	169	2.53	35 x 35	ECS2VQF471M□□300035
	560	355	142	2.86	30 x 50	ECS2VQF561M□□300050
		355	142	2.83	35 x 40	ECS2VQF561M□□350040
	680	293	117	3.06	30 x 55	ECS2VQF681M□□300055
		293	117	3.10	35 x 45	ECS2VQF681M□□350045
	820	243	97	3.40	40 x 40	ECS2VQF821M□□400040
		243	97	3.40	30 x 65	ECS2VQF821M□□300065
	1000	199	80	3.82	35 x 50	ECS2VQF102M□□350060
		199	80	3.80	40 x 50	ECS2VQF102M□□400050
	1200	166	66	4.25	40 x 55	ECS2VQF122M□□400055
		133	53	4.72	40 x 65	ECS2VQF152M□□400065
	1500	133	53	4.72	40 x 65	ECS2VQF152M□□400065
		270	737	1.62	30 x 35	ECS2GQF271M□□300035
	330	603	221	2.10	30 x 35	ECS2GQF331M□□300035
400 (450) 2G	390	510	187	2.20	30 x 40	ECS2GQF391M□□300040
		510	187	2.31	35 x 35	ECS2GQF391M□□350035
	470	423	155	2.70	30 x 50	ECS2GQF471M□□300050
		423	155	2.60	35 x 40	ECS2GQF471M□□350040
	560	355	130	2.90	40 x 35	ECS2GQF561M□□400035
		355	130	2.95	30 x 55	ECS2GQF561M□□300055
	680	293	107	3.25	35 x 50	ECS2GQF681M□□350050
		293	107	3.45	40 x 45	ECS2GQF681M□□400045
	820	243	89	3.81	35 x 55	ECS2GQF821M□□350055
		243	89	3.92	40 x 50	ECS2GQF821M□□400050
	1000	199	73	4.30	35 x 65	ECS2GQF102M□□350065
		199	73	4.35	40 x 55	ECS2GQF102M□□400055
	1200	166	61	4.80	40 x 65	ECS2GQF122M□□400065
		220	1206	1.67	30 x 35	ECS2WQF221M□□300035
	270	983	295	1.88	30 x 40	ECS2WQF271M□□300040
450 (500) 2W	330	804	241	2.18	30 x 45	ECS2WQF331M□□300045
		804	241	2.09	35 x 35	ECS2WQF331M□□350035
	390	680	204	2.45	30 x 50	ECS2WQF391M□□300050
		680	204	2.43	35 x 40	ECS2WQF391M□□350040
	470	565	169	2.79	30 x 55	ECS2WQF471M□□300055
		565	169	2.83	35 x 45	ECS2WQF471M□□350045
	560	565	169	2.70	40 x 35	ECS2WQF561M□□400035
		474	142	3.15	30 x 60	ECS2WQF561M□□300060
	680	474	142	3.20	35 x 50	ECS2WQF561M□□350050
		474	142	3.00	40 x 40	ECS2WQF561M□□400040
	820	390	117	3.53	35 x 55	ECS2WQF681M□□350055
		390	117	3.40	40 x 45	ECS2WQF681M□□400045
	1000	324	97	3.85	35 x 65	ECS2WQF821M□□350065
		324	97	3.88	40 x 55	ECS2WQF821M□□400055
	159	159	80	4.26	40 x 65	ECS2WQF102M□□400065

## Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Customer products are available on request.



# CD 29HE QR SERIES



SNAP-IN/LUG

3000h at 105°C

- Long Life at High Temperature
- Outstanding Ripple current
- Servo drivers, Frequency converters  
Solar inverters etc,



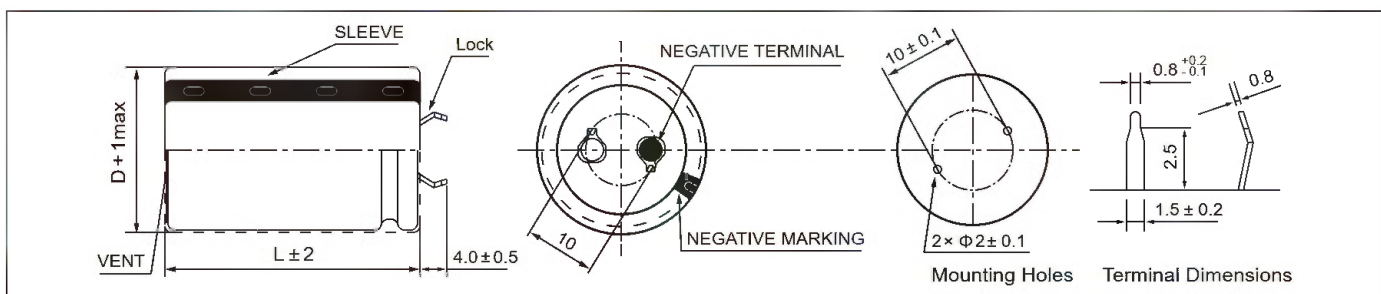
Items	Characteristics		
Operating Temperature Range(°C)	-40 ~ +105		
Voltage Range (V)	400 ~ 450		
Capacitance Range(μF)	220~820		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (μA)	$I_L=0.01C_R U_R$ (μA) or 1.5mA, whichever is smaller. ( $C_R$ : Nominal Capacitance, in μF)		
Dissipation Factor (20°C, 120Hz)	≤0.15		
Stability at Low Temperature (Impedance Ratio at 120Hz)	UR (V)	400	450
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3	7
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	8	12

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	5000h	≥ 15000h	3000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition:	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ 105°C	105°C

\*Shelf Life test:  $U_R$  to be applied for 60min, >24h before measurement

## Dimensions

mm



## Ripple Current Coefficient

Frequency (Hz)	50	120	300	1k	10k	50k
Rated Voltage (V)						
400~450	0.76	1.00	1.25	1.40	1.45	1.50

Ambient Temp(°C)	40	60	70	85	105
Coefficient	2.24	1.94	1.77	1.50	1.00

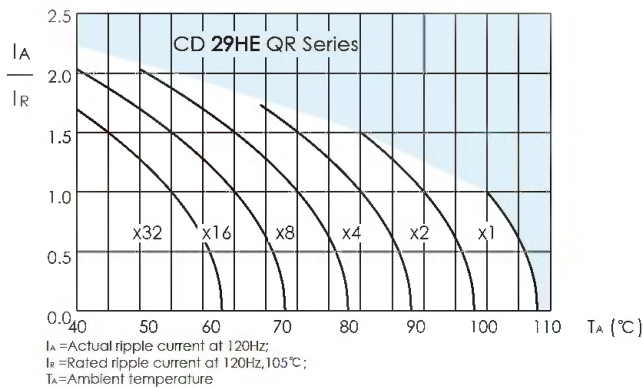


## Ratings for CD 29HE QR Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	270	558	279	2.13	30×35	ECS2GQR271M □□ 300035
	270	558	279	2.20	35×25	ECS2GQR271M □□ 350025
	330	476	238	2.49	30×40	ECS2GQR331M □□ 300040
	330	476	238	2.56	35×30	ECS2GQR331M □□ 350030
	390	410	205	2.72	30×45	ECS2GQR391M □□ 300045
	390	410	205	2.84	35×35	ECS2GQR391M □□ 350035
	470	340	170	3.10	30×50	ECS2GQR471M □□ 300050
	470	340	170	3.26	35×40	ECS2GQR471M □□ 350040
	560	290	145	3.62	30×55	ECS2GQR561M □□ 300055
	560	290	145	3.69	35×45	ECS2GQR561M □□ 350045
	680	244	122	4.16	35×50	ECS2GQR681M □□ 350050
	820	206	103	4.74	35×60	ECS2GQR821M □□ 350060
450 (500) 2W	220	658	329	1.88	30×35	ECS2WQR221M □□ 300035
	220	658	329	1.90	35×25	ECS2WQR221M □□ 350025
	270	548	274	2.21	30×40	ECS2WQR271M □□ 300040
	270	548	274	2.27	35×30	ECS2WQR271M □□ 350030
	330	456	228	2.52	30×45	ECS2WQR331M □□ 300045
	330	456	228	2.60	35×35	ECS2WQR331M □□ 350035
	390	404	202	2.82	30×50	ECS2WQR391M □□ 300050
	390	404	202	2.87	35×40	ECS2WQR391M □□ 350040
	470	334	167	3.21	30×55	ECS2WQR471M □□ 300055
	470	334	167	3.39	35×45	ECS2WQR471M □□ 350045
	560	286	143	3.73	35×50	ECS2WQR561M □□ 350050
	680	240	120	4.24	35×60	ECS2WQR681M □□ 350060

Customer products are available on request.

## Lifetime Diagram





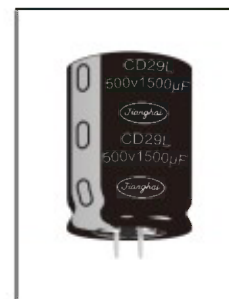
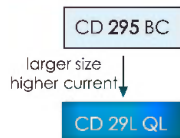
# CD 29L QL SERIES



SNAP-IN/LUG

5000h at 85°C

- Larger Size Components
- Long Useful Life
- High Ripple Current
- Industrial Power Supplies

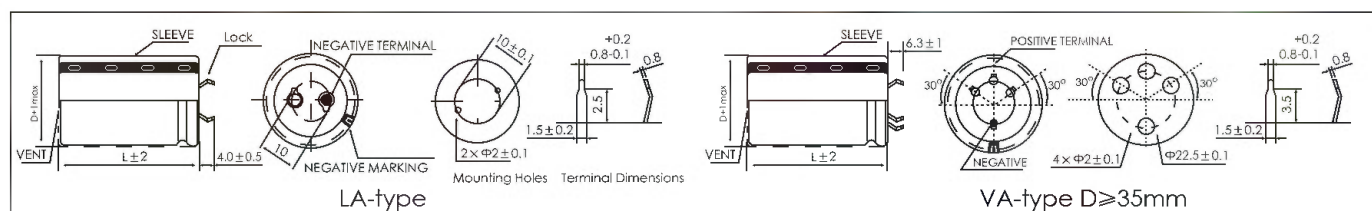


Items	Characteristics				
Operating Temperature Range (°C)	-40 ~ +85		-25 ~ +85		
Voltage Range (V)	160 ~ 400		450 ~ 500		
Capacitance Range (μF)	390 ~ 4700				
Capacitance Tolerance (20°C, 120Hz)	± 20%				
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01 CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)				
Dissipation Factor (20°C, 120Hz)	0.15				
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160~200	250~400	450	500
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	3	4		
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	6	8	-	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	7000h	>100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Temperature Coefficient

Temperature(°C)		+40	+55	+70	+85
Coefficient	≥160V	1.7	1.5	1.3	1.0

## Frequency Coefficient

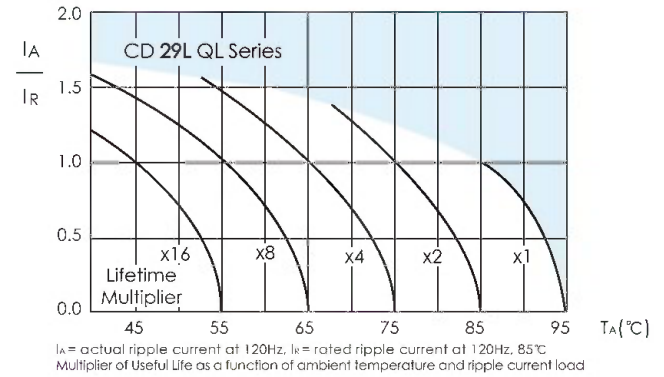
Frequency	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
Rated Voltage (V)	≥ 160					
	0.80	1.00	1.16	1.30	1.41	1.45



## Ratings for CD 29L QL Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	2200	91	63	4.9	35 x 45	ECS2CQL222M□□350045
	2700	74	52	5.3	35 x 50	ECS2CQL272M□□350050
	3300	60	42	5.5	35 x 70	ECS2CQL332M□□350070
		60	42	5.5	40 x 60	ECS2CQL332M□□400060
	3900	51	36	5.9	35 x 80	ECS2CQL392M□□350080
	4700	42	30	7.3	40 x 80	ECS2CQL472M□□400080
200 (250) 2D	1500	133	93	4.3	35 x 40	ECS2DQL152M□□350040
	1800	111	77	4.7	35 x 45	ECS2DQL182M□□350045
	2200	91	63	5.4	35 x 50	ECS2DQL222M□□350050
		91	63	5.4	40 x 40	ECS2DQL222M□□400040
	2700	74	52	5.9	35 x 60	ECS2DQL272M□□350060
		74	52	5.9	40 x 50	ECS2DQL272M□□400050
	3300	60	42	6.5	35 x 80	ECS2DQL332M□□350080
		60	42	6.5	40 x 60	ECS2DQL332M□□400060
	3900	51	36	7.0	40 x 80	ECS2DQL392M□□400080
	4700	42	30	9.2	40 x 90	ECS2DQL472M□□400090
250 (300) 2E	1000	199	139	3.5	35 x 35	ECS2EQL102M□□350035
	1200	166	116	3.6	35 x 40	ECS2EQL122M□□350040
	1500	133	93	4.2	35 x 45	ECS2EQL152M□□350045
	1800	111	77	4.6	35 x 50	ECS2EQL182M□□350050
		111	77	4.6	40 x 40	ECS2EQL182M□□400040
	2200	91	77	5.1	35 x 60	ECS2EQL222M□□350060
	2700	74	63	6.0	40 x 60	ECS2EQL272M□□400060
		74	63	6.0	40 x 60	ECS2EQL272M□□400060
400 (450) 2G	560	355	249	3.0	35 x 45	ECS2GQL561M□□350045
		355	249	2.8	40 x 40	ECS2GQL561M□□400040
	680	293	205	3.5	35 x 50	ECS2GQL681M□□350050
		293	205	3.3	40 x 40	ECS2GQL681M□□400040
	820	242	170	3.8	35 x 50	ECS2GQL821M□□350050
		242	170	4.1	40 x 50	ECS2GQL821M□□400050
	1000	199	139	4.4	35 x 55	ECS2GQL102M□□350055
		199	139	4.8	40 x 60	ECS2GQL102M□□400060
	1200	166	116	5.3	35 x 70	ECS2GQL122M□□350070
		166	116	5.5	40 x 60	ECS2GQL122M□□400060
	1500	133	93	6.5	40 x 80	ECS2GQL152M□□400080
		133	93	6.3	45 x 60	ECS2GQL152M□□450060
	1800	111	77	7.3	35 x 90	ECS2GQL182M□□350090
		111	77	7.9	40 x 100	ECS2GQL182M□□400100
	2200	91	63	8.6	40 x 100	ECS2GQL222M□□400100
		91	63	8.1	45 x 80	ECS2GQL222M□□450080
450 (500) 2W	470	424	296	2.7	35 x 45	ECS2WQL471M□□350045
	560	355	249	3.1	35 x 50	ECS2WQL561M□□350050
		355	249	3.1	40 x 40	ECS2WQL561M□□400040
	680	293	205	3.5	35 x 60	ECS2WQL681M□□350060
		293	205	3.4	40 x 50	ECS2WQL681M□□400050
	820	243	170	4.4	35 x 70	ECS2WQL821M□□350070
		243	170	4.4	40 x 60	ECS2WQL821M□□400060
	1000	199	139	5.2	35 x 80	ECS2WQL102M□□350080
		199	139	5.2	40 x 60	ECS2WQL102M□□400060
	1200	166	116	5.9	40 x 70	ECS2WQL122M□□400070
		166	116	6.0	45 x 60	ECS2WQL122M□□450060
	1500	133	93	6.8	40 x 85	ECS2WQL152M□□400085
		133	93	6.7	45 x 70	ECS2WQL152M□□450070
	1800	111	77	7.6	40 x 100	ECS2WQL182M□□400100
	2200	91	64	8.6	45 x 100	ECS2WQL222M□□450100
500 (550) 2H	390	510	357	2.4	35 x 45	ECS2HQL391M□□350045
	470	424	296	2.8	35 x 50	ECS2HQL471M□□350050
	560	355	249	3.3	35 x 60	ECS2HQL561M□□350060
		355	249	3.3	40 x 50	ECS2HQL561M□□400050
	680	293	205	3.8	35 x 70	ECS2HQL681M□□350070
		293	205	3.7	40 x 60	ECS2HQL681M□□400060
	820	243	170	4.6	35 x 80	ECS2HQL821M□□350080
		243	170	4.6	40 x 70	ECS2HQL821M□□400070
	1000	199	139	5.4	40 x 80	ECS2HQL102M□□400080
		199	139	5.4	45 x 70	ECS2HQL102M□□450070
	1200	166	116	6.4	40 x 90	ECS2HQL122M□□400090
	1500	133	93	7.2	40 x 100	ECS2HQL152M□□400100

## Lifetime Diagram



Customer products are available on request.



# CD 29UH UT SERIES



SNAP-IN/LUG

3000h at 105°C

- Ultra High Voltage
- Long Life at High Temperature
- High Ripple Current
- Suit for high frequency regenerative voltage for AC servomotor, general inverter.

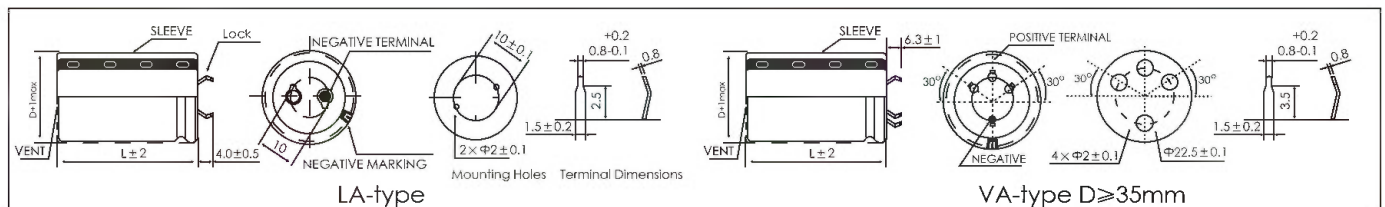


Items	Characteristics		
Operating Temperature Range (°C)	-25 ~ +105		
Voltage Range (V)	575、600		
Capacitance Range (μF)	56 ~ 390		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	575	600
	Tan δ (max)	0.20	
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	575	600
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	8	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	>200000h	3000h	3000h	500h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Factor	2.7	2.5	2.1	1.7	1.0

## Frequency Coefficient

Frequency(Hz)	50	120	300	1K	10K	≥50K
Factor	0.75	1.00	1.16	1.30	1.41	1.45

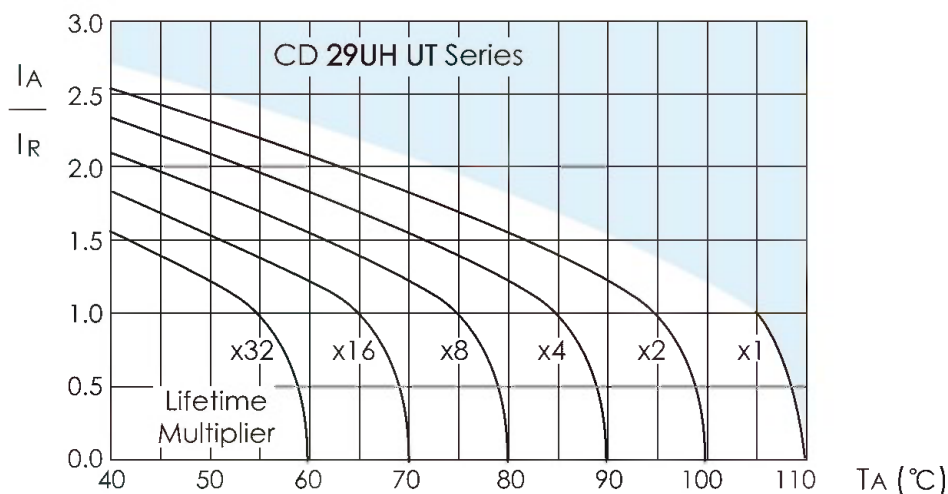


## Ratings for CD 29UH UT Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
575 (625) 2Z	68	3903	1659	0.52	30 × 25	ECS2ZUT680M□□300025
	82	3236	1376	0.58	30 × 30	ECS2ZUT820M□□300030
	100	2654	1128	0.63	30 × 35	ECS2ZUT101M□□300035
	120	2212	940	0.70	30 × 40	ECS2ZUT121M□□300040
	150	1769	752	0.81	30 × 45	ECS2ZUT151M□□300045
	180	1474	627	0.89	30 × 50	ECS2ZUT181M□□300050
	220	1206	513	1.01	30 × 60	ECS2ZUT221M□□300060
	270	983	418	1.12	30 × 70	ECS2ZUT271M□□300070
		983	418	1.12	35 × 55	ECS2ZUT271M□□350055
	330	804	342	1.21	30 × 85	ECS2ZUT331M□□300085
		804	342	1.21	35 × 60	ECS2ZUT331M□□350060
		804	342	1.21	40 × 50	ECS2ZUT331M□□400050
	390	680	289	1.30	40 × 60	ECS2ZUT391M□□400060
		680	289	1.30	35 × 65	ECS2ZUT391M□□350065
600 (650) 2S	56	4739	2014	0.50	30 × 25	ECS2SUT560M□□300025
	68	3903	1659	0.56	30 × 30	ECS2SUT680M□□300030
	82	3236	1376	0.61	30 × 35	ECS2SUT820M□□300035
		3236	1376	0.61	35 × 25	ECS2SUT820M□□350025
	100	2654	1128	0.67	30 × 40	ECS2SUT101M□□300040
		2654	1128	0.67	35 × 30	ECS2SUT101M□□350030
	120	2212	940	0.74	30 × 45	ECS2SUT121M□□300045
		2212	940	0.74	35 × 35	ECS2SUT121M□□350035
	150	1769	752	0.83	30 × 50	ECS2SUT151M□□300050
		1769	752	0.83	35 × 40	ECS2SUT151M□□350040
	180	1474	627	0.91	30 × 55	ECS2SUT181M□□300055
		1474	627	0.91	35 × 45	ECS2SUT181M□□350045
	220	1206	513	1.05	30 × 60	ECS2SUT221M□□300060
		1206	513	1.05	35 × 50	ECS2SUT221M□□350050
	270	983	418	1.17	35 × 55	ECS2SUT271M□□350055
	330	804	342	1.27	35 × 65	ECS2SUT331M□□350065

Customer products are available on request.

## Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



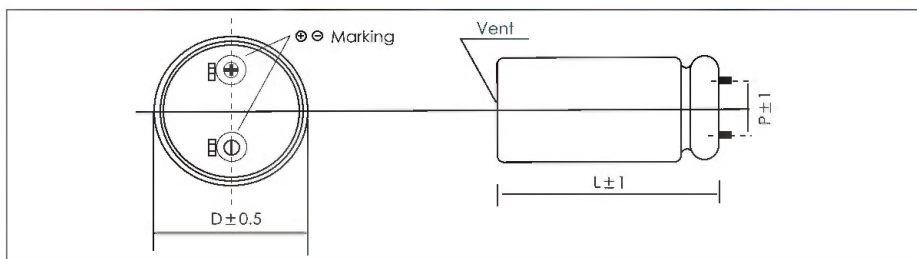
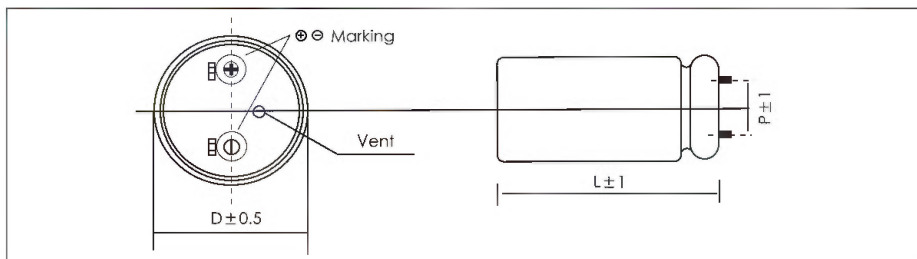
- High stability
- Compact and light weight
- For photoflash application



Items	Characteristics	
Operating Temperature Range (°C)	-20 ~ +55	
Rated Voltage (V)	330WV.DC	360WV.DC
Voltage Proof (V)	350SV.DC	390SV.DC
Capacitance Tolerance (20°C, 120Hz)	-10% ~ +20%	
Dissipation Factor (20°C, 120Hz)	150 ~ 600μF : Less than 0.1 700 ~ 1500μF : Less than 0.15	
Leakage Current	I = 1 × C (20°C, 5 minutes) Max I: Leakage Current (μA) C: Nominal Capacitance (μF)	
Charge and Discharge	Charge and discharge at rated voltage at 5~35°C in every 30 seconds for 5000 times via Xe flash tube with discharge resistance of 0.7~1.0Ω.	
	Capacitance Change	Within ± 10% of the initial value
	Dissipation Factor	Not more than 150% of the specified value
	Leakage Current	Not more than 150% of the specified value
Shelf life	Storage without voltage applied at 70°C for 500 hours and measured at 20 ± 5°C	
	Capacitance Change	Within ± 10% of the initial value
	Dissipation Factor	Not more than 150% of the specified value
	Leakage Current	Not more than 150% of the specified value
After test: UR to be applied for 60minutes, 24 to 48 hours before measurement.		

## Dimensions

mm





## Ratings for CD 17 HS Series

### 330 WV. DC (350 SV.DC)

D(mm) P(mm) Cap- acitance(μF)	20		22		25		30		35	
	8		10		10		10		10	
	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N
150	25	ECL2UHS151V□□200025								
180	30	ECL2UHS181V□□200030	25	ECL2UHS181V□□220025						
200	35	ECL2UHS201V□□200035	30	ECL2UHS201V□□220030	25	ECL2UHS201V□□250025				
250	40	ECL2UHS251V□□200040	30	ECL2UHS251V□□220030	30	ECL2UHS251V□□250030				
300	45	ECL2UHS301V□□200045	35	ECL2UHS301V□□220035	30	ECL2UHS301V□□250030	25	ECL2UHS301V□□300025		
350	50	ECL2UHS351V□□200050	40	ECL2UHS351V□□220040	35	ECL2UHS351V□□250035	25	ECL2UHS351V□□300025		
400			45	ECL2UHS401V□□220045	40	ECL2UHS401V□□250040	30	ECL2UHS401V□□300030	25	ECL2UHS401V□□350025
450			50	ECL2UHS451V□□220050	45	ECL2UHS451V□□250045	30	ECL2UHS451V□□300030	25	ECL2UHS451V□□350025
500					50	ECL2UHS501V□□250050	35	ECL2UHS501V□□300035	25	ECL2UHS501V□□350025
600					55	ECL2UHS601V□□250055	35	ECL2UHS601V□□300035	30	ECL2UHS601V□□350030
700							40	ECL2UHS701V□□300040	30	ECL2UHS701V□□350030
800							45	ECL2UHS801V□□300045	35	ECL2UHS801V□□350035
900							45	ECL2UHS901V□□300045	35	ECL2UHS901V□□350035
1000							50	ECL2UHS102V□□300050	40	ECL2UHS102V□□350040
1200							60	ECL2UHS122V□□300060	45	ECL2UHS122V□□350045
1300									45	ECL2UHS132V□□350045
1500									50	ECL2UHS152V□□350050

### 360 WV. DC (390 SV.DC)

D(mm) P(mm) Cap- acitance(μF)	20		22		25		30		35	
	8		10		10		10		10	
	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N	L(mm)	P/N
150	30	ECL2NHS151V□□200030	25	ECL2NHS151V□□220025						
180	35	ECL2NHS181V□□200035	30	ECL2NHS181V□□220030	25	ECL2NHS181V□□250025				
200	35	ECL2NHS201V□□200035	30	ECL2NHS201V□□220030	30	ECL2NHS201V□□250030				
250	40	ECL2NHS251V□□200040	35	ECL2NHS251V□□220035	30	ECL2NHS251V□□250030	25	ECL2NHS251V□□300025		
300	50	ECL2NHS301V□□200050	40	ECL2NHS301V□□220040	35	ECL2NHS301V□□250035	30	ECL2NHS301V□□300030		
350			45	ECL2NHS351V□□220045	40	ECL2NHS351V□□250040	30	ECL2NHS351V□□300030	25	ECL2NHS351V□□350025
400			50	ECL2NHS401V□□220050	45	ECL2NHS401V□□250045	35	ECL2NHS401V□□300035	25	ECL2NHS401V□□350025
450					50	ECL2NHS451V□□250050	35	ECL2NHS451V□□300035	30	ECL2NHS451V□□350030
500					60	ECL2NHS501V□□250060	40	ECL2NHS501V□□300040	30	ECL2NHS501V□□350030
600							40	ECL2NHS601V□□300040	35	ECL2NHS601V□□350035
700							45	ECL2NHS701V□□300045	35	ECL2NHS701V□□350035
800							50	ECL2NHS801V□□300050	40	ECL2NHS801V□□350040
900							60	ECL2NHS901V□□300060	40	ECL2NHS901V□□350040
1000							60	ECL2NHS102V□□300060	45	ECL2NHS102V□□350045
1200									50	ECL2NHS122V□□350050
1300									55	ECL2NHS132V□□350055
1500									60	ECL2NHS152V□□350060

Customer products are available on request.



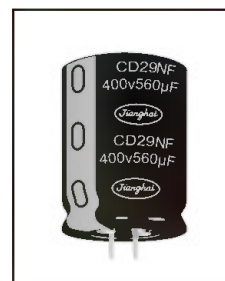
# CD 29NF NF SERIES



SNAP-IN/LUG

2000h at 105°C

- Corrosion-proof
- Load Life of 2000h at 105°C
- Industrial electronics in special hazardous environments

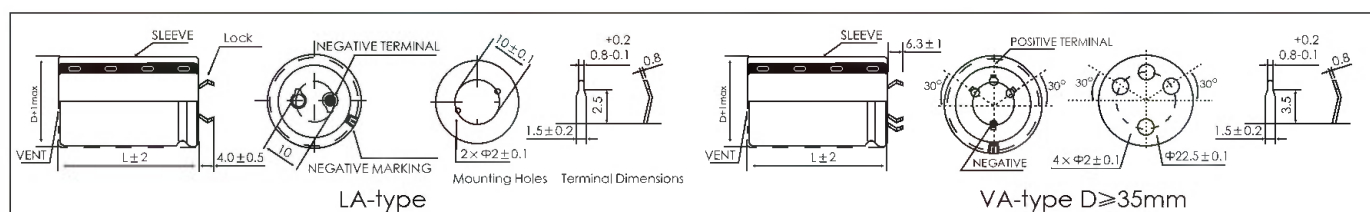


Items	Characteristics	
Operating Temperature Range(°C)	-25 ~ +105	
Voltage Range (V)	350 ~ 450	
Capacitance Range(μF)	120 ~ 680	
Capacitance Tolerance (20°C ,120Hz)	± 20%	
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage $U_{Trent}$ is not more than 0.01CV or 1.5mA, whichever is smaller C:Nominal Capacitance(μF) V:Rated Voltage(V)	
Dissipation Factor (20°C , 120Hz)	Rated Voltage (v)	350~450
	Tan δ(max)	0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (v)	350~450
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	8

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	4000h	≥200000h	200h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C Voltage applied After test: $U_R$ to be applied for 30min, 24 to 48h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency (Hz)	50/60	120	300	1K	10K	≥50K
Factor	0.75	1.00	1.16	1.30	1.41	1.45

## Temperature Coefficient

Temperature (°C)	+40	+55	+70	+85	+105
Coefficient	2.7	2.5	2.1	1.7	1.0



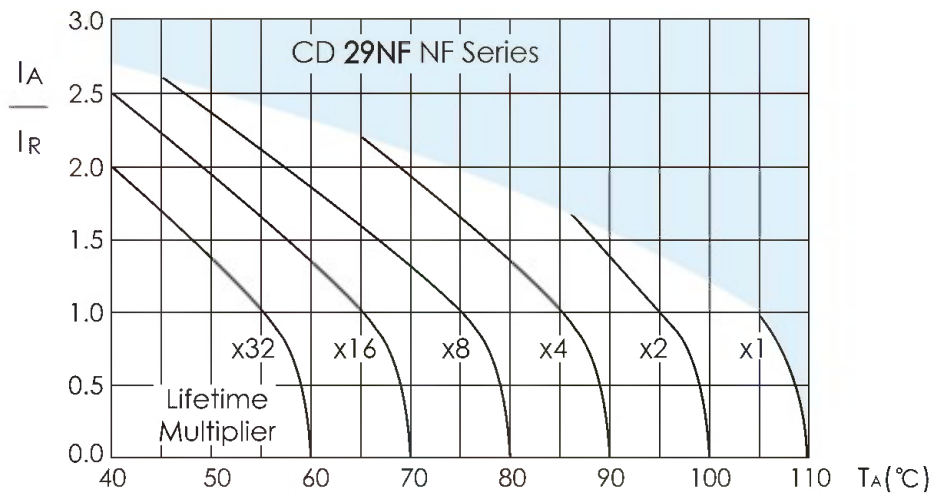
## Ratings for CD 29NF NF Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	180	1474	516	0.93	22x40	ECS2VNF181M □□ 220040
	180	1474	516	0.91	25x35	ECS2VNF181M □□ 250035
	180	1474	516	0.89	30x25	ECS2VNF181M □□ 300025
	220	1206	422	1.07	22x45	ECS2VNF221M □□ 220045
	220	1206	422	1.05	25x40	ECS2VNF221M □□ 250040
	270	983	344	1.13	22x50	ECS2VNF271M □□ 220050
	270	983	344	1.11	25x45	ECS2VNF271M □□ 250045
	270	983	344	1.10	30x35	ECS2VNF271M □□ 300035
	270	983	344	1.05	35x25	ECS2VNF271M □□ 350025
	330	804	281	1.25	25x50	ECS2VNF331M □□ 250050
	330	804	281	1.23	30x40	ECS2VNF331M □□ 300040
	330	804	281	1.20	35x30	ECS2VNF331M □□ 350030
	390	680	238	1.32	30x40	ECS2VNF391M □□ 300040
	390	680	238	1.29	35x35	ECS2VNF391M □□ 350035
	470	565	198	1.41	30x45	ECS2VNF471M □□ 300045
	470	565	198	1.38	35x40	ECS2VNF471M □□ 350040
	560	474	166	1.50	30x50	ECS2VNF561M □□ 300050
	560	474	166	1.49	35x45	ECS2VNF561M □□ 350045
	680	474	166	1.71	35x50	ECS2VNF681M □□ 350050
400 (450) 2G	120	2212	719	0.72	25x30	ECS2GNF121M □□ 250030
	150	1769	575	0.83	22x40	ECS2GNF151M □□ 220040
	150	1769	575	0.81	25x30	ECS2GNF151M □□ 250030
	150	1769	575	0.79	30x25	ECS2GNF151M □□ 300025
	180	1474	479	0.93	22x50	ECS2GNF181M □□ 220050
	180	1474	479	0.90	25x35	ECS2GNF181M □□ 250035
	220	1206	392	1.03	25x40	ECS2GNF221M □□ 250040
	220	1206	392	1.01	30x30	ECS2GNF221M □□ 300030
	220	1206	392	0.97	35x25	ECS2GNF221M □□ 350025
	270	983	319	1.23	25x50	ECS2GNF271M □□ 250050
	270	983	319	1.22	30x40	ECS2GNF271M □□ 300040
	270	983	319	1.18	35x30	ECS2GNF271M □□ 350030
	330	804	261	1.44	30x45	ECS2GNF331M □□ 300045
	330	804	261	1.40	35x35	ECS2GNF331M □□ 350035
	390	680	221	1.54	30x45	ECS2GNF391M □□ 300045
	390	680	221	1.52	35x40	ECS2GNF391M □□ 350040
	470	565	184	1.71	35x45	ECS2GNF471M □□ 350045
	560	474	154	1.91	35x50	ECS2GNF561M □□ 350050
450 (500) 2W	120	2212	608	0.71	22x40	ECS2WNF121M □□ 220040
	120	2212	608	0.70	25x30	ECS2WNF121M □□ 250030
	120	2212	608	0.65	30x25	ECS2WNF121M □□ 300025
	150	1769	487	0.78	22x45	ECS2WNF151M □□ 220045
	150	1769	487	0.77	25x35	ECS2WNF151M □□ 250035
	180	1474	405	0.88	22x50	ECS2WNF181M □□ 220050
	180	1474	405	0.87	25x40	ECS2WNF181M □□ 250040
	180	1474	405	0.86	30x30	ECS2WNF181M □□ 300030
	220	1206	332	1.03	25x50	ECS2WNF221M □□ 250050
	220	1206	332	1.01	30x35	ECS2WNF221M □□ 300035
	270	983	270	1.23	30x40	ECS2WNF271M □□ 300040
	330	804	221	1.35	30x45	ECS2WNF331M □□ 300045
	330	804	221	1.32	35x35	ECS2WNF331M □□ 350035
	390	680	187	1.61	30x50	ECS2WNF391M □□ 300050
	390	680	187	1.60	35x45	ECS2WNF391M □□ 350045
	470	565	155	1.75	35x50	ECS2WNF471M □□ 350050

Customer products are available on request.



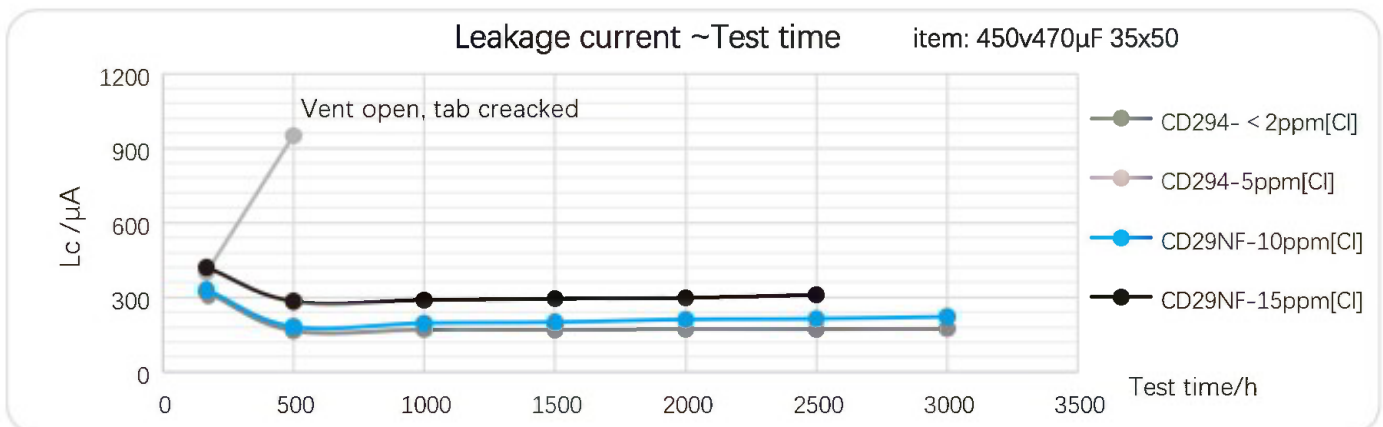
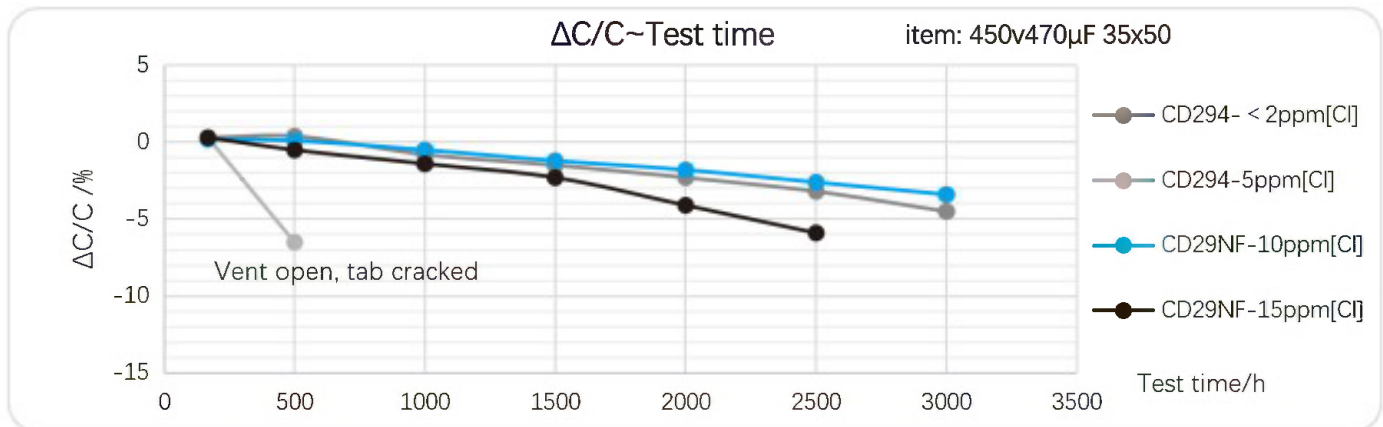
## Lifetime Diagram



## Typical Lifetime Curves

Lifetime can be guaranteed with 10~15ppm [Cl<sup>-</sup>] in electrolyte.

For general purpose designed CD294 series, product will fail in early life with 5ppm [Cl<sup>-</sup>] in electrolyte.







## Screw Terminal Aluminum Electrolytic Capacitors





## Part Number System for Screw Type

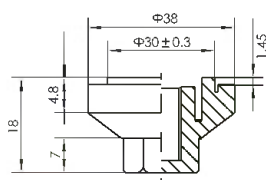
EC	G	2G	BP	682	M	E	155	B	A	□★
Capacitor Type	Terminal Type	Rated Voltage Code	Series Code	Capacitance Code (μF)	Capacitance Tolerance	Diameter	Length	Mounting	Terminal Options	Supplyment Code
EC= Electrolytic Capacitor	Screw=G	10 =1A	CD135 =BP	100 =101	±20% =M	36 =A	53 =053	Bolt =B	For terminal please refer to "Terminal Dimensions"	
		16 =1C	CD136 =PK	470 =471	±15% =L	40 =B	65 =065	3-leg Bracket=Y		
		25 =1E	CD137 =PX	1000=102	±10% =K	51 =C	96 =096	2-leg Bracket=I		
		35 =1V	CD138 =PC	2200=222	+30/-0% =F	64 =D	100=100	No Bracket=N		
		50 =1H	CD139 =BL	6800=682	+20/-0% =R	77 =E	155=155			
		63 =1J	CD13L =PL		+75/-10%=U	90 =F	236=236			
		80 =1K	CD138S =WP		+50/-10%=T	101=G				
		100 =2A	CD13H =BH		+30/-10%=Q					
		160 =2C	CD139S =HC		+20/-10%=V					
		200 =2D	CD13P =HP		+20/-5% =H					
		250 =2E	CD137S =PR		+50/-20%=S					
		350 =2V	CDVT =WT		+20/-15%=N					
		400 =2G	CD137U =UP							
		420 =2X								
		450 =2W								
		500 =2H								
		550 =2Y								
		575 =2Z								
		600 =2S								
		630 =J2								

★Customer special requirement.

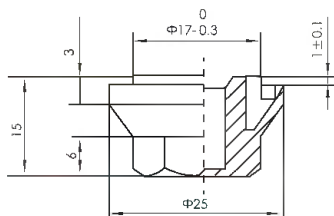
Ex1: CD135 400V4700μF 77x115 ± 20% M5  
PN:ECG2GBP472ME115YA

Ex2: CD138S 450V3300μF 77x121 ± 20% bolt  
PN:ECG2WWP332ME121BC

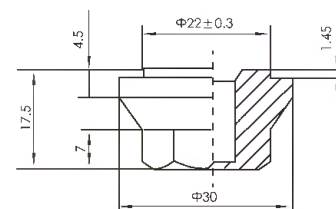
## Accessories: Bolt Mounting (Code B)



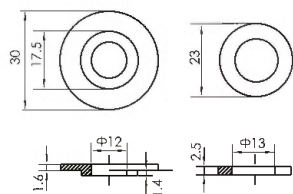
◆Nylon cap nut M12  
Order code: CN131C-01



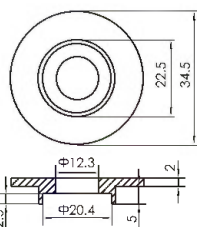
◆Nylon cap nut M8  
Order code: CN131C-02



◆Nylon cap nut M12  
Order code: CN131C-03

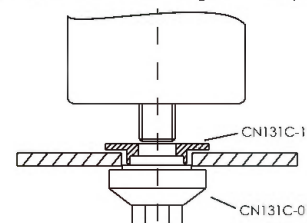


◆Insulating washer(plastic PBT)  
Order code: CN131C-12

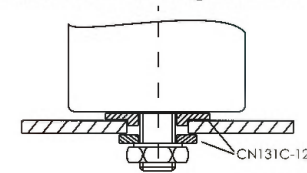


◆Insulating washer(plastic PP)  
Order code: CN131C-11

### ●Insulated mounting with cap nut



### ●Insulated mounting with steel nut

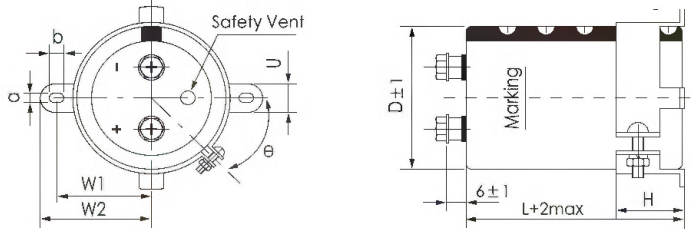


- Note: 1) Maximum tightening torque M12: 12.5Nm  
2) Recommended mounting hole diameter : 30.5mm(mounting with cap nut CN 131C-01)  
3) It is necessary to keep the insulation between bottom stud and mounting chasis.



## ■ Accessories: Bracket Mounting/mm

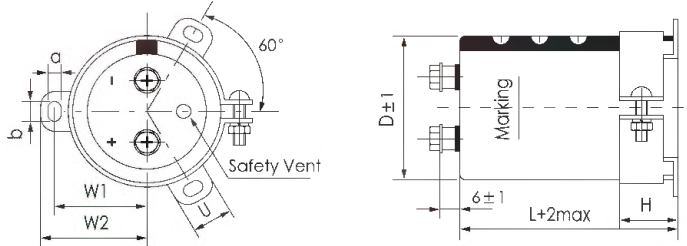
### ◆ 2-legs Bracket (Code I)



ΦD	W1	W2	a	b	U	H	Order Code
36	24	29	3.8	7	10	15	CT136B-01
51	34	40	5	7	14	30	CT151B-01
64	40.5	46.5	5	7	14	30	CT164B-01
77	46.8	53	5	7	14	30	CT176B-01
90	54	60.3	5	7	14	35	CT189B-01

\*θ is optional for 45° or 30°

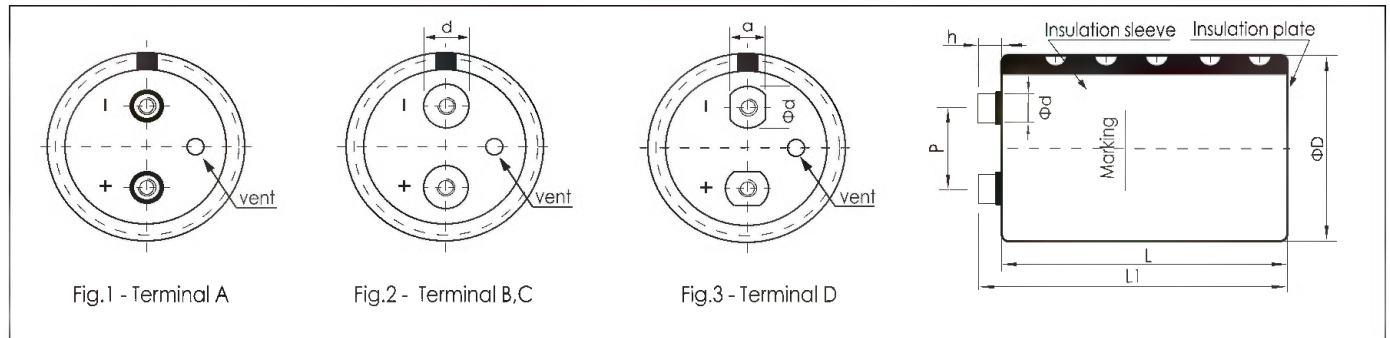
### ◆ 3-legs Bracket (Code Y)



ΦD	W1	W2	a	b	U	H	Order Code
51	31.8	36.5	5	7	14	30	CT151B-02
64	38.1	42.6	5	7	14	30	CT164B-02
77	44.5	49.2	5	7	14	30	CT176B-02
90	50.8	55.6	5	7	14	30	CT189B-02
101	57.5	63.5	5.5	8	20	35	CT199B-02

\*Bracket will be delivered separately. If bracket is not necessary, enter "N" for the type of bracket code.

## ■ Terminal Dimensions /mm



Terminal Code	Can Diameter ΦD±1mm	Thread	Φd±0.3mm	Thread Depth	h±0.5mm	L1±2.0mm	Drawing
A	51~90	M5	10.0	9	6.0	L+h	Fig.1
B	77~90	M6	17.2	11	6.0	L+h	Fig.2
C	64	M5	13.0	9	6.0	L+h	Fig.2
	77~90	M5	17.2	11	6.0	L+h	Fig.2
D	51	M5	13 (a=10)	9	5.0	L+h	Fig.3
	64	M5	15 (a=13)	9	6.0	L+h	Fig.3
	77	M6	15 (a=13)	9	6.0	L+h	Fig.3

\*Screws will be delivered separately.

\*Special Terminals (Low post h=3.2, 1/4-28, 10-32 thread) are available on request.

\*Hex head M5×10 and M6×12 are standard screws. Longer screws (M5×20 e.g) are available on request.

\*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm, M8: 6Nm.

\*Max ripple current for screw terminal M5: 60 Arms, M6: 100 Arms.

Note: Generally, screw terminal capacitors should mount upright with terminal side face upwards.  
If the capacitors is mounted horizontally, safety vent should located in 12, 9 o' clock position.  
Safety vent in 6 o' clock position or downwards is not allowed.

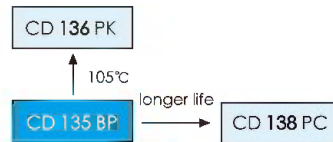


# CD 135 BP SERIES



2000h at 85°C

- Features
  - Standard at 85°C
  - RoHS Compliant
- Applications
  - UPS
  - Drive, Inverter

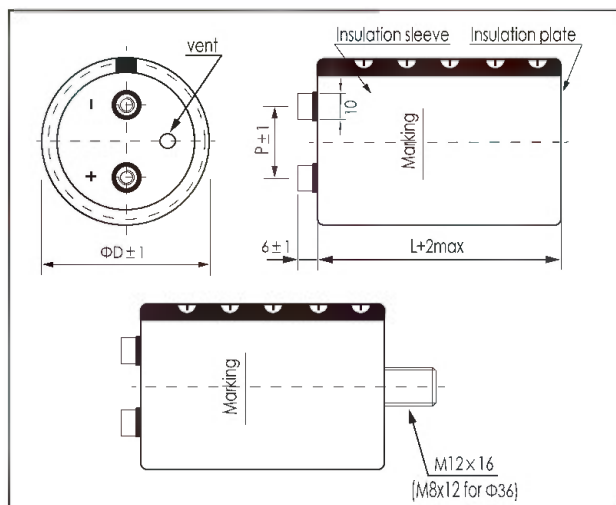


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +85	-25 ~ +85
Voltage Range (V)	10 ~ 250	350 ~ 500
Capacitance Range (μF)	470 ~ 820000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Less than values shown in the standard ratings	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>4000h	>65000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

mm



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal: M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 400v3300μF)

ECG	2G	BP	332	M	D	115	Y	□	* Terminals
									Mounting Style
									B Bolt Mounting
									Y 3-leg Bracket
									I 2-leg Bracket
									N No Bracket
									Diameter
									Code
									36mm A
									51mm C
									64mm D
									77mm E
									90mm F
									100mm G

## Ripple Current Coefficient

Frequency(Hz)	Rated Voltage(V)				
	50/60	120	300	1k	>10k
10~50	0.95	1.00	1.04	1.10	1.15
63~100	0.95	1.00	1.06	1.16	1.30
160~500	0.80	1.00	1.10	1.25	1.50

Ambient Temp (°C)	40	60	70	85
Coefficient	2.70	2.00	1.70	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



## Ratings for CD 135 BP Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
10 (13) 1A	33000	0.80	21	4.3	36 × 53	ECG1ABP333MA053□□
	39000	0.80	18	4.7	36 × 53	ECG1ABP393MA053□□
	47000	0.80	15	5.2	36 × 65	ECG1ABP473MA065□□
	56000	0.80	13	6.1	36 × 83	ECG1ABP563MA083□□
	68000	0.80	10	6.7	36 × 83	ECG1ABP683MA083□□
	82000	0.80	9	7.7	36 × 100	ECG1ABP823MA100□□
	100000	0.80	8	8.8	36 × 100	ECG1ABP104MA100□□
	120000	0.80	7	10.0	36 × 121	ECG1ABP124MA121□□
	150000	1.00	7	10.8	36 × 121	ECG1ABP154MA121□□
	180000	1.00	6	12.0	51 × 96	ECG1ABP184MC096□□
	220000	1.50	5	11.2	51 × 121	ECG1ABP224MC121□□
	270000	1.50	4	12.8	51 × 121	ECG1ABP274MC121□□
	330000	1.50	4	15.3	64 × 96	ECG1ABP334MD096□□
	390000	1.50	3	17.3	64 × 115	ECG1ABP394MD115□□
	470000	2.00	3	16.7	64 × 130	ECG1ABP474MD130□□
16 (20) 1C	560000	2.00	3	19.0	77 × 115	ECG1ABP564ME115□□
	680000	2.00	3	21.7	77 × 130	ECG1ABP684ME130□□
	820000	2.00	2	24.7	77 × 155	ECG1ABP824ME155□□
	22000	0.60	22	4.1	36 × 53	ECG1CBP223MA053□□
	27000	0.60	19	4.5	36 × 53	ECG1CBP273MA053□□
	33000	0.60	16	5.0	36 × 53	ECG1CBP333MA053□□
	39000	0.60	13	5.9	36 × 65	ECG1CBP393MA065□□
	47000	0.60	11	6.4	36 × 83	ECG1CBP473MA083□□
	56000	0.60	10	7.3	36 × 83	ECG1CBP563MA083□□
	68000	0.60	8	8.4	36 × 100	ECG1CBP683MA100□□
	82000	0.80	7	8.3	36 × 100	ECG1CBP823MA100□□
	100000	0.80	6	9.5	36 × 121	ECG1CBP104MA121□□
	120000	0.80	5	10.9	36 × 121	ECG1CBP124MA121□□
	150000	1.00	4	11.3	51 × 96	ECG1CBP154MC096□□
	180000	1.00	3	12.8	51 × 115	ECG1CBP184MC115□□
	220000	1.00	3	15.3	51 × 130	ECG1CBP224MC130□□
25 (32) 1E	270000	1.00	3	17.6	64 × 96	ECG1CBP274MD096□□
	330000	1.50	3	16.8	64 × 115	ECG1CBP334MD115□□
	390000	1.50	3	18.3	64 × 130	ECG1CBP394MD130□□
	470000	1.50	2	21.3	77 × 115	ECG1CBP474ME115□□
	560000	1.50	2	23.6	77 × 130	ECG1CBP564ME130□□
	680000	1.50	2	27.6	77 × 155	ECG1CBP684ME155□□
	820000	2.00	2	27.1	90 × 157	ECG1CBP824MF157□□
	15000	0.50	22	3.7	36 × 53	ECG1EBP153MA053□□
	18000	0.50	18	4.1	36 × 53	ECG1EBP183MA053□□
	22000	0.50	16	4.5	36 × 53	ECG1EBP223MA053□□
	27000	0.50	13	5.0	36 × 65	ECG1EBP273MA065□□
	33000	0.50	11	5.9	36 × 83	ECG1EBP333MA083□□
	39000	0.50	9	6.7	36 × 83	ECG1EBP393MA083□□
	47000	0.50	8	7.7	36 × 100	ECG1EBP473MA100□□
	56000	0.60	7	7.9	36 × 100	ECG1EBP563MA100□□
	68000	0.60	6	9.1	36 × 121	ECG1EBP683MA121□□
35 (44) 1V	82000	0.60	5	10.4	36 × 121	ECG1EBP823MA121□□
	100000	0.80	4	10.3	51 × 96	ECG1EBP104MC096□□
	120000	0.80	4	11.7	51 × 115	ECG1EBP124MC115□□
	150000	0.80	3	14.1	51 × 130	ECG1EBP154MC130□□
	180000	0.80	3	15.7	64 × 96	ECG1EBP184MD096□□
	220000	1.00	3	16.1	64 × 115	ECG1EBP224MD115□□
	270000	1.00	3	18.6	64 × 130	ECG1EBP274MD130□□
	330000	1.00	2	21.9	64 × 155	ECG1EBP334MD155□□
	390000	1.20	2	22.0	77 × 115	ECG1EBP394ME115□□
	470000	1.20	2	25.6	77 × 155	ECG1EBP474ME155□□
	560000	1.20	2	27.9	90 × 131	ECG1EBP564MF131□□
	680000	1.20	2	32.5	90 × 157	ECG1EBP684MF157□□
	10000	0.40	24	3.4	36 × 53	ECG1VBP103MA053□□
	12000	0.40	20	3.7	36 × 53	ECG1VBP123MA053□□
	15000	0.40	17	4.2	36 × 65	ECG1VBP153MA065□□
	18000	0.40	14	4.9	36 × 83	ECG1VBP183MA083□□

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
35 (44) 1V	270000	1.00	3	20.3	77 × 155	ECG1VBP274ME155□□
	330000	1.00	2	23.5	90 × 131	ECG1VBP334MF131□□
	390000	1.00	2	26.4	90 × 157	ECG1VBP394MF157□□
	470000	1.00	2	29.6	90 × 157	ECG1VBP474MF157□□
	5600	0.30	46	3.0	36 × 53	ECG1HBP562MA053□□
	6800	0.30	38	3.3	36 × 53	ECG1HBP682MA053□□
	8200	0.30	31	3.6	36 × 53	ECG1HBP822MA053□□
	10000	0.30	26	4.0	36 × 65	ECG1HBP103MA065□□
	12000	0.30	22	4.7	36 × 83	ECG1HBP123MA083□□
	15000	0.30	15	5.5	36 × 83	ECG1HBP153MA083□□
	18000	0.30	12	6.2	36 × 100	ECG1HBP183MA100□□
	22000	0.40	11	6.3	36 × 121	ECG1HBP223MA121□□
	27000	0.40	10	7.1	36 × 121	ECG1HBP273MA121□□
	33000	0.40	9	8.2	51 × 96	ECG1HBP333MC096□□
	39000	0.50	8	8.1	51 × 96	ECG1HBP393MC096□□
	47000	0.50	8	9.3	51 × 115	ECG1HBP473MC115□□
50 (63) 1H	56000	0.50	6	10.5	64 × 96	ECG1HBP563MD096□□
	68000	0.50	5	12.0	64 × 96	ECG1HBP683MD096□□
	82000	0.50	4	13.7	64 × 115	ECG1HBP823MD115□□
	100000	0.60	4	14.7	77 × 115	ECG1HBP104ME115□□
	120000	0.60	3	16.7	77 × 115	ECG1HBP124ME115□□
	150000	0.60	3	19.3	77 × 130	ECG1HBP154ME130□□
	180000	0.60	3	21.9	77 × 155	ECG1HBP184ME155□□
	220000	0.60	2	21.4	90 × 131	ECG1HBP224MF131□□
	270000	0.60	2	24.6	90 × 157	ECG1HBP274MF157□□
	3900	0.25	47	2.7	36 × 53	ECG1JBP392MA053□□
	4700	0.25	39	3.0	36 × 53	ECG1JBP472MA053□□
	5600	0.25	38	3.3	36 × 53	ECG1JBP562MA053□□
	6800	0.25	32	3.6	36 × 65	ECG1JBP682MA065□□
	8200	0.25	26	4.3	36 × 83	ECG1JBP822MA083□□
	10000	0.25	23	4.9	36 × 83	ECG1JBP103MA083□□
	12000	0.25	18	5.6	36 × 100	ECG1JBP123MA100□□
63 (79) 1J	15000	0.30	16	5.9	36 × 100	ECG1JBP153MA100□□
	18000	0.30	15	6.7	36 × 121	ECG1JBP183MA121□□
	22000	0.30	13	7.8	36 × 121	ECG1JBP223MA121□□
	27000	0.40	12	7.4	51 × 96	ECG1JBP273MC096□□
	33000	0.40	8	8.4	51 × 96	ECG1JBP333MC096□□
	39000	0.40	7	9.5	51 × 115	ECG1JBP393MC115□□
	47000	0.40	6	11.3	51 × 130	ECG1JBP473MC130□□
	56000	0.40	6	12.8	64 × 115	ECG1JBP563MD115□□
	68000	0.50	5	12.7	64 × 121	ECG1JBP683MD121□□
	82000	0.50	4	14.5	64 × 130	ECG1JBP823MD130□□
	100000	0.50	4	16.7	77 × 115	ECG1JBP104ME115□□
	120000	0.50	3	18.9	77 × 130	ECG1JBP124ME130□□
	150000	0.50	2	22.4	77 × 155	ECG1JBP154ME155□□
	180000	0.60	2	22.4	90 × 131	ECG1JBP184MF131□□
	220000	0.60	2	26.2	90 × 157	ECG1JBP224MF157□□
80 (100) 1K	3300	0.25	54	2.5	36 × 53	ECG1KBP332MA053□□
	3900	0.25	46	2.8	36 × 53	ECG1KBP392MA053□□
	4700	0.25	38	3.0	36 × 65	ECG1KBP472MA065□□
	5600	0.25	32	3.6	36 × 83	ECG1KBP562MA083□□
	6800	0.25	26	3.9	36 × 83	ECG1KBP682MA083□□
	8200	0.25	22	4.5	36 × 83	ECG1KBP822MA083□□
	10000	0.25	17	5.2	36 × 100	ECG1KBP103MA100□□
	12000	0.25	15	5.9	36 × 100	ECG1KBP123MA100□□
	15000	0.25	12	6.8	36 × 121	ECG1KBP153MA121□□
	18000	0.25	10	7.8	36 × 121	ECG1KBP183MA121□□
	22000	0.30	10	8.0	51 × 96	ECG1KBP223MC096□□
	27000	0.30	8	9.2	51 × 96	ECG1KBP273MC096□□
	33000	0.30	7	10.5	51 × 115	ECG1KBP333MC115□□
	39000	0.30	6	12.0	51 × 130	ECG1KBP393MC130□□
	47000	0.30	5	13.6	64 × 115	ECG1KBP473MD115□□
	56000	0.40	4	13.4	64 × 130	ECG1KBP563MD130□□
100 (125) 2A	68000	0.40	4	15.4	77 × 115	ECG1KBP683ME115□□
	82000	0.40	4	17.5	77 × 130	ECG1KBP823ME130□□
	100000	0.40	3	20.5	77 × 155	ECG1KBP104ME155□□
	120000	0.40	2	22.4	90 × 131	ECG1KBP124MF131□□
	150000	0.40	2	26.5	90 × 157	ECG1KBP154MF157□□
	1800	0.25	48	1.9	36 × 53	ECG2ABP182MA053□□
	2200	0.25	44	2.1	36 × 53	ECG2ABP222MA053□□
	2700	0.25	39	2.3	36 × 53	ECG2ABP272MA053□□
	3300	0.25	35	2.6	36 × 65	ECG2ABP332MA065□□
	3900	0.25	28	3.0	36 × 83	ECG2ABP392MA083□□
	4700	0.25	26	3.5	36 × 83	ECG2ABP472MA083□□
	5600	0.25	23	3.9	36 × 100	ECG2ABP562MA100□□
	6800	0.25	22	4.5	36 × 100	ECG2ABP682MA100□□
	8200	0.25	20	5.1	36 × 121	ECG2ABP822MA121□□
	10000	0.25	19	5.9	36 × 121	ECG2ABP103MA121□□
	12000	0.25	16	6.4	51 × 75	ECG2ABP123MC095□□

Mounting code["B" for bolt mounting, "Y"/"N" for bracket mounting]  
Terminal options[A,B,C see "Dimensions" for details.]

SCREW



# CD 135 BP SERIES



## Ratings for CD 135 BP Series

SCREW

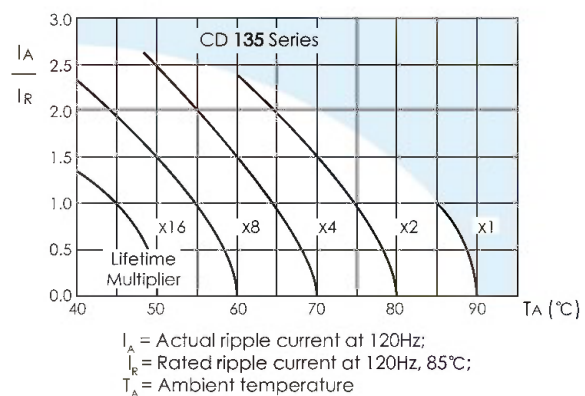
U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	3300	0.25	31	5.2	36 x 121	ECG2CBP332MA121 □□
	4700	0.25	21	5.9	51 x 75	ECG2CBP472MC075 □□
	5600	0.25	19	7.0	51 x 96	ECG2CBP562MC096 □□
	6800	0.25	16	7.8	51 x 96	ECG2CBP682MC096 □□
	10000	0.25	13	10.4	64 x 96	ECG2CBP103MD096 □□
	12000	0.25	10	11.6	51 x 120	ECG2CBP123MC120 □□
	15000	0.25	9	14.3	64 x 130	ECG2CBP153MD130 □□
	18000	0.25	8	15.6	64 x 130	ECG2CBP183MD130 □□
	22000	0.25	6	18.3	77 x 130	ECG2CBP223ME130 □□
	33000	0.25	4	23.8	90 x 131	ECG2CBP333MF131 □□
	39000	0.25	2	27.9	90 x 157	ECG2CBP393MF157 □□
	2200	0.25	38	3.9	36 x 100	ECG2DBP222MA100 □□
200 (250) 2D	3300	0.25	24	4.9	51 x 75	ECG2DBP332MC075 □□
	4700	0.25	20	6.4	51 x 96	ECG2DBP472MC096 □□
	5600	0.25	18	7.6	51 x 115	ECG2DBP562MC115 □□
	6800	0.25	14	8.8	51 x 130	ECG2DBP682MC130 □□
	8200	0.25	11	9.4	64 x 96	ECG2DBP822MD096 □□
	10000	0.25	9	10.4	64 x 96	ECG2DBP103MD096 □□
	15000	0.25	7	14.4	77 x 96	ECG2DBP153ME096 □□
	18000	0.25	6	16.5	77 x 130	ECG2DBP183ME130 □□
	22000	0.25	4	19.6	77 x 155	ECG2DBP223ME155 □□
	33000	0.25	3	25.3	90 x 157	ECG2DBP333MF157 □□
	1500	0.25	49	3.2	36 x 100	ECG2EBP152MA100 □□
	2200	0.25	33	4.0	51 x 75	ECG2EBP222MC075 □□
250 (300) 2E	3300	0.25	23	5.4	51 x 96	ECG2EBP332MC096 □□
	4700	0.25	17	7.1	64 x 96	ECG2EBP472MD096 □□
	6800	0.25	12	9.1	64 x 115	ECG2EBP682MD115 □□
	8200	0.25	11	10.0	64 x 115	ECG2EBP822MD115 □□
	10000	0.25	11	11.7	64 x 130	ECG2EBP103MD130 □□
	15000	0.25	7	15.1	77 x 130	ECG2EBP153ME130 □□
	18000	0.25	6	17.7	77 x 155	ECG2EBP183ME155 □□
	22000	0.25	3	20.9	90 x 157	ECG2EBP223MF157 □□
	470	0.2	228	2.2	36 x 83	ECG2VBP471MA083 □□
	680	0.2	152	2.6	36 x 83	ECG2VBP681MA083 □□
	1000	0.2	104	3.4	36 x 100	ECG2VBP102MA100 □□
	1500	0.2	72	4.3	51 x 75	ECG2VBP152MC075 □□
350 (400) 2V	1800	0.2	58	5.1	51 x 96	ECG2VBP182MC096 □□
	2200	0.2	48	5.7	51 x 96	ECG2VBP222MC096 □□
	2700	0.2	39	7.1	51 x 130	ECG2VBP272MC130 □□
	3300	0.2	32	7.9	51 x 130	ECG2VBP332MC130 □□
	3900	0.2	28	9.0	64 x 115	ECG2VBP392MD115 □□
	4700	0.2	25	10.3	64 x 130	ECG2VBP472MD130 □□
	5600	0.2	22	11.4	77 x 115	ECG2VBP562ME115 □□
	6800	0.2	17	13.1	77 x 130	ECG2VBP682ME130 □□
	8200	0.2	14	15.4	77 x 155	ECG2VBP822ME155 □□
	10000	0.2	12	18.1	90 x 157	ECG2VBP103MF157 □□
	12000	0.2	10	20.0	90 x 157	ECG2VBP123MF157 □□
	15000	0.2	8	24.5	90 x 196	ECG2VBP153MF196 □□
400 (450) 2G	18000	0.2	6	28.8	90 x 236	ECG2VBP183MF236 □□
	470	0.2	178	2.2	36 x 83	ECG2GBP471MA083 □□
	680	0.2	119	2.8	36 x 100	ECG2GBP681MA100 □□
	1000	0.2	82	3.5	51 x 75	ECG2GBP102MC075 □□
	1200	0.2	68	3.8	51 x 75	ECG2GBP122MC075 □□
	1500	0.2	58	4.7	51 x 96	ECG2GBP152MC096 □□
	1800	0.2	47	5.2	51 x 96	ECG2GBP182MC096 □□
	2200	0.2	35	6.4	51 x 120	ECG2GBP222MC120 □□
	2700	0.2	33	7.0	64 x 96	ECG2GBP272MD096 □□
	3300	0.2	31	8.2	64 x 115	ECG2GBP332MD115 □□

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	3900	0.2	25	9.4	64 x 130	ECG2GBP392MD130 □□
	4700	0.2	24	10.4	77 x 115	ECG2GBP472ME115 □□
	5600	0.2	19	11.9	77 x 130	ECG2GBP562ME130 □□
	6800	0.2	16	14.1	77 x 155	ECG2GBP682ME155 □□
	8200	0.2	14	16.4	90 x 157	ECG2GBP822MF157 □□
	10000	0.2	11	18.3	90 x 157	ECG2GBP103MF157 □□
	12000	0.2	10	21.8	90 x 196	ECG2GBP123MF196 □□
	15000	0.2	8	26.3	90 x 236	ECG2GBP153MF236 □□
	470	0.2	200	2.2	36 x 83	ECG2WBP471MA083 □□
	680	0.2	140	2.8	36 x 100	ECG2WBP681MA100 □□
	820	0.2	96	3.2	51 x 75	ECG2WBP821MC075 □□
	1000	0.2	82	3.5	51 x 75	ECG2WBP102MC075 □□
450 (500) 2W	1200	0.2	72	4.2	51 x 96	ECG2WBP122MC096 □□
	1500	0.2	58	5.1	51 x 115	ECG2WBP152MC115 □□
	1800	0.2	46	5.9	51 x 130	ECG2WBP182MC130 □□
	2200	0.2	33	6.3	64 x 96	ECG2WBP222MD096 □□
	2700	0.2	32	7.5	64 x 115	ECG2WBP272MD115 □□
	3300	0.2	30	8.7	64 x 130	ECG2WBP332MD130 □□
	3900	0.2	29	9.5	77 x 115	ECG2WBP392ME115 □□
	4700	0.2	24	10.9	77 x 130	ECG2WBP472ME130 □□
	5600	0.2	16	12.8	77 x 155	ECG2WBP562ME155 □□
	6800	0.2	14	15.0	90 x 157	ECG2WBP682MF157 □□
	8200	0.2	12	16.5	90 x 157	ECG2WBP822MF157 □□
	10000	0.2	10	20.0	90 x 196	ECG2WBP103MF196 □□
500 (550) 2H	12000	0.2	8	23.6	90 x 236	ECG2WBP123MF236 □□
	1000	0.25	85	4.6	51 x 115	ECG2HBP102MC115 □□
	1500	0.25	60	5.7	64 x 96	ECG2HBP152MD096 □□
	2200	0.25	41	6.9	64 x 130	ECG2HBP222MD130 □□
	2700	0.25	36	8.1	77 x 115	ECG2HBP272ME115 □□
	3300	0.25	32	9.6	77 x 130	ECG2HBP332ME130 □□
	3900	0.25	30	10.8	77 x 130	ECG2HBP392ME130 □□
	4700	0.25	27	12.1	77 x 155	ECG2HBP472ME155 □□
	5600	0.25	21	13.8	90 x 157	ECG2HBP562MF157 □□
	6800	0.25	18	15.8	90 x 171	ECG2HBP682MF171 □□
	8200	0.25	14	17.2	77 x 220	ECG2HBP822ME220 □□
	10000	0.25	10	22.1	90 x 236	ECG2HBP103MF236 □□

Mounting code("B" for bolt mounting, "Y/I/N" for bracket mounting) —  
Terminal options(A,B,C see "Dimensions" for details.) —

Customer products are available on request.

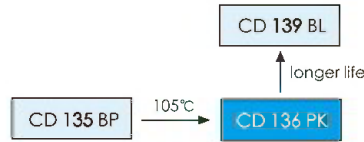
## Lifetime Diagram





2000h at 105°C

- Features
  - Standard at 105°C
  - RoHS Compliant
- Applications
  - Professional Inverters and Power Supplies

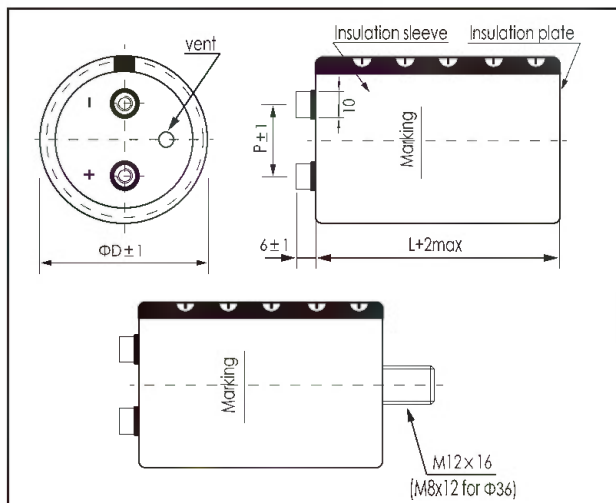


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	25 ~ 100	160 ~ 450
Capacitance Range (μF)	220 ~ 33000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Less than values shown in the standard ratings	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>4000h	>200000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

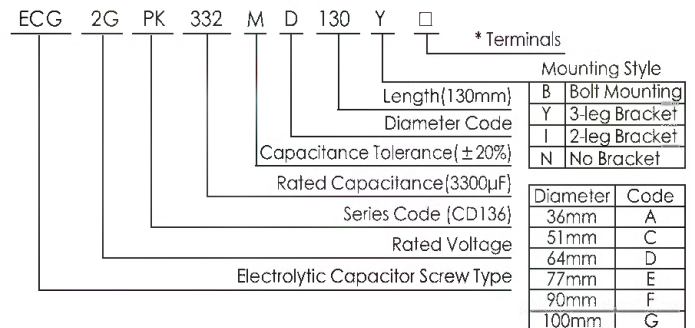
mm



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 400v3300μF)



## Ripple Current Coefficient

Frequency(Hz)	50/60	120	300	1K	>10k
Rated Voltage(V)					
25~100	0.95	1.00	1.04	1.10	1.15
160~250	0.90	1.00	1.08	1.15	1.20
350~450	0.80	1.00	1.18	1.35	1.40

Ambient Temp(°C)	40	55	70	85	105
Coefficient					
25~100V	4.9	3.9	3.0	1.8	1.0
160~250V	3.8	3.3	2.5	2.0	1.0
350~450V	2.44	2.28	2.12	2.0	1.0

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



# CD 136 PK SERIES



## Ratings for CD 136 PK Series

SCREW

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
25 (32) 1E	10000	0.35	25	2.9	36×53	ECG1EPK103MA053□□
	15000	0.35	20	4.2	36×83	ECG1EPK153MA083□□
	22000	0.40	13	5.1	36×83	ECG1EPK223MA083□□
	33000	0.40	10	6.3	36×100	ECG1EPK333MA100□□
	47000	0.40	7	8	51×75	ECG1EPK473MC075□□
	68000	0.50	6	10	51×115	ECG1EPK683MC115□□
	100000	0.60	5	11.3	64×96	ECG1EPK104MD096□□
	150000	0.80	4	12.9	64×115	ECG1EPK154MD115□□
	220000	1.00	3	14.8	77×115	ECG1EPK224ME115□□
35 (44) 1V	6800	0.30	25	2.6	36×53	ECG1VPK682MA053□□
	10000	0.30	20	3.7	36×83	ECG1VPK103MA083□□
	15000	0.30	13	4.5	36×83	ECG1VPK153MA083□□
	22000	0.35	10	5.5	36×100	ECG1VPK223MA100□□
	33000	0.40	7	6.7	51×75	ECG1VPK333MC075□□
	47000	0.45	6	8.1	51×96	ECG1VPK473MC096□□
	68000	0.50	5	10	51×115	ECG1VPK683MC115□□
	100000	0.60	4	12.1	64×115	ECG1VPK104MD115□□
	150000	0.70	3	13.8	77×115	ECG1VPK154ME115□□
50 (63) 1H	220000	0.70	2	17.6	90×131	ECG1VPK224MF131□□
	3300	0.20	50	2.2	36×53	ECG1HPK332MA053□□
	4700	0.25	36	3.3	36×53	ECG1HPK472MA053□□
	6800	0.25	32	3.4	36×83	ECG1HPK682MA083□□
	10000	0.25	22	4.1	36×83	ECG1HPK103MA083□□
	15000	0.30	14	4.9	36×100	ECG1HPK153MA100□□
	22000	0.35	10	5.9	51×75	ECG1HPK223MC075□□
	33000	0.40	7	7.8	51×115	ECG1HPK333MC115□□
	47000	0.40	6	9.5	64×96	ECG1HPK473MD096□□
63 (79) 1J	68000	0.45	5	11.6	64×115	ECG1HPK683MD115□□
	100000	0.50	4	14.1	77×115	ECG1HPK104ME115□□
	150000	0.50	3	18.9	90×131	ECG1HPK154MF131□□
	2200	0.15	70	2.1	36×53	ECG1JPK222MA053□□
	3300	0.20	50	2.2	36×53	ECG1JPK332MA053□□
	4700	0.20	36	3.1	36×83	ECG1JPK472MA083□□
	6800	0.20	25	3.7	36×83	ECG1JPK682MA083□□
	10000	0.25	20	4.4	36×100	ECG1JPK103MA100□□
	15000	0.25	14	5.7	51×75	ECG1JPK153MC075□□
80 (100) 1K	22000	0.30	10	6.8	51×96	ECG1JPK223MC096□□
	33000	0.30	7	9.2	64×96	ECG1JPK333MD096□□
	47000	0.35	6	10.9	64×115	ECG1JPK473MD115□□
	68000	0.40	5	13	77×115	ECG1JPK683ME115□□
	100000	0.40	4	17.2	90×131	ECG1JPK104MF131□□
	2200	0.15	57	2.1	36×53	ECG1KPK222MA053□□
	3300	0.15	38	3	36×83	ECG1KPK332MA083□□
	4700	0.15	27	3.6	36×83	ECG1KPK472MA083□□
	6800	0.20	19	4	36×100	ECG1KPK682MA100□□
100 (125) 2A	10000	0.20	17	5.2	51×75	ECG1KPK103MC075□□
	15000	0.25	11	6.2	51×96	ECG1KPK153MC096□□
	22000	0.25	8	8.2	64×96	ECG1KPK223MD096□□
	33000	0.30	7	9.7	77×96	ECG1KPK333ME096□□
	47000	0.30	6	12.5	77×115	ECG1KPK473ME115□□
	68000	0.30	5	16.4	90×131	ECG1KPK683MF131□□
	1000	0.15	70	1.4	36×53	ECG2APK102MA053□□
	1500	0.15	55	1.7	36×53	ECG2APK152MA053□□
	2200	0.15	38	2.5	36×83	ECG2APK222MA083□□
	3300	0.15	25	3	36×83	ECG2APK332MA083□□
	4700	0.15	21	3.9	36×100	ECG2APK472MA100□□
	6800	0.15	19	5	51×75	ECG2APK682MC075□□
	10000	0.15	13	6.5	51×96	ECG2APK103MC096□□
	15000	0.20	9	7.6	64×96	ECG2APK153MD096□□
	22000	0.20	7	9.7	77×96	ECG2APK223ME096□□
	33000	0.25	6	11.8	77×130	ECG2APK333ME130□□
	47000	0.25	5	15	90×131	ECG2APK473MF131□□

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	-
160 (200) 2C	470	0.15	265	1	36×53	ECG2CPK471MA053□□
	680	0.15	186	1.1	36×53	ECG2CPK681MA053□□
	1000	0.15	125	1.7	36×83	ECG2CPK102MA083□□
	1500	0.15	85	2	36×83	ECG2CPK152MA083□□
	2200	0.15	55	2.7	36×100	ECG2CPK222MA100□□
	3300	0.15	38	3.5	51×83	ECG2CPK332MC083□□
	4700	0.15	35	4.4	51×96	ECG2CPK472MC096□□
	6800	0.15	25	5.9	64×96	ECG2CPK682MD096□□
	10000	0.15	15	7.6	77×96	ECG2CPK103ME096□□
200 (250) 2D	15000	0.15	11	10.3	77×130	ECG2CPK153ME130□□
	22000	0.15	6	13.2	90×131	ECG2CPK223MF131□□
	330	0.15	375	0.8	36×53	ECG2DPK331MA053□□
	470	0.15	262	1	36×53	ECG2DPK471MA053□□
	680	0.15	180	1.1	36×53	ECG2DPK681MA053□□
	1000	0.15	125	1.7	36×83	ECG2DPK102MA083□□
	1500	0.15	75	2.2	36×100	ECG2DPK152MA100□□
	2200	0.15	50	2.8	51×75	ECG2DPK222MC075□□
	3300	0.15	36	3.7	51×96	ECG2DPK332MC096□□
250 (300) 2E	4700	0.15	24	4.9	64×96	ECG2DPK472MD096□□
	6800	0.15	16	6.3	64×115	ECG2DPK682MD115□□
	10000	0.15	12	8.1	77×115	ECG2DPK103ME115□□
	15000	0.15	6	10.9	90×131	ECG2DPK153MF131□□
	330	0.15	160	0.8	36×53	ECG2EPK331MA053□□
	470	0.15	120	1	36×53	ECG2EPK471MA053□□
	680	0.15	85	1.4	36×83	ECG2EPK681MA083□□
	1000	0.15	55	1.9	36×100	ECG2EPK102MA100□□
	1500	0.15	40	2.3	51×75	ECG2EPK152MC075□□
400 (450) 2G	2200	0.15	28	3.1	51×96	ECG2EPK222MC096□□
	3300	0.15	20	4.2	64×96	ECG2EPK332MD096□□
	4700	0.15	15	5.4	64×115	ECG2EPK472MD115□□
	6800	0.15	10	6.9	64×115	ECG2EPK682MD115□□
	10000	0.15	8	9.3	77×155	ECG2EPK103ME155□□
	15000	0.15	6	12.2	90×157	ECG2EPK153MF157□□
	1000	0.15	82	3.9	51×75	ECG2GPK102MC075□□
	1200	0.15	70	4.7	51×96	ECG2GPK122MC096□□
	1500	0.15	49	5.6	51×115	ECG2GPK152MC115□□
450 (500) 2W	1800	0.15	39	6.4	51×130	ECG2GPK182MC130□□
	2200	0.15	30	7.0	64×96	ECG2GPK222MD096□□
	2700	0.15	22	8.3	64×115	ECG2GPK272MD115□□
	3300	0.15	20	9.7	64×130	ECG2GPK332MD130□□
	3900	0.15	18	11.2	64×155	ECG2GPK392MD155□□
	3900	0.15	18	10.6	77×115	ECG2GPK392ME115□□
	4700	0.15	13	13.5	64×195	ECG2GPK472MD195□□
	4700	0.15	13	12.1	77×130	ECG2GPK472ME130□□
	5600	0.15	12	15.0	64×195	ECG2GPK562MD195□□
	5600	0.15	12	14.3	77×155	ECG2GPK562ME155□□
	6800	0.15	11	16.7	90×157	ECG2GPK682MF157□□
	8200	0.15	10	18.4	90×157	ECG2GPK822MF157□□
	10000	0.15	9	22.0	90×196	ECG2GPK103MF196□□
	220	0.15	415	1.1	36×53	ECG2WPK221MA053□□
	330	0.15	277	1.5	36×100	ECG2WPK331MA100□□
	470	0.15	195	2.1	51×83	ECG2WPK471MC083□□
	680	0.15	135	2.7	51×96	ECG2WPK681MC096□□
	1000	0.15	90	4.2	51×100	ECG2WPK102MC100□□
	1500	0.15	54	5.7	51×130	ECG2WPK152MC130□□
	2200	0.15	33	7.3	64×115	ECG2WPK222MD115□□
	3300	0.15	22	10.1	77×130	ECG2WPK332ME130□□
	4700	0.15	15	12.6	77×155	ECG2WPK472ME155□□
	5600	0.15	11	15.8	90×157	ECG2WPK562MF157□□

Mounting code(" B" for bolt mounting, "Y"/"N" for bracket mounting)  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.



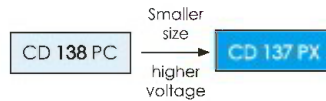
5000h at 85°C

## Features

- High Reliability at High Voltage
- Long Life at Compact Size
- RoHS Compliant

## Applications

- Professional Inverters and Power Supplies

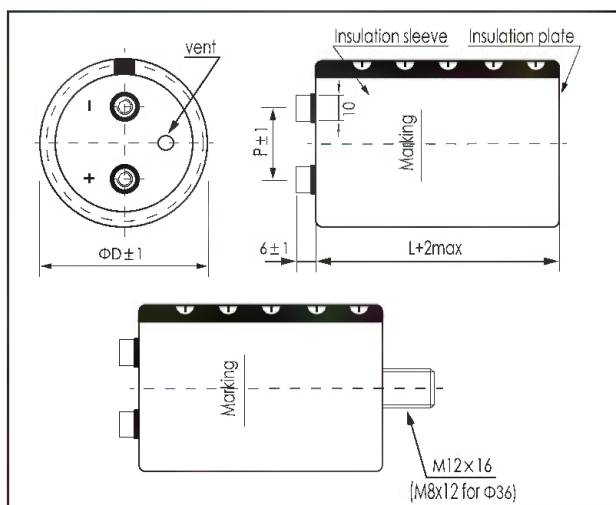


Items	Characteristics				
Operating Temperature Range (°C)	-40 ~ +85				
Voltage Range (V)	400 ~ 550				
Capacitance Range (μF)	1000 ~ 22000				
Capacitance Tolerance (20°C, 120Hz)	± 20%				
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)				
Dissipation Factor (20°C, 120Hz)	$U_R(V)$	400	450	500	550
	$\tan\delta_{max}$	0.15		0.20	

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>10000h	>100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

mm



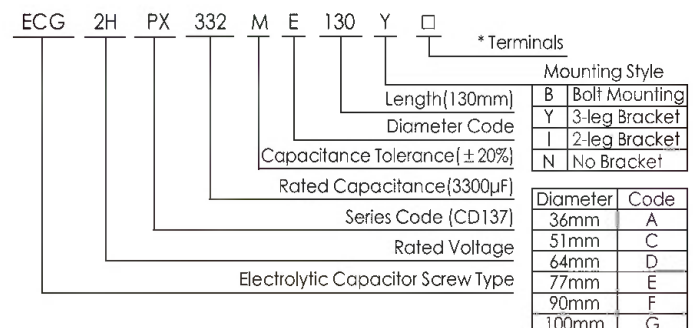
ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.

\*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.

\*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 500v3300μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures. It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

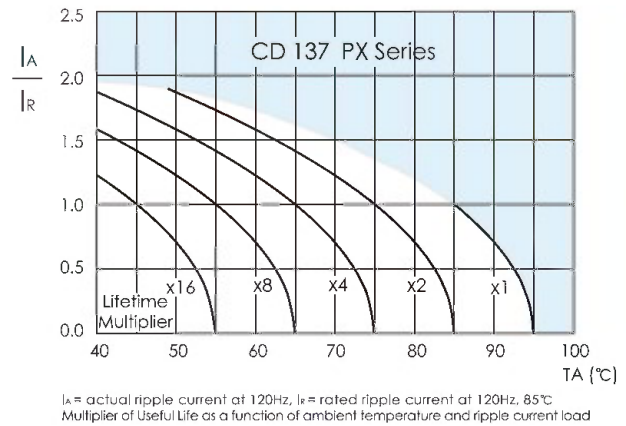


## Ratings for CD 137 PX Series

$U_r$ (Surge Voltage) Code	Rated Capa- citance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
400 (450) 2G	2200	98	28	8.8	51 x 115	ECG2GPX222MC115□□
	2700	80	24	10.2	51 x 130	ECG2GPX272MC130□□
	3300	65	21	11.0	64 x 96	ECG2GPX332MD096□□
	3900	55	19	12.8	64 x 115	ECG2GPX392MD115□□
	4700	46	15	14.8	64 x 130	ECG2GPX472MD130□□
	5600	38	14	16.2	77 x 115	ECG2GPX562ME115□□
	6800	32	13	18.7	77 x 130	ECG2GPX682ME130□□
	8200	26	12	22.0	77 x 155	ECG2GPX822ME155□□
	10000	22	10	26.7	77 x 195	ECG2GPX103ME195□□
	10000	22	10	24.2	90 x 131	ECG2GPX103MF131□□
	12000	18	8	28.5	90 x 157	ECG2GPX123MF157□□
	15000	14	6	34.8	90 x 196	ECG2GPX153MF196□□
	18000	12	5	41.2	90 x 236	ECG2GPX183MF236□□
	22000	10	5	47.0	101 x 237	ECG2GPX223MG237□□
450 (500) 2W	1800	119	45	7.6	51 x 115	ECG2WPX182MC115□□
	2200	98	35	8.8	51 x 130	ECG2WPX222MC130□□
	2700	80	30	9.5	64 x 96	ECG2WPX272MD096□□
	3300	65	24	11.2	64 x 115	ECG2WPX332MD115□□
	3900	55	20	12.8	64 x 130	ECG2WPX392MD130□□
	4700	46	16	14.1	77 x 115	ECG2WPX472ME115□□
	5600	38	13	16.2	77 x 130	ECG2WPX562ME130□□
	6800	32	11	19.1	77 x 155	ECG2WPX682ME155□□
	8200	26	10	23.0	77 x 195	ECG2WPX822ME195□□
	8200	26	10	21.0	90 x 131	ECG2WPX822MF131□□
	10000	22	9	25.7	90 x 171	ECG2WPX103MF171□□
	12000	18	8	29.7	90 x 196	ECG2WPX123MF196□□
	12000	18	8	29.3	101 x 175	ECG2WPX123MG175□□
	15000	14	7	35.9	90 x 236	ECG2WPX153MF236□□
500 (550) 2H	15000	14	7	34.2	101 x 195	ECG2WPX153MG195□□
	18000	12	6	40.5	101 x 237	ECG2WPX183MG237□□
	1200	215	94	6.2	51 x 115	ECG2HPX122MC115□□
	1200	215	94	6.3	64 x 96	ECG2HPX122MD096□□
	1500	172	72	7.3	51 x 130	ECG2HPX152MC130□□
	1500	172	72	7.1	64 x 96	ECG2HPX152MD096□□
	1800	143	51	8.3	64 x 115	ECG2HPX182MD115□□
	2200	117	40	9.6	64 x 130	ECG2HPX222MD130□□
	2700	96	35	10.7	77 x 115	ECG2HPX272ME115□□
	3300	78	30	12.4	77 x 130	ECG2HPX332ME130□□
	3900	66	25	14.4	77 x 155	ECG2HPX392ME155□□
	4700	55	24	16.5	77 x 171	ECG2HPX472ME171□□
	4700	55	24	15.8	90 x 131	ECG2HPX472MF131□□
	5600	46	22	19.0	77 x 195	ECG2HPX562ME195□□
550 (600) 2Y	5600	46	22	18.6	90 x 157	ECG2HPX562MF157□□
	6800	38	19	21.2	90 x 171	ECG2HPX682MF171□□
	8200	31	14	24.5	90 x 196	ECG2HPX822MF196□□
	8200	31	14	24.2	101 x 175	ECG2HPX822MG175□□
	10000	26	12	29.3	90 x 236	ECG2HPX103MF236□□
	10000	26	12	27.9	101 x 195	ECG2HPX103MG195□□
	12000	22	11	33.1	101 x 237	ECG2HPX123MG237□□
	1000	258	110	5.9	51 x 130	ECG2YPX102MC130□□
	1200	215	95	6.8	64 x 115	ECG2YPX122MD115□□
	1500	172	74	8.0	64 x 130	ECG2YPX152MD130□□
	1800	143	72	8.7	77 x 115	ECG2YPX182ME115□□
	2200	117	50	10.1	77 x 130	ECG2YPX222ME130□□
	2700	96	40	12.0	77 x 155	ECG2YPX272ME155□□
	3300	78	36	13.3	77 x 155	ECG2YPX332ME155□□
	3900	66	30	15.5	90 x 157	ECG2YPX392MF157□□
	4700	55	24	17.6	90 x 171	ECG2YPX472MF171□□
	5600	46	20	20.3	90 x 196	ECG2YPX562MF196□□
	6800	38	16	24.1	90 x 236	ECG2YPX682MF236□□
	8200	31	14	27.3	101 x 237	ECG2YPX822MG237□□

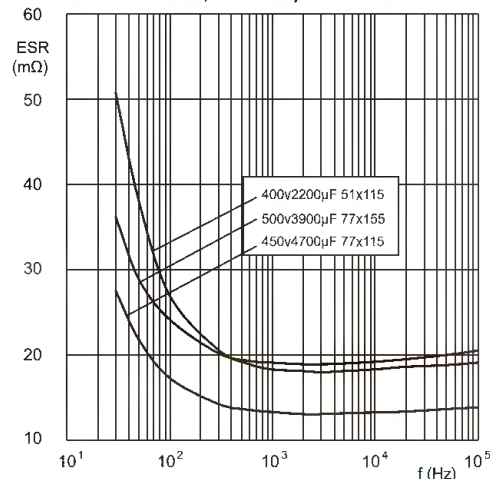
Mounting code("B" for bolt mounting, "Y/I/N" for bracket mounting)  
Terminal options(A,B,C see "Dimensions" for details.)

## Lifetime Diagram

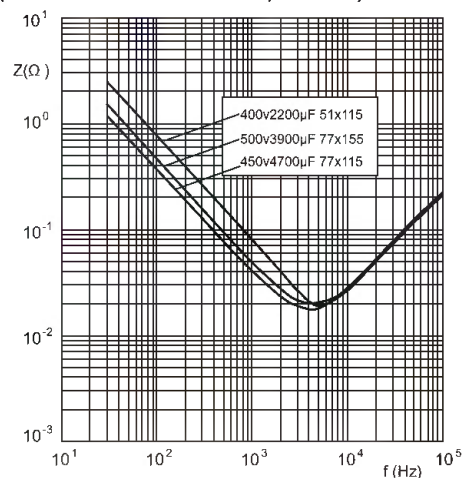


## Typical Curves

### ESR ~ Frequency f at 20°C



### Impedance Z ~ Frequency f at 20°C

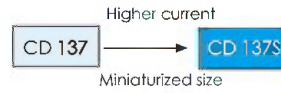


Customer products are available on request.



5000h at 85°C

- Features
  - Extremely compact
  - High ripple current & High Reliability
  - RoHS Compliant
- Applications
  - Higher Currents for High Professional Power Application and Inverters



## Specifications

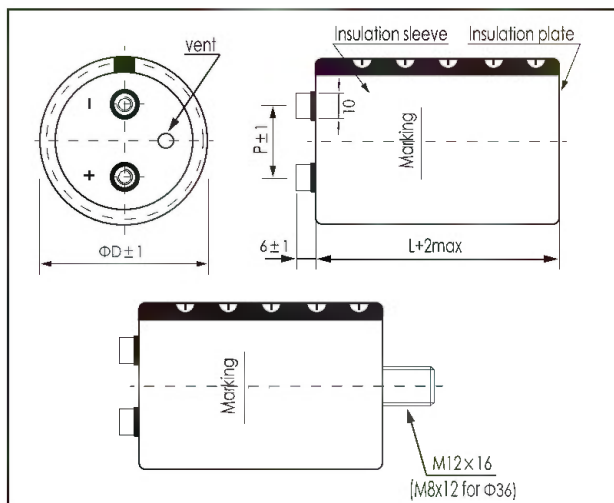
Items	Characteristics
Operating Temperature Range	-40 ~ +85 °C
Rated Voltage $U_R$	350 ~ 500V <sub>dc</sub>
Capacitance Range	1000 ~ 22000μF
Capacitance Tolerance	± 20% (M) (at 20°C, 120Hz)
Leakage Current $I_L$	$I_L = 0.01 C_R U_R$ (μA) or 5mA, whichever is smaller. ( $C_R$ : Nominal Capacitance, in μF) (at 20°C, 5minutes)
Dissipation Factor $\tan \delta$	Less than 0.15 (at 20°C, 120Hz)
Stability at Low Temperature	$C(-25^\circ\text{C})/C(+20^\circ\text{C}) \geq 0.7$ , $C(-40^\circ\text{C})/C(+20^\circ\text{C}) \geq 0.6$ (at 120Hz)

	Useful Life		Load Life	Endurance Life	Shelf Life
Lifetime	12000h	>150000h	5000h	5000h	1000h
Leakage Current $I_L$	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change $\Delta C$	Within ± 20% of initial value		Within ± 15% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor $\tan \delta$	Not more than 200% of specified value		Not more than 175% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition:	$U_R$ $I_R$ 85°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ 85°C	85°C

\*Shelf Life test:  $U_R$  to be applied for 60min, >24h before measurement

## Dimensions

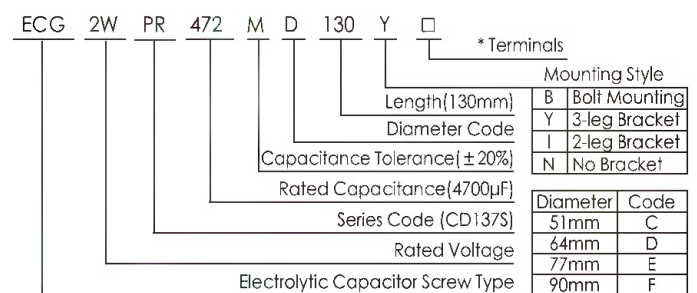
mm



ΦD/mm	51	64	77	90
P/mm	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v4700μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.18	1.30	1.40

Ambient Temp (°C)	40	60	70	85
Coefficient	2.24	1.81	1.56	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



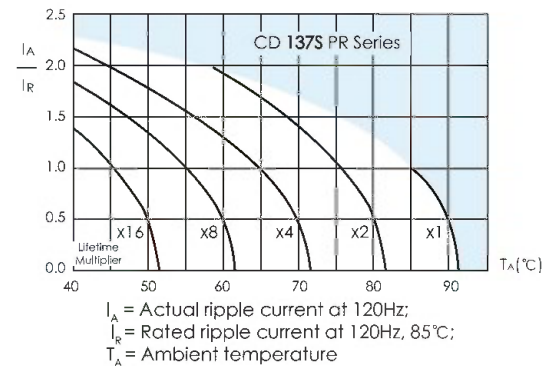
# CD 137S PR SERIES



## Ratings for CD 137S PR Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400) 2V	2200	56	28	8.38	51 × 80	ECG2VPR222MC080 □□
	2700	46	23	9.90	51 × 96	ECG2VPR272MC096 □□
	3300	40	20	11.0	51 × 105	ECG2VPR332MC105 □□
		40	20	11.4	64 × 80	ECG2VPR332MD080 □□
	3900	34	17	12.7	51 × 117	ECG2VPR392MC117 □□
		34	17	13.2	64 × 96	ECG2VPR392MD096 □□
	4700	28	14	14.4	64 × 96	ECG2VPR472MD096 □□
		24	12	16.8	64 × 115	ECG2VPR562MD115 □□
	5600	24	12	17.2	77 × 96	ECG2VPR562ME096 □□
	6800	20	10	18.8	64 × 130	ECG2VPR682MD130 □□
		20	10	19.5	77 × 105	ECG2VPR682ME105 □□
	8200	18	9	22.3	77 × 117	ECG2VPR822ME115 □□
	10000	14	7	28.3	90 × 115	ECG2VPR103MF115 □□
	12000	12	6	29.8	77 × 155	ECG2VPR123ME155 □□
		12	6	32.0	90 × 130	ECG2VPR123MF130 □□
400 (450) 2G	1800	68	34	7.58	51 × 80	ECG2GPR182MC080 □□
	2200	56	28	9.05	51 × 96	ECG2GPR222MC096 □□
	2700	46	23	10.4	51 × 105	ECG2GPR272MC105 □□
		46	23	10.5	64 × 80	ECG2GPR272MD080 □□
	3300	38	19	12.5	51 × 130	ECG2GPR332MC130 □□
		38	19	12.4	64 × 96	ECG2GPR332MD096 □□
	3900	32	16	13.3	64 × 96	ECG2GPR392MD096 □□
		28	14	15.2	64 × 115	ECG2GPR472MD115 □□
	4700	28	14	16.3	77 × 96	ECG2GPR472ME096 □□
		24	12	17.1	64 × 130	ECG2GPR562MD130 □□
	5600	24	12	18.2	77 × 105	ECG2GPR562ME100 □□
	6800	20	10	20.6	77 × 117	ECG2GPR682ME115 □□
		18	9	23.3	77 × 130	ECG2GPR822ME130 □□
	10000	14	7	27.0	77 × 155	ECG2GPR103ME155 □□
		14	7	29.1	90 × 130	ECG2GPR103MF130 □□
450 (500) 2W	12000	12	6	31.5	77 × 190	ECG2GPR123ME190 □□
	15000	10	5	37.2	77 × 220	ECG2GPR153ME220 □□
		10	5	38.3	90 × 170	ECG2GPR153MF170 □□
	18000	9	4.5	42.4	90 × 196	ECG2GPR183MF196 □□
	1500	112	56	7.10	51 × 80	ECG2WPR152MC080 □□
	1800	94	47	8.03	51 × 96	ECG2WPR182MC096 □□
	2200	78	39	9.22	51 × 105	ECG2WPR222MC105 □□
		78	39	9.70	64 × 80	ECG2WPR222MD080 □□
	2700	66	33	10.5	51 × 117	ECG2WPR272MC117 □□
		66	33	10.9	64 × 96	ECG2WPR272MD096 □□
	3300	56	28	12.1	64 × 100	ECG2WPR332MD100 □□
		48	24	13.9	64 × 115	ECG2WPR392MD115 □□
	3900	48	24	15.2	77 × 96	ECG2WPR392ME096 □□
		40	20	15.5	64 × 130	ECG2WPR472MD130 □□
	4700	40	20	16.9	77 × 105	ECG2WPR472ME105 □□
		34	17	18.2	64 × 155	ECG2WPR562MD155 □□
500 (550) 2H	5600	34	17	19.4	77 × 117	ECG2WPR562ME115 □□
	6800	28	14	21.5	77 × 130	ECG2WPR682ME130 □□
		28	14	24.3	90 × 115	ECG2WPR682MF115 □□
	8200	24	12	24.5	77 × 155	ECG2WPR822ME155 □□
		24	12	27.5	90 × 130	ECG2WPR822MF130 □□
	10000	20	10	29.2	77 × 190	ECG2WPR103ME190 □□
		20	10	30.3	90 × 145	ECG2WPR103MF145 □□
	12000	17	8.5	33.4	77 × 220	ECG2WPR123ME220 □□
		17	8.5	34.6	90 × 170	ECG2WPR123MF170 □□
	15000	14	6.8	39.8	90 × 196	ECG2WPR153MF196 □□
	1000	176	88	6.14	51 × 80	ECG2HPR102MC080 □□
	1200	146	73	7.00	51 × 92	ECG2HPR122MC092 □□
	1500	120	60	8.06	51 × 105	ECG2HPR152MC105 □□
		120	60	8.15	64 × 80	ECG2HPR152MD080 □□
	1800	102	51	9.25	51 × 117	ECG2HPR182MC117 □□
	2200	86	43	10.6	64 × 100	ECG2HPR222MD100 □□
		86	43	11.0	77 × 85	ECG2HPR222ME085 □□
	2700	72	36	12.2	64 × 115	ECG2HPR272MD115 □□
		60	30	14.1	77 × 105	ECG2HPR332ME105 □□
	3300	60	30	14.1	77 × 105	ECG2HPR332ME105 □□
	3900	52	26	16.5	77 × 130	ECG2HPR392ME130 □□
	4700	42	21	18.8	77 × 143	ECG2HPR472ME143 □□
		42	21	19.2	90 × 115	ECG2HPR472MF115 □□
	5600	38	19	21.4	90 × 130	ECG2HPR562MF130 □□
	6800	32	16	24.6	90 × 145	ECG2HPR682MF145 □□
	8200	26	13	28.5	90 × 170	ECG2HPR822MF170 □□
	10000	22	11	32.9	90 × 196	ECG2HPR103MF196 □□
	12000	20	10	34.7	90 × 220	ECG2HPR123MF220 □□

## Lifetime Diagram



Customer products are available on request.



5000h at 85°C

- Extremely compact
- High ripple current & High Reliability
- RoHS Compliant

CD 137S PR → smaller size CD 137U UP



SCREW

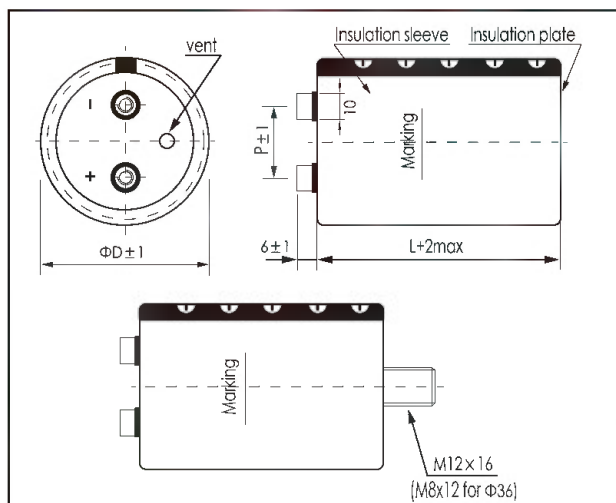
Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +85°C
Rated Voltage Range (V)	400 ~ 450
Capacitance Range (μF)	1800 ~ 22000
Capacitance Tolerance (20°C, 120Hz)	± 20% (M)
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor tanδ (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (Impedance ratio at 120Hz)	$C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ , $C(-40^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.6$

	Useful Life		Load Life	Endurance Test	Shelf Life
Life Time	10000h	≥ 100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 200% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition:	$U_R$ $I_R$ 85°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C

\*Shelf Life test:  $U_R$  to be applied for 60min, >24h before measurement

## Dimensions

mm



ΦD/mm	51	64	77	90
P/mm	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.

\*Max tightening torque for screw terminal: M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.

\*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 400v10000μF)

ECG	2G	UP	103	M	E	130	Y	□	* Terminals
									Mounting Style
									B Bolt Mounting
									Y 3-leg Bracket
									I 2-leg Bracket
									N No Bracket
									Diameter
									Code
									36mm A
									51mm C
									64mm D
									77mm E
									90mm F
									100mm G

## Ripple Current Coefficient

Frequency(Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.18	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures. It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

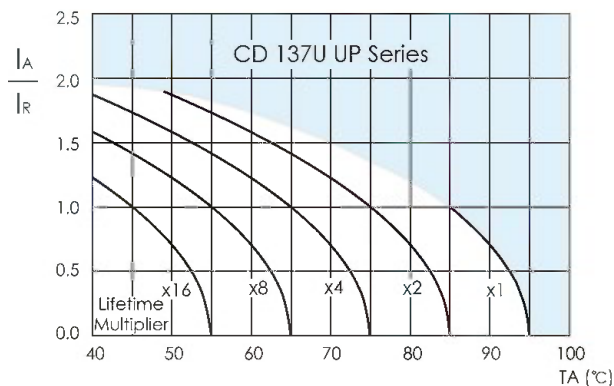


## Ratings for CD 137U UP Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
400 (450) 2G	2200	76	38	7.69	51 × 80	ECG2GUP222MC080□□
	2700	64	32	8.90	51 × 96	ECG2GUP272MC096□□
	3300	52	26	10.3	51 × 105	ECG2GUP332MC105□□
		52	26	10.6	64 × 80	ECG2GUP332MD080□□
	3900	42	21	11.7	51 × 130	ECG2GUP392MC130□□
	4700	36	18	12.9	64 × 100	ECG2GUP472MD100□□
	5600	32	16	14.7	64 × 115	ECG2GUP562MD115□□
	6800	28	14	16.6	64 × 130	ECG2GUP682MD130□□
		28	14	17.5	77 × 105	ECG2GUP682ME105□□
	8200	24	12	19.5	77 × 115	ECG2GUP822ME115□□
	10000	20	10	22.4	77 × 130	ECG2GUP103ME130□□
	12000	16	8	26.3	77 × 155	ECG2GUP123ME155□□
		16	8	27.0	90 × 130	ECG2GUP123MF130□□
	15000	14	7	31.6	77 × 190	ECG2GUP153ME190□□
	18000	12	6	35.4	77 × 220	ECG2GUP183ME220□□
		12	6	36.3	90 × 170	ECG2GUP183MF170□□
450 (500) 2W	22000	9	4.5	39.1	90 × 196	ECG2GUP223MF196□□
	1800	118	59	7.12	51 × 80	ECG2WUP182MC080□□
	2200	96	48	8.30	51 × 96	ECG2WUP222MC096□□
	2700	80	40	9.45	51 × 105	ECG2WUP272MC105□□
		80	40	9.81	64 × 80	ECG2WUP272MD080□□
	3300	66	33	11.0	51 × 130	ECG2WUP332MC130□□
	3900	58	29	12.0	64 × 100	ECG2WUP392MD100□□
	4700	50	25	13.5	64 × 115	ECG2WUP472MD115□□
	5600	44	22	15.5	64 × 130	ECG2WUP562MD130□□
	6800	36	18	19.2	77 × 115	ECG2WUP682ME115□□
	8200	30	15	21.8	77 × 130	ECG2WUP822ME130□□
	10000	24	12	24.9	77 × 155	ECG2WUP103ME155□□
	12000	20	10	28.4	77 × 190	ECG2WUP123ME190□□
	15000	16	8	33.8	77 × 220	ECG2WUP153ME220□□
	18000	14	7	37.0	90 × 196	ECG2WUP182MF196□□

Customer products are available on request.

## Lifetime Diagram

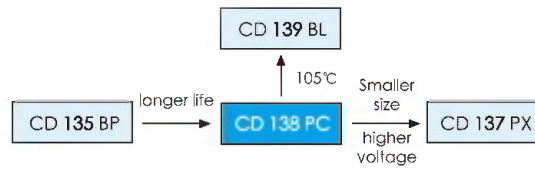


$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



5000h at 85°C

- Features
  - Long Life
  - High Reliability
  - RoHS Compliant
- Applications
  - High Currents for High Professional
  - Power Application and Inverters

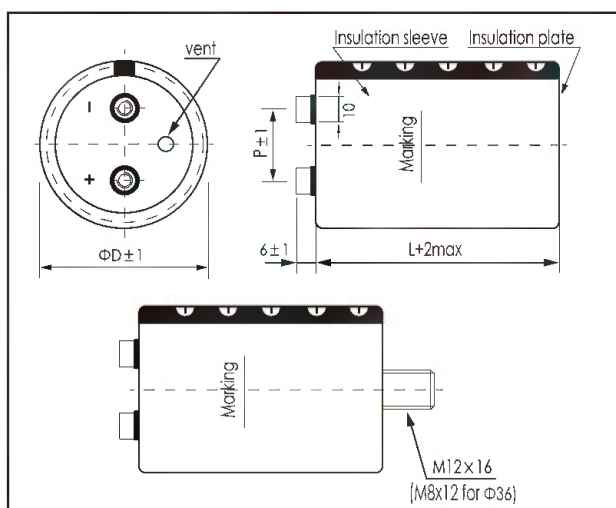


Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +85
Voltage Range (V)	350 ~ 450
Capacitance Range (μF)	1000 ~ 18000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (120Hz)	$C_{-25^{\circ}\text{C}} / C_{+20^{\circ}\text{C}} \geq 0.7$

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>10000h	>100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	After test: $U_R = 0$ $I_R = 0$ 85°C for 60min >24h before measurement

## Dimensions

mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 400v6800μF)

ECG	2G	PC	682	M	E	155	Y	□	* Terminals
									Mounting Style
									Length(155mm)
									Diameter Code
									Capacitance Tolerance(± 20%)
									Rated Capacitance(6800μF)
									Series Code (CD138)
									Rated Voltage
									Electrolytic Capacitor Screw Type

## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



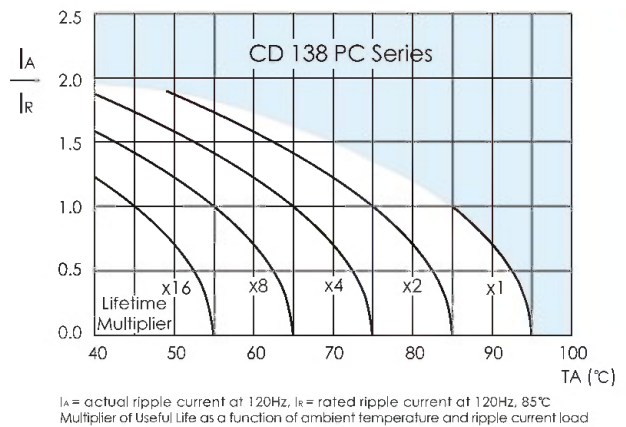
## Ratings for CD 138 PC Series

$U_R$ (Surge Voltage) Code	Rated Capa- cance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	1200	215	67	5.50	51 x 83	ECG2VPC122MC083□□
	1500	172	55	6.10	51 x 83	ECG2VPC152MC083□□
	1800	143	43	7.40	51 x 96	ECG2VPC182MC096□□
	2200	117	30	8.20	51 x 96	ECG2VPC222MC096□□
	2700	96	27	10.20	51 x 130	ECG2VPC272MC130□□
	3300	78	23	11.30	51 x 130	ECG2VPC332MC130□□
	3900	66	19	12.80	64 x 115	ECG2VPC392MD115□□
	4700	55	16	14.80	64 x 130	ECG2VPC472MD130□□
	5600	46	14	16.30	77 x 115	ECG2VPC562ME115□□
	6800	38	13	18.80	77 x 130	ECG2VPC682ME130□□
	8200	31	11	22.10	77 x 155	ECG2VPC822ME155□□
	10000	26	10	25.90	90 x 157	ECG2VPC103MF157□□
	12000	22	8	28.40	90 x 157	ECG2VPC123MF157□□
	15000	17	6	34.60	90 x 196	ECG2VPC153MF196□□
	18000	14	4	41.40	90 x 236	ECG2VPC183MF236□□
400 (450) 2G	1000	215	82	5.00	51 x 83	ECG2GPC102MC083□□
	1200	179	70	5.50	51 x 83	ECG2GPC122MC083□□
	1500	143	50	6.70	51 x 96	ECG2GPC152MC096□□
	1800	119	40	7.40	51 x 96	ECG2GPC182MC096□□
	2200	98	28	9.20	51 x 130	ECG2GPC222MC130□□
	2700	80	23	9.90	64 x 96	ECG2GPC272MD096□□
	3300	65	21	11.80	64 x 115	ECG2GPC332MD115□□
	3900	55	19	13.50	64 x 130	ECG2GPC392MD130□□
	4700	46	15	14.90	77 x 115	ECG2GPC472ME115□□
	5600	39	14	17.00	77 x 130	ECG2GPC562ME130□□
	6800	32	13	20.20	77 x 155	ECG2GPC682ME155□□
	8200	26	12	23.50	90 x 157	ECG2GPC822MF157□□
	10000	22	10	25.90	90 x 157	ECG2GPC103MF157□□
	12000	18	8	31.00	90 x 196	ECG2GPC123MF196□□
	15000	14	6	37.50	90 x 236	ECG2GPC153MF236□□
450 (500) 2W	1000	215	93	5.00	51 x 83	ECG2WPC102MC083□□
	1200	179	69	6.00	51 x 96	ECG2WPC122MC096□□
	1500	143	56	7.20	51 x 115	ECG2WPC152MC115□□
	1800	119	45	8.30	51 x 130	ECG2WPC182MC130□□
	2200	98	35	9.00	64 x 96	ECG2WPC222MD096□□
	2700	80	30	10.70	64 x 115	ECG2WPC272MD115□□
	3300	65	24	12.40	64 x 130	ECG2WPC332MD130□□
	3900	55	20	13.60	77 x 115	ECG2WPC392ME115□□
	4700	46	16	15.60	77 x 130	ECG2WPC472ME130□□
	5600	38	13	18.30	77 x 155	ECG2WPC562ME155□□
	6800	32	11	21.40	90 x 157	ECG2WPC682MF157□□
	8200	26	10	23.50	90 x 157	ECG2WPC822MF157□□
	10000	22	9	28.30	90 x 196	ECG2WPC103MF196□□
	12000	18	8	33.60	90 x 236	ECG2WPC123MF236□□

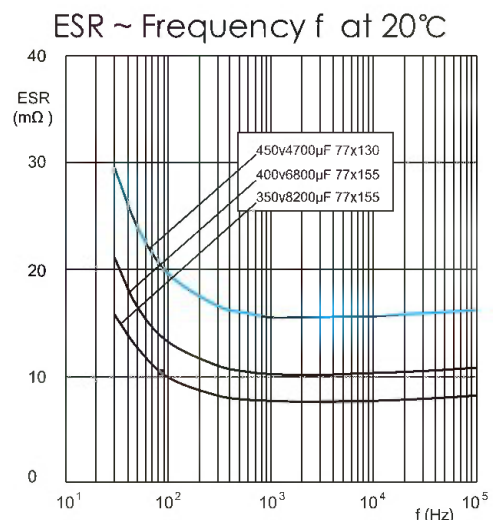
Mounting code["B" for bolt mounting, "Y/I/N" for bracket mounting]  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.

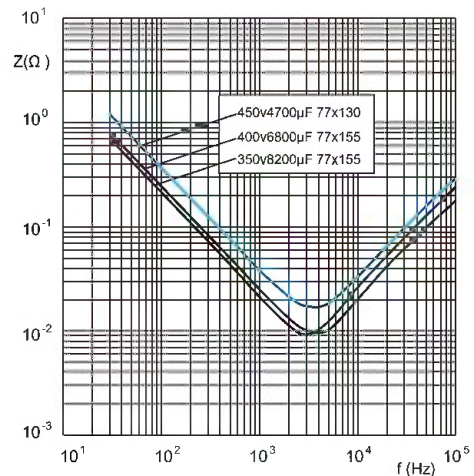
## Lifetime Diagram



## Typical Curves



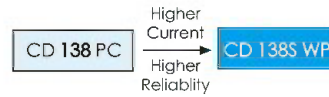
## Impedance Z ~ Frequency f at 20°C





10000h at 85°C

- Features
  - Higher ripple current
  - Long useful life & High Reliability
  - RoHS Compliant
- Applications
  - For Professional Power application and Inverters

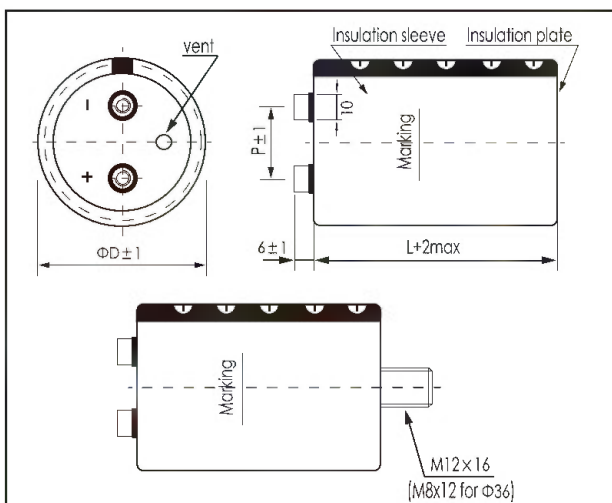


Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +85
Voltage Range (V)	350 ~ 500
Capacitance Range (μF)	1500 ~ 12000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (120Hz)	$C_{-25^{\circ}\text{C}} / C_{+20^{\circ}\text{C}} \geq 0.7$

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	15000h	>250000h	10000h	12000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

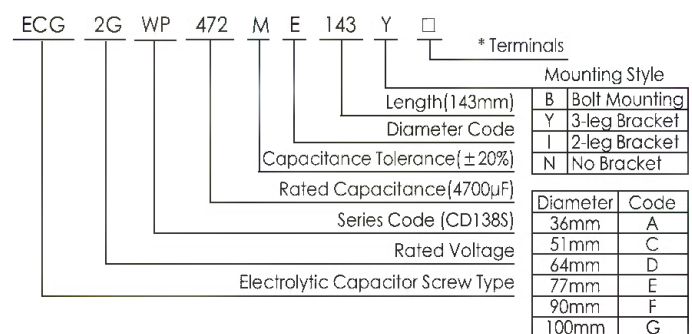
mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
 Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately.  
 See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v4700μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



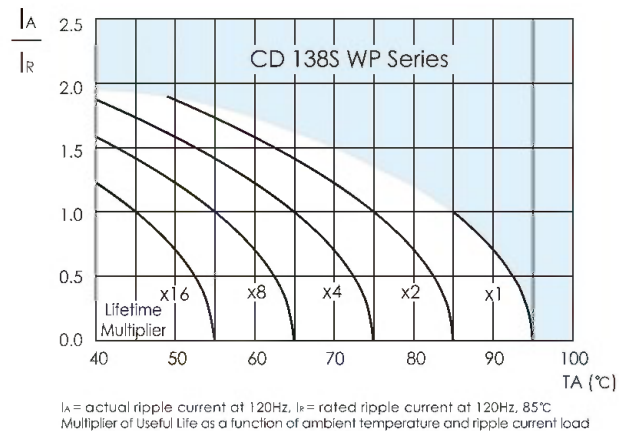
## Ratings for CD 138S WP Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	3900	50	25	14.6	64 x 96	ECG2VWP392MD096□□
	4700	40	20	16.9	64 x 115	ECG2VWP472MD115□□
	5600	34	17	19.8	64 x 130	ECG2VWP562MD130□□
	5600	34	17	21.6	77 x 115	ECG2VWP562ME115□□
	6800	28	14	25.0	77 x 143	ECG2VWP682ME143□□
	6800	28	14	26.2	90 x 105	ECG2VWP682MF105□□
	8200	24	12	29.3	77 x 143	ECG2VWP822ME143□□
	8200	24	12	30.1	77 x 155	ECG2VWP822ME155□□
	10000	18	9	35.7	90 x 157	ECG2VWP103MF157□□
	12000	16	8	39.1	90 x 157	ECG2VWP123MF157□□
400 (450) 2G	2700	76	38	11.5	64 x 96	ECG2GWP272MD096□□
	3300	60	30	14.2	64 x 115	ECG2GWP332MD115□□
	3900	52	26	16.5	64 x 115	ECG2GWP392MD115□□
	3900	52	26	17.2	77 x 105	ECG2GWP392ME105□□
	4700	42	21	18.1	64 x 130	ECG2GWP472MD130□□
	4700	42	21	20.8	77 x 115	ECG2GWP472ME115□□
	5600	36	18	22.7	77 x 130	ECG2GWP562ME130□□
	5600	36	18	23.8	90 x 105	ECG2GWP562MF105□□
	6800	30	15	26.6	77 x 155	ECG2GWP682ME155□□
	6800	30	15	27.4	90 x 130	ECG2GWP682MF130□□
	8200	24	12	32.2	90 x 157	ECG2GWP822MF157□□
	10000	20	10	35.7	90 x 157	ECG2GWP103MF157□□
	2200	92	46	10.4	64 x 96	ECG2WWP222MD096□□
	2200	92	46	11.5	77 x 80	ECG2WWP222ME080□□
450 (500) 2W	2700	76	38	12.8	64 x 115	ECG2WWP272MD115□□
	3300	60	30	15.2	64 x 130	ECG2WWP332MD130□□
	3300	60	30	15.8	77 x 105	ECG2WWP332ME105□□
	3900	54	27	16.5	64 x 130	ECG2WWP392MD130□□
	3900	54	27	18.0	77 x 115	ECG2WWP392ME115□□
	4700	42	21	20.8	77 x 143	ECG2WWP472ME143□□
	4700	42	21	21.8	90 x 105	ECG2WWP472MF105□□
	5600	36	18	24.2	77 x 143	ECG2WWP562ME143□□
	5600	36	18	24.9	90 x 130	ECG2WWP562MF130□□
	6800	30	15	29.4	90 x 157	ECG2WWP682MF157□□
	8200	24	12	32.2	90 x 157	ECG2WWP822MF157□□
	10000	20	10	36.9	90 x 171	ECG2WWP103MF171□□
500 (550) 2H	1500	148	74	8.6	64 x 96	ECG2HWP152MD096□□
	1800	132	62	10.0	64 x 115	ECG2HWP182MD115□□
	2200	102	51	11.7	64 x 130	ECG2HWP222MD130□□
	2700	82	41	15.0	77 x 115	ECG2HWP272ME115□□
	3300	68	34	17.5	77 x 130	ECG2HWP332ME130□□
	3900	58	29	20.2	77 x 143	ECG2HWP392ME143□□
	4700	48	24	21.8	90 x 130	ECG2HWP472MF130□□
	5600	40	20	25.3	90 x 157	ECG2HWP562MF157□□
	6800	32	16	29.0	90 x 171	ECG2HWP682MF171□□

Mounting code{" B" for bolt mounting, "Y/I/N" for bracket mounting }  
Terminal options(A,B,C see "Dimensions" for details.)

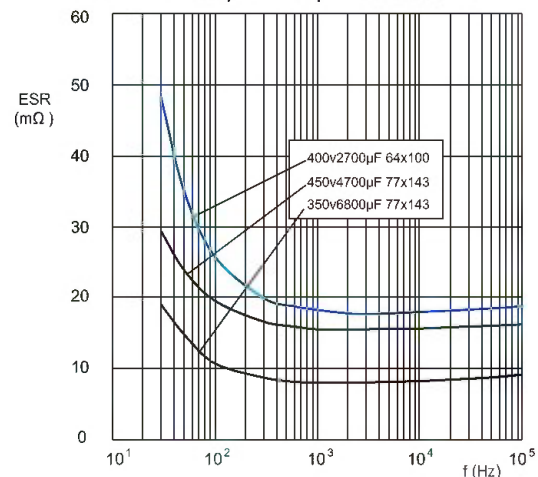
Customer products are available on request.

## Lifetime Diagram

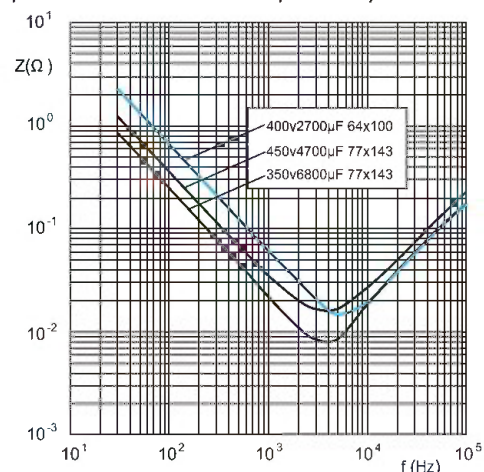


## Typical Curves

### ESR ~ Frequency f at 20°C



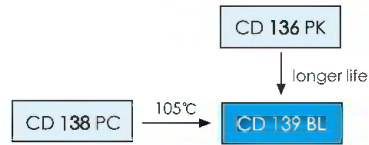
### Impedance Z ~ Frequency f at 20°C





5000h at 105°C

- Features
  - Long Useful Life at 105°C
  - RoHS Compliant
- Applications
  - Highest Professional Power
  - Application

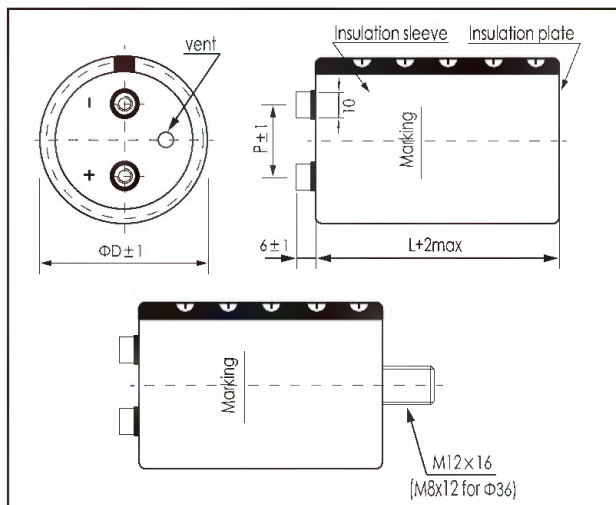


Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +105
Voltage Range (V)	350 ~ 450
Capacitance Range (μF)	1000 ~ 15000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (120Hz)	$C_{-25^{\circ}\text{C}} / C_{+20^{\circ}\text{C}} \geq 0.7$

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>9000h	>200000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v2700μF)

ECG	2W	BL	272	M	D	130	Y	□	* Terminals
									Mounting Style
									B Bolt Mounting
									Y 3-leg Bracket
									I 2-leg Bracket
									N No Bracket
									Diameter
									36mm A
									51mm C
									64mm D
									77mm E
									90mm F
									100mm G

## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85	105
Coefficient	2.44	2.16	2.00	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



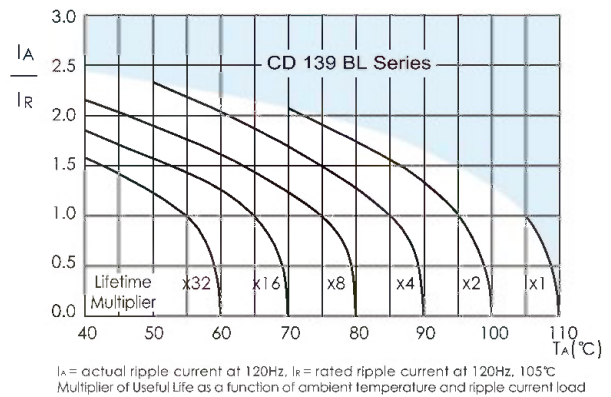
## Ratings for CD 139 BL Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
350 (400) 2V	1000	259	69	3.9	51 × 75	ECG2VBL102MC075□□
	1200	215	65	4.2	51 × 75	ECG2VBL122MC075□□
	1500	172	55	5.2	51 × 96	ECG2VBL152MC096□□
	1800	143	43	5.7	51 × 96	ECG2VBL182MC096□□
	2200	117	30	7.1	51 × 130	ECG2VBL222MC130□□
	2700	96	27	7.7	64 × 96	ECG2VBL272MD096□□
	3300	78	23	9.1	64 × 115	ECG2VBL332MD115□□
	3900	66	19	10.4	64 × 130	ECG2VBL392MD130□□
	4700	55	15	12.2	64 × 155	ECG2VBL472MD155□□
		55	16	11.5	77 × 115	ECG2VBL472ME115□□
	5600	46	13	14.6	64 × 195	ECG2VBL562MD195□□
		46	14	13.1	77 × 130	ECG2VBL562ME130□□
	6800	38	13	15.5	77 × 155	ECG2VBL682ME155□□
	8200	31	11	18.1	90 × 157	ECG2VBL822MF157□□
	10000	26	10	19.9	90 × 157	ECG2VBL103MF157□□
400 (450) 2G	12000	22	8	23.8	90 × 196	ECG2VBL123MF196□□
	15000	17	6	28.8	90 × 236	ECG2VBL153MF236□□
	1000	215	70	3.9	51 × 75	ECG2GBL102MC075□□
	1200	179	64	4.6	51 × 96	ECG2GBL122MC096□□
	1500	143	54	5.6	51 × 115	ECG2GBL152MC115□□
	1800	119	43	6.4	51 × 130	ECG2GBL182MC130□□
	2200	98	41	6.9	64 × 96	ECG2GBL222MD096□□
	2700	80	38	8.2	64 × 115	ECG2GBL272MD115□□
	3300	65	29	9.5	64 × 130	ECG2GBL332MD130□□
	3900	55	26	11.1	64 × 155	ECG2GBL392MD155□□
		55	28	10.4	77 × 115	ECG2GBL392ME115□□
	4700	46	20	13.4	64 × 195	ECG2GBL472MD195□□
		46	22	12.0	77 × 130	ECG2GBL472ME130□□
	5600	39	19	14.6	64 × 195	ECG2GBL562MD195□□
		39	19	14.0	77 × 155	ECG2GBL562ME155□□
450 (500) 2W	6800	32	17	16.5	90 × 157	ECG2GBL682MF157□□
	8200	26	15	18.1	90 × 157	ECG2GBL822MF157□□
	10000	22	12	21.7	90 × 196	ECG2GBL103MF196□□
	12000	18	8	25.8	90 × 236	ECG2GBL123MF236□□
	1000	215	70	4.2	51 × 96	ECG2WBL102MC096□□
	1200	179	66	5.0	51 × 115	ECG2WBL122MC115□□
	1500	143	54	5.9	51 × 130	ECG2WBL152MC130□□
	1800	119	44	6.3	64 × 96	ECG2WBL182MD096□□
	2200	98	42	7.4	64 × 115	ECG2WBL222MD115□□
	2700	80	40	8.6	64 × 130	ECG2WBL272MD130□□
	2700	80	42	8.7	77 × 115	ECG2WBL272ME115□□
	3300	65	31	10.2	64 × 155	ECG2WBL332MD155□□
		65	35	10.1	77 × 130	ECG2WBL332ME130□□
	3900	55	28	12.3	64 × 195	ECG2WBL392MD195□□
	4700	46	25	12.9	77 × 155	ECG2WBL472ME155□□
	5600	38	22	15.4	77 × 195	ECG2WBL562ME195□□
		38	24	14.9	90 × 157	ECG2WBL562MF157□□
	6800	32	21	18.0	90 × 196	ECG2WBL682MF196□□
	8200	27	18	19.8	90 × 196	ECG2WBL822MF196□□
	10000	22	16	23.6	90 × 236	ECG2WBL103MF236□□

Mounting code("B" for bolt mounting, "Y/I/N" for bracket mounting)  
Terminal options(A,B,C see "Dimensions" for details.)

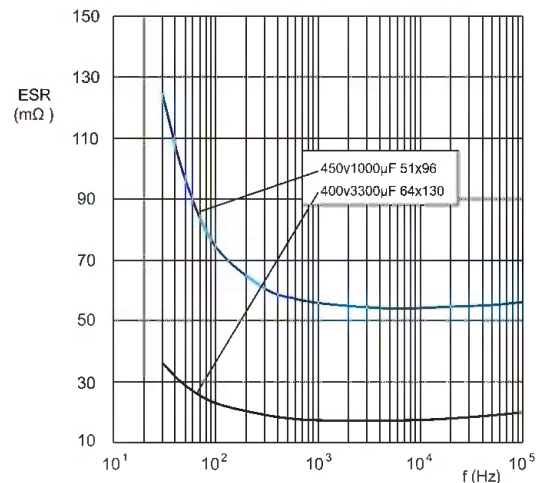
Customer products are available on request.

## Lifetime Diagram

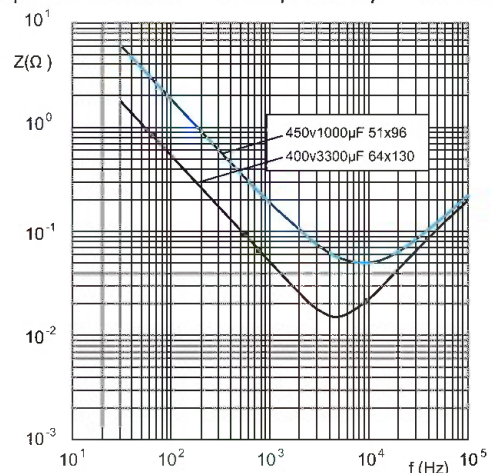


## Typical Curves

### ESR ~ Frequency f at 20°C



### Impedance Z ~ Frequency f at 20°C





5000h at 105°C

## Features

- Long Useful Life at 105°C
- Higher current and High Reliability
- RoHS Compliant

## Applications

- Highest Professional Power
- Application

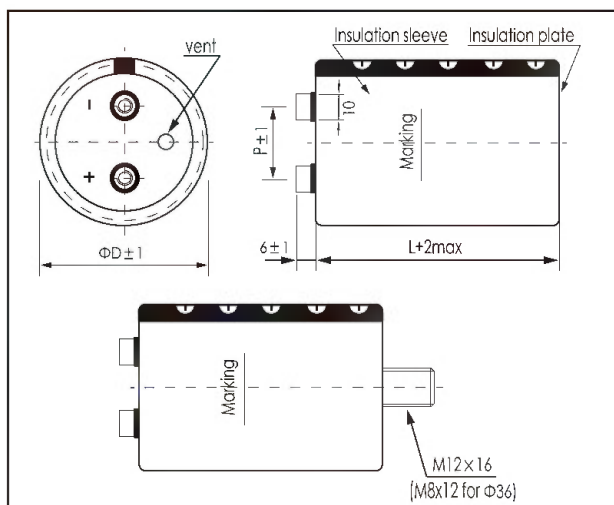


Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +105
Voltage Range (V)	350 ~ 450
Capacitance Range (μF)	2200 ~ 15000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (120Hz)	$C_{-25^{\circ}\text{C}} / C_{+20^{\circ}\text{C}} \geq 0.7$

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>9000h	>200000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

mm



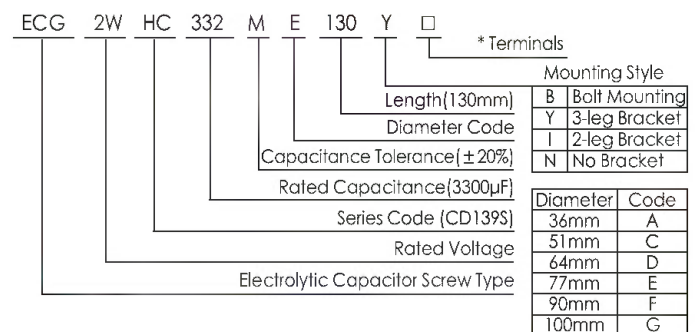
ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.

\*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.

\*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v3300μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85	105
Coefficient	2.44	2.16	2.00	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.

It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



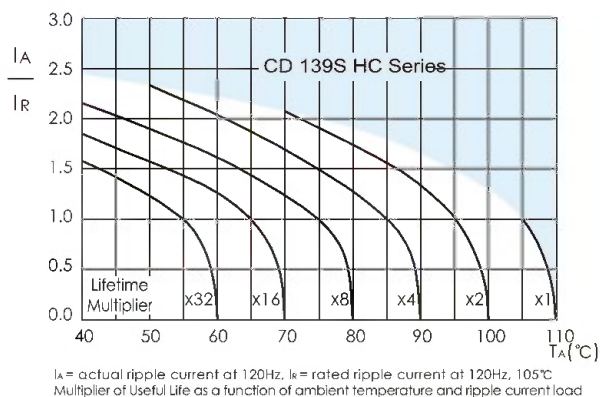
## Ratings for CD 139S HC Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	3300	55	23	14.4	64×115	ECG2VHC332MD115□□
	3900	46	19	16.6	64×130	ECG2VHC392MD130□□
	4700	39	17	19.8	64×155	ECG2VHC472MD155□□
	4700	39	17	19.1	77×115	ECG2VHC472ME115□□
	5600	32	14	21.9	77×130	ECG2VHC562ME130□□
	6800	27	12	26.2	77×155	ECG2VHC682ME155□□
	8200	22	11	29.3	90×157	ECG2VHC822MF157□□
	10000	18	10	32.3	90×157	ECG2VHC103MF157□□
	12000	15	8	39.0	90×196	ECG2VHC123MF196□□
400 (450) 2G	2700	56	28	13.1	64×115	ECG2GHC272MD115□□
	3300	46	23	15.2	64×130	ECG2GHC332MD130□□
	3900	39	21	17.9	64×155	ECG2GHC392MD155□□
	3900	39	21	18.2	77×115	ECG2GHC392ME115□□
	4700	32	17	20.1	77×130	ECG2GHC472ME130□□
	5600	27	15	23.8	77×155	ECG2GHC562ME155□□
	6800	22	13	26.7	90×157	ECG2GHC682MF157□□
	8200	18	11	29.3	90×157	ECG2GHC822MF157□□
	10000	15	9	35.6	90×196	ECG2GHC103MF196□□
450 (500) 2W	2200	69	38	11.8	64×115	ECG2WHC222MD115□□
	2700	56	31	13.7	64×130	ECG2WHC272MD130□□
	2700	56	31	14.5	77×115	ECG2WHC272ME115□□
	3300	46	23	16.5	64×155	ECG2WHC332MD155□□
	3300	46	25	16.9	77×130	ECG2WHC332ME130□□
	4700	32	18	21.7	77×155	ECG2WHC472ME155□□
	5600	27	16	26.4	77×195	ECG2WHC562ME195□□
	5600	27	16	24.2	90×157	ECG2WHC562MF157□□
	6800	22	14	29.5	90×196	ECG2WHC682MF196□□
	8200	19	12	32.4	90×196	ECG2WHC822MF196□□

Mounting code( "B" for bolt mounting, "Y//N" for bracket mounting )  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.

## Lifetime Diagram





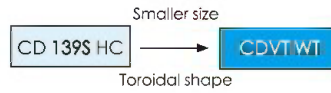
5000h at 105°C, 20000h at 85°C

## Features

- Long Life, Smaller size
- High reliability, Large can toroidal design
- RoHS Compliant

## Applications

- Highest currents for high professional power application and inverters.

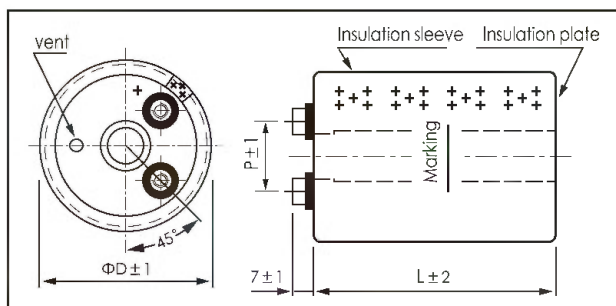


Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +105
Voltage Range (V)	350 ~ 500
Capacitance Range (μF)	680 ~ 10000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 7 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Vibration Rating	10-55Hz, 10g sinusoidal in three axis, 2 hours per axis.

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>9000h	>20000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

mm



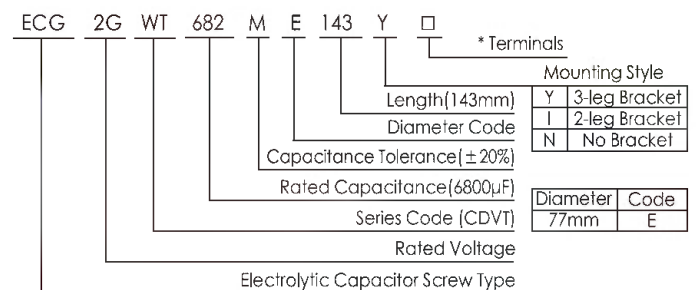
ΦD/mm	77
P/mm	31.8

\*Hex head screw M5 x 10 are standard screws.  
Other screws are available on request.

\*Max tightening torque for screw terminal M5: 3Nm.  
Max torque for bolt mounting M12: 12.5Nm.

\*Screws, Bracket and cap nut will be delivered separately.  
See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v22000μF)



## Ripple Current Coefficient

Frequency(Hz)	50/60	120	300	1K	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	45	65	85	105
Coefficient	2.45	2.12	1.73	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



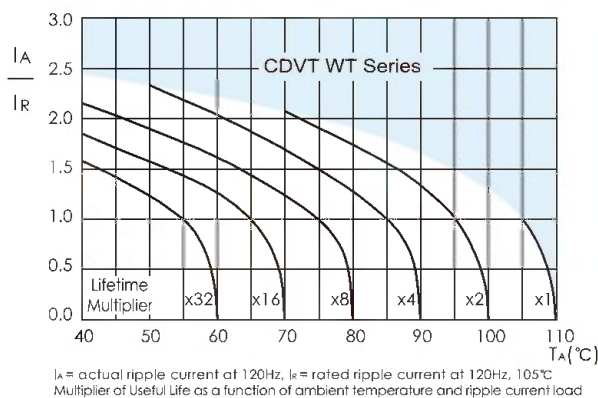
## Ratings for CDVT WT Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 25°C, 120Hz	Typ ESR 25°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	1800	47.3	31.2	11.8	77×54	ECG2VWT182E054□□
	2700	31.9	21.1	15.4	77×67	ECG2VWT272E067□□
	3300	26.4	17.4	17.1	77×79	ECG2VWT332E079□□
	4700	18.7	12.3	21.6	77×92	ECG2VWT472E092□□
	5600	15.4	10.2	24.9	77×105	ECG2VWT562E105□□
	6800	13.2	8.7	30.2	77×130	ECG2VWT682E130□□
	8200	11.0	7.3	34.5	77×143	ECG2VWT822E143□□
	10000	8.8	5.8	41.0	77×168	ECG2VWT103E168□□
400 (450) 2G	1500	58.3	38.5	10.7	77×54	ECG2GWT152E054□□
	2200	39.6	26.1	13.9	77×67	ECG2GWT222E067□□
	2700	33.0	21.8	15.4	77×79	ECG2GWT272E079□□
	3300	26.4	17.4	18.1	77×92	ECG2GWT332E092□□
	3900	23.1	15.2	20.8	77×105	ECG2GWT392E105□□
	4700	18.7	12.3	24.0	77×117	ECG2GWT472E117□□
	5600	15.4	10.2	27.4	77×130	ECG2GWT562E130□□
	6800	13.2	8.7	31.4	77×143	ECG2GWT682E143□□
420 (470) 2X	8200	11.0	7.3	37.1	77×168	ECG2GWT822E168□□
	1200	97.9	64.6	9.3	77×54	ECG2XWT122E054□□
	1800	64.9	42.8	12.2	77×67	ECG2XWT182E067□□
	2200	44.0	29.0	14.9	77×79	ECG2XWT222E079□□
	3300	35.2	23.2	17.5	77×92	ECG2XWT332E092□□
	3900	29.7	19.6	20.1	77×105	ECG2XWT392E105□□
	4700	25.3	16.7	24.2	77×130	ECG2XWT472E130□□
	5600	20.9	13.8	27.6	77×143	ECG2XWT562E143□□
450 (500) 2W	6800	17.6	11.6	32.7	77×168	ECG2XWT682E168□□
	1000	97.9	64.6	9.3	77×54	ECG2WWT102E054□□
	1500	64.9	42.8	12.2	77×67	ECG2WWT152E067□□
	2200	52.8	34.8	13.5	77×79	ECG2WWT222E079□□
	2700	44.0	29.0	15.9	77×92	ECG2WWT272E092□□
	3300	35.2	23.2	18.5	77×105	ECG2WWT332E105□□
	3900	29.7	19.6	21.1	77×117	ECG2WWT392E117□□
	4700	25.3	16.7	24.2	77×130	ECG2WWT472E130□□
500 (550) 2H	5600	20.9	13.8	28.6	77×155	ECG2WWT562E155□□
	680	226.6	149.6	6.5	77×54	ECG2HWT681E054□□
	1000	154.0	101.6	8.4	77×67	ECG2HWT102E067□□
	1500	102.3	67.5	10.3	77×79	ECG2HWT152E079□□
	1800	85.8	56.6	12.0	77×92	ECG2HWT182E092□□
	2200	70.4	46.5	14.0	77×105	ECG2HWT222E105□□
	2700	57.2	37.8	16.3	77×117	ECG2HWT272E117□□
	3300	46.2	30.5	19.6	77×143	ECG2HWT332E143□□
	3900	39.6	26.1	22.1	77×168	ECG2HWT392E168□□

Mounting code( "B" for bolt mounting, "Y/I/N" for bracket mounting )  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.

## Lifetime Diagram





2000h at 85°C

- Features
  - 600V to 650V standard at 85°C
  - RoHS Compliant
- Applications
  - High Professional Inverters and Power Supplies



## Specifications

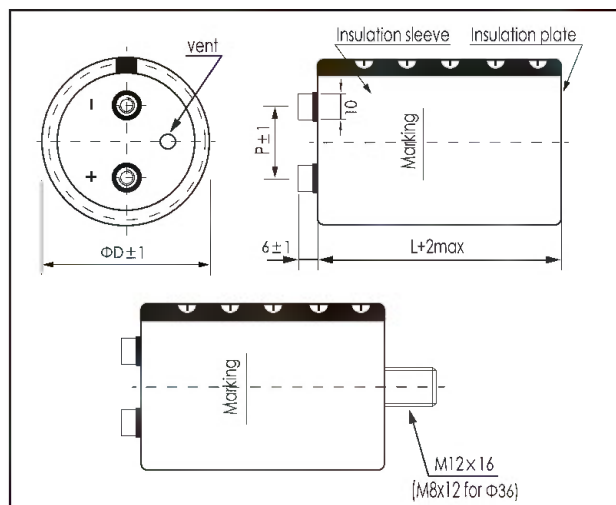
Items	Characteristics
Operating Temperature Range	-25 ~ +85°C
Rated Voltage $U_R$	600 ~ 650V <sub>dc</sub>
Capacitance Range	1000 ~ 5000μF
Capacitance Tolerance	± 20% (M) (at 20°C, 120Hz)
Leakage Current $I_L$	$I_L = 0.01 C_R U_R$ (μA) or 5mA, whichever is smaller. ( $C_R$ : Nominal Capacitance, in μF) (at 20°C, 5minutes)
Dissipation Factor $\tan \delta$	0.25 max (at 20°C, 120Hz)

	Useful Life		Load Life	Endurance Life	Shelf Life
Lifetime	>4000h	>65000h	2000h	2000h	500h
Leakage Current $I_L$	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change $\Delta C$	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor $\tan \delta$	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition:	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ 85°C	85°C

\*Shelf Life test:  $U_R$  to be applied for 60min, >24h before measurement

## Dimensions

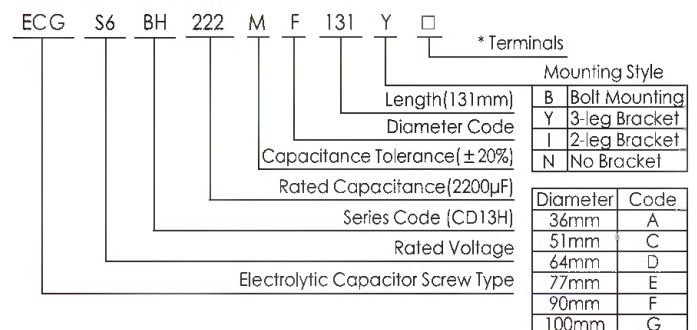
mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 650v2200μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



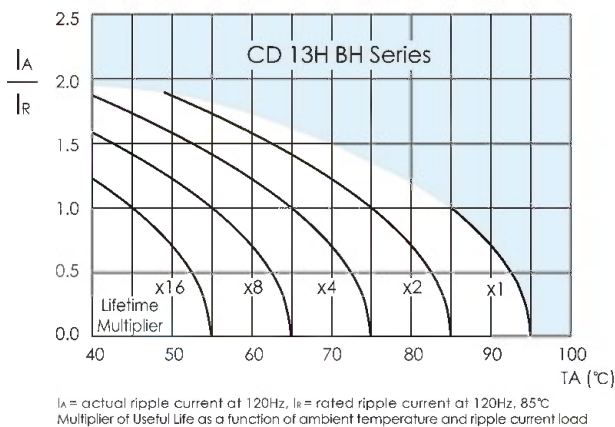
## Ratings for CD 13H BH Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
600 (650) 2S	1200	242	121	7.7	64×96	ECG2SBH122MD096□□
	1500	224	112	9.3	64×115	ECG2SBH152MD115□□
	1800	194	97	10.1	77×96	ECG2SBH182ME096□□
	2200	162	81	12.0	77×115	ECG2SBH222ME115□□
	2700	132	66	14.0	77×130	ECG2SBH272ME130□□
	3300	88	44	16.4	77×155	ECG2SBH332ME155□□
	3300	88	44	16.4	90×131	ECG2SBH332MF131□□
	3900	74	37	17.8	90×131	ECG2SBH392MF131□□
	4700	62	31	21.0	90×157	ECG2SBH472MF157□□
	5600	56	28	24.5	90×196	ECG2SBH562MF196□□
650 (700) S6	1000	300	150	6.0	64×130	ECGS6BH102ME130□□
	1200	266	133	6.7	77×115	ECGS6BH122ME115□□
	1500	212	106	8.1	77×130	ECGS6BH152ME130□□
	1800	176	88	9.8	77×155	ECGS6BH182ME155□□
	2200	144	72	10.7	90×131	ECGS6BH222MF131□□
	2700	128	64	12.8	90×157	ECGS6BH272MF157□□
	3300	106	53	14.7	90×171	ECGS6BH332MF171□□
	3900	94	47	17.9	90×196	ECGS6BH392MF196□□
	4700	78	39	21.6	90×196	ECGS6BH472MF196□□
	5600	70	35	24.9	101×220	ECGS6BH562MG220□□

Mounting code( "B" for bolt mounting, "Y/I/N" for bracket mounting )  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.

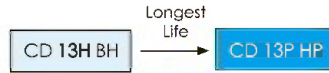
## Lifetime Diagram





5000h at 85°C

- Features
  - 600V with 5000h at 85°C
  - RoHS Compliant
- Applications
  - High Professional Inverters and Power Supplies



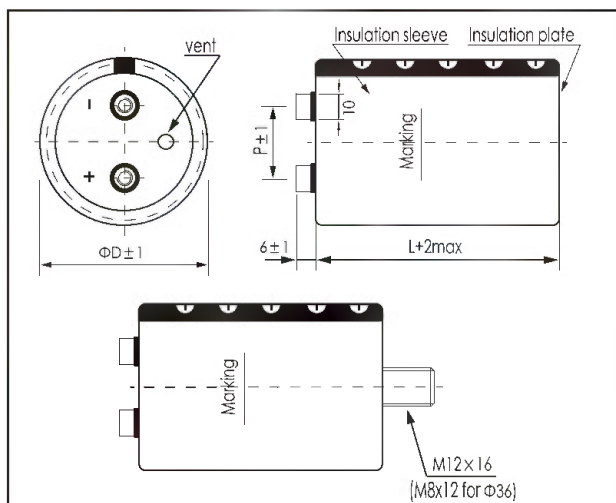
SCREW

Items	Characteristics
Operating Temperature Range (°C)	-25 ~ +85
Voltage Range (V)	600
Capacitance Range (μF)	1000 ~ 5600
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.25

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>10000h	>100000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

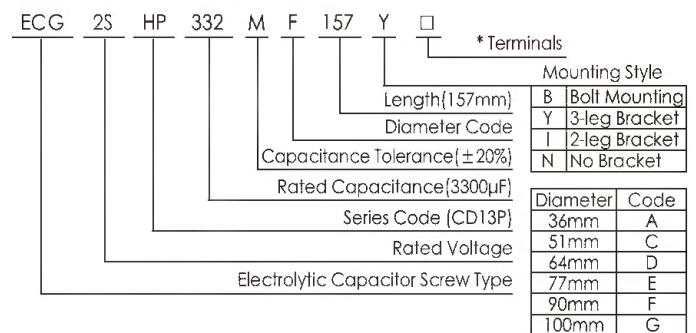
mm



$\phi D/mm$	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 600v3300μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



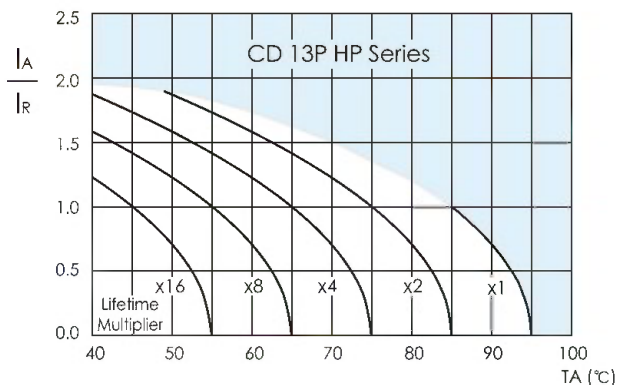
## Ratings for CD 13P HP Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
600 (650) 2S	1000	210	105	5.4	64×130	ECG2SHP102MD130□□
	1200	188	94	6.1	77×115	ECG2SHP122ME115□□
	1500	150	75	7.3	77×130	ECG2SHP152ME130□□
	1800	124	62	8.9	77×155	ECG2SHP182ME155□□
	2200	102	51	9.7	90×131	ECG2SHP222MF131□□
	2700	90	45	11.6	90×157	ECG2SHP272MF157□□
	3300	76	38	13.4	90×171	ECG2SHP332MF171□□
	3900	66	33	16.2	90×196	ECG2SHP392MF196□□
	4700	56	28	19.5	90×196	ECG2SHP472MF196□□
	5600	50	25	22.5	101×220	ECG2SHP562MG220□□

Mounting code{ "B" for bolt mounting, "Y/I/N" for bracket mounting }  
Terminal options{A,B,C see "Dimensions" for details.}

Customer products are available on request.

## Lifetime Diagram

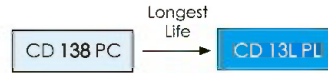


$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



20000h at 85°C

- Features
  - Longest useful life
  - High Reliability
  - RoHS Compliant
- Applications
  - Highest Professional Power
  - Application



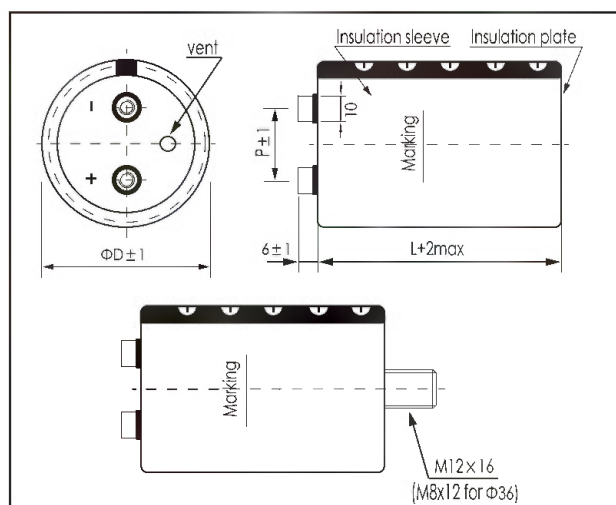
SCREW

Items	Characteristics
Operating Temperature Range (°C)	-40 ~ +85
Voltage Range (V)	350 ~ 450
Capacitance Range (μF)	1000 ~ 15000
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (120Hz)	$C_{-25^{\circ}\text{C}} / C_{+20^{\circ}\text{C}} \geq 0.7$

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	>25000h	>250000h	20000h	20000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 10% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 60min >24h before measurement

## Dimensions

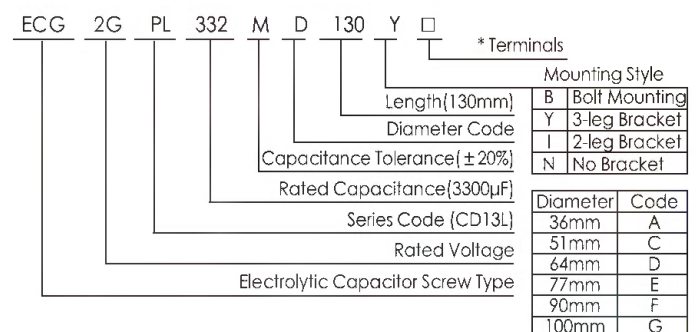
mm



$\phi D/\text{mm}$	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

## Part Number System (Ex: 400v3300μF)



## Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



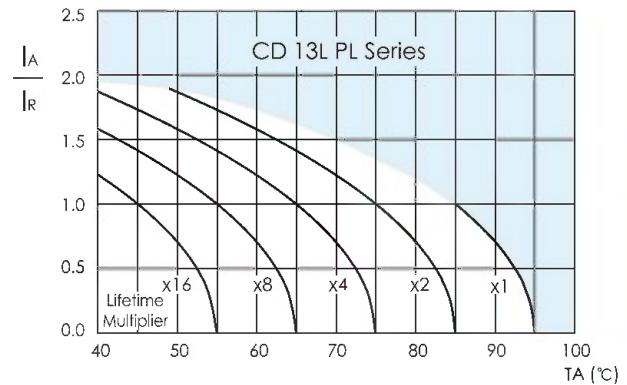
## Ratings for CD 13L PL Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	-
350 (400) 2V	1000	259	69	3.9	51 x 75	ECG2VPL102MC075□□
	1200	215	65	4.2	51 x 75	ECG2VPL122MC075□□
	1500	172	55	5.2	51 x 96	ECG2VPL152MC096□□
	1800	143	43	5.7	51 x 96	ECG2VPL182MC096□□
	2200	117	30	7.1	51 x 130	ECG2VPL222MC130□□
	2700	96	27	7.7	64 x 96	ECG2VPL272MD096□□
	3300	78	23	9.1	64 x 115	ECG2VPL332MD115□□
	3900	66	19	10.4	64 x 130	ECG2VPL392MD130□□
	4700	55	15	12.2	64 x 155	ECG2VPL472MD155□□
		55	16	11.5	77 x 115	ECG2VPL472ME115□□
	5600	46	13	14.6	64 x 195	ECG2VPL562MD195□□
		46	14	13.1	77 x 130	ECG2VPL562ME130□□
	6800	38	13	15.5	77 x 155	ECG2VPL682ME155□□
	8200	31	11	18.1	90 x 157	ECG2VPL822MF157□□
	10000	26	10	19.9	90 x 157	ECG2VPL103MF157□□
	12000	22	8	23.8	90 x 196	ECG2VPL123MF196□□
	15000	17	6	28.8	90 x 236	ECG2VPL153MF236□□
400 (450) 2G	1000	215	70	3.9	51 x 75	ECG2GPL102MC075□□
	1200	179	64	4.6	51 x 96	ECG2GPL122MC096□□
	1500	143	54	5.6	51 x 115	ECG2GPL152MC115□□
	1800	119	43	6.4	51 x 130	ECG2GPL182MC130□□
	2200	98	41	6.9	64 x 96	ECG2GPL222MD096□□
	2700	80	38	8.2	64 x 115	ECG2GPL272MD115□□
	3300	65	29	9.5	64 x 130	ECG2GPL332MD130□□
	3900	55	26	11.1	64 x 155	ECG2GPL392MD155□□
		55	28	10.4	77 x 115	ECG2GPL392ME115□□
	4700	46	20	13.4	64 x 195	ECG2GPL472MD195□□
		46	22	12.0	77 x 130	ECG2GPL472ME130□□
	5600	39	19	14.6	64 x 195	ECG2GPL562MD195□□
		39	19	14.0	77 x 155	ECG2GPL562ME155□□
	6800	32	17	16.5	90 x 157	ECG2GPL682MF157□□
	8200	26	15	18.1	90 x 157	ECG2GPL822MF157□□
	10000	22	12	21.7	90 x 196	ECG2GPL103MF196□□
	12000	18	8	25.8	90 x 236	ECG2GPL123MF236□□
450 (500) 2W	1000	215	70	4.2	51 x 96	ECG2WPL102MC096□□
	1200	179	66	5.0	51 x 115	ECG2WPL122MC115□□
	1500	143	54	5.9	51 x 130	ECG2WPL152MC130□□
	1800	119	44	6.3	64 x 96	ECG2WPL182MD096□□
	2200	98	42	7.4	64 x 115	ECG2WPL222MD115□□
	2700	80	40	8.6	64 x 130	ECG2WPL272MD130□□
	2700	80	42	8.7	77 x 115	ECG2WPL272ME115□□
		65	31	10.2	64 x 155	ECG2WPL332MD155□□
	3300	65	35	10.1	77 x 130	ECG2WPL332ME130□□
		55	28	12.3	64 x 195	ECG2WPL392MD195□□
	4700	46	25	12.9	77 x 155	ECG2WPL472ME155□□
	5600	38	22	15.4	77 x 195	ECG2WPL562ME195□□
		38	24	14.9	90 x 157	ECG2WPL562MF157□□
	6800	32	21	18.0	90 x 196	ECG2WPL682MF196□□
	8200	27	18	19.8	90 x 196	ECG2WPL822MF196□□
	10000	22	16	23.6	90 x 236	ECG2WPL103MF236□□

Mounting code(" B" for bolt mounting, "Y/I/N" for bracket mounting )  
Terminal options(A,B,C see "Dimensions" for details.)

Customer products are available on request.

## Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



## Optional Service: Charge-Discharge

- Higher ripple current
- Suit to high frequency Charge-Discharge
- RoHS Compliant
- High frequency regenerative voltage for AC servomotor, general inverter.

## Series available for Charge-Discharge

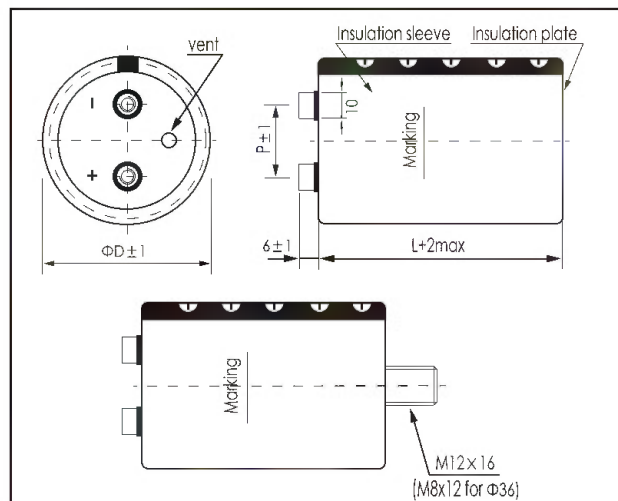
Type of Series	CD137	CD138	CD138S	CD139	CD139S
Temperature range	-40°C~+85°C			-40°C~+105°C	
Load Life	5000h	5000h	5000h	5000h	5000h
Reference page	P.113	P.119	P.121	P.123	P.125

To regular series, charge-discharge function can be added as an optional service, the size and other electrical parameters are the same.

Items	Characteristics
Rated Voltage ( $U_R$ )	400 ~ 450
Capacitance Tolerance (20°C, 120Hz)	± 20%
Leakage Current ( $I_L$ )	$I_L = 0.01 C_R U_R$ (μA) or 5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	Less than 0.15
Stability at Low Temperature (Impedance Ratio at 120Hz)	$C_{-25^\circ\text{C}} / C_{+20^\circ\text{C}} \geq 0.7$
Rated Ripple Current ( $I_R$ )	Please refer to series available for Charge-Discharge
Performance of Charge-Discharge	The following requirements must be met when the capacitors are restored to 20°C after subjected to charge-discharge test with the voltage waveform shown below at room temperature (25 ± 10°C).
	Capacitance Change ( $\Delta C$ )
	Within 20% of initial value
	Dissipation Factor ( $\tan\delta$ )
	Not more than 200% of specified value
	Leakage Current (IL)
	Not more than specified value
Frequency Cycles	3Hz
	20million times
Voltage Waveform	

## Dimensions

mm



$\Phi D$ /mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.

\*Max tightening torque for screw terminal M5: 3Nm, M6: 6Nm.

\*Max torque for bolt mounting M12: 12.5Nm.

\*Screws, Bracket and cap nut will be delivered separately.

See "Accessories" for shape and dimensions.

## Part Number System (Ex: 450v4700μF)

ECG	2W	PC	472	M	E	130	Y	A	G	* Terminals
										Mounting Style
										B Bolt Mounting
										Y 3-leg Bracket
										I 2-leg Bracket
										N No Bracket
										Diameter
										Code
										36mm A
										51mm C
										64mm D
										77mm E
										90mm F
										100mm G

Add a supplement code "G" at the end of Part Number to figure Charge-Discharge option.

## Ripple Current Coefficient

Please refer to series available for Charge-Discharge

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.

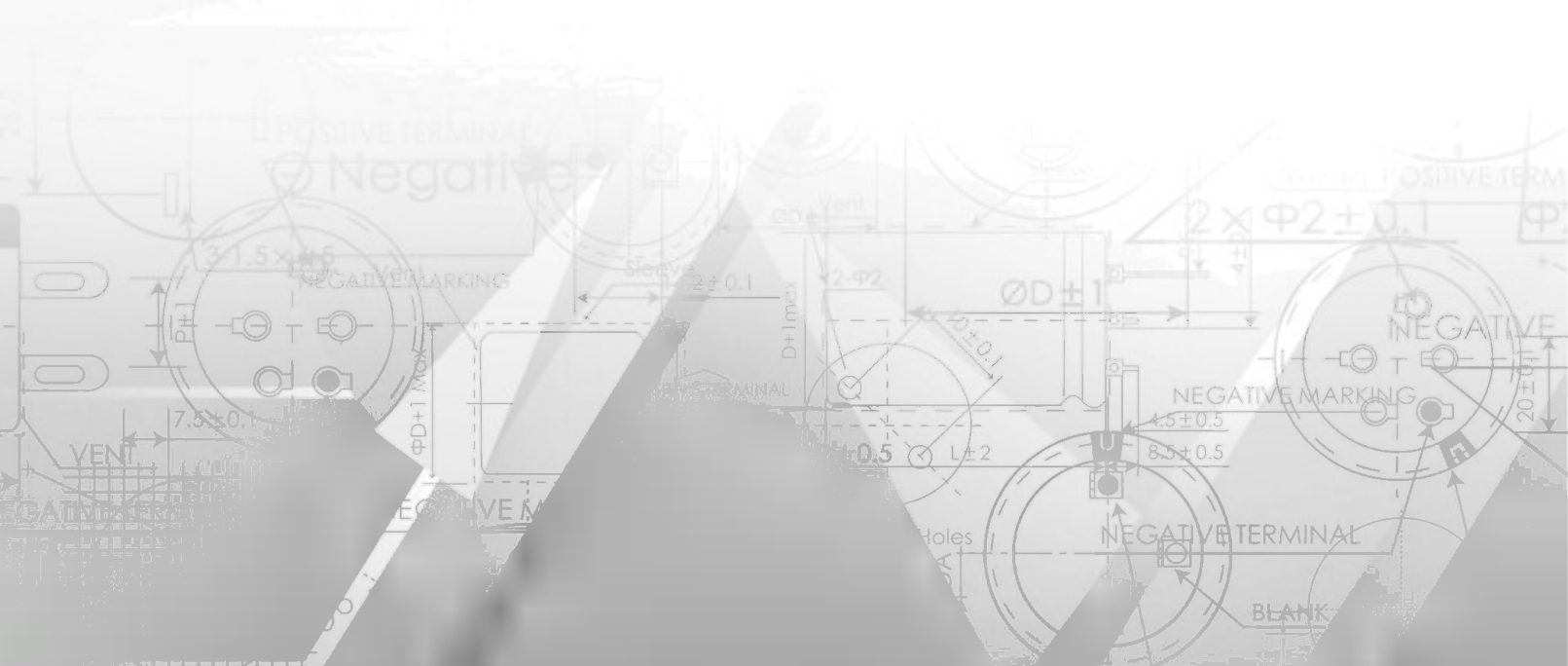
It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Product in this catalog are subject to change without notice. Request our product specifications before purchase and/or use. Please use our products based on this catalog and product specification.





## Miniature Aluminum Electrolytic Capacitors





## Part Number System for Radial

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Capacitor Type Code		Terminal Type Code		Rated Voltage Code (V)		Series Code		Capacitance Code (μF)		Capacitance Tolerance Code (%)		Lead Form Code		Dimension Code								Sleeve Code		Customer Special Requirement Code																																																																																																																																																																																																																																																																																																																																																																																																																																														
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### Note1:

- 1.The number from 14<sup>th</sup> to 16<sup>th</sup> defines the diameter of capacitor.
- 2.The 14<sup>th</sup> number is the tenth digit.
- 3.The 15<sup>th</sup> number is the single digit.
- 4.The 16<sup>th</sup> number is on the right of the floatpoint.

### Note2:

- 1.The number from 17<sup>th</sup> to 19<sup>th</sup> defines the height of capacitor.
- 2.The 17<sup>th</sup> number is the hundredth digit.
- 3.The 18<sup>th</sup> number is the tenth digit.
- 4.The 19<sup>th</sup> number is the single digit.

For example :

CD110 16V2200μF ±20% LL 12.5\*25 PVC

Code: ECR1CPT222MLL125025V



## Lead Cutting and Forming Code

Unit: mm

<p>FM(<math>\Phi 4 \sim \Phi 8</math>)</p> <p>Technical drawing of FM lead cutting and forming code. Side view shows dimensions: <math>\Phi D</math>, <math>2.5+0/-0.5</math>, <math>P</math>, <math>d</math>, <math>5 \pm 0.5</math>, <math>4.5 \pm 0.5</math>. Top view shows dimensions: <math>1.2 \pm 0.05</math>, <math>1.5 \pm 0.10</math>.</p>	<p>FC(<math>\Phi 4 \sim \Phi 8</math>)</p> <p>Technical drawing of FC lead cutting and forming code. Side view shows dimensions: <math>\Phi D</math>, <math>2.5+0/-0.5</math>, <math>P</math>, <math>d</math>, <math>5 \pm 0.5</math>, <math>4.5 \pm 0.5</math>. Top view shows a simple cross-section.</p>	<p>MC(<math>\Phi 10 \sim \Phi 20</math>)</p> <p>Technical drawing of MC lead cutting and forming code. Side view shows dimensions: <math>\Phi D</math>, <math>2.5+0/-0.5</math>, <math>P</math>, <math>d</math>, <math>5 \pm 0.5</math>, <math>4.5 \pm 0.5</math>. Top view shows dimensions: <math>1.2 \pm 0.05</math>, <math>1.5 \pm 0.10</math>.</p>
<p>CC(<math>\Phi 4 \sim \Phi 20</math>)</p> <p>Technical drawing of CC lead cutting and forming code. Side view shows dimensions: <math>\Phi D</math>, <math>d</math>, <math>P</math>, <math>L</math>. Top view shows a simple cross-section.</p> <p>L: <math>4.5 \pm 0.5</math></p>	<p>WS(<math>\Phi 10 \sim \Phi 20</math>)</p> <p>Technical drawing of WS lead cutting and forming code. Side view shows dimensions: <math>h</math>, <math>L</math>. Top view shows dimensions: <math>P</math>, <math>d</math>.</p> <p>L: <math>3.7 \pm 0.3</math> h: <math>3.0 \pm 0.5</math> P: Lead Pitch</p>	
<p>WX(<math>\Phi 10 \sim \Phi 20</math>)</p> <p>Technical drawing of WX lead cutting and forming code. Side view shows dimensions: <math>L</math>, <math>h</math>. Top view shows dimensions: <math>d</math>, <math>P</math>.</p> <p>L: <math>3.7 \pm 0.3</math> h: <math>3.0 \pm 0.5</math> P: Lead Pitch</p>	<p>KP(<math>\Phi 18 \sim \Phi 20</math>)</p> <p>A: <math>3.2 \pm 0.5</math> B: <math>1.7 \pm 0.5</math> C: <math>0.45 \pm 0.3</math> d: <math>0.8 \pm 0.05</math> P: <math>7.5 \pm 0.5</math></p> <p>Technical drawing of KP lead cutting and forming code. Side view shows dimensions: <math>A</math>, <math>B</math>, <math>C</math>, <math>d</math>, <math>P</math>. Top view shows a negative marking.</p> <p>Negative Marking</p>	
<p>KS(<math>\Phi 18 \sim \Phi 20</math>)</p> <p>A: <math>3.7 \pm 0.5</math> C: <math>2.2 \pm 0.5</math> F: <math>7.5 \pm 0.5</math> E: <math>2.7 \pm 0.5</math> <math>\Phi d</math>: <math>0.8 \pm 0.05</math> H: <math>3.0 \pm 0.5</math></p> <p>Technical drawing of KS lead cutting and forming code. Side view shows dimensions: <math>A</math>, <math>C</math>, <math>F</math>, <math>E</math>, <math>\Phi d</math>, <math>H</math>. Top view shows a negative marking.</p> <p>Negative Marking</p>	<p>KX(<math>\Phi 18 \sim \Phi 20</math>)</p> <p>A: <math>3.7 \pm 0.5</math> C: <math>2.2 \pm 0.5</math> F: <math>7.5 \pm 0.5</math> E: <math>2.7 \pm 0.5</math> <math>\Phi d</math>: <math>0.8 \pm 0.05</math> H: <math>3.0 \pm 0.5</math></p> <p>Technical drawing of KX lead cutting and forming code. Side view shows dimensions: <math>A</math>, <math>C</math>, <math>F</math>, <math>E</math>, <math>\Phi d</math>, <math>H</math>. Top view shows a negative marking.</p> <p>Negative Marking</p>	
<p>ES(<math>\Phi 10 \sim \Phi 12.5</math>)</p> <p>Technical drawing of ES lead cutting and forming code. Side view shows dimensions: <math>h1</math>, <math>h2</math>, <math>d</math>, <math>P</math>, <math>L</math>. Top view shows a simple cross-section.</p> <p>h1: <math>11 \pm 0.5</math> h2: <math>6 \pm 0.5</math></p> <p>L: <math>0.4 \pm 0.3</math> P: Lead Pitch</p>	<p>EX(<math>\Phi 10 \sim \Phi 12.5</math>)</p> <p>Technical drawing of EX lead cutting and forming code. Side view shows dimensions: <math>h1</math>, <math>h2</math>, <math>d</math>, <math>P</math>, <math>L</math>. Top view shows a simple cross-section.</p> <p>h1: <math>11 \pm 0.5</math> h2: <math>6 \pm 0.5</math></p> <p>L: <math>0.4 \pm 0.3</math> P: Lead Pitch</p>	



## Taping Dimensions and Code

Fig 1

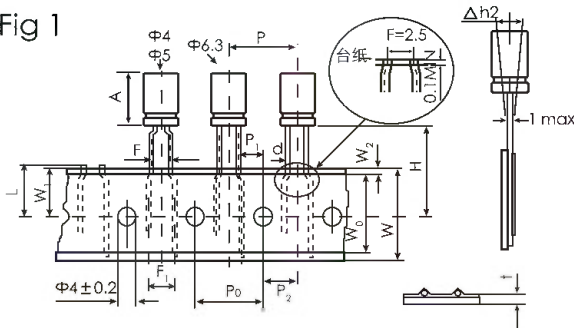


Fig 2

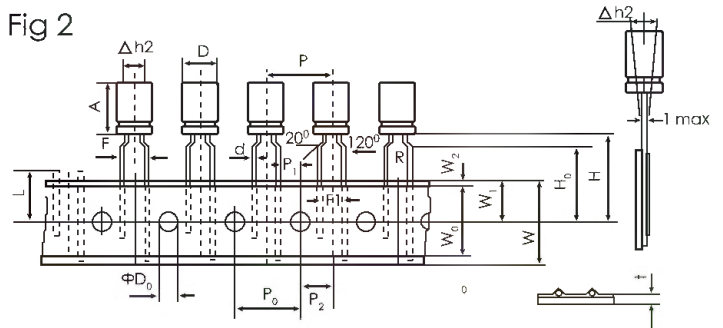


Fig 3

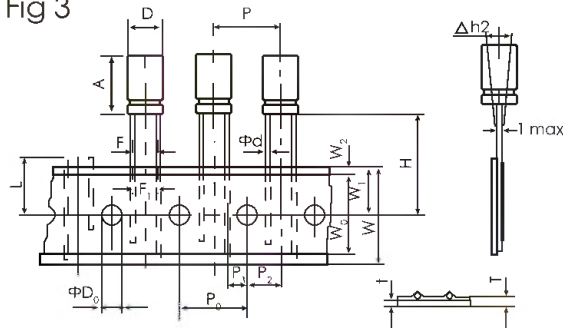


Fig 4

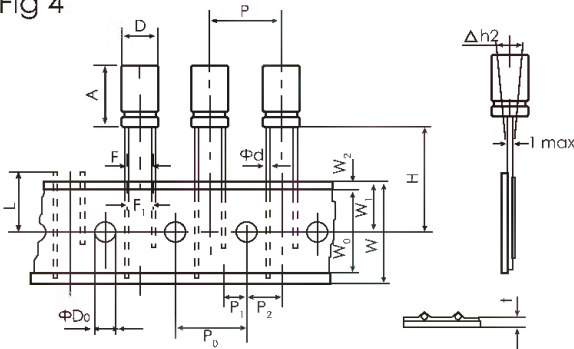
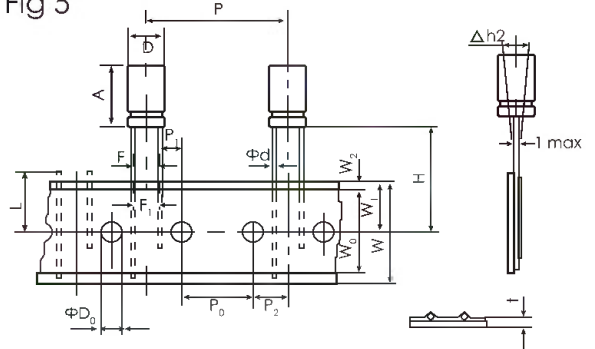


Fig 5



Unit: mm

Item	ΦD	A	Φd	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	H0	L	ΦD0	Δh2	t	Fig.	Taping Code
tol.	+0.5 max		± 0.05	± 1.0	± 0.2	± 0.5	± 1.0	+0.8 -0.2	± 1.0	± 0.5	min	± 0.5	max	+0.75 -0.5	± 0.5	max	± 0.5	max	± 0.2		
Nominal	4	7 (+1.0)	0.45	12.7	12.7	5.1	6.35	2.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85		5	5					17.5	16.0					2	FB
	5	7 (+1.0)	0.45	12.7	12.7	5.1	6.35	2.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85		5	5					17.5	16.0					2	FB
		11.5 (+1.5)	0.5	12.7	12.7	5.1	6.35	2.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85		5	5					16.0	-					2	FB
	6.3	7 (+1.0)	0.45	12.7	12.7	5.1	6.35	2.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85		5	5					17.5	16.0					2	FB
		11.5 (+1.5)	0.5	12.7	12.7	5.1	6.35	2.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	1	FA
						3.85		5	5					16.0	-					2	FB
	8	11.5~20 (+1.5)	0.6	12.7	12.7	4.6	6.35	3.5	3.5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	3	FA
						3.85		5	5					20.0	16.0					2	FB
	10	12.5~20 (+2.0)	0.6	12.7	12.7	3.85	6.35	5	5	18.0	10.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	4	FA
						6.35		5	5					18.5	-					5	FD
	12.5	20~25 (+2.0)	0.6	15	15	5.0	7.5	5	5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	4	FA
				25.4	12.7	3.85		5	5					18.5	-					5	FD
	16	20~25.5 (+2.0)	0.8	30	15	3.75	7.5	7.5	7.5	18.0	12.0	9.0	1.5	18.5	-	11.0	4.0	1.0	0.7	5	FD

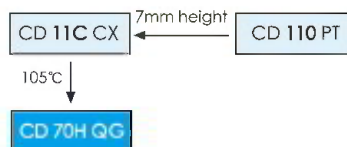


# CD 70H QG SERIES



1000h at 105°C

- Load life of 1000 hours at 105°C
- 7mm Products
- VTR, digital cameras, car radios, micro cassette tape recorder etc

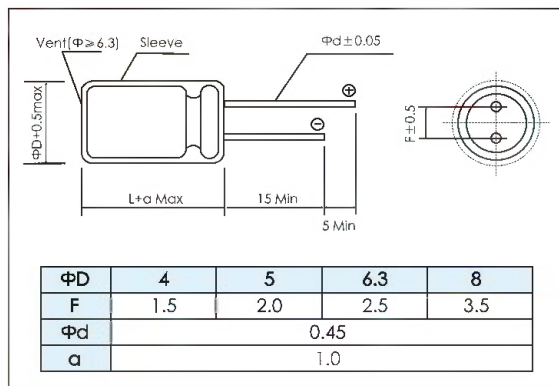


Items	Characteristics						
Operating Temperature Range (°C)	-55 ~ +105						
Capacitance Tolerance (20°C, 120Hz)	± 20%						
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater. C: Nominal Capacitance (μF) V: Rated Voltage (V)						
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50
	Impedance Ratio	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$		2			
		$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$		3			

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	2000h	130000h	1000h	1000h	500h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement $U_R = 0$ $I_R = 0$ 105°C

## Dimensions

mm



## Frequency Coefficient

Frequency	50-60Hz	120Hz	1kHz	10k~100kHz
Rated Voltage(V)				
6.3 ~ 16	0.68	0.72	0.92	1.0
25 ~ 35	0.48	0.63	0.80	1.0
50	0.45	0.50	0.70	1.0

## Temperature Coefficient

Temperature(°C)	+85	+105
Coefficient	1.35	1



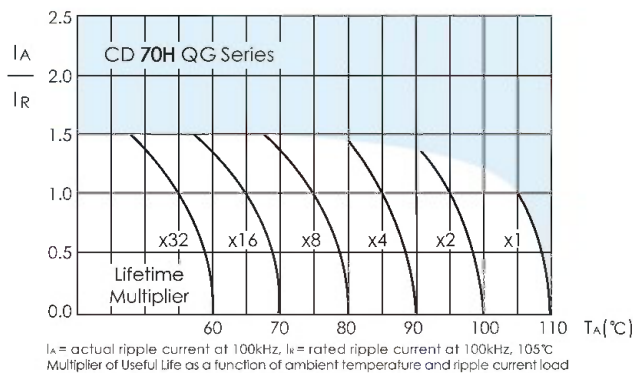
## Ratings for CD 70H QG Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	22	13	42	4×7	ECR0JQG220M□□040007
	33	9	52	5×7	ECR0JQG330M□□050007
	47	6	64	5×7	ECR0JQG470M□□050007
	100	3	96	6.3×7	ECR0JQG101M□□063007
10 (13) 1A	22	11	49	5×7	ECR1AQG220M□□050007
	33	8	60	5×7	ECR1AQG330M□□050007
	47	5	95	6.3×7	ECR1AQG470M□□063007
16 (20) 1C	10	21	39	4×7	ECR1CQG100M□□040007
	22	10	54	5×7	ECR1CQG220M□□050007
	33	6	83	6.3×7	ECR1CQG330M□□063007
	47	5	95	6.3×7	ECR1CQG470M□□063007
25 (32) 1E	2.2	84	21	4×7	ECR1EQG2R2M□□040007
	3.3	56	25	4×7	ECR1EQG3R3M□□040007
	4.7	40	47	5×7	ECR1EQG4R7M□□050007
	10	19	84	6.3×7	ECR1EQG100M□□063007
	22	8	90	6.3×7	ECR1EQG220M□□063007
35 (44) 1V	2.2	72	23	4×7	ECR1VQG2R2M□□040007
	3.3	48	25	4×7	ECR1VQG3R3M□□040007
	4.7	34	48	5×7	ECR1VQG4R7M□□050007
	10	16	90	6.3×7	ECR1VQG100M□□063007
50 (63) 1H	0.1	1327.0	6	4×7	ECR1HQG0R1M□□040007
	0.22	603.2	8	4×7	ECR1HQGR22M□□040007
	0.33	402.1	10	4×7	ECR1HQGR33M□□040007
	0.47	282.3	12	4×7	ECR1HQGR47M□□040007
	1	132.7	16	4×7	ECR1HQG010M□□040007
	2.2	60.3	25	4×7	ECR1HQG2R2M□□040007
	3.3	40.2	28	4×7	ECR1HQG3R3M□□040007
	4.7	28.2	48	5×7	ECR1HQG4R7M□□050007
	10	13.3	75	6.3×7	ECR1HQG100M□□063007

MINIATURE

Customer products are available on request.

## Lifetime Diagram



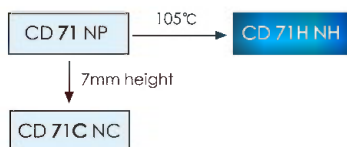


# CD 71H NH SERIES



2000h at 105°C

- Load life of 2000 hours at 105°C
- Bi-polar



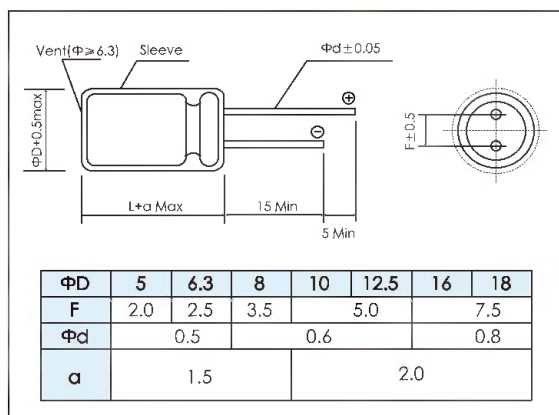
Items	Characteristics										
Operating Temperature Range (°C)	-55 ~ +105										
Rated Voltage Range (V)	6.3 ~ 160										
Capacitance Tolerance (20°C, 120Hz)	± 20%										
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.06CV or 10, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)										
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	160
	Tan δ (max)	0.24	0.24	0.20	0.20	0.16	0.14	0.12	0.10	0.10	0.15
When nominal capacitance is over 1000uF, tanδ shall be added 0.02 to the listed value with increase of every 1000uF											
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	160
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4	3	2							4
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	10	8	6	4						-

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	180000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 50% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 150% of specified value	Not more than 150% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

Note: The life test excluding shelf life should be conducted with the polarity inverted every 250hrs.

## Dimensions

mm



## Frequency Coefficient

Frequency Cap- acitance(μF)	50~60Hz	120Hz	1kHz	10kHz	100kHz
0.47 ~ 4.7	0.65	1.00	1.35	2.30	2.50
10 ~ 47	0.75	1.00	1.25	1.75	1.80
100 ~ 1000	0.80	1.00	1.15	1.40	1.50
2200 ~ 6800	0.85	1.00	1.03	1.08	1.08

## Temperature Coefficient

Temperature(°C)	+85	+105
Coefficient	1.35	1



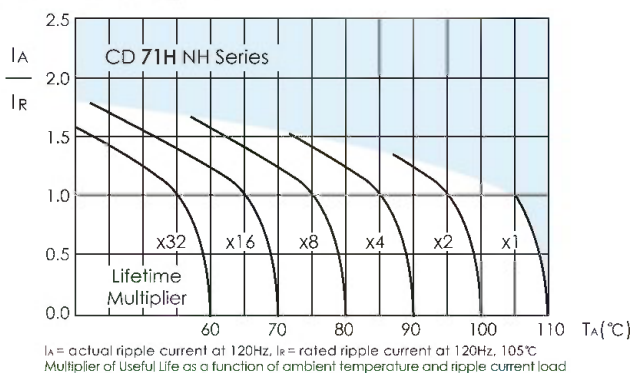
## Ratings for CD 71H NH Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	33	9.7	45	5×11.5	ECR0JNH330M□□050011
	47	6.8	54	5×11.5	ECR0JNH470M□□050011
	100	3.2	90	6.3×11.5	ECR0JNH101M□□063011
	220	1.5	150	8×11.5	ECR0JNH221M□□080011
	330	0.97	185	8×11.5	ECR0JNH331M□□080011
	470	0.68	260	10×12.5	ECR0JNH471M□□100012
	1000	0.32	460	10×20	ECR0JNH102M□□100020
	2200	0.16	820	12.5×25	ECR0JNH222M□□125025
	3300	0.11	1110	16×25	ECR0JNH332M□□160025
	4700	0.09	1430	16×31.5	ECR0JNH472M□□160031
10 (13) 1A	6800	0.07	1830	18×35.5	ECR0JNH682M□□180035
	22	15	37	5×11.5	ECR1ANH220M□□050011
	33	9.7	45	5×11.5	ECR1ANH330M□□050011
	47	6.8	54	5×11.5	ECR1ANH470M□□050011
	100	3.2	90	6.3×11.5	ECR1ANH101M□□063011
	220	1.5	150	8×11.5	ECR1ANH221M□□080011
	330	0.97	240	10×16	ECR1ANH331M□□100016
	470	0.68	290	10×16	ECR1ANH471M□□100016
	1000	0.32	510	12.5×20	ECR1ANH102M□□125020
	2200	0.16	910	16×25	ECR1ANH222M□□160025
16 (20) 1C	3300	0.11	1200	16×31.5	ECR1ANH332M□□160031
	4700	0.09	1520	18×35.5	ECR1ANH472M□□180035
	10	27	27	5×11.5	ECR1CNH100M□□050011
	22	12	40	5×11.5	ECR1CNH220M□□050011
	33	8.0	49	5×11.5	ECR1CNH330M□□050011
	47	5.7	67	6.3×11.5	ECR1CNH470M□□063011
	100	2.7	110	8×11.5	ECR1CNH101M□□080011
	220	1.2	195	10×12.5	ECR1CNH221M□□100012
	330	0.80	265	10×16	ECR1CNH331M□□100016
	470	0.57	345	10×20	ECR1CNH471M□□100020
25 (32) 1E	1000	0.27	605	12.5×25	ECR1CNH102M□□125025
	2200	0.13	1070	16×31.5	ECR1CNH222M□□160031
	3300	0.10	1400	18×35.5	ECR1CNH332M□□180035
	10	27	27	5×11.5	ECR1ENH100M□□050011
	22	12	46	6.3×11.5	ECR1ENH220M□□063011
	33	8.0	56	6.3×11.5	ECR1ENH330M□□063011
	47	5.7	67	6.3×11.5	ECR1ENH470M□□063011
	100	2.7	110	8×11.5	ECR1ENH101M□□080011
	220	1.2	215	10×16	ECR1ENH221M□□100016
	330	0.80	320	12.5×20	ECR1ENH331M□□125020
35 (44) 1V	470	0.57	380	12.5×20	ECR1ENH471M□□125020
	1000	0.27	670	16×25	ECR1ENH102M□□160025
	2200	0.13	1140	18×35.5	ECR1ENH222M□□180035
	4.7	45	21	5×11.5	ECR1VNH47M□□050011
	10	21	30	5×11.5	ECR1VNH100M□□050011
	22	9.7	51	6.3×11.5	ECR1VNH220M□□063011
	33	6.4	72	8×11.5	ECR1VNH330M□□080011
	47	4.5	86	8×11.5	ECR1VNH470M□□080011
	100	2.1	160	10×12.5	ECR1VNH101M□□100012
	220	0.97	290	10×20	ECR1VNH221M□□100020
1000	330	0.64	350	12.5×25	ECR1VNH331M□□125025
	470	0.45	465	16×25	ECR1VNH471M□□160025
	1000	0.21	805	16×31.5	ECR1VNH102M□□160031

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
50 (63) 1H	0.47	395	7	5×11.5	ECR1HNHR47M□□050011
	1	186	10	5×11.5	ECR1HNH010M□□050011
	2.2	84	15	5×11.5	ECR1HNH2R2M□□050011
	3.3	56	18	5×11.5	ECR1HNH3R3M□□050011
	4.7	40	22	5×11.5	ECR1HNH4R7M□□050011
	10	19	37	6.3×11.5	ECR1HNH100M□□063011
	22	8.4	63	8×11.5	ECR1HNH220M□□080011
	33	5.6	77	8×11.5	ECR1HNH330M□□080011
	47	4.0	105	10×12.5	ECR1HNH470M□□100012
	100	1.9	190	10×20	ECR1HNH101M□□100020
	220	0.84	340	12.5×25	ECR1HNH221M□□125025
	330	0.56	460	16×25	ECR1HNH331M□□160025
470	0.40	590	16×31.5	ECR1HNH471M□□160031	
63 (79) 1J	3.3	48	20	5×11.5	ECR1JNH3R3M□□050011
	4.7	34	24	6.3×11.5	ECR1JNH4R7M□□063011
	10	16	40	6.3×11.5	ECR1JNH100M□□063011
	22	7.2	68	8×11.5	ECR1JNH220M□□080011
	33	4.8	98	10×12.5	ECR1JNH330M□□100012
	47	3.4	130	10×16	ECR1JNH470M□□100016
	100	1.6	225	12.5×20	ECR1JNH101M□□125020
	220	0.72	405	16×25	ECR1JNH221M□□160025
	330	0.48	535	16×31.5	ECR1JNH331M□□160031
470	0.34	680	18×35.5	ECR1JNH471M□□180035	
80 (100) 1K	2.2	72	16	5×11.5	ECR1KNH2R2M□□050011
	3.3	48	23	6.3×11.5	ECR1KNH3R3M□□063011
	4.7	34	27	6.3×11.5	ECR1KNH4R7M□□063011
	10	16	46	8×11.5	ECR1KNH100M□□080011
	22	7.2	89	10×16	ECR1KNH220M□□100016
	33	4.8	105	10×16	ECR1KNH330M□□100016
	47	3.4	140	10×20	ECR1KNH470M□□100020
	100	1.6	245	12.5×25	ECR1KNH101M□□125025
	220	0.72	435	16×31.5	ECR1KNH221M□□160031
	330	0.48	570	18×35.5	ECR1KNH331M□□180035
	0.47	282	8	5×11.5	ECR2ANH47M□□050011
	1	133	12	5×11.5	ECR2ANH010M□□050011
2.2	60	20	6.3×11.5	ECR2ANH2R2M□□063011	
100 (125) 2A	3.3	40	25	6.3×11.5	ECR2ANH3R3M□□063011
	4.7	28	30	6.3×11.5	ECR2ANH4R7M□□063011
	10	13	50	8×11.5	ECR2ANH100M□□080011
	22	6.0	97	10×16	ECR2ANH220M□□100016
	33	4.0	140	12.5×20	ECR2ANH330M□□125020
	47	2.8	170	12.5×20	ECR2ANH470M□□125020
	100	1.3	300	16×25	ECR2ANH101M□□160025
	220	0.60	510	18×35.5	ECR2ANH221M□□180035
	3.3	60	45	10×16	ECR2CNH3R3M□□100016
	4.7	42	55	10×16	ECR2CNH4R7M□□100016
	10	20	103	12.5×20	ECR2CNH100M□□125020
	22	9.1	168	12.5×25	ECR2CNH220M□□125025
160 (200) 2C	33	6.01	228	16×25	ECR2CNH330M□□160025
	47	4.21	312	16×35.5	ECR2CNH470M□□160035
	100	2.0	403	18×35.5	ECR2CNH101M□□180035

Customer products are available on request.

## Lifetime Diagram



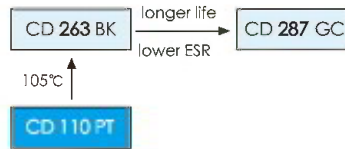


# CD 110 PT SERIES



2000h at 85°C

- Standard 85°C
- Load life of 2000 hours at 85°C
- High and stable quality
- Small size and low cost
- For general consumer electronic products application



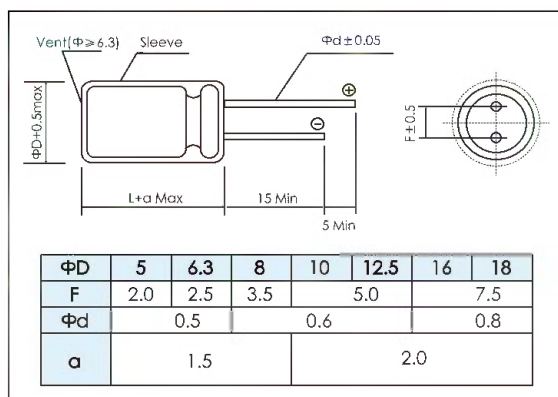
MINIATURE

Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +85	-25 ~ +85
Voltage Range (V)	6.3 ~ 250	315 ~ 500
Capacitance Range (μF)	0.1 ~ 22000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	6.3 ~ 100V	160 ~ 500V
	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater.	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.03CV + 10
C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100 160 200 250~350 400 450 500
	Tan δ (max)	0.22 0.19 0.16 0.14 0.12 0.10 0.09 0.08 0.12 0.15 0.20 0.23
When nominal capacitance is over 1000μF tan δ shall be added 0.02 to the listed value with increase of every 1000μF		
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100 160 200 250 315~500
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4 3 2 3 6
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8 6 4 3 -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ ≤ 8 : 3000h Φ ≥ 10 : 4000h	Φ ≤ 8 : 35000h Φ ≥ 10 : 50000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 50% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 150% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> 1.4 × I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> I <sub>R</sub> = 0 85°C	After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Rated Voltage (V)	Frequency	50/60Hz	120Hz	1kHz	10kHz	100kHz
	CV (μFV)					
6.3 ~ 16	ALL CV value	0.80	1.00	1.10	1.20	1.20
25 ~ 35	≤ 1000	0.80	1.00	1.50	1.70	1.70
	> 1000	0.80	1.00	1.20	1.30	1.30
50 ~ 100	≤ 1000	0.80	1.00	1.60	1.90	1.90
	> 1000	0.80	1.00	1.20	1.30	1.30
160 ~ 500	ALL CV value	0.80	1.00	1.30	1.50	1.60

## Temperature Coefficient

Temperature(°C)	+70	+85
Coefficient	1.35	1



## Ratings for CD 110 PT Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mAmps)	(mm)	-
6.3 (7.2) 0J	220	1.33	200	5×11.5	ECROJPT221M□□050011
	330	0.88	270	6.3×11.5	ECROJPT331M□□063011
	470	0.62	322	6.3×11.5	ECROJPT471M□□063011
	1000	0.29	546	8×11.5	ECROJPT102M□□080011
	2200	0.14	1010	10×20	ECROJPT222M□□100020
	3300	0.10	1230	10×20	ECROJPT332M□□100020
	4700	0.08	1710	12.5×20	ECROJPT472M□□125020
	6800	0.06	1930	12.5×25	ECROJPT682M□□125025
	10000	0.05	2450	16×25	ECROJPT103M□□160025
	15000	0.04	2860	16×35.5	ECROJPT153M□□160035
	22000	0.04	3340	18×40	ECROJPT223M□□180040
10 (13) 1A	47	5.36	99	5×11.5	ECRIAPT470M□□050011
	100	2.52	146	5×11.5	ECRIAPT101M□□050011
	220	1.15	240	6.3×11.5	ECRIAPT221M□□063011
	330	0.76	290	6.3×11.5	ECRIAPT331M□□063011
	470	0.54	417	8×11.5	ECRIAPT471M□□080011
	1000	0.25	650	10×12.5	ECRIAPT102M□□100012
	2200	0.13	1080	10×20	ECRIAPT222M□□100020
	3300	0.09	1430	12.5×20	ECRIAPT332M□□125020
	4700	0.07	1780	12.5×25	ECRIAPT472M□□125025
	6800	0.06	2220	16×25	ECRIAPT682M□□160025
	10000	0.05	2700	16×35.5	ECRIAPT103M□□160035
16 (20) 1C	10	21.2	50	5×11.5	ECRICPT100M□□050011
	22	9.65	75	5×11.5	ECRICPT220M□□050011
	33	6.43	92	5×11.5	ECRICPT330M□□050011
	47	4.52	110	5×11.5	ECRICPT470M□□050011
	100	2.12	160	5×11.5	ECRICPT101M□□050011
	220	0.97	264	6.3×11.5	ECRICPT221M□□063011
	330	0.64	383	8×11.5	ECRICPT331M□□080011
	470	0.45	457	8×11.5	ECRICPT471M□□080011
	1000	0.21	791	10×16	ECRICPT102M□□100016
	2200	0.11	1350	12.5×20	ECRICPT222M□□125020
	3300	0.08	1690	12.5×25	ECRICPT332M□□125025
25 (32) 1E	4700	0.06	2100	16×25	ECRICPT472M□□160025
	6800	0.05	2580	16×35.5	ECRICPT682M□□160035
	10000	0.05	3130	18×35.5	ECRICPT103M□□180035
	4.7	39.5	38	5×11.5	ECRIEPT47M□□050011
	10	18.6	55	5×11.5	ECRIEPT100M□□050011
	22	8.44	82	5×11.5	ECRIEPT220M□□050011
	33	5.63	100	5×11.5	ECRIEPT330M□□050011
	47	3.95	118	5×11.5	ECRIEPT470M□□050011
	100	1.86	199	6.3×11.5	ECRIEPT101M□□063011
	220	0.84	349	8×11.5	ECRIEPT221M□□080011
	330	0.56	510	10×12.5	ECRIEPT331M□□100012
35 (44) 1V	470	0.40	545	10×12.5	ECRIEPT471M□□100012
	1000	0.19	996	10×20	ECRIEPT102M□□100020
	2200	0.10	1660	12.5×25	ECRIEPT222M□□125025
	3300	0.07	2030	16×25	ECRIEPT332M□□160025
	4700	0.06	2650	16×31.5	ECRIEPT472M□□160031
	6800	0.05	3290	18×35.5	ECRIEPT682M□□180035
	4.7	33.9	40	5×11.5	ECRIVPT47M□□050011
	10	15.9	59	5×11.5	ECRIVPT100M□□050011
	22	7.24	87	5×11.5	ECRIVPT220M□□050011
	33	4.83	107	5×11.5	ECRIVPT330M□□050011
	47	3.39	130	5×11.5	ECRIVPT470M□□050011
50 (63) 1H	100	1.59	214	6.3×11.5	ECRIVPT101M□□063011
	220	0.72	443	8×11.5	ECRIVPT221M□□080011
	330	0.48	542	10×12.5	ECRIVPT331M□□100012
	470	0.34	664	10×16	ECRIVPT471M□□100016
	1000	0.16	1210	12.5×20	ECRIVPT102M□□125020
	2200	0.08	1950	16×25	ECRIVPT222M□□160025
	3300	0.06	2510	16×35.5	ECRIVPT332M□□160035
	4700	0.05	2990	18×35.5	ECRIVPT472M□□180035
63 (79) 1J	0.1	1327	3	5×11.5	ECR1HPT0R1M□□050011
	0.22	603	6	5×11.5	ECR1HPTR22M□□050011
	0.33	402	9	5×11.5	ECR1HPTR33M□□050011
	0.47	282	13	5×11.5	ECR1HPTR47M□□050011
	1	133	21	5×11.5	ECR1HPT010M□□050011
	2.2	60.3	31	5×11.5	ECR1HPT2R2M□□050011
	3.3	40.2	38	5×11.5	ECR1HPT3R3M□□050011
	4.7	28.2	45	5×11.5	ECR1HPT4R7M□□050011
	10	13.3	66	5×11.5	ECR1HPT100M□□050011
	22	6.03	98	5×11.5	ECR1HPT220M□□050011
	33	4.02	126	5×11.5	ECR1HPT330M□□050011
100 (125) 2A	47	2.82	155	6.3×11.5	ECR1HPT470M□□063011
	100	1.33	260	8×11.5	ECR1HPT101M□□080011
	220	0.60	443	10×12.5	ECR1HPT221M□□100012
	330	0.40	595	10×16	ECR1HPT331M□□100016
	470	0.28	887	12.5×20	ECR1HPT471M□□125020
	1000	0.13	1400	16×25	ECR1HPT102M□□160025
	2200	0.07	2340	16×35.5	ECR1HPT222M□□160035
	3300	0.06	2810	18×35.5	ECR1HPT332M□□180035
	4.7	25.4	45	5×11.5	ECR1JPT4R7M□□050011
	10	11.9	66	5×11.5	ECR1JPT100M□□050011
	22	5.43	100	5×11.5	ECR1JPT220M□□050011
160 (200) 2C	33	3.62	140	6.3×11.5	ECR1JPT330M□□063011
	47	2.54	170	6.3×11.5	ECR1JPT470M□□063011
	100	1.19	300	10×12.5	ECR1JPT101M□□100012
	220	0.54	470	10×16	ECR1JPT221M□□100016
	330	0.36	710	10×20	ECR1JPT331M□□100020
	470	0.25	900	12.5×20	ECR1JPT471M□□125020
	1000	0.12	1300	16×25	ECR1JPT102M□□160025
	0.1	1062	2.1	5×11.5	ECR2APT0R1M□□050011
	0.22	483	4.7	5×11.5	ECR2APTR22M□□050011
	0.33	322	7	5×11.5	ECR2APTR33M□□050011
	0.47	226	10	5×11.5	ECR2APTR47M□□050011
160 (200) 2C	1	106.2	21	5×11.5	ECR2APT010M□□050011
	2.2	48.3	30	5×11.5	ECR2APT2R2M□□050011
	3.3	32.2	40	5×11.5	ECR2APT3R3M□□050011
	4.7	22.6	45	5×11.5	ECR2APT4R7M□□050011
	10	10.6	75	6.3×11.5	ECR2APT100M□□063011
	22	4.83	130	6.3×11.5	ECR2APT220M□□063011
	33	3.22	180	8×11.5	ECR2APT330M□□080011
	47	2.26	230	10×12.5	ECR2APT470M□□100012
	100	1.06	370	10×20	ECR2APT101M□□100020
	220	0.48	620	12.5×25	ECR2APT221M□□125025
	330	0.32	760	16×25	ECR2APT331M□□160025
160 (200) 2C	470	0.23	1000	16×25	ECR2APT471M□□160025
	1000	0.11	1380	18×40	ECR2APT102M□□180040
	0.47	339	15	6.3×11.5	ECR2CPTR47M□□063011
	1	159	22	6.3×11.5	ECR2CPT010M□□063011
	2.2	72.4	32	6.3×11.5	ECR2CPT2R2M□□063011
	3.3	48.3	40	6.3×11.5	ECR2CPT3R3M□□063011
	4.7	33.9	48	6.3×11.5	ECR2CPT4R7M□□063011
	10	15.9	81	8×11.5	ECR2CPT100M□□080011
	22	7.24	151	10×16	ECR2CPT220M□□100016
	33	4.83	202	10×20	ECR2CPT330M□□100020
	47	3.39	266	12.5×20	ECR2CPT470M□□125020
160 (200) 2C	100	1.59	422	12.5×25	ECR2CPT101M□□125025
	220	0.72	783	16×31.5	ECR2CPT221M□□160031
	330	0.48	1080	18×31.5	ECR2CPT331M□□180031



## Ratings for CD 110 PT Series

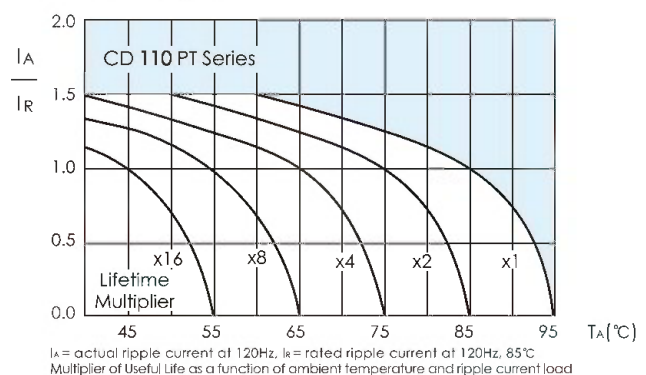
MINIATURE

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
200 (250) 2D	0.47	339	15	6.3×11.5	ECR2DPT47M□□063011
	1	159	22	6.3×11.5	ECR2DPT010M□□063011
	2.2	72.4	32	6.3×11.5	ECR2DPT2R2M□□063011
	3.3	48.3	40	6.3×11.5	ECR2DPT3R3M□□063011
	4.7	33.9	56	8×11.5	ECR2DPT4R7M□□080011
	10	15.9	94	8×11.5	ECR2DPT100M□□080011
	22	7.24	170	10×20	ECR2DPT220M□□100020
	33	4.83	223	12.5×20	ECR2DPT330M□□125020
	47	3.39	265	12.5×20	ECR2DPT470M□□125020
	100	1.59	483	16×25.5	ECR2DPT101M□□160025
	220	0.72	882	18×36	ECR2DPT221M□□180036
250 (300) 2E	0.47	423	15	6.3×11.5	ECR2EPT47M□□063011
	1	199	22	6.3×11.5	ECR2EPT010M□□063011
	2.2	90.5	32	6.3×11.5	ECR2EPT2R2M□□063011
	3.3	60.3	48	8×11.5	ECR2EPT3R3M□□080011
	4.7	42.3	56	8×11.5	ECR2EPT4R7M□□080011
	10	19.9	101	10×12.5	ECR2EPT100M□□100012
	22	9.05	182	10×20	ECR2EPT220M□□100020
	33	6.03	243	12.5×20	ECR2EPT330M□□125020
	47	4.23	295	12.5×25	ECR2EPT470M□□125025
315 (350) 2F	0.47	423	15	6.3×11.5	ECR2FPT47M□□063011
	1	199	22	6.3×11.5	ECR2FPT010M□□063011
	2.2	90.5	38	8×11.5	ECR2FPT2R2M□□080011
	3.3	60.3	53	10×12.5	ECR2FPT3R3M□□100012
	4.7	42.3	65	10×12.5	ECR2FPT4R7M□□100012
	10	19.9	115	10×16	ECR2FPT100M□□100016
	22	9.05	182	12.5×20	ECR2FPT220M□□125020
	33	6.03	277	16×25.5	ECR2FPT330M□□160025
	47	4.23	330	16×25.5	ECR2FPT470M□□160025
350 (400) 2V	0.47	423.5	15	6.3×11.5	ECR2VPT47M□□063011
	1	199	22	6.3×11.5	ECR2VPT010M□□063011
	2.2	90.5	38	6.3×11.5	ECR2VPT2R2M□□063011
	3.3	60.3	53	8×11.5	ECR2VPT3R3M□□080011
	4.7	42.3	65	10×12.5	ECR2VPT4R7M□□100012
	10	19.9	115	10×20	ECR2VPT100M□□100020
	22	9.05	197	12.5×20	ECR2VPT220M□□125020
	33	6.03	277	12.5×25	ECR2VPT330M□□125025
	47	4.23	330	16×25.5	ECR2VPT470M□□160025
	100	1.99	507	18×31.5	ECR2VPT101M□□180031

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
400 (450) 2G	0.47	565	15	6.3×11.5	ECR2GPT47M□□063011
	1	265	22	6.3×11.5	ECR2GPT010M□□063011
	2.2	121	38	8×11.5	ECR2GPT2R2M□□080011
	3.3	80.4	54	10×12.5	ECR2GPT3R3M□□100012
	4.7	56.5	71	10×12.5	ECR2GPT4R7M□□100012
	10	26.5	123	10×20	ECR2GPT100M□□100020
	22	12.1	197	12.5×25	ECR2GPT220M□□125025
	33	8.04	277	16×25.5	ECR2GPT330M□□160025
	47	5.65	361	16×25.5	ECR2GPT470M□□160025
	68	3.9	423	18×25.5	ECR2GPT680M□□180025
	82	3.2	509	18×31.5	ECR2GPT820M□□180031
450 (500) 2W	0.47	649	18	6.3×11.5	ECR2WPT47M□□063011
	1	305	25	6.3×11.5	ECR2WPT010M□□063011
	2.2	139	43	8×11.5	ECR2WPT2R2M□□080011
	3.3	92.5	59	10×12.5	ECR2WPT3R3M□□100012
	4.7	64.9	76	10×16	ECR2WPT4R7M□□100016
	10	30.5	123	10×20	ECR2WPT100M□□100020
	22	13.9	226	12.5×25	ECR2WPT220M□□125025
	33	9.2	304	16×25.5	ECR2WPT330M□□160025
	47	6.5	380	16×31.5	ECR2WPT470M□□160031
	68	4.5	436	18×25.5	ECR2WPT680M□□180025
	82	3.7	530	18×31.5	ECR2WPT820M□□180031
500 (550) 2H	1	305	35	10×12.5	ECR2HPT010M□□100012
	2.2	139	45	10×16	ECR2HPT2R2M□□100016
	3.3	92.5	75	10×20	ECR2HPT3R3M□□100020
	4.7	64.9	100	12.5×20	ECR2HPT4R7M□□125020
	10	30.5	165	12.5×25	ECR2HPT100M□□125025

Customer products are available on request.

## Lifetime Diagram





8000h at 85°C

- Longer life
- High ripple current



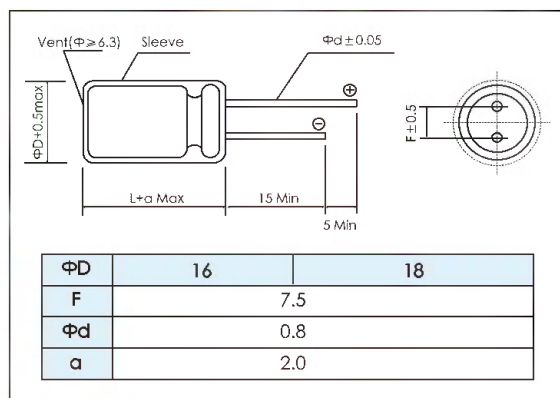
MINIATURE

Items	Characteristics											
Operating Temperature Range (°C)	-25 ~ +85											
Voltage Range (V)	420 ~ 500											
Capacitance Range (μF)	47 ~ 150											
Capacitance Tolerance (20°C, 120Hz)	± 20%											
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.04CV+100  C: Nominal Capacitance (μF)    V: Rated Voltage (V)											
Dissipation Factor (20°C, 120Hz)	<table><tr><td>Wv (V)</td><td>420</td><td>450</td><td>500</td></tr><tr><td>Tan δ (max)</td><td colspan="3">0.2</td></tr></table>				Wv (V)	420	450	500	Tan δ (max)	0.2		
Wv (V)	420	450	500									
Tan δ (max)	0.2											
Stability at Low Temperature (Impedance Ratio at 120Hz)	<table><tr><td>Wv (V)</td><td colspan="3">420 ~ 500</td></tr><tr><td><math>Z_{-25^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}}</math></td><td colspan="3">8</td></tr></table>				Wv (V)	420 ~ 500			$Z_{-25^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}}$	8		
Wv (V)	420 ~ 500											
$Z_{-25^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}}$	8											

	Useful Life	Load Life	Endurance Test	Shelf Life
Lifetime	10000h	8000h	8000h	1000h
Leakage Current	Not more than specified value	Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value	Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value	Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	After test: $U_R = 0$ $I_R = 0$ 85°C >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	1kHz	10kHz	50kHz	100kHz
Coefficient	0.8	1.0	1.3	1.4	1.9	2.0

## Temperature Coefficient

Temperature(°C)	+70	+85
Coefficient	1.35	1

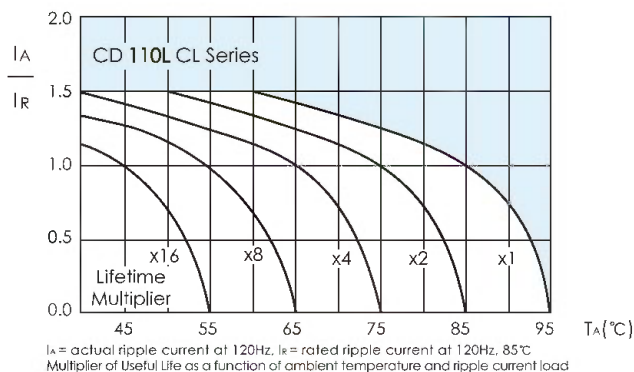


## Ratings for CD 110L CL Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C,120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
420 (470) 2X	47	5.6	3.9	440	16×31.5	ECR2XCL470M□□160031
	68	3.9	2.7	565	16×36	ECR2XCL680M□□160036
	68	3.9	2.7	565	18×31.5	ECR2XCL680M□□180031
	82	3.2	2.2	630	16×40	ECR2XCL820M□□160040
	82	3.2	2.2	630	18×31.5	ECR2XCL820M□□180031
	100	2.7	1.9	730	16×45	ECR2XCL101M□□160045
	100	2.7	1.9	730	18×36	ECR2XCL101M□□180036
	120	2.2	1.5	850	16×50	ECR2XCL121M□□160050
	120	2.2	1.5	850	18×40	ECR2XCL121M□□180040
	150	1.8	1.3	940	16×60	ECR2XCL151M□□160060
450 (500) 2W	150	1.8	1.3	940	18×46	ECR2XCL151M□□180046
	47	5.6	3.9	440	16×31.5	ECR2WCL470M□□160031
	68	3.9	2.7	565	16×36	ECR2WCL680M□□160036
	68	3.9	2.7	580	18×31.5	ECR2WCL680M□□180031
	82	3.2	2.2	630	16×40	ECR2WCL820M□□160040
	82	3.2	2.2	640	18×31.5	ECR2WCL820M□□180031
	100	2.7	1.9	730	16×45	ECR2WCL101M□□160045
	100	2.7	1.9	750	18×36	ECR2WCL101M□□180036
	120	2.2	1.5	850	16×50	ECR2WCL121M□□160050
	120	2.2	1.5	860	18×40	ECR2WCL121M□□180040
500 (550) 2H	150	1.8	1.3	940	16×60	ECR2WCL151M□□160060
	150	1.8	1.3	940	18×46	ECR2WCL151M□□180046
	47	5.6	3.9	400	16×36	ECR2HCL470M□□160036
	47	5.6	3.9	420	18×31.5	ECR2HCL470M□□180031
	68	3.9	2.7	520	16×45	ECR2HCL680M□□160045
	68	3.9	2.7	540	18×36	ECR2HCL680M□□180036
	82	3.2	2.2	600	16×55	ECR2HCL820M□□160055
	82	3.2	2.2	610	18×40	ECR2HCL820M□□180040
	100	2.7	1.9	710	16×60	ECR2HCL101M□□160060
	100	2.7	1.9	720	18×46	ECR2HCL101M□□180046

Customer products are available on request.

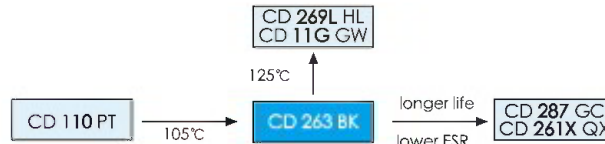
## Lifetime Diagram





2000h at 105°C

■ Standard 105°C

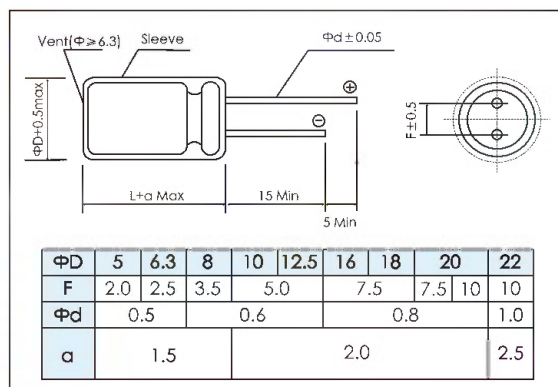


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	6.3 ~ 250	315 ~ 500
Capacitance Range (μF)	0.1 ~ 15000	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	6.3 ~ 100V	160 ~ 500V
	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater.	After 1 minute at 20°C application of rated voltage, leakage current is not more than: CV ≤ 1000 : 0.1CV + 40 CV > 1000 : 0.04CV + 100
C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100 160 200 250 315 350 400 420 450 500
	Tan δ (max)	0.22 0.19 0.16 0.14 0.12 0.10 0.09 0.08 0.15 0.20
When nominal capacitance is over 1000μF tan δ shall be added 0.02 to the listed value with increase of every 1000μF		
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3 10 16 25 35 50 63 100 160 200 250 315 350 400 420 450 500
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4 3 2 3 6
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8 6 4 3 8 -

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	3000h	>100000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 150% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Rated Voltage (V)	Frequency	50/60Hz	120Hz	1kHz	10kHz	50kHz	100kHz
	Cap (μF)						
6.3 ~ 100	0.1 ~ 4.7	0.32	0.4	0.7	0.8	0.92	1.0
	10 ~ 47	0.40	0.5	0.8	0.9	0.96	1.0
	100 ~ 220	0.56	0.7	0.9	0.9	0.96	1.0
	330 ~ 1000	0.64	0.8	0.9	1.0	1.0	1.0
	2200 ~ 15000	0.72	0.9	1.0	1.0	1.0	1.0
160 ~ 500	0.47 ~ 10	0.80	1.0	1.75	2.0	2.4	2.5
	22 ~ 56	0.80	1.0	1.6	1.8	1.9	2.0
	68 ~ 220	0.80	1.0	1.3	1.4	1.6	1.65

## Temperature Coefficient

Rated Voltage(V)	Temperature(°C)		
	+70	+85	+105
6.3 ~ 100	2.0	1.7	1.0
160 ~ 500	1.8	1.4	1.0



# CD 263 BK SERIES

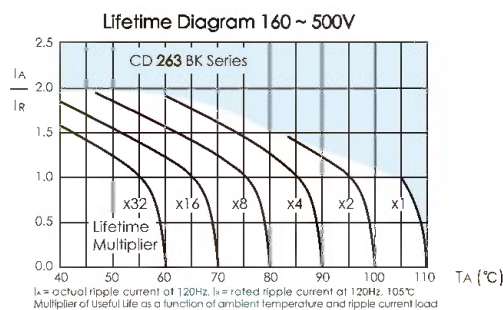
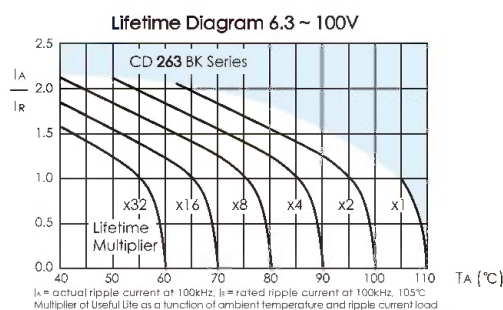


## Ratings for CD 263 BK Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	33	8.8	2.5	105	5×11.5	ECR0JBK330M□□050011
	47	6.2	1.5	120	5×11.5	ECR0JBK470M□□050011
	100	2.9	1.2	130	5×11.5	ECR0JBK101M□□050011
	220	1.3	0.87	180	6.3×11.5	ECR0JBK221M□□063011
	330	0.9	0.58	220	6.3×11.5	ECR0JBK331M□□063011
	470	0.6	0.39	315	8×11.5	ECR0JBK471M□□080011
	1000	0.29	0.23	500	10×12.5	ECR0JBK102M□□100012
	2200	0.14	0.095	1000	12.5×20	ECR0JBK222M□□125020
	3300	0.105	0.09	1050	12.5×20	ECR0JBK332M□□125020
	4700	0.079	0.061	1670	16×25	ECR0JBK472M□□160025
	6800	0.062	0.056	1740	16×25	ECR0JBK682M□□160025
	10000	0.053	0.045	2110	16×31.5	ECR0JBK103M□□160031
	15000	0.044	0.036	2580	18×35.5	ECR0JBK153M□□180035
	22	11.5	2.5	92	5×11.5	ECR1ABK220M□□050011
	33	7.6	1.9	105	5×11.5	ECR1ABK330M□□050011
10 (13) 1A	47	5.4	1.5	120	5×11.5	ECR1ABK470M□□050011
	100	2.5	1.2	130	5×11.5	ECR1ABK101M□□050011
	220	1.1	0.58	220	6.3×11.5	ECR1ABK221M□□063011
	330	0.76	0.47	265	8×11.5	ECR1ABK331M□□080011
	470	0.54	0.39	315	8×11.5	ECR1ABK471M□□080011
	1000	0.25	0.18	615	10×16	ECR1ABK102M□□100016
	2200	0.13	0.09	1050	12.5×20	ECR1ABK222M□□125020
	3300	0.09	0.068	1300	12.5×20	ECR1ABK332M□□125025
	4700	0.07	0.056	1740	16×25	ECR1ABK472M□□160025
	6800	0.06	0.045	2110	16×31.5	ECR1ABK682M□□160031
	10000	0.05	0.036	2580	18×35.5	ECR1ABK103M□□180035
	10	21.2	0.56	92	5×11.5	ECR1CBK100M□□050011
	22	9.7	1.9	105	5×11.5	ECR1CBK220M□□050011
	33	6.4	1.5	120	5×11.5	ECR1CBK330M□□050011
	47	4.5	1.2	130	5×11.5	ECR1CBK470M□□050011
16 (20) 1C	100	2.1	0.58	220	6.3×11.5	ECR1CBK101M□□063011
	220	0.97	0.47	290	8×11.5	ECR1CBK221M□□080011
	330	0.64	0.39	315	8×11.5	ECR1CBK331M□□080011
	470	0.45	0.23	500	10×12.5	ECR1CBK471M□□100012
	1000	0.21	0.12	825	10×20	ECR1CBK102M□□100020
	2200	0.11	0.068	1300	12.5×20	ECR1CBK222M□□125025
	3300	0.08	0.056	1740	16×25	ECR1CBK332M□□160025
	4700	0.06	0.045	2110	16×31.5	ECR1CBK472M□□160031
	6800	0.05	0.036	2580	18×35.5	ECR1CBK682M□□180035
	4.7	39.5	3	85	5×11.5	ECR1EBK47M□□050011
	10	18.6	2.5	92	5×11.5	ECR1EBK100M□□050011
	22	8.4	1.9	105	5×11.5	ECR1EBK220M□□050011
	33	5.6	1.5	120	5×11.5	ECR1EBK330M□□050011
	47	4.0	1.2	130	5×11.5	ECR1EBK470M□□050011
	100	1.9	0.58	220	6.3×11.5	ECR1EBK101M□□063011
25 (32) 1E	220	0.84	0.39	315	8×11.5	ECR1EBK221M□□080011
	330	0.56	0.23	500	10×12.5	ECR1EBK331M□□100025
	470	0.40	0.18	615	10×16	ECR1EBK471M□□100016
	1000	0.19	0.09	1050	12.5×20	ECR1EBK102M□□125020
	2200	0.10	0.056	1740	16×25	ECR1EBK222M□□160025
	3300	0.07	0.045	2110	16×31.5	ECR1EBK332M□□160031
	4700	0.06	0.036	2580	18×35.5	ECR1EBK472M□□180035
	4.7	33.9	2.5	92	5×11.5	ECR1VBK47M□□050011
	10	15.9	1.8	105	5×11.5	ECR1VBK100M□□050011
	22	7.2	1.5	120	5×11.5	ECR1VBK220M□□050011
	33	4.8	1.5	130	5×11.5	ECR1VBK330M□□050011
	47	3.4	0.58	220	6.3×11.5	ECR1VBK470M□□063011
	100	1.6	0.39	315	8×11.5	ECR1VBK101M□□080011
	220	0.72	0.23	500	10×12.5	ECR1VBK221M□□100012
	330	0.48	0.18	615	10×16	ECR1VBK331M□□100016
35 (44) 1V	470	0.34	0.12	825	10×20	ECR1VBK471M□□100020
	1000	0.16	0.068	1300	12.5×25	ECR1VBK102M□□125025
	2200	0.08	0.045	2110	16×31.5	ECR1VBK222M□□160031
	3300	0.06	0.036	2580	18×35.5	ECR1VBK332M□□180035
	3300	0.06	0.036	2580	18×35.5	ECR1VBK332M□□180035

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
50 (63) 1H	0.1	1327	18	10	5×11.5	ECR1HBK0R1M□□050011
	0.22	603	13	15	5×11.5	ECR1HBK22M□□050011
	0.33	402	10	18	5×11.5	ECR1HBK33M□□050011
	0.47	282	7	23	5×11.5	ECR1HBK47M□□050011
	1	133	4.9	35	5×11.5	ECR1HBK010M□□050011
	2.2	60	4.2	53	5×11.5	ECR1HBK2R2M□□050011
	3.3	40	3.9	65	5×11.5	ECR1HBK3R3M□□050011
	4.7	28	3.6	82	5×11.5	ECR1HBK4R7M□□050011
	10	13	2.7	100	5×11.5	ECR1HBK100M□□050011
	22	6	1.9	125	5×11.5	ECR1HBK220M□□050011
	33	4	1.1	195	6.3×11.5	ECR1HBK330M□□063011
	47	2.8	0.9	245	6.3×11.5	ECR1HBK470M□□063011
	100	1.3	0.5	385	8×11.5	ECR1HBK101M□□080011
	220	0.60	0.27	505	10×16	ECR1HBK221M□□100016
	330	0.40	0.18	675	10×20	ECR1HBK331M□□100020
63 (79) 1J	470	0.28	0.12	895	12.5×20	ECR1HBK471M□□125020
	1000	0.13	0.076	1495	16×25	ECR1HBK102M□□160025
	2200	0.07	0.05	2190	18×35.5	ECR1HBK222M□□180035
	4.7	25	5.8	74	5×11.5	ECR1JBK47M□□050011
	10	12	3.6	95	5×11.5	ECR1JBK100M□□050011
	22	5	2.1	130	6.3×11.5	ECR1JBK220M□□063011
	33	4	1.7	160	6.3×11.5	ECR1JBK330M□□063011
	47	2.5	1.2	305	8×11.5	ECR1JBK470M□□080011
	100	1.2	0.65	395	10×12.5	ECR1JBK101M□□100012
	220	0.54	0.32	505	10×20	ECR1JBK221M□□100020
	330	0.36	0.22	660	12.5×20	ECR1JBK331M□□125020
	470	0.25	0.16	850	12.5×25	ECR1JBK471M□□125025
	1000	0.12	0.098	1430	16×31.5	ECR1JBK102M□□160031
	0.47	226	13	30	5×11.5	ECR2ABK47M□□050011
	1	106	11	45	5×11.5	ECR2ABK010M□□050011
100 (125) 2A	2.2	48	9.2	60	5×11.5	ECR2ABK2R2M□□050011
	3.3	32	7.2	67	5×11.5	ECR2ABK3R3M□□050011
	4.7	23	6.3	75	5×11.5	ECR2ABK4R7M□□050011
	10	11	3.3	110	6.3×11.5	ECR2ABK100M□□063011
	22	5	1.4	165	8×11.5	ECR2ABK220M□□080011
	33	3.2	0.94	305	10×12.5	ECR2ABK330M□□100012
	47	2.3	0.68	320	10×16	ECR2ABK470M□□100016
	100	1.1	0.28	585	12.5×20	ECR2ABK101M□□125020
	220	0.48	0.16	1120	16×25	ECR2ABK221M□□160025
	330	0.32	0.13	1290	16×25	ECR2ABK331M□□160025
	470	0.23	0.11	1350	16×31.5	ECR2ABK471M□□160031

## Lifetime Diagram





## Ratings for CD 263 BK Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
160 (200) 2C	0.47	423.5	12	6.3×11.5	ECR2CBK47M□□063011
	1	199.0	18	6.3×11.5	ECR2CBK010M□□063011
	2.2	90.5	26	6.3×11.5	ECR2CBK2R2M□□063011
	3.3	60.3	37	8×11.5	ECR2CBK3R3M□□080011
	4.7	42.3	44	8×11.5	ECR2CBK4R7M□□080011
	10	19.9	75	10×12.5	ECR2CBK100M□□100012
	22	9.0	135	10×16	ECR2CBK220M□□100016
	33	6.0	175	10×20	ECR2CBK330M□□100020
	47	4.2	230	12.5×20	ECR2CBK470M□□125020
	100	2.0	330	16×25.5	ECR2CBK101M□□160025
	220	0.9	500	16×35.5	ECR2CBK221M□□160035
	0.47	423.5	12	6.3×11.5	ECR2DBK47M□□063011
200 (250) 2D	1	199.0	18	6.3×11.5	ECR2DBK010M□□063011
	2.2	90.5	26	6.3×11.5	ECR2DBK2R2M□□063011
	3.3	60.3	37	8×11.5	ECR2DBK3R3M□□080011
	4.7	42.3	50	10×12.5	ECR2DBK4R7M□□100012
	10	19.9	80	10×16	ECR2DBK100M□□100016
	22	9.0	135	10×20	ECR2DBK220M□□100020
	33	6.0	190	12.5×20	ECR2DBK330M□□125020
	47	4.0	230	12.5×25	ECR2DBK470M□□125025
	100	2.0	360	16×25.5	ECR2DBK101M□□160025
	220	0.9	525	18×31.5	ECR2DBK221M□□180031
	0.47	423.5	12	6.3×11.5	ECR2EBK47M□□063011
	1	199.0	18	6.3×11.5	ECR2EBK010M□□063011
250 (300) 2E	2.2	90.5	30	8×11.5	ECR2EBK2R2M□□080011
	3.3	60.3	43	8×11.5	ECR2EBK3R3M□□080011
	4.7	42.3	50	10×12.5	ECR2EBK4R7M□□100012
	10	19.9	90	10×16	ECR2EBK100M□□100016
	22	9.0	155	12.5×20	ECR2EBK220M□□125020
	33	6.0	190	12.5×25	ECR2EBK330M□□125025
	47	4.2	225	16×25.5	ECR2EBK470M□□160025
	100	2.0	340	16×31.5	ECR2EBK101M□□160031
	150	1.3	405	18×25.5	ECR2EBK151M□□180025
	220	0.9	570	18×36	ECR2EBK221M□□180036
	0.47	564.6	11	6.3×11.5	ECR2FBK47M□□063011
	1	265.4	18	8×11.5	ECR2FBK010M□□080011
315 (350) 2F	2.2	120.6	30	10×12.5	ECR2FBK2R2M□□100012
	3.3	80.4	36	10×12.5	ECR2FBK3R3M□□100012
	4.7	56.5	47	10×16	ECR2FBK4R7M□□100016
	10	26.5	95	10×20	ECR2FBK100M□□100020
	22	12.1	130	12.5×20	ECR2FBK220M□□125020
	33	8.0	180	12.5×25	ECR2FBK330M□□125025
	47	5.6	330	16×25.5	ECR2FBK470M□□160025
	100	2.7	620	18×31.5	ECR2FBK101M□□180031
	0.47	564.6	11	6.3×11.5	ECR2VBK47M□□063011
	1	265.4	18	8×11.5	ECR2VBK010M□□080011
	2.2	120.6	30	10×12.5	ECR2VBK2R2M□□100012
	3.3	80.4	36	10×12.5	ECR2VBK3R3M□□100012
350 (400) 2V	4.7	56.5	47	10×16	ECR2VBK4R7M□□100016
	10	26.5	95	10×20	ECR2VBK100M□□100020
	22	12.1	130	12.5×20	ECR2VBK220M□□125020
	33	8.0	180	12.5×25	ECR2VBK330M□□125025
	47	5.6	330	16×25.5	ECR2VBK470M□□160025
	100	2.7	620	18×31.5	ECR2VBK101M□□180031
	1	265.4	18	8×11.5	ECR2GBK1R1M□□080011
	2.2	120.6	30	10×12.5	ECR2GBK2R2M□□100012
	3.3	80.4	40	10×16	ECR2GBK3R3M□□100016
	4.7	56.5	52	10×20	ECR2GBK4R7M□□100020
	10	26.5	110	12.5×20	ECR2GBK100M□□125020
	22	12.1	150	12.5×25	ECR2GBK220M□□125025
400 (450) 2G	33	8.0	215	16×25.5	ECR2GBK330M□□160025
	47	5.6	360	16×25.5	ECR2GBK470M□□160025
	68	3.9	470	18×25.5	ECR2GBK680M□□180025
	82	3.2	575	18×31.5	ECR2GBK820M□□180031
	100	2.7	675	18×36	ECR2GBK101M□□180036
	120	2.2	735	18×40	ECR2GBK121M□□180040
	150	1.8	825	20×41	ECR2GBK151M□□200041
	1	265.4	19	10×12.5	ECR2WBK010M□□100012
	2.2	120.6	29	10×16	ECR2WBK2R2M□□100016
	3.3	80.4	42	10×20	ECR2WBK3R3M□□100020
	4.7	56.5	54	10×20	ECR2WBK4R7M□□100020
	10	26.5	122	10×20	ECR2WBK100M□□100020
450 (500) 2W	22	12.1	170	12.5×20	ECR2WBK100M□□125020
	33	8.0	240	16×25.5	ECR2WBK330M□□160025
	47	5.6	400	16×31.5	ECR2WBK470M□□160031
	68	3.9	570	18×31.5	ECR2WBK680M□□180031
	82	3.2	640	18×31.5	ECR2WBK820M□□180031
	100	2.7	750	18×36	ECR2WBK820M□□180036
	120	2.2	820	18×40	ECR2WBK121M□□180040
	150	1.8	920	18×46	ECR2WBK151M□□180046

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
450 (500) 2W	150	1.8	920	20×41	ECR2WBK151M□□200041
	180	1.5	1100	22×41	ECR2WBK181M□□220041
	220	1.2	1200	22×45	ECR2WBK221M□□220045
	1	265.4	21	10×12.5	ECR2HBK010M□□100012
	2.2	120.6	35	10×16	ECR2HBK2R2M□□100016
	3.3	80.4	48	10×20	ECR2HBK3R3M□□100020
	4.7	56.5	63	12.5×20	ECR2HBK4R7M□□125020
	10	26.5	120	12.5×25	ECR2HBK100M□□125025
	22	12.1	180	16×25.5	ECR2HBK220M□□160025
	33	8.0	240	16×31.5	ECR2HBK330M□□160031
	47	5.6	405	18×31.5	ECR2HBK470M□□180031
	68	3.9	560	18×36	ECR2HBK680M□□180036
500 (550) 2H	82	3.9	560	18×40	ECR2HBK820M□□180040
	100	2.7	800	18×46	ECR2HBK101M□□180046
	120	2.2	840	22×45	ECR2HBK121M□□220045
	150	1.8	890	22×45	ECR2HBK151M□□220045

Customer products are available on request.

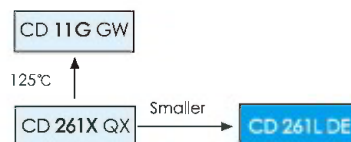


# CD 261L DE SERIES



10000-12000h at 105°C

- Rated voltage Range: 160V~450V; High Reliability
- Downsized and larger capacitance from current CD261X series
- For Electronic Lighting Ballast, LED Lighting applications

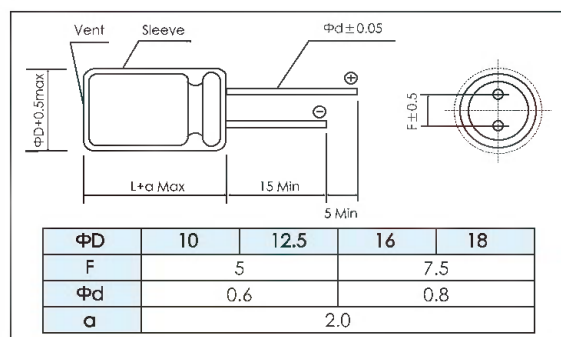


Items	Characteristics							
Operating Temperature Range (°C)	-40 ~ +105							
Voltage Range (V)	160 ~ 450							
Capacitance Range (μF)	10 ~ 820							
Capacitance Tolerance (20°C, 120Hz)	± 20%							
Leakage Current (μA)	After 1minute at 20°C application of rated voltage,leakage current is not more than 0.04CV+100. C: Nominal Capacitance (μF)    V: Rated Voltage (V)							
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160	200	250	350	400	420	450
	Tan δ (max)	0.15			0.20			
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160	200	250	350	400	420	450
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	3		4	6			
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	6			8			

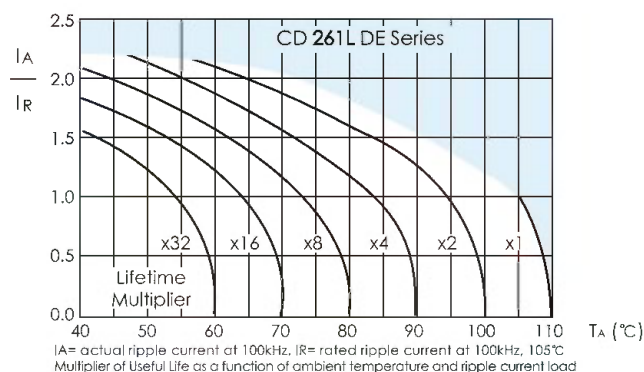
	Useful Life		Load Life	Endurance Test	Shelf Life	
Lifetime	L ≤ 20.5 :12000h L ≥ 25 :14000h	≥ 100000h	L ≤ 20.5 :10000h L ≥ 25 :12000h	L ≤ 20.5 :10000h L ≥ 25 :12000h	1000h	
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value	
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value	
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value	
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105℃	U <sub>R</sub> 1.4 x I <sub>R</sub> 60℃	U <sub>R</sub> I <sub>R</sub> 105℃	U <sub>R</sub> I <sub>R</sub> = 0 105℃	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105℃	After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Lifetime Diagram



## Frequency Coefficient

Frequency Cap (μF)	50/60Hz	120Hz	500Hz	1kHz	10kHz	100kHz
10~82	0.32	0.40	0.52	0.60	0.84	1.00
100~220	0.36	0.44	0.58	0.67	0.93	1.00
270~820	0.40	0.50	0.65	0.75	0.95	1.00

## Temperature Coefficient

Temperature(°C)	+65	+85	+105
Coefficient	2.1	1.7	1.0



## Ratings for CD 261L DE Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N	
(V)	(μF)	(Ω)	(Ω)	(mArms)	(mm)	-	
160 (200) 2C	47	4.23	1.69	650	10×16	ECR2CDE470M□□100016	
	68	2.93	1.17	800	10×20	ECR2CDE680M□□100020	
	82	2.43	0.97	1038	10×25	ECR2CDE820M□□100025	
	100	1.99	0.8	1193	10×30	ECR2CDE101M□□100030	
		1.99	0.8	1350	12.5×20	ECR2CDE101M□□125020	
	120	1.66	0.66	1395	10×35	ECR2CDE121M□□100035	
	150	1.33	0.53	1575	10×40	ECR2CDE151M□□100040	
		1.33	0.53	1643	12.5×25	ECR2CDE151M□□125025	
	180	1.11	0.44	1800	10×50	ECR2CDE181M□□100050	
		1.11	0.44	1958	12.5×30	ECR2CDE181M□□125030	
	220	1.11	0.44	1800	16×20	ECR2CDE181M□□160020	
		0.9	0.36	2250	16×25.5	ECR2CDE221M□□160025	
	270	0.9	0.36	2250	12.5×35	ECR2CDE221M□□125035	
		0.9	0.36	2228	18×20.5	ECR2CDE221M□□180020	
	330	0.74	0.29	2240	12.5×40	ECR2CDE271M□□125040	
		0.74	0.29	2420	16×31.5	ECR2CDE271M□□160031	
	390	0.6	0.24	2800	12.5×50	ECR2CDE331M□□125050	
		0.6	0.24	2700	16×31.5	ECR2CDE331M□□160031	
	470	0.6	0.24	2360	18×25.5	ECR2CDE331M□□180025	
		0.51	0.2	2760	16×36	ECR2CDE391M□□160036	
	560	0.42	0.17	3100	16×40	ECR2CDE471M□□160040	
		0.42	0.17	3100	18×31.5	ECR2CDE471M□□180031	
	200 (250) 2D	560	0.36	0.14	3720	16×50	ECR2CDE561M□□160050
		680	0.36	0.14	3680	18×40	ECR2CDE561M□□180040
		680	0.29	0.12	4260	18×45	ECR2CDE681M□□180045
		820	0.24	0.1	4460	18×50	ECR2CDE821M□□180050
33		6.03	2.41	650	10×16	ECR2DDE330M□□100016	
47		4.23	1.69	800	10×20	ECR2DDE470M□□100020	
56		3.55	1.42	1038	10×25	ECR2DDE560M□□100025	
68		2.93	1.17	1075	10×25	ECR2DDE680M□□100025	
		2.93	1.17	1350	12.5×20	ECR2DDE680M□□125020	
82		2.43	0.97	1250	10×30	ECR2DDE820M□□100030	
100		1.99	0.8	1440	10×35	ECR2DDE101M□□100035	
120		1.66	0.66	1665	10×40	ECR2DDE121M□□100040	
		1.66	0.66	1631	12.5×30	ECR2DDE121M□□125030	
150		1.66	0.66	1560	16×20	ECR2DDE121M□□160020	
		1.33	0.53	1755	10×45	ECR2DDE151M□□100045	
180		1.33	0.53	1800	12.5×35	ECR2DDE151M□□125035	
		1.11	0.44	2070	12.5×35	ECR2DDE181M□□125035	
220		1.11	0.44	2025	16×25.5	ECR2DDE181M□□160025	
		1.11	0.44	2000	18×20.5	ECR2DDE181M□□180020	
270		0.9	0.36	2263	12.5×45	ECR2DDE221M□□125045	
		0.9	0.36	2430	16×31.5	ECR2DDE221M□□160031	
330		0.74	0.29	2520	12.5×50	ECR2DDE271M□□125050	
		0.74	0.29	2360	16×31.5	ECR2DDE271M□□160031	
390		0.74	0.29	2200	18×25.5	ECR2DDE271M□□180025	
		0.6	0.24	2860	16×40	ECR2DDE331M□□160040	
470		0.6	0.24	2600	18×31.5	ECR2DDE331M□□180031	
		0.51	0.2	3100	16×45	ECR2DDE391M□□160045	
250 (300) 2E	470	0.51	0.2	2860	18×36	ECR2DDE391M□□180036	
	560	0.42	0.17	3360	16×50	ECR2DDE471M□□160050	
	680	0.42	0.17	3240	18×40	ECR2DDE471M□□180040	
	560	0.36	0.14	3540	18×45	ECR2DDE561M□□180045	
	22	9.04	3.62	650	10×16	ECR2EDE220M□□100016	
	33	6.03	2.41	800	10×20	ECR2EDE330M□□100020	
	47	4.23	1.69	975	10×25	ECR2EDE470M□□100025	
	56	4.23	1.69	1100	10×30	ECR2EDE470M□□100030	
	68	3.55	1.42	1350	12.5×20	ECR2EDE560M□□125020	
	82	2.93	1.17	1250	10×35	ECR2EDE680M□□100035	
		2.43	0.97	1425	10×40	ECR2EDE820M□□100040	
	100	2.43	0.97	1425	12.5×25	ECR2EDE820M□□125025	
		1.99	0.8	1620	10×45	ECR2EDE101M□□100045	
	120	1.99	0.8	1553	12.5×30	ECR2EDE101M□□125030	
		1.99	0.8	1428	16×20	ECR2EDE101M□□160020	
	150	1.66	0.66	1755	10×50	ECR2EDE121M□□100050	
		1.66	0.66	1778	12.5×35	ECR2EDE121M□□125035	
	180	1.66	0.66	1640	18×20.5	ECR2EDE121M□□180020	
		1.33	0.53	2070	12.5×40	ECR2EDE151M□□125040	
	220	1.33	0.53	1958	16×31.5	ECR2EDE151M□□160031	
		1.11	0.44	2183	12.5×50	ECR2EDE181M□□125050	
	270	1.11	0.44	2138	16×31.5	ECR2EDE181M□□160031	
		1.11	0.44	2070	18×25.5	ECR2EDE181M□□180025	
	330	0.9	0.36	2475	16×36	ECR2EDE221M□□160036	
		0.9	0.36	2475	18×31.5	ECR2EDE221M□□180031	
	390	0.74	0.29	2540	16×40	ECR2EDE271M□□160040	
		0.74	0.29	2520	18×36	ECR2EDE271M□□180036	
470	0.6	0.24	2960	16×50	ECR2EDE331M□□160050		
350 (400) 2V	330	0.6	0.24	2900	18×40	ECR2EDE331M□□180040	
	390	0.51	0.2	3180	18×45	ECR2EDE391M□□180045	
	470	0.42	0.17	3660	18×50	ECR2EDE471M□□180050	
	420 (470) 2X	12	22.1	6.63	338	10×16	ECR2VDE120M□□100016
		22	12.06	3.62	500	10×20	ECR2VDE220M□□100020
		27	9.82	2.95	775	10×25	ECR2VDE270M□□100025
		33	8.04	2.41	825	10×30	ECR2VDE330M□□100030
			8.04	2.41	850	12.5×20	ECR2VDE330M□□125020
		39	6.8	2.04	975	10×35	ECR2VDE390M□□100035
			5.64	1.69	1125	10×40	ECR2VDE470M□□100040
		47	5.64	1.69	1125	12.5×25	ECR2VDE470M□□125025
			4.74	1.42	1300	10×45	ECR2VDE560M□□100045
		56	4.74	1.42	1375	12.5×30	ECR2VDE560M□□125030
			4.74	1.42	1200	16×20	ECR2VDE560M□□160020
		68	3.9	1.17	1500	10×50	ECR2VDE680M□□100050
			3.9	1.17	1525	12.5×35	ECR2VDE680M□□125035
		82	3.23	0.97	1775	12.5×40	ECR2VDE820M□□125040
			3.23	0.97	1625	16×25.5	ECR2VDE820M□□160025
		100	2.65	0.8	1778	12.5×45	ECR2VDE101M□□125045
			2.65	0.8	1733	16×31.5	ECR2VDE101M□□160031
		120	2.65	0.8	1710	18×25.5	ECR2VDE101M□□180025
			2.21	0.66	1913	12.5×50	ECR2VDE121M□□125050
		150	2.21	0.66	2003	16×36	ECR2VDE121M□□160036
			1.77	0.53	2250	16×40	ECR2VDE151M□□160040
		180	1.77	0.53	2025	18×31.5	ECR2VDE151M□□180031
			1.47	0.44	2520	16×50	ECR2VDE181M□□160050
		220	1.47	0.44	2340	18×40	ECR2VDE181M□□180040
1.21			0.36	2700	18×45	ECR2VDE221M□□180045	
450 (500) 2Y		270	0.98	0.29	2800	18×50	ECR2VDE271M□□180050
	10	26.53	7.96	313	10×16	ECR2GDE100M□□100016	
	18	14.74	4.42	550	10×20	ECR2GDE180M□□100020	
	22	12.06	3.62	600	10×25	ECR2GDE220M□□100025	
	27	9.82	2.95	850	12.5×20	ECR2GDE270M□□125020	
		8.04	2.41	850	10×30	ECR2GDE330M□□100035	
	39	6.8	2.04	975	10×35	ECR2GDE390M□□100040	
		6.8	2.04	975	12.5×25	ECR2GDE390M□□125025	
	47	5.64	1.69	1100	10×40	ECR2GDE470M□□100045	
		5.64	1.69	1138	12.5×30	ECR2GDE470M□□125030	
	56	5.64	1.69	1090	16×20	ECR2GDE470M□□160020	
		4.74	1.42	1230	12.5×30	ECR2GDE560M□□100050	
	68	4.74	1.42	1313	12.5×35	ECR2GDE560M□□125035	
		4.74	1.42	1250	18×20.5	ECR2GDE560M□□180020	
	82	3.9	1.17	1500	12.5×40	ECR2GDE680M□□125040	
		3.9	1.17	1425	16×25.5	ECR2GDE680M□□160025	
	100	3.23	0.97	1700	12.5×45	ECR2GDE820M□□125045	
		3.23	0.97	1675	16×31.5	ECR2GDE820M□□160031	
	120	3.23	0.97	1600	18×25.5	ECR2GDE820M□□180025	
		2.65	0.8	1710	12.5×50	ECR2GDE101M□□125050	
	150	2.65	0.8	1710	16×36	ECR2GDE101M□□160036	
		2.65	0.8	1598	18×31.5	ECR2GDE101M□□180031	
	180	2.21	0.66	1935	16×40	ECR2GDE121M□□160040	
		2.21	0.66	1890	18×31.5	ECR2GDE121M□□180031	
	220	2.21	0.66	1958	18×36	ECR2GDE121M□□180036	
		1.77	0.53	2100	18×36	ECR2GDE151M□□160050	
270	1.77	0.53	2216	18×40	ECR2GDE151M□□180040		
	1.47	0.44	2300	18×40	ECR2GDE181M□□180045		
500 (550) 2Z	180	1.47	0.44	2464	18×45	ECR2GDE181M□□180045	
	220	1.21	0.36	2745	18×50	ECR2GDE221M□□180050	
	15	17.68	5.31	475	10×20	ECR2XDE150M□□100020	
	18	14.74	4.42	575	10×25	ECR2XDE180M□□100025	
	22	12.06	3.62	625	10×25	ECR2XDE220M□□100025	
	27	9.82	2.95	725	10×30	ECR2XDE270M□□100030	
		9.82	2.95	750	12.5×20	ECR2XDE270M□□125020	
	33	8.04	2.41	850	10×35	ECR2XDE330M□□100035	
		8.04	2.41	875	12.5×25	ECR2XDE330M□□125025	
	39	8.04	2.41	1000	12.5×30	ECR2XDE330M□□125030	
		6.8	2.04	975	10×40	ECR2XDE390M□□100040	
	47	6.8	2.04	1000	16×20	ECR2XDE390M□□160020	
		5.64	1.69	1100	10×45	ECR2XDE470M□□100045	
	56	5.64	1.69	1100	12.5×30	ECR2XDE470M□□125030	
		5.64	1.69	1263	12.5×35	ECR2XDE470M□□125035	
	68	5.64	1.69	1100	16×25.5	ECR2XDE470M□□160025	
		4.74	1.42	1275	12.5×35	ECR2XDE560M□□125035	
	82	4.74	1.42	1425	12.5×40	ECR2XDE560M□□125040	
		4.74	1.42	1275	16×25.5	ECR2XDE560M□□160025	
	100	4.74	1.42	1200	18×20.5	ECR2XDE560M□□180020	
		3.9	1.17	1500	12.5×45	ECR2XDE680M□□125045	
	120	3.9	1.17	1675	12.5×50	ECR2XDE680M□□125050	
		3.9	1.17	1400	16×31.5	ECR2XDE680M□□160031	
	150	3.9	1.17	1538	18×25.5	ECR2XDE680M□□180025	



# CD 261L DE SERIES

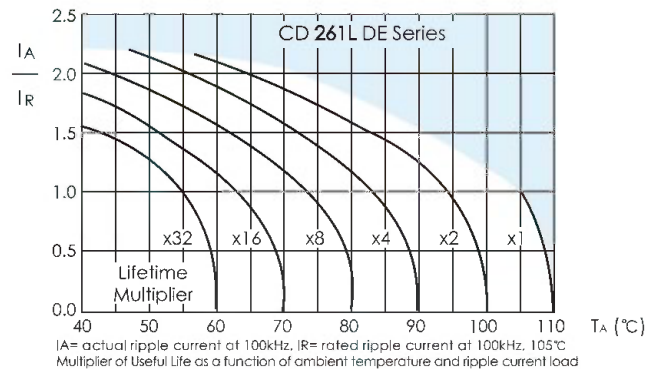


## Ratings for CD 261L DE Series

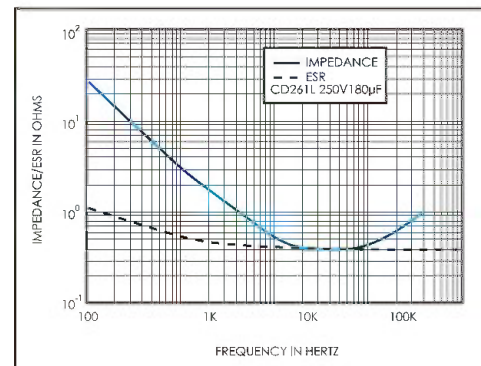
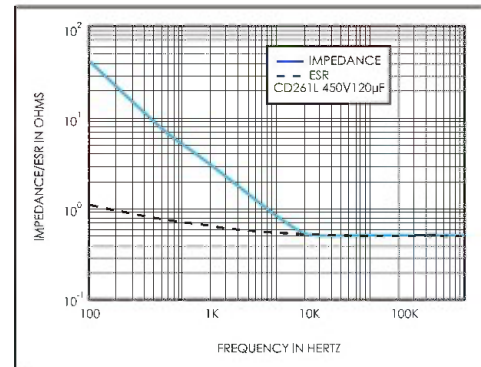
U <sub>s</sub> (Surge Voltage) Code	Rated Capa- ciance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
420 (470) 2X	82	3.23	0.97	1725	12.5 x 50	ECR2XDE820M□□125050
		3.23	0.97	1600	16 x 31.5	ECR2XDE820M□□160031
		3.23	0.97	1725	16 x 36	ECR2XDE820M□□160036
		3.23	0.97	1600	18 x 25.5	ECR2XDE820M□□180025
		3.23	0.97	1825	18 x 31.5	ECR2XDE820M□□180031
		2.65	0.8	1800	16 x 40	ECR2XDE101M□□160040
	100	2.65	0.8	1755	18 x 31.5	ECR2XDE101M□□180031
		2.65	0.8	1879	18 x 36	ECR2XDE101M□□180036
		2.21	0.66	2070	16 x 45	ECR2XDE121M□□160045
	120	2.21	0.66	1913	18 x 36	ECR2XDE121M□□180036
		2.21	0.66	2093	18 x 40	ECR2XDE121M□□180040
		1.77	0.53	2115	16 x 50	ECR2XDE151M□□160050
	150	1.77	0.53	2385	18 x 45	ECR2XDE151M□□180045
		1.47	0.44	2475	18 x 50	ECR2XDE181M□□180050
	10	26.53	7.96	325	10 x 16	ECR2WDE100M□□100016
		17.68	5.31	475	10 x 20	ECR2WDE150M□□100020
	15	17.68	5.31	525	10 x 25	ECR2WDE150M□□100025
		14.74	4.42	575	10 x 25	ECR2WDE180M□□100025
	22	12.06	3.62	675	10 x 30	ECR2WDE220M□□100030
		12.06	3.62	700	12.5 x 20	ECR2WDE220M□□125020
	27	9.82	2.95	800	10 x 35	ECR2WDE270M□□100035
		9.82	2.95	725	12.5 x 20	ECR2WDE270M□□125020
		9.82	2.95	850	12.5 x 25	ECR2WDE270M□□125025
	33	8.04	2.41	875	10 x 35	ECR2WDE330M□□100035
		8.04	2.41	900	12.5 x 25	ECR2WDE330M□□125025
		8.04	2.41	900	16 x 20	ECR2WDE330M□□160020
		8.04	2.41	1000	12.5 x 30	ECR2WDE330M□□125030
	39	6.8	2.04	1000	10 x 40	ECR2WDE390M□□100040
		6.8	2.04	1075	12.5 x 30	ECR2WDE390M□□125030
		6.8	2.04	1150	12.5 x 35	ECR2WDE390M□□125035
		6.8	2.04	1000	16 x 20	ECR2WDE390M□□160020
	47	5.64	1.69	1200	10 x 50	ECR2WDE470M□□100050
		5.64	1.69	1100	12.5 x 30	ECR2WDE470M□□125030
		5.64	1.69	1200	12.5 x 35	ECR2WDE470M□□125035
		5.64	1.69	1250	16 x 25.5	ECR2WDE470M□□160025
450 (500) 2W	56	5.64	1.69	1150	18 x 20.5	ECR2WDE470M□□180020
		4.74	1.42	1250	12.5 x 35	ECR2WDE560M□□125035
		4.74	1.42	1350	12.5 x 40	ECR2WDE560M□□125040
		4.74	1.42	1463	16 x 25.5	ECR2WDE560M□□160025
	68	4.74	1.42	1250	18 x 20.5	ECR2WDE560M□□180020
		3.9	1.17	1450	12.5 x 40	ECR2WDE680M□□125040
		3.9	1.17	1525	16 x 31.5	ECR2WDE680M□□160031
		3.9	1.17	1650	16 x 36	ECR2WDE680M□□160036
	82	3.9	1.17	1525	18 x 25.5	ECR2WDE680M□□180025
		3.23	0.97	1650	12.5 x 45	ECR2WDE820M□□125045
		3.23	0.97	1750	12.5 x 50	ECR2WDE820M□□125050
		3.23	0.97	1625	16 x 31.5	ECR2WDE820M□□160031
	100	3.23	0.97	1600	18 x 25.5	ECR2WDE820M□□180025
		3.23	0.97	1825	18 x 31.5	ECR2WDE820M□□180031
		2.65	0.8	1640	16 x 36	ECR2WDE101M□□160036
		2.65	0.8	1875	16 x 40	ECR2WDE101M□□160040
	120	2.65	0.8	1687	18 x 31.5	ECR2WDE101M□□180031
		2.65	0.8	1879	18 x 36	ECR2WDE101M□□180036
		2.21	0.66	1935	18 x 36	ECR2WDE121M□□180036
	150	2.21	0.66	2093	18 x 40	ECR2WDE121M□□180040
		1.77	0.53	2150	18 x 40	ECR2WDE151M□□180040
		1.77	0.53	2250	18 x 45	ECR2WDE151M□□180045
	180	1.77	0.53	2385	18 x 50	ECR2WDE151M□□180050
		1.47	0.44	2450	18 x 50	ECR2WDE181M□□180050

Customer products are available on request.

## Lifetime Diagram



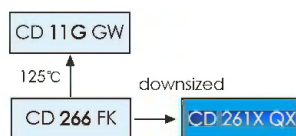
## Typical Curves





5000 - 10000h at 105°C

- Extra high Ripple Current
- Downsized
- Electronic Ballast, LED Lighting

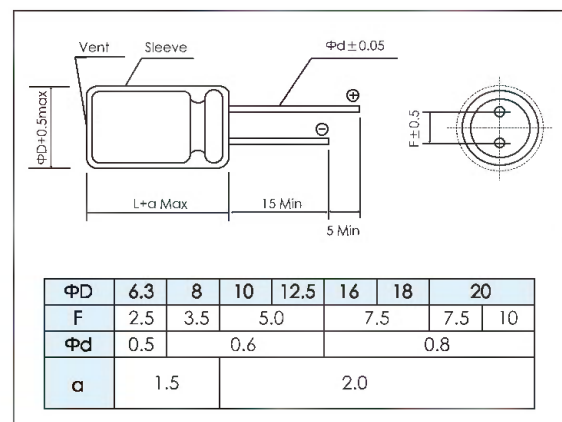


Items	Characteristics								
Operating Temperature Range (°C)	-40 ~ +105								
Voltage Range (V)	160 ~ 500								
Capacitance Range (μF)	1.0 ~ 330								
Capacitance Tolerance (20°C, 120Hz)	± 20%								
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.04CV + 100. C: Nominal Capacitance (μF)    V: Rated Voltage (V)								
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160	200	250	350	400	450	500	
	Tan δ (max)	0.15			0.20				
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160	200	250	350	400	450	500	
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	3			6				
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	6			8				10

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi 6.3 \times 11.5$ : 7000h $\Phi 8 \sim 10$ : 10000h $\Phi \geq 12.5$ : 12000h	$\geq 100000h$	$\Phi 6.3 \times 11.5$ : 5000h $\Phi 8 \sim 10$ : 8000h $\Phi \geq 12.5$ : 10000h	$\Phi 6.3 \times 11.5$ : 7000h $\Phi 8 \sim 10$ : 10000h $\Phi \geq 12.5$ : 12000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.6 \times I_R$ 50°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	50kHz	100kHz
Cap (μF)					
1 ~ 5.6	0.2	0.4	0.8	0.92	1.0
6.8 ~ 15	0.3	0.6	0.9	0.96	1.0
22 ~ 82	0.4	0.7	0.9	0.96	1.0
100 ~ 220	0.45	0.75	0.9	0.96	1.0

## Temperature Coefficient

Ambient Temperature (°C)	+65	+85	+105
Coefficient	2.1	1.7	1.0



# CD 261X QX SERIES



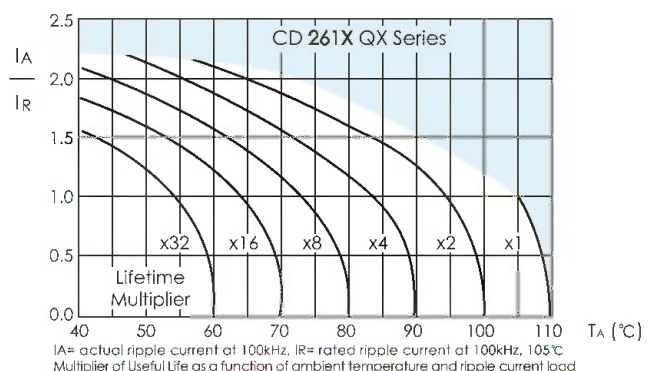
## Ratings for CD 261X QX Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mArms)	(mm)	-
160 (200) 2C	10	19.9	8	320	10×16	ECR2CQX100M□□100016
	22	9	3.6	500	10×20	ECR2CQX220M□□100020
	33	6	2.4	650	10×20	ECR2CQX330M□□100020
	47	4.2	1.7	750	10×20	ECR2CQX470M□□100020
	68	2.9	1.2	1180	12.5×20	ECR2CQX680M□□125020
		2.9	1.2	1180	16×20	ECR2CQX680M□□160020
	100	2	0.8	1420	12.5×25	ECR2CQX101M□□125025
		2	0.8	1420	16×20	ECR2CQX101M□□160020
	150	1.3	0.5	1890	16×25.5	ECR2CQX151M□□160025
	220	0.9	0.4	2370	18×25.5	ECR2CQX221M□□180025
200 (250) 2D	330	0.6	0.2	3220	18×31.5	ECR2CQX331M□□180031
	4.7	42.3	16.9	160	8×11.5	ECR2DQX47M□□080011
	6.8	29.3	11.7	200	10×12.5	ECR2DQX68M□□100012
	10	19.9	8	220	8×11.5	ECR2DQX100M□□080011
		19.9	8	280	10×12.5	ECR2DQX100M□□100012
	22	9	3.6	400	10×12.5	ECR2DQX220M□□100012
		9	3.6	500	10×20	ECR2DQX220M□□100020
	33	6	2.4	650	10×20	ECR2DQX330M□□100020
	47	4.2	1.7	980	12.5×20	ECR2DQX470M□□125020
	68	2.9	1.2	1300	12.5×25	ECR2DQX680M□□125025
250 (300) 2E	68	2.9	1.2	1300	16×20	ECR2DQX680M□□160020
		2.9	1.2	1300	16×20	ECR2DQX680M□□160020
	100	2	0.8	1420	16×20	ECR2DQX101M□□160020
	150	1.3	0.5	1890	16×25.5	ECR2DQX151M□□160025
	220	0.9	0.4	2330	18×25.5	ECR2DQX221M□□180025
	330	0.6	0.2	3220	18×35.5	ECR2DQX331M□□180035
	4.7	42.3	16.9	160	8×11.5	ECR2EQX47M□□080011
	6.8	29.3	11.7	250	10×12.5	ECR2EQX68M□□100012
	10	19.9	8	320	10×16	ECR2EQX100M□□100016
	22	9	3.6	470	10×16	ECR2EQX220M□□100016
9		3.6	500	10×20	ECR2EQX220M□□100020	
350 (400) 2V	33	6	2.4	760	12.5×16	ECR2EQX330M□□125016
		6	2.4	800	12.5×20	ECR2EQX330M□□125020
	47	4.2	1.7	980	12.5×20	ECR2EQX470M□□125020
	68	2.9	1.2	1300	16×20	ECR2EQX680M□□160020
		2.9	1.2	1300	12.5×25	ECR2EQX680M□□125025
	100	2	0.8	1530	16×25.5	ECR2EQX101M□□160025
		2	0.8	1440	18×20.5	ECR2EQX101M□□180020
	150	1.3	0.5	1960	18×25.5	ECR2EQX151M□□180025
	220	0.9	0.4	2545	18×31.5	ECR2EQX221M□□180031
	3.3	80.4	24.1	130	8×11.5	ECR2VQX33M□□100012
400 (450) 2G	4.7	56.5	16.9	150	10×12.5	ECR2VQX47M□□100012
	5.6	47.4	14.2	150	8×11.5	ECR2VQX56M□□080011
		47.4	14.2	180	10×12.5	ECR2VQX56M□□100012
	6.8	39	11.7	280	10×16	ECR2VQX68M□□100016
	10	26.5	8	280	10×12.5	ECR2VQX100M□□100012
	22	12.1	3.6	650	12.5×20	ECR2VQX220M□□125020
	33	8	2.4	850	12.5×25	ECR2VQX330M□□125025
	47	5.6	1.7	1080	16×20	ECR2VQX470M□□160020
	68	3.9	1.2	1350	18×20.5	ECR2VQX680M□□180020
	82	3.2	0.97	1530	18×25.5	ECR2VQX820M□□180025
400 (450) 2G	1	265.4	79.6	50	6.3×11.5	ECR2GQX010M□□063001
	1.5	176.9	53.1	70	6.3×11.5	ECR2GQX115M□□063001
		176.9	53.1	80	8×11.5	ECR2GQX115M□□080011
	2.2	120.6	36.2	95	8×11.5	ECR2GQX220M□□080011
		120.6	36.2	140	10×12.5	ECR2GQX220M□□100012
	3.3	80.4	24.1	150	10×12.5	ECR2GQX330M□□100012
		80.4	24.1	180	10×16	ECR2GQX330M□□100016
	4.7	56.5	16.9	160	8×11.5	ECR2GQX47M□□080011
		56.5	16.9	220	10×16	ECR2GQX47M□□100016
	5.6	47.4	14.2	200	10×12.5	ECR2GQX56M□□100012
400 (450) 2G	6.8	39	11.7	230	10×16	ECR2GQX68M□□100016
		39	11.7	280	10×20	ECR2GQX68M□□100020
	10	26.5	8	350	10×20	ECR2GQX100M□□100020
	15	17.7	5.3	500	12.5×16	ECR2GQX150M□□125016
		17.7	5.3	550	12.5×20	ECR2GQX150M□□125020
	22	12.1	3.6	650	12.5×20	ECR2GQX220M□□125020

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
400 (450) 2G	22	12.1	3.6	760	12.5×25	ECR2GQX220M□□125025
		12.1	3.6	760	16×20	ECR2GQX220M□□160020
	33	8	2.4	900	16×20	ECR2GQX330M□□160020
		47	5.6	1.7	1180	16×25.5
	5.6		1.7	1180	18×20.5	ECR2GQX470M□□180020
		68	3.9	1.2	1470	18×25.5
	82	3.2	1	1600	18×31.5	ECR2GQX820M□□180031
	100	2.7	0.8	1778	18×36	ECR2GQX101M□□180036
	2.2	120.6	36.2	90	8×11.5	ECR2WQX2R2M□□080011
		120.6	36.2	90	10×12.5	ECR2WQX2R2M□□100012
	3.3	80.4	24.1	180	10×12.5	ECR2WQX3R3M□□100012
		80.4	24.1	190	10×16	ECR2WQX3R3M□□100016
	4.7	56.5	16.9	212	10×16	ECR2WQX4R7M□□100016
	5.6	47.4	14.2	200	10×16	ECR2WQX5R6M□□100016
	6.8	39	11.7	230	10×16	ECR2WQX6R8M□□100016
		39	11.7	280	10×20	ECR2WQX6R8M□□100020
450 (500) 2W	10	26.5	8	330	10×20	ECR2WQX100M□□100020
	15	17.7	5.3	450	12.5×20	ECR2WQX150M□□125020
	22	12.1	3.6	730	16×20	ECR2WQX220M□□160020
		12.1	3.6	600	12.5×25	ECR2WQX220M□□125025
	33	8	2.4	980	16×25.5	ECR2WQX330M□□160025
		47	5.6	1.7	1090	16×25.5
	5.6		1.7	1200	18×25.5	ECR2WQX470M□□180025
		68	3.9	1.2	1440	18×25
	3.9		1.2	1575	18×31.5	ECR2WQX680M□□180031
		82	3.2	1	1600	18×31.5
	3.2		1	1675	18×36	ECR2WQX820M□□180036
		100	2.7	0.8	1700	18×31.5
	2.7		0.8	1730	18×36	ECR2WQX101M□□180036
		120	2.2	0.7	1750	18×36
	2.2		0.7	1820	18×40	ECR2WQX121M□□180040
		150	1.8	0.5	2020	18×40
	1.8		0.5	2140	18×45	ECR2WQX151M□□180045
		180	1.5	0.4	2380	18×45
	1.5		0.4	2460	18×50	ECR2WQX181M□□180050
		220	1.2	0.36	2600	18×50
500 (550) 2H	10	26.5	9.3	360	12.5×20	ECR2HQX100M□□125020
	15	17.7	6.2	480	12.5×25	ECR2HQX150M□□125025
	22	12.1	4.2	580	16×25.5	ECR2HQX220M□□160025
	33	8	2.8	720	16×31.5	ECR2HQX330M□□160031
	47	5.6	2	900	18×31.5	ECR2HQX470M□□180031
	56	4.8	1.6	980	18×31.5	ECR2HQX560M□□180031
	68	3.9	1.4	1250	18×36	ECR2HQX680M□□180036
	82	3.2	1.1	1330	18×40	ECR2HQX820M□□180040
	100	2.7	0.9	1430	18×45	ECR2HQX101M□□180045
		2.7	0.9	1450	20×41	ECR2HQX101M□□200041
	120	2.3	0.8	1640	18×50	ECR2HQX121M□□180050
	150	1.8	0.5	1950	22×45	ECR2HQX151M□□220045

Customer products are available on request.

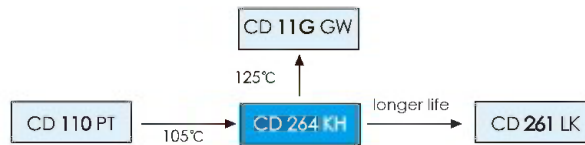
## Lifetime Diagram





3000h at 105°C

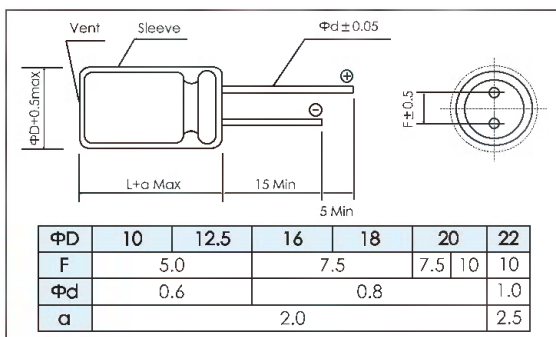
- High rated voltage, up to 500V
- High-reliability and professional applications
- Lighting, monitors, general industrial
- Filtering of high voltages in power supplies



Items	Characteristics									
Operating Temperature Range (℃)	-40 ~ +105				-25 ~ +105					
Voltage Range (V)	160 ~ 250				350 ~ 500					
Capacitance Range (μF)	1 ~ 220									
Capacitance Tolerance (20℃, 120Hz)	± 20%									
Leakage Current (μA)	After 1 minute at 20℃ application of rated voltage, leakage current is not more than: CV ≤ 1000 : I ≤ 0.06CV + 40 CV > 1000 : I ≤ 0.03CV + 70 C: Nominal Capacitance (μF)    V: Rated Voltage (V)									
Dissipation Factor (20℃, 120Hz)	WV (V)	160	200	250	350	400	420	450	500	
	Tan δ (max)	0.12			0.15		0.20			
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)		160	200	250	350	400	420	450	500
	Impedance Ratio	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	3			6				8
		Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	4			-				

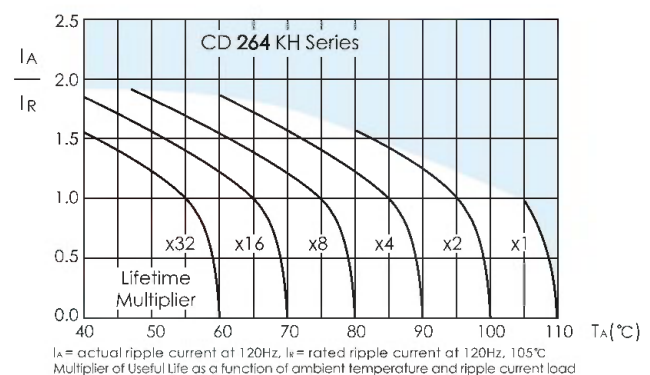
	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	>70000h	3000h	4000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 60°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions



mm

## Lifetime Diagram



## Frequency Coefficient

Frequency Cap (μF)	50/60Hz	120Hz	1kHz	10kHz	50kHz	100kHz
1.0 ~ 10	0.8	1.0	1.75	2.0	2.4	2.5
22 ~ 47	0.8	1.0	1.6	1.8	1.9	2.0
56 ~ 220	0.8	1.0	1.3	1.4	1.55	1.6

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.80	1.40	1.00



# CD 264 KH SERIES



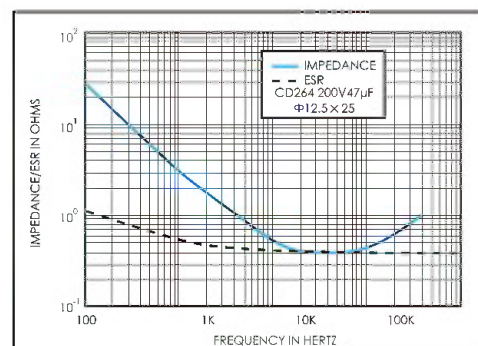
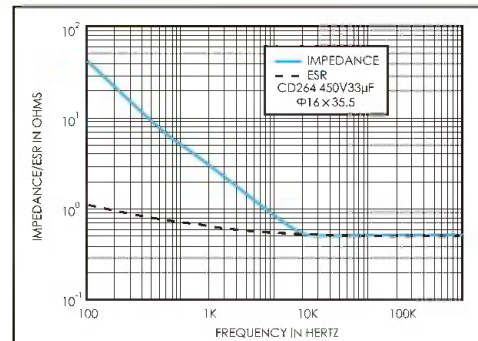
## Ratings for CD 264 KH Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
160 (200) 2C	10	15.9	5.3	95	10×12.5	ECR2CKH100M□□100012
	22	7.2	2.4	145	10×16	ECR2CKH220M□□100016
	33	4.8	1.6	190	10×20	ECR2CKH330M□□100020
	47	3.4	1.1	280	12.5×20	ECR2CKH470M□□125020
	100	1.6	0.5	380	18×20	ECR2CKH101M□□180020
	220	0.7	0.2	630	16×25.5	ECR2CKH101M□□160025
200 (250) 2D	4.7	33.9	11.2	60	10×12.5	ECR2DKH4R7M□□100012
	10	15.9	5.3	95	10×16	ECR2DKH100M□□100016
	22	7.2	2.4	145	10×20	ECR2DKH220M□□100020
	33	4.8	1.6	190	12.5×20	ECR2DKH330M□□125020
	47	3.4	1.1	280	12.5×25	ECR2DKH470M□□125025
	100	1.6	0.5	410	16×20	ECR2DKH221M□□160020
250 (300) 2E	4.7	33.9	11.2	60	10×12.5	ECR2DKH101M□□160025
	10	15.9	5.3	95	10×16	ECR2DKH101M□□180020
	22	7.2	2.4	180	12.5×20	ECR2DKH101M□□100012
	33	4.8	1.6	250	12.5×25	ECR2EKH100M□□100016
	47	3.4	1.1	300	16×20	ECR2EKH220M□□125020
	100	1.6	0.5	410	16×25.5	ECR2EKH330M□□160025
350 (400) 2V	4.7	33.9	11.2	60	10×12.5	ECR2EKH470M□□160025
	10	15.9	5.3	105	10×16	ECR2EKH101M□□160031
	22	7.2	2.4	180	12.5×20	ECR2EKH101M□□180025
	33	4.8	1.6	250	12.5×25	ECR2EKH101M□□180025
	47	3.4	1.1	300	16×20	ECR2EKH101M□□180025
	100	1.6	0.5	410	16×25.5	ECR2EKH101M□□180025
400 (450) 2G	4.7	33.9	11.2	60	10×12.5	ECR2EKH101M□□180025
	10	15.9	5.3	105	10×16	ECR2VKH100M□□100016
	22	7.2	2.4	180	12.5×20	ECR2VKH220M□□125020
	33	4.8	1.6	250	12.5×25	ECR2VKH330M□□125025
	47	3.4	1.1	300	16×20	ECR2VKH470M□□160025
	100	1.6	0.5	410	16×25.5	ECR2VKH470M□□180020
420 (470) 2K	4.7	33.9	11.2	60	10×12.5	ECR2VKH101M□□180031
	10	15.9	5.3	105	10×16	ECR2GKH2R2M□□100012
	22	7.2	2.4	180	12.5×20	ECR2GKH3R3M□□100016
	33	4.8	1.6	250	12.5×25	ECR2GKH4R7M□□100016
	47	3.4	1.1	300	16×20	ECR2GKH470M□□100020
	100	1.6	0.5	410	16×25.5	ECR2GKH470M□□100020
450 (500) 2W	4.7	33.9	11.2	60	10×12.5	ECR2GKH100M□□125020
	10	15.9	5.3	105	10×16	ECR2GKH220M□□125025
	22	7.2	2.4	180	12.5×20	ECR2GKH330M□□180020
	33	4.8	1.6	250	12.5×25	ECR2GKH330M□□160025
	47	3.4	1.1	300	16×20	ECR2GKH470M□□180025
	100	1.6	0.5	410	16×25.5	ECR2GKH470M□□180025

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
450 (500) 2W	82	3.2	1.1	650	18×36	ECR2WKH820M□□180036
	100	3.2	1.1	650	16×40	ECR2WKH820M□□160040
	120	3.2	1.1	580	20×30	ECR2WKH820M□□200030
	150	2.7	0.9	760	18×36	ECR2WKH101M□□180036
	180	2.7	0.9	760	16×45	ECR2WKH101M□□160045
	220	2.7	0.9	680	20×30	ECR2WKH101M□□200030
500 (550) 2H	120	2.2	0.7	830	18×40	ECR2WKH121M□□180040
	150	2.2	0.7	830	16×50	ECR2WKH121M□□160050
	180	1.8	0.6	920	20×41	ECR2WKH151M□□200041
	220	1.8	0.6	920	18×40	ECR2WKH151M□□180040
	250	1.8	0.6	920	16×60	ECR2WKH151M□□160060
	280	1.5	0.5	1100	22×45	ECR2WKH181M□□220041
550 (600) 2I	1	265.4	106.2	32	10×12.5	ECR2XKH010M□□100012
	2.2	120.6	48.3	49	10×16	ECR2XKH2R2M□□100016
	3.3	80.4	32.2	68	10×20	ECR2XKH3R3M□□100020
	4.7	56.5	22.6	84	12.5×20	ECR2XKH4R7M□□125020
	10	26.5	10.6	145	12.5×25	ECR2XKH100M□□125025
	22	12.1	4.8	230	16×25.5	ECR2XKH220M□□160025
600 (650) 2J	33	8	3.2	295	16×31.5	ECR2XKH330M□□160031
	47	5.6	2.3	415	18×31.5	ECR2XKH470M□□180031
	56	5.6	2.3	415	16×36	ECR2XKH470M□□160036
	68	4.7	1.9	460	18×31.5	ECR2XKH560M□□180031
	82	4.7	1.9	460	16×40	ECR2XKH560M□□160040
	100	3.9	1.6	580	18×36	ECR2XKH680M□□180036
650 (700) 2L	100	3.9	1.6	580	18×40	ECR2XKH680M□□180040
	120	3.2	1.3	650	16×45	ECR2XKH680M□□160045
	150	3.2	1.3	650	18×40	ECR2XKH820M□□180040
	180	2.7	1.1	820	16×55	ECR2XKH820M□□160055
	220	2.7	1.1	820	20×41	ECR2XKH101M□□200041
	250	2.7	1.1	820	18×44	ECR2XKH101M□□180044
700 (750) 2M	280	2.2	0.9	860	16×60	ECR2XKH101M□□160060
	330	1.8	0.7	930	22×45	ECR2XKH121M□□220045
	380	1.8	0.7	930	22×45	ECR2XKH151M□□220045
	450	1.8	0.7	930	22×45	ECR2XKH151M□□220045
	500	1.8	0.7	930	22×45	ECR2XKH151M□□220045
	550	1.8	0.7	930	22×45	ECR2XKH151M□□220045

Customer products are available on request.

## Typical Curves





5000h at 105°C

- Polarized aluminum electrolytic capacitors, non-solid
- Pressure relief
- Long useful life: 10000 hours at 105°C
- High rated voltage, up to 500V
- High-reliability and professional applications
- Lighting, monitors, general industrial
- Filtering of high voltages in power supplies

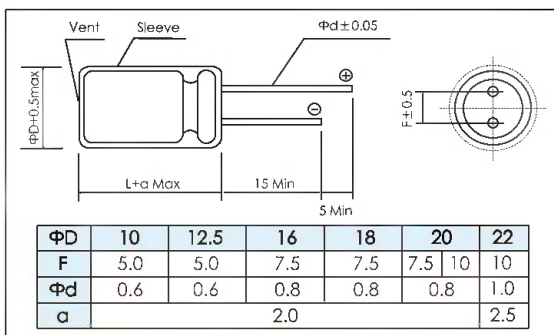


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +105	-25 ~ +105
Voltage Range (V)	160 ~ 250	350 ~ 500
Capacitance Range (μF)	1 ~ 220	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than: $CV \leq 1000: I \leq 0.06$ $CV > 1000: I \leq 0.03$ $CV + 70$ C: Nominal Capacitance (μF)    V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	WV (V)	160    200    250    350    400    420    450    500
	Tan δ (max)	0.12    0.15    0.20
When nominal capacitance is over 1000μF tan δ shall be added 0.02 to the listed value with increase of every 1000 μF		
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	160    200    250    350    400    420    450    500
	Impedance	$Z_{-25^\circ\text{C}} / Z_{+20^\circ\text{C}}$ 3    6    8
	Ratio	$Z_{-40^\circ\text{C}} / Z_{+20^\circ\text{C}}$ 4    -

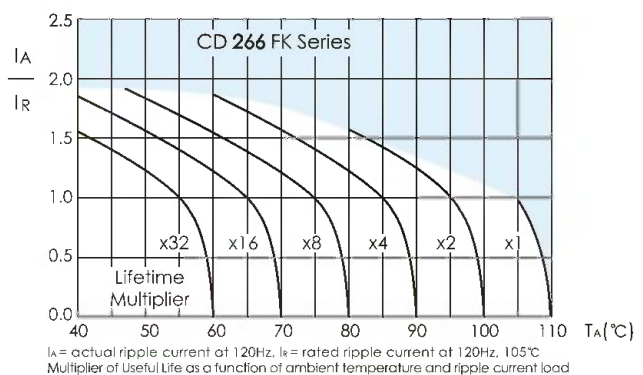
	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ 10 : 8000h ≥ Φ 12.5~22: 10000h	90000h	Φ 10 : 4000h ≥ Φ 12.5~22: 5000h	Φ 10 : 6000h ≥ Φ 12.5~22: 7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C ≤ 1% Failure Rate	$U_R$ $1.4 \times I_R$ 60°C ≤ 1% Failure Rate	$U_R$ $I_R$ 105°C guaranteed	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Lifetime Diagram



## Frequency Coefficient

Frequency Cap (μF)	50/60Hz	120Hz	1kHz	10kHz	50kHz	100kHz
1.0~10	0.8	1.0	1.75	2.0	2.4	2.5
22~47	0.8	1.0	1.6	1.8	1.9	2.0
56~220	0.8	1.0	1.3	1.4	1.55	1.6

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.80	1.40	1.00



# CD 266 FK SERIES



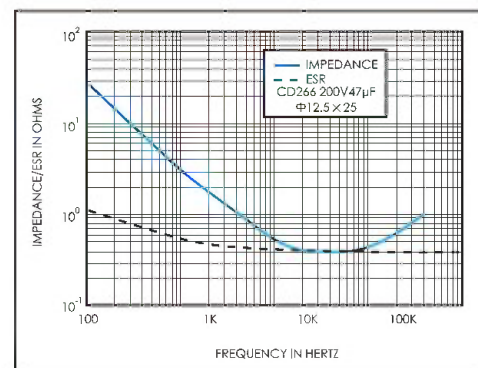
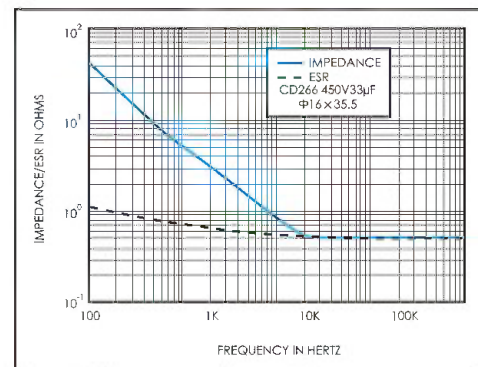
## Ratings for CD 266 FK Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
160 (200) 2C	10	15.9	7	95	10×2.5	ECR2CFK100M□□100012
	22	7.2	3.5	145	10×16	ECR2CFK220M□□100016
	33	4.8	2.2	190	10×20	ECR2CFK330M□□100020
	47	3.4	1.5	280	12.5×20	ECR2CFK470M□□125020
	100	1.6	0.7	380	18×20	ECR2CFK101M□□180020
	100	1.6	0.7	380	16×25.5	ECR2CFK101M□□160025
200 (250) 2D	220	0.7	0.3	630	16×35.5	ECR2CFK221M□□160035
	4.7	33.9	14	60	10×12.5	ECR2DFK4R7M□□100012
	10	15.9	7	95	10×16	ECR2DFK100M□□100016
	22	7.2	3.5	145	10×20	ECR2DFK220M□□100020
	33	4.8	2.2	190	12.5×20	ECR2DFK330M□□125020
	47	3.4	1.5	280	12.5×25	ECR2DFK470M□□125025
250 (300) 2E	100	1.6	0.7	410	16×20	ECR2DFK470M□□160020
	100	1.6	0.7	410	16×25.5	ECR2DFK101M□□160025
	100	1.6	0.7	410	18×20	ECR2DFK101M□□180020
	4.7	33.9	14	60	10×12.5	ECR2EFK4R7M□□100012
	10	15.9	7	105	10×16	ECR2EFK100M□□100016
	22	7.2	3.5	180	12.5×20	ECR2EFK220M□□125020
350 (400) 2V	33	4.8	2.2	250	12.5×25	ECR2EFK330M□□125025
	33	4.8	2.2	250	16×20	ECR2EFK330M□□160020
	47	3.4	1.5	300	16×25.5	ECR2EFK470M□□160025
	47	3.4	1.5	300	18×20	ECR2EFK470M□□180020
	100	1.6	0.7	410	16×31.5	ECR2EFK101M□□160031
	100	1.6	0.7	410	18×25.5	ECR2EFK101M□□180025
400 (450) 2G	150	1.1	0.5	500	18×25.5	ECR2EFK151M□□180025
	220	0.7	0.3	700	18×36	ECR2EFK221M□□180036
	3.3	60.3	28	50	8×11.5	ECR2VFK3R3M□□080011
	4.7	42.3	19	65	10×16	ECR2VFK4R7M□□100016
	10	19.9	10	120	10×20	ECR2VFK100M□□100020
	22	9.0	4	180	12.5×20	ECR2VFK220M□□125020
450 (500) 2W	33	6.0	2.5	210	12.5×25	ECR2VFK330M□□125025
	47	4.2	1.8	350	16×25.5	ECR2VFK470M□□160025
	47	4.2	1.8	350	18×20	ECR2VFK470M□□180020
	100	2.0	0.8	650	18×31.5	ECR2VFK101M□□180031
	2.2	90.5	40	40	10×12.5	ECR2GFK2R2M□□100012
	3.3	60.3	28	50	10×16	ECR2GFK3R3M□□100016
500 (550) 2H	4.7	42.3	19	70	10×20	ECR2GFK4R7M□□100020
	10	19.9	10	120	12.5×20	ECR2GFK100M□□125020
	22	9.0	4	200	12.5×25	ECR2GFK220M□□125025
	33	6.0	2.5	245	18×20	ECR2GFK330M□□180020
	33	6.0	2.5	245	16×25.5	ECR2GFK330M□□160025
	47	4.2	1.8	380	18×25.5	ECR2GFK470M□□180025
500 (550) 2H	47	4.2	1.8	380	16×31.5	ECR2GFK470M□□160031
	68	2.9	1.2	500	18×25.5	ECR2GFK680M□□180025
	82	2.4	1	610	18×31.5	ECR2GFK820M□□180031
	100	2.0	0.8	700	18×36	ECR2GFK101M□□180036
	120	1.7	0.6	785	18×40	ECR2GFK121M□□180040
	150	1.3	0.5	840	20×41	ECR2GFK151M□□200041
500 (550) 2H	1	265.4	80	30	10×12.5	ECR2WFK010M□□100012
	2.2	120.6	40	45	10×16	ECR2WFK2R2M□□100016
	3.3	80.4	24	65	10×20	ECR2WFK3R3M□□100020
	4.7	56.5	17	80	12.5×20	ECR2WFK4R7M□□125020
	10	26.5	8	140	12.5×25	ECR2WFK100M□□125025
	22	12.1	3.5	220	16×25.5	ECR2WFK220M□□160025
500 (550) 2H	33	8.0	2.5	280	16×31.5	ECR2WFK330M□□160031
	47	5.6	2	420	16×31.5	ECR2WFK470M□□160031
	68	3.9	1.4	610	18×31.5	ECR2WFK680M□□180031
	82	3.2	1.1	680	18×31.5	ECR2WFK820M□□180031
	100	2.7	0.9	800	18×36	ECR2WFK820M□□180036
	100	2.7	0.9	800	18×36	ECR2WFK101M□□180036
500 (550) 2H	120	2.2	0.8	875	18×40	ECR2WFK121M□□180040
	150	1.8	0.6	935	20×41	ECR2WFK151M□□200041
	180	1.5	0.5	1100	22×4	ECR2WFK181M□□220041
	220	1.2	0.4	1200	22×41	ECR2WFK221M□□220045
	1	265.4	106	32	10×12.5	ECR2HFK010M□□100012
	2.2	120.6	48	49	10×16	ECR2HFK2R2M□□100016
500 (550) 2H	3.3	80.4	32	68	10×20	ECR2HFK3R3M□□100020
	4.7	56.5	22.6	84	12.5×20	ECR2HFK4R7M□□125020
	10	26.5	10.6	145	12.5×25	ECR2HFK100M□□125025
	22	12.1	4.8	230	16×25.5	ECR2HFK220M□□160025
	33	8.0	3.2	295	16×31.5	ECR2HFK330M□□160031

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
500 (550) 2H	47	5.6	2.3	415	18×31.5	ECR2HFK470M□□180031
	68	3.9	1.6	620	18×36	ECR2HFK680M□□180036
		3.9	1.6	620	18×40	ECR2HFK680M□□180040
	82	3.2	1.3	680	18×36	ECR2HFK820M□□180036
		3.2	1.3	680	18×40	ECR2HFK820M□□180040
	100	2.7	1.1	860	18×46	ECR2HFK101M□□180046
		2.7	1.1	860	20×41	ECR2HFK101M□□200041
	120	2.2	0.9	900	22×45	ECR2HFK121M□□220045
	150	1.8	0.7	980	22×45	ECR2HFK151M□□220045

Customer products are available on request.

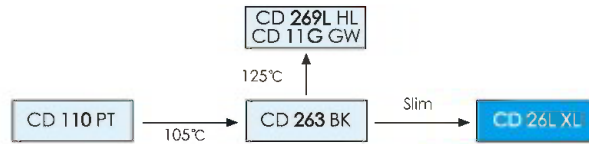
## Typical Curves





2000h at 105°C

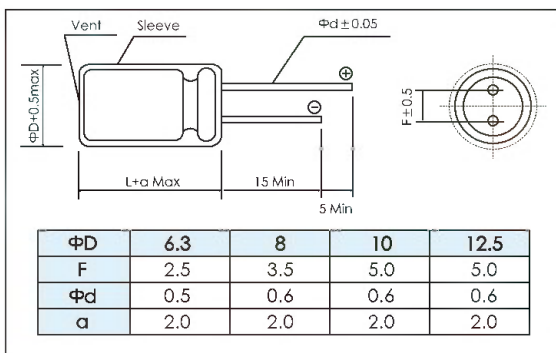
- Slim Type
- High ripple current



Items	Characteristics						
Operating Temperature Range (℃)	-25 ~ +105						
Voltage Range (V)	200 ~ 500						
Capacitance Range (μF)	12 ~ 220						
Capacitance Tolerance (20℃, 120Hz)	± 20%						
Leakage Current (μA)	After 1 minute at 20℃ application of rated voltage, leakage current is not more than 0.02CV. C: Nominal Capacitance (μF)    V: Rated Voltage (V)						
Dissipation Factor (20℃, 120Hz)	Rated Voltage (V)	200	250	400	420	450	500
	Tan δ (max)	0.12	0.15	0.20			
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200 ~ 250		400 ~ 500			
	$Z_{-25℃} / Z_{+20℃}$	3		8			

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	4000h	≥ 100000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	$U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

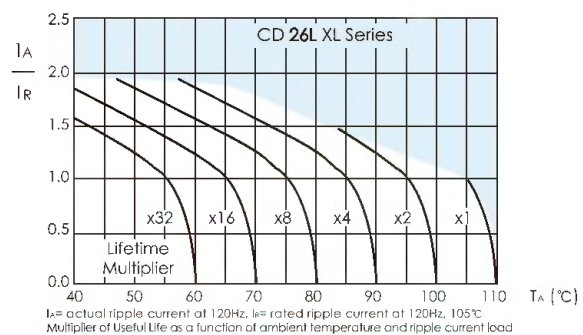


mm

## Frequency Coefficient

Frequency(Hz)	50/60	120	500	1K	≥10K
Coefficient					
200 ~ 250V	0.8	1.0	1.20	1.30	1.40
400 ~ 500V	0.8	1.0	1.25	1.40	1.50

## Lifetime Diagram



## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.8	1.4	1.0



## Ratings for CD 26L XL Series

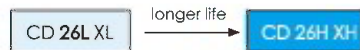
U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
200 (250) 2D	82	1.9	1.2	400	10 × 30	ECR2DXL820M□□100030
	100	1.6	1	460	10 × 36	ECR2DXL101M□□100036
	120	1.3	0.8	530	10 × 40	ECR2DXL121M□□100040
	150	1.1	0.6	620	12.5 × 30	ECR2DXL151M□□125030
	180	0.9	0.5	700	12.5 × 36	ECR2DXL181M□□125036
	220	0.7	0.4	800	12.5 × 40	ECR2DXL221M□□125040
250 (300) 2E	47	4.2	2.5	295	8 × 50	ECR2EXL470M□□080050
	68	2.9	1.8	330	10 × 36	ECR2EXL680M□□100036
	82	2.4	1.5	420	10 × 40	ECR2EXL820M□□100040
	100	2	1.2	480	10 × 50	ECR2EXL101M□□100050
	120	1.7	1	560	12.5 × 36	ECR2EXL121M□□125036
		1.7	1	630	10 × 60	ECR2EXL121M□□125060
400 (450) 2G	150	1.3	0.8	650	12.5 × 40	ECR2EXL151M□□125040
	27	9.8	4.4	240	10 × 30	ECR2GXL270M□□100030
	33	8.0	3.6	280	10 × 36	ECR2GXL330M□□100036
	39	6.8	3.1	320	10 × 40	ECR2GXL390M□□100040
	47	5.6	2.5	370	12.5 × 30	ECR2GXL470M□□125030
		5.6	2.5	370	10 × 50	ECR2GXL470M□□100050
	56	4.7	2.1	420	12.5 × 36	ECR2GXL560M□□125036
	68	3.9	1.8	480	12.5 × 45	ECR2GXL680M□□125045
	82	3.2	1.5	520	12.5 × 50	ECR2GXL820M□□125050
	100	2.7	1.2	580	12.5 × 50	ECR2GXL101M□□125050
420 (470) 2X	22	12	7.2	200	10 × 30	ECR2XXL220M□□100030
	27	9.8	5.9	230	10 × 36	ECR2XXL270M□□100036
	33	8	4.8	270	10 × 40	ECR2XXL330M□□100040
	39	6.8	4.1	310	12.5 × 30	ECR2XXL390M□□125030
	47	5.6	3.4	360	12.5 × 36	ECR2XXL470M□□125036
		5.6	3.4	360	10 × 50	ECR2XXL470M□□100050
	56	4.7	2.8	430	12.5 × 40	ECR2XXL560M□□125040
	68	3.9	2.3	490	12.5 × 45	ECR2XXL680M□□125045
	82	3.2	1.9	550	12.5 × 50	ECR2XXL820M□□125050
450 (500) 2W	12	22.1	13.2	120	6.3 × 50	ECR2WXL120M□□063050
	18	14.7	8.8	180	8 × 50	ECR2WXL180M□□080050
	21	12.6	7.5	210	8 × 50	ECR2WXL210M□□080050
	27	9.8	5.9	250	10 × 40	ECR2WXL270M□□100040
	33	8.0	4.8	280	12.5 × 30	ECR2WXL330M□□125030
	39	6.8	4.1	320	12.5 × 36	ECR2WXL390M□□125036
		6.8	4.1	320	10 × 50	ECR2WXL390M□□100050
	47	5.7	3.4	380	12.5 × 40	ECR2WXL470M□□125040
		5.7	3.4	380	10 × 50	ECR2WXL470M□□100050
	53	5.0	3.0	410	10 × 50	ECR2WXL530M□□100050
	56	4.7	2.8	440	12.5 × 50	ECR2WXL560M□□125050
		4.7	2.8	440	10 × 60	ECR2WXL560M□□100060
	60	4.4	2.6	470	10 × 60	ECR2WXL600M□□100060
	68	3.9	2.3	550	12.5 × 50	ECR2WXL680M□□125050
	82	3.2	1.9	667	12.5 × 50	ECR2WXL820M□□125050
	100	2.7	1.6	800	12.5 × 61	ECR2WXL101M□□125061
500 (550) 2H	22	12.1	7.2	190	8 × 50	ECR2HXL220M□□080050
	39	6.8	4.1	300	10 × 50	ECR2HXL390M□□100050
	47	5.7	3.4	400	12.5 × 50	ECR2HXL470M□□125050
	53	5	3.0	420	12.5 × 61	ECR2HXL530M□□125061
	56	4.7	2.8	450	12.5 × 61	ECR2HXL560M□□125061

Customer products are available on request.



3000 ~ 5000h at 105°C

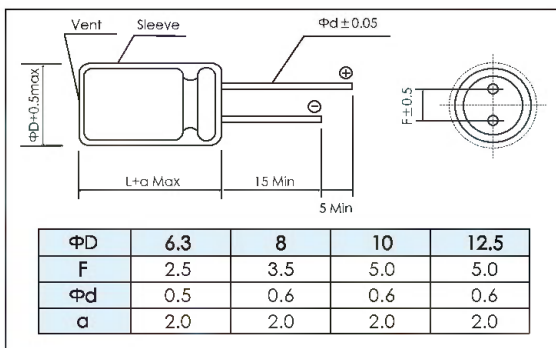
- Slim Type
- High ripple current



Items	Characteristics			
Operating Temperature Range (°C)	-25 ~ +105			
Voltage Range (V)	200 ~ 500			
Capacitance Range (μF)	33 ~ 220			
Capacitance Tolerance (20°C, 120Hz)	± 20%			
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.02CV. C: Nominal Capacitance (μF) V: Rated Voltage (V)			
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	200	250 ~ 420	450
	Tan δ (max)	0.12	0.15	0.12
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	200 ~ 250		400 ~ 500
	$Z_{-25°C} / Z_{+20°C}$	3		8

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 10$ : 6000h $\Phi > 10$ : 10000h	$\geq 250000h$	$\Phi \leq 10$ : 3000h $\Phi > 10$ : 5000h	$\Phi \leq 10$ : 4000h $\Phi > 10$ : 5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.2 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

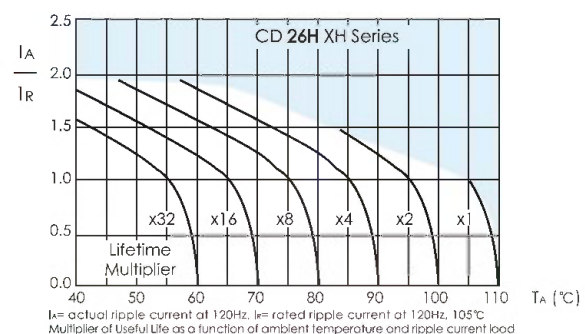


mm

## Frequency Coefficient

Frequency(Hz)		50/60	120	500	1K	≥ 10K
Coefficient	200 ~ 250V	0.8	1.0	1.20	1.30	1.40
	400 ~ 500V	0.8	1.0	1.25	1.40	1.50

## Lifetime Diagram



## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.8	1.4	1.0



## Ratings for CD 26H XH Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
200 (250) 2D	82	1.9	1.0	420	10×36	ECR2DXH820M□□100036
	100	1.6	0.9	480	10×40	ECR2DXH101M□□100040
	120	1.3	0.7	540	10×45	ECR2DXH121M□□100045
	150	1.1	0.6	650	12.5×36	ECR2DXH151M□□125036
	180	0.9	0.5	730	12.5×42	ECR2DXH181M□□125042
	220	0.7	0.4	840	12.5×45	ECR2DXH221M□□125045
250 (300) 2E	47	4.2	2.3	310	8×50	ECR2EXH470M□□080050
	68	2.9	1.6	340	10×36	ECR2EXH680M□□100036
	82	2.4	1.3	440	10×43	ECR2EXH820M□□100043
	100	2	1.1	500	10×50	ECR2EXH101M□□100050
	120	1.7	0.9	580	12.5×40	ECR2EXH121M□□125040
	150	1.3	0.7	680	12.5×45	ECR2EXH151M□□125045
	180	1.1	0.6	760	12.5×50	ECR2EXH181M□□125050
	220	0.9	0.5	880	12.5×61	ECR2EXH221M□□125061
400 (450) 2G	33	6.0	3.3	290	10×40	ECR2GXH330M□□100040
	47	4.2	2.3	390	10×50	ECR2GXH470M□□100050
	47	4.2	2.3	390	12.5×35	ECR2GXH470M□□125035
	56	3.6	2	440	12.5×40	ECR2GXH560M□□125040
	68	2.9	1.6	500	12.5×45	ECR2GXH680M□□125045
	82	2.4	1.3	540	12.5×61	ECR2GXH820M□□125061
	100	2	1.1	610	12.5×61	ECR2GXH101M□□125061
420 (470) 2X	39	4.1	2.2	320	10×45	ECR2XXH390M□□100045
	47	3.4	1.9	370	10×50	ECR2XXH470M□□100050
	56	2.8	1.6	450	12.5×40	ECR2XXH560M□□125040
	68	2.3	1.3	520	12.5×45	ECR2XXH680M□□125045
	82	1.9	1.1	580	12.5×61	ECR2XXH820M□□125061
450 (500) 2W	12	13.3	7.5	130	6.3×50	ECR2WXH120M□□063050
	18	8.8	5	190	8×50	ECR2WXH180M□□080050
	21	7.6	4.3	200	8×50	ECR2WXH210M□□080050
	27	5.9	3.3	230	10×40	ECR2WXH270M□□100040
	33	4.8	2.7	290	10×45	ECR2WXH330M□□100045
	39	4.1	2.2	330	10×50	ECR2WXH390M□□100050
	39	4.1	2.2	330	12.5×36	ECR2WXH390M□□125036
	47	5.6	2.8	400	12.5×40	ECR2WXH470M□□125040
	53	5.0	2.5	430	12.5×45	ECR2WXH530M□□125045
	56	4.7	2.4	460	12.5×50	ECR2WXH560M□□125050
	68	2.3	1.3	540	12.5×50	ECR2WXH680M□□125050
	82	1.9	1	600	12.5×61	ECR2WXH820M□□125061
500 (550) 2H	22	12.1	6.6	200	8×50	ECR2HXH220M□□080050
	39	6.8	3.7	310	10×50	ECR2HXH390M□□100050
	47	5.6	2.8	410	12.5×50	ECR2HXH470M□□125050
	53	5.0	2.5	440	12.5×61	ECR2HXH530M□□125061
	56	4.7	2.4	470	12.5×61	ECR2HXH560M□□125061

Customer products are available on request.



5000h at 105°C

- Slim Type
- High ripple current

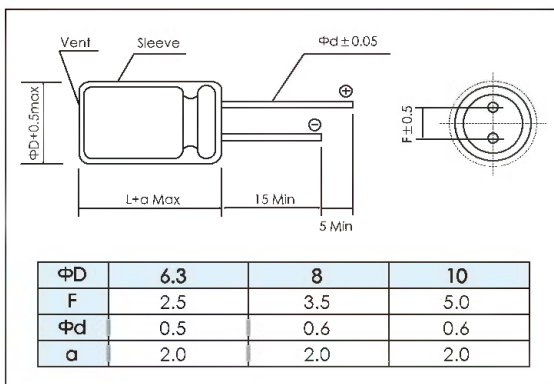


Items	Characteristics		
Operating Temperature Range (°C)	-25 ~ +105		
Voltage Range (V)	450 ~ 500		
Capacitance Range (μF)	12 ~ 39		
Capacitance Tolerance (20°C, 120Hz)	± 20%		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage $I_{Trent}$ is not more than 0.01CV or 1.5mA, whichever is smaller C:Nominal Capacitance(μF) V:Rated Voltage(V)		
Dissipation Factor (20°C, 120Hz)	WV (v)	450	500
	Tan δ(max)	0.12	0.20
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (v)	450~500	
	Impedance Ratio	$Z_{-25°C} / Z_{+20°C}$	8

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	10000h	≥ 250000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ 1.2x $I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	<div> <math>U_R = 0</math>  <math>I_R = 0</math>            105°C         </div> <div>           After test:  <math>U_R</math> to be applied            for 30min            24 to 48h before            measurement         </div>

## Dimensions

mm



## Frequency Coefficient

Frequency (Hz)		50/60	120	500	1K	≥10K
Coefficient	450~500V	0.8	1.0	1.25	1.40	1.50

## Temperature Coefficient

Temperature (°C)	+70	+85	+105
Coefficient	1.8	1.4	1.0



## Ratings for CD 26HL ZR Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi D \times L$	P/N
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	-
450 (500) 2W	12	22	13.3	130	6.3 × 50	ECR2WZR120M□□063050
500 (550) 2H	22	12	7.2	200	8 × 50	ECR2HZR220M□□080050
	33	8	4.8	280	10 × 50	ECR2HZR330M□□100050
	39	6.8	4.1	300	10 × 50	ECR2HZR390M□□100050

Customer products are available on request.



5000h at 105°C

- 105°C long life, Ultra miniaturized
- High ripple current



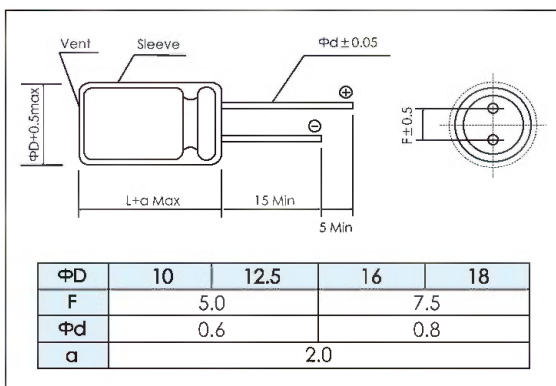
MINIATURE

Items	Characteristics		
Operating Temperature Range (°C)	-25 ~ 105		
Rated Voltage (V)	400 ~ 450VDC		
Capacitance Range(μF)	33 ~ 220		
Capacitance Tolerance (20°C,120Hz)	± 20%		
Leakage Current (μA)	After 1 minutes at 20°C application of rated voltage, leakage current is not more than 0.02CV C:Nominal Capacitance(μF) V:Rated Voltage(V)		
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	400-420	450
	Tanδ(max)	0.15	0.12
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	400~450	
	Z(-25°C)/ Z(+20°C)	8	

	Useful Life		Load Life	Endurance Life	Shelf Life
Life Time	10000h	≥250000h	5000h	5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature Failure Rate Level	Ur Ir 105°C	Ur 1.2xIr 40°C	Ur Ir 105°C	Ur Ir= 0 105°C	U <sub>s</sub> = 0 I <sub>s</sub> = 0 105°C After test: U <sub>s</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency(Hz)		50/60	120	500	1K	≥10K
Coefficient	400~450V	0.8	1	1.25	1.4	1.5

## Temperature Coefficient

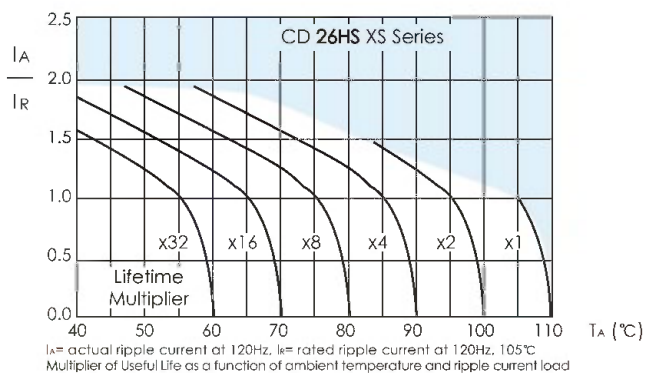
Temperature (°C)	+70	+85	+105
Coefficient	1.8	1.4	1.0



## Ratings for CD 26HS XS Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
400 (450) 2G	39	5.1	370	10x40	ECR2GXS390M □□ 100040
	47	4.2	420	10x45	ECR2GXS470M □□ 100045
	56	3.6	470	10x50	ECR2GXS560M □□ 100050
	68	2.9	540	12.5x40	ECR2GXS680M □□ 125040
	82	2.4	610	12.5x45	ECR2GXS820M □□ 125045
	100	2.0	680	12.5x50	ECR2GXS101M □□ 125050
	100	2.0	710	16x31.5	ECR2GXS101M □□ 160031
	120	1.7	800	16x36	ECR2GXS121M □□ 160036
	150	1.3	920	16x40	ECR2GXS151M □□ 160040
	150	1.3	890	18x31.5	ECR2GXS151M □□ 180031
	180	1.1	1080	16x50	ECR2GXS181M □□ 160050
	180	1.1	1060	18x40	ECR2GXS181M □□ 180040
	220	0.9	1200	18x46	ECR2GXS221M □□ 180046
420 (470) 2X	39	5.1	360	10x40	ECR2XXS390M □□ 100040
	47	4.2	430	10x50	ECR2XXS470M □□ 100050
	56	3.6	480	12.5x40	ECR2XXS560M □□ 125040
	68	2.9	520	12.5x40	ECR2XXS680M □□ 125040
	82	2.4	590	12.5x45	ECR2XXS820M □□ 125045
	100	2.0	690	16x31.5	ECR2XXS101M □□ 160031
	120	1.7	780	16x36	ECR2XXS121M □□ 160036
	120	1.7	800	18x31.5	ECR2XXS121M □□ 180031
	150	1.3	940	16x45	ECR2XXS151M □□ 160045
	150	1.3	920	18x36	ECR2XXS151M □□ 180036
	180	1.1	1050	16x50	ECR2XXS181M □□ 160050
	180	1.1	1040	18x40	ECR2XXS181M □□ 180040
	220	0.9	1220	18x50	ECR2XXS221M □□ 180050
450 (500) 2W	33	4.8	340	10x40	ECR2WXS330M □□ 100040
	39	4.1	380	10x45	ECR2WXS390M □□ 100045
	47	3.4	440	12.5x40	ECR2WXS470M □□ 125040
	56	2.8	490	12.5x40	ECR2WXS560M □□ 125040
	68	2.3	550	12.5x45	ECR2WXS680M □□ 125045
	82	1.9	620	12.5x50	ECR2WXS820M □□ 125050
	82	1.9	640	16x31.5	ECR2WXS820M □□ 160031
	100	1.6	730	16x36	ECR2WXS101M □□ 160036
	120	1.3	820	16x40	ECR2WXS121M □□ 160040
	120	1.3	800	18x31.5	ECR2WXS121M □□ 180031
	150	1.1	980	16x50	ECR2WXS151M □□ 160050
	150	1.1	970	18x40	ECR2WXS151M □□ 180040
	180	0.9	1090	18x46	ECR2WXS181M □□ 180046
	220	0.7	1220	18x50	ECR2WXS221M □□ 180050

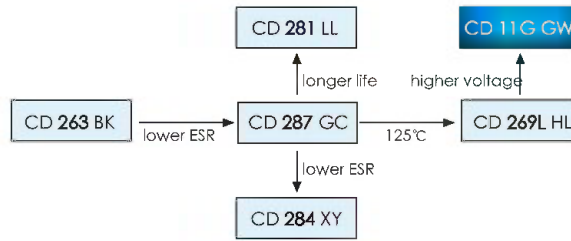
## Lifetime Diagram





2000h at 125°C

- High Ripple Current at High Temperature
- Suited for ballast and energy-saved lamp application of which high temperature and high reliability are required
- High Reliability

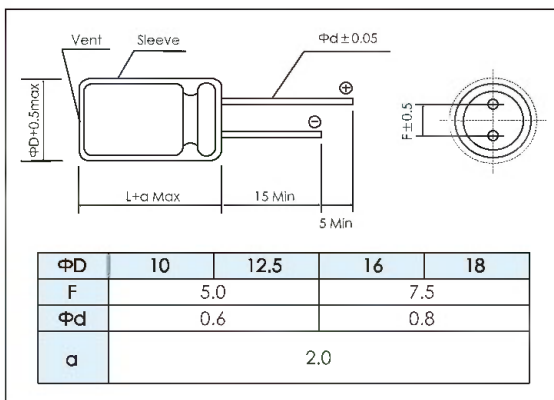


Items	Characteristics	
Operating Temperature Range (°C)	-40 ~ +125	-25 ~ +125
Voltage Range (V)	160 ~ 250	350 ~ 450
Capacitance Range (μF)	1 ~ 330	
Capacitance Tolerance (20°C, 120Hz)	± 20%	
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.03CV+70. C: Nominal Capacitance (μF) V: Rated Voltage (V)	
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160 200 250 350 400 450
	Tan δ (max)	0.12 0.12 0.12 0.15 0.15 0.15

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ10: 3000h Φ ≥ 12.5: 4000h	50000h	Φ10: 2000h Φ ≥ 12.5: 3000h	3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 125°C	$U_R$ $1.4 \times I_R$ 75°C	$U_R$ $I_R$ 125°C	$U_R$ $I_R = 0$ 125°C	After test: $U_R = 0$ $I_R = 0$ 125°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



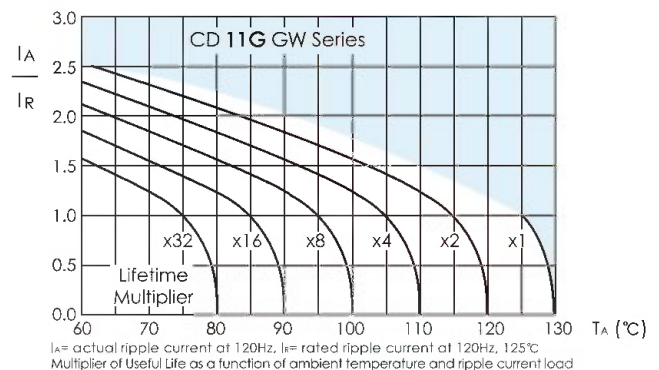
## Temperature Coefficient

Temperature(°C)	+85	+105	+125
Coefficient	2.2	1.60	1.00

## Frequency Coefficient

Frequency(Hz)	50/60Hz	120Hz	500Hz	1kHz	≥ 10kHz
Coefficient	0.80	1.0	1.2	1.3	1.5

## Lifetime Diagram

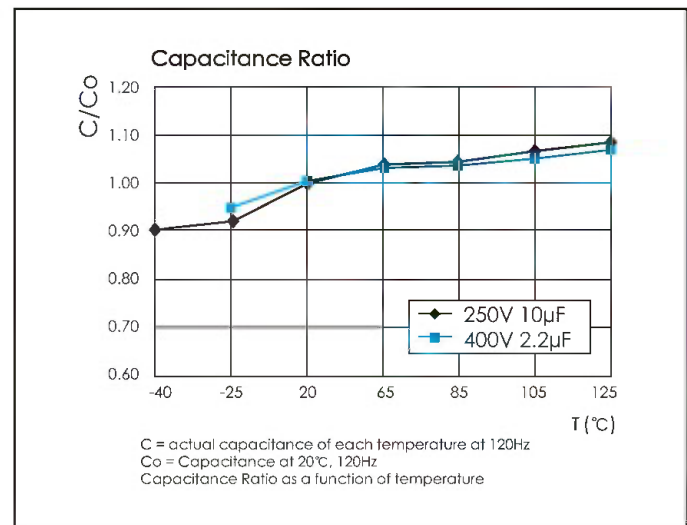




## Ratings for CD 11G GW Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 125°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	-
160 (200) 2C	6.8	23.4	10.2	45	10 × 12.5	ECR2CGW6R8M□□100012
	10	15.9	6.9	62	10 × 16	ECR2CGW100M□□100016
	22	7.2	3.2	101	10 × 20	ECR2CGW220M□□100020
	33	4.8	2.1	139	12.5 × 20	ECR2CGW330M□□125020
	47	3.4	1.5	165	12.5 × 20	ECR2CGW470M□□125020
	100	1.6	0.7	302	16 × 25	ECR2CGW101M□□160025
	220	0.7	0.31	514	18 × 31.5	ECR2CGW221M□□180031
200 (250) 2D	330	0.5	0.21	673	18 × 36	ECR2CGW331M□□180036
	6.8	23.4	11	45	10 × 12.5	ECR2DGW6R8M□□100012
	10	15.9	7.5	62	10 × 16	ECR2DGW100M□□100016
	22	7.2	3.5	101	10 × 20	ECR2DGW220M□□100020
	33	4.8	2.3	139	12.5 × 20	ECR2DGW330M□□125020
	47	3.4	1.6	165	12.5 × 20	ECR2DGW470M□□125020
	100	1.6	0.75	302	16 × 25	ECR2DGW101M□□160025
250 (300) 2E	220	0.7	0.34	514	18 × 31.5	ECR2DGW221M□□180031
	330	0.5	0.23	673	18 × 36	ECR2DGW331M□□180036
	2.2	72.4	31	26	10 × 12.5	ECR2EGW2R2M□□100012
	3.3	48.3	21	31	10 × 12.5	ECR2EGW3R3M□□100012
	4.7	33.9	14.5	42	10 × 16	ECR2EGW4R7M□□100016
	6.8	23.4	10	51	10 × 16	ECR2EGW6R8M□□100016
	10	15.9	7	68	10 × 20	ECR2EGW100M□□100020
350 (400) 2V	22	7.2	3.2	113	12.5 × 20	ECR2EGW220M□□125020
	33	4.8	2.1	153	12.5 × 25	ECR2EGW330M□□125025
	47	3.4	1.5	207	16 × 25	ECR2EGW470M□□160025
	100	1.6	0.7	346	18 × 31.5	ECR2EGW101M□□180031
	220	0.7	0.31	550	18 × 36	ECR2EGW221M□□180036
	2.2	90.5	32	26	10 × 16	ECR2VGW2R2M□□100016
	3.3	60.3	21	32	10 × 16	ECR2VGW3R3M□□100016
400 (450) 2G	4.7	42.3	15	42	10 × 20	ECR2VGW4R7M□□100020
	5.6	35.5	12.5	46	10 × 20	ECR2VGW5R6M□□100020
	6.8	29.3	10.5	56	12.5 × 20	ECR2VGW6R8M□□125020
	10	19.9	7	68	12.5 × 20	ECR2VGW100M□□125020
	22	9.0	3.2	112	12.5 × 25	ECR2VGW220M□□125025
	33	6.0	2.1	155	16 × 25	ECR2VGW330M□□160025
	47	4.2	1.5	201	16 × 31.5	ECR2VGW470M□□160031
450 (500) 2W	1.0	199.0	60	16	10 × 12.5	ECR2GGW010M□□100012
	2.2	90.5	27	26	10 × 16	ECR2GGW2R2M□□100016
	3.3	60.3	18	32	10 × 16	ECR2GGW3R3M□□100016
	4.7	42.3	12.8	42	10 × 20	ECR2GGW4R7M□□100020
	5.6	35.5	10.8	46	10 × 20	ECR2GGW5R6M□□100020
	6.8	29.3	8.9	56	12.5 × 20	ECR2GGW6R8M□□125020
	10	19.9	6	68	12.5 × 20	ECR2GGW100M□□125020
	22	9.0	2.7	112	12.5 × 25	ECR2GGW220M□□125025
	33	6.0	1.8	155	16 × 25	ECR2GGW330M□□160025
	47	4.2	1.3	201	16 × 31.5	ECR2GGW470M□□160031
	1.0	199.0	60	16	10 × 12.5	ECR2WGW010M□□100012
	2.2	90.5	27	26	10 × 16	ECR2WGW2R2M□□100016
	3.3	60.3	18	32	10 × 16	ECR2WGW3R3M□□100016
	4.7	42.3	12.8	42	10 × 20	ECR2WGW4R7M□□100020
	5.6	35.5	10.8	51	12.5 × 20	ECR2WGW5R6M□□125020
	6.8	29.3	8.9	56	12.5 × 20	ECR2WGW6R8M□□125020
	10	19.9	6	75	12.5 × 25	ECR2WGW100M□□125025
	22	9.0	2.7	127	16 × 25	ECR2WGW220M□□160025
	33	6.0	1.8	168	16 × 31.5	ECR2WGW330M□□160031
	47	4.2	1.3	212	18 × 31.5	ECR2WGW470M□□180031

## Typical Curves



Customer products are available on request.



5000h at 125°C

- Load life of 5000 hours at 125°C
- Suited for ballast and energy-saved lamp application of which high temperature and high reliability are required

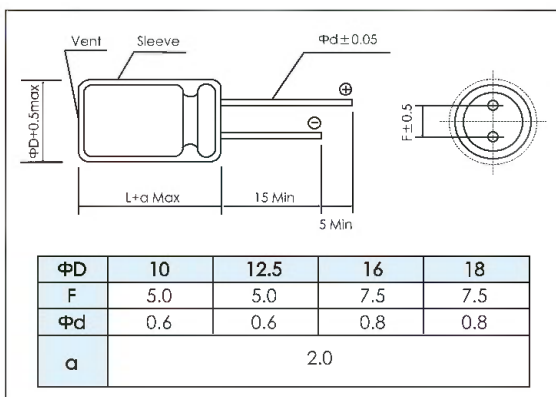


Items	Characteristics						
Operating Temperature Range (°C)	-40 ~ +125				-25 ~ +125		
Voltage Range (V)	160 ~ 250				350 ~ 450		
Capacitance Range (μF)	2.2 ~ 330						
Capacitance Tolerance (20°C, 120Hz)	± 20%						
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.03CV+70. C: Nominal Capacitance (μF)    V: Rated Voltage (V)						
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	160	200	250	350	400	450
	Tan δ (max)	0.12	0.12	0.12	0.15	0.15	0.15

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	6000h	80000h	Φ10: 4000h Φ12.5~18: 5000h	6000h	500h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 25% of initial value	Within ± 25% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 125°C	$U_R$ $1.4 \times I_R$ 85°C	$U_R$ $I_R$ 125°C	$U_R$ $I_R = 0$ 125°C	$U_R = 0$ $I_R = 0$ 125°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

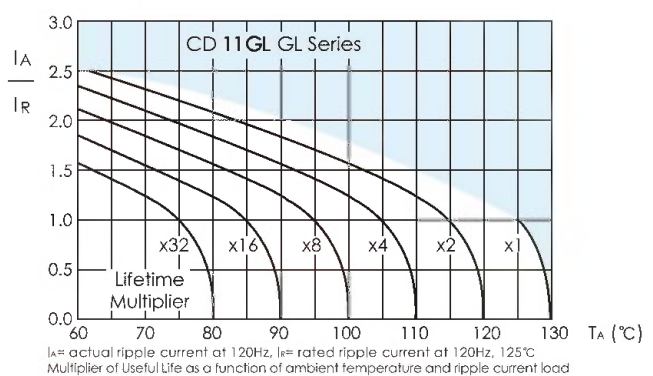
mm



## Frequency Coefficient

Frequency	50/60Hz	120Hz	500Hz	1kHz	≥ 10kHz
Coefficient	0.80	1.0	1.2	1.3	1.5

## Lifetime Diagram



## Temperature Coefficient

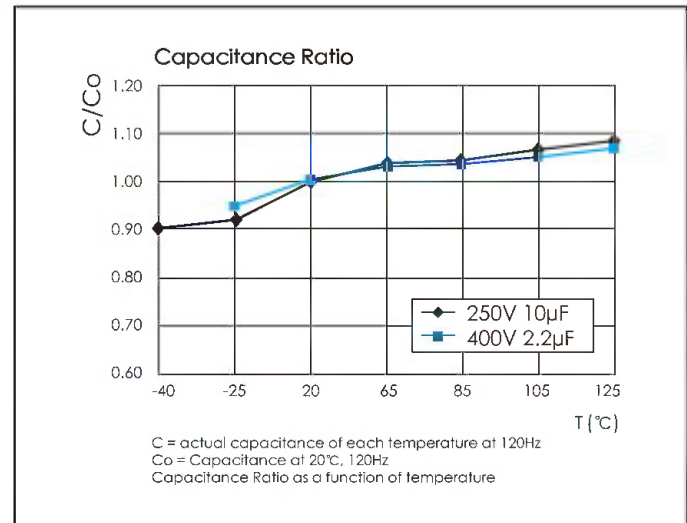
Temperature(°C)	+85	+105	+125
Coefficient	2.2	1.6	1.0



## Ratings for CD 11GL GL Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 125°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
160 (200) 2C	10	15.9	8.0	62	10×16	ECR2CGL100M□□100016
	22	7.2	3.6	101	10×20	ECR2CGL220M□□100020
	33	4.8	2.4	139	12.5×20	ECR2CGL330M□□125020
	47	3.4	1.7	165	12.5×20	ECR2CGL470M□□125020
	100	1.6	0.8	302	16×25	ECR2CGL101M□□160025
	220	0.7	0.4	514	18×31.5	ECR2CGL221M□□180031
	330	0.5	0.2	673	18×36	ECR2CGL331M□□180036
200 (250) 2D	10	15.9	8.0	62	10×16	ECR2DGL100M□□100016
	22	7.2	3.6	101	10×20	ECR2DGL220M□□100020
	33	4.8	2.4	139	12.5×20	ECR2DGL330M□□125020
	47	3.4	1.7	165	12.5×20	ECR2DGL470M□□125020
	100	1.6	0.8	302	16×25	ECR2DGL101M□□160025
	220	0.7	0.4	514	18×31.5	ECR2DGL221M□□180031
	330	0.5	0.2	673	18×36	ECR2DGL331M□□180036
250 (300) 2E	4.7	33.9	16.9	42	10×16	ECR2EGL4R7M□□100016
	6.8	23.4	11.7	51	10×16	ECR2EGL6R8M□□100016
	10	15.9	8.0	68	10×20	ECR2EGL100M□□100020
	22	7.2	3.6	113	12.5×20	ECR2EGL220M□□125020
	33	4.8	2.4	153	12.5×25	ECR2EGL330M□□125025
	47	3.4	1.7	207	16×25	ECR2EGL470M□□160025
	100	1.6	0.8	346	18×31.5	ECR2EGL101M□□180031
350 (400) 2V	220	0.7	0.4	550	18×36	ECR2EGL221M□□180036
	2.2	90.5	36.2	26	10×16	ECR2VGL2R2M□□100016
	3.3	60.3	24.1	32	10×16	ECR2VGL3R3M□□100016
	4.7	42.3	16.9	42	10×20	ECR2VGL4R7M□□100020
	5.6	35.5	14.2	46	10×20	ECR2VGL5R6M□□100020
	6.8	29.3	11.7	56	12.5×20	ECR2VGL6R8M□□125020
	10	19.9	8.0	68	12.5×20	ECR2VGL100M□□125020
400 (450) 2G	22	9.0	3.6	112	12.5×25	ECR2VGL220M□□125025
	33	6.0	2.4	155	16×25	ECR2VGL330M□□160025
	47	4.2	1.7	201	16×31.5	ECR2VGL470M□□160031
	2.2	90.5	36.2	26	10×16	ECR2GGL2R2M□□100016
	3.3	60.3	24.1	32	10×16	ECR2GGL3R3M□□100016
	4.7	42.3	16.9	42	10×20	ECR2GGL4R7M□□100020
	5.6	35.5	14.2	46	10×20	ECR2GGL5R6M□□100020
450 (500) 2W	6.8	29.3	11.7	56	12.5×20	ECR2GGL6R8M□□125020
	10	19.9	8.0	68	12.5×20	ECR2GGL100M□□125020
	22	9.0	3.6	112	12.5×25	ECR2GGL220M□□125025
	33	6.0	2.4	155	16×25	ECR2GGL330M□□160025
	47	4.2	1.7	201	16×31.5	ECR2GGL470M□□160031
	2.2	90.5	36.2	26	10×16	ECR2WGL2R2M□□100016
	3.3	60.3	24.1	32	10×16	ECR2WGL3R3M□□100016
450 (500) 2W	4.7	42.3	16.9	42	10×20	ECR2WGL4R7M□□100020
	5.6	35.5	14.2	51	12.5×20	ECR2WGL5R6M□□125020
	6.8	29.3	11.7	56	12.5×20	ECR2WGL6R8M□□125020
	10	19.9	8.0	75	12.5×25	ECR2WGL100M□□125025
	22	9.0	3.6	127	16×25	ECR2WGL220M□□160025
	33	6.0	2.4	168	16×31.5	ECR2WGL330M□□160031
	47	4.2	1.7	212	18×31.5	ECR2WGL470M□□180031

## Typical Curves

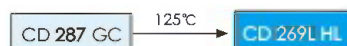


Customer products are available on request.



2000~5000h at 125°C

- Load life of 2000~5000 hours at 125°C
- High Reliability at High Temperature
- Automotive
- Professional Long-Life Applications

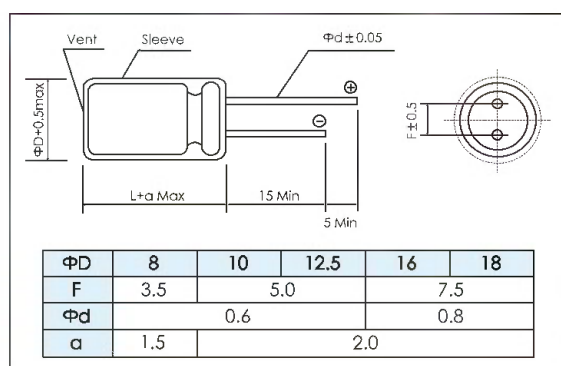


Items	Characteristics							
Operating Temperature Range (°C)	-40 ~ +125							
Voltage Range (V)	10 ~ 100							
Capacitance Range (μF)	1 ~ 4700							
Capacitance Tolerance (20°C, 120Hz)	± 20%							
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.03CV or 4, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)							
Dissipation Factor (20°C, 120Hz)	WV (V)	10	16	25	35	50	63	100
	Tan δ (max)	0.20	0.16	0.14	0.12	0.10	0.09	0.08
	For Capacitances >1000μF add 0.02 to every 1000μF							
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	10	16	25	35	50	63	100
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	3	2					
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	6	4					

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ 8 : 4000h Φ 10 : 6000h Φ ≥ 12.5 : 10000h	≥ 180000h	Φ 8 : 2000h Φ 10 : 3000h Φ ≥ 12.5 : 5000h	Φ 8 : 3000h Φ 10 : 5000h Φ ≥ 12.5 : 7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 50% of initial value		Within ± 30% of initial value	Within ± 30% of initial value	Within ± 30% of initial value
Dissipation Factor	Not more than 500% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 300% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 125°C	$U_R$ $1.4 \times I_R$ 60°C	$U_R$ $I_R$ 125°C	$U_R$ $I_R = 0$ 125°C	After test: $U_R = 0$ $I_R = 0$ 125°C >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency		50/60Hz	120Hz	1kHz	10kHz	100kHz
Coefficient	1 ~ 4.7	0.35	0.42	0.60	0.80	1.00
	10 ~ 33	0.45	0.55	0.75	0.90	1.00
	47 ~ 330	0.60	0.70	0.85	0.95	1.00
	470 ~ 1500	0.65	0.75	0.90	0.98	1.00
	2200 ~ 4700	0.75	0.80	0.95	1.00	1.00

## Temperature Coefficient

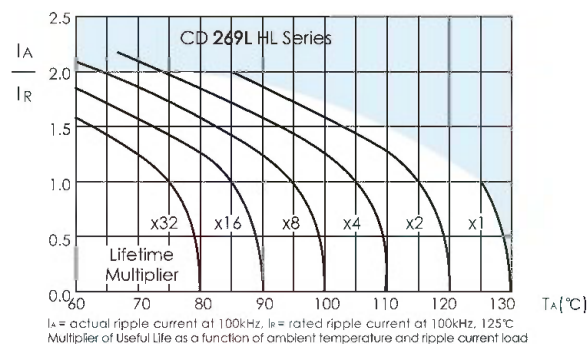
Temperature(°C)	+65	+85	+105	+125
Coefficient	2.2	2.0	1.7	1.0



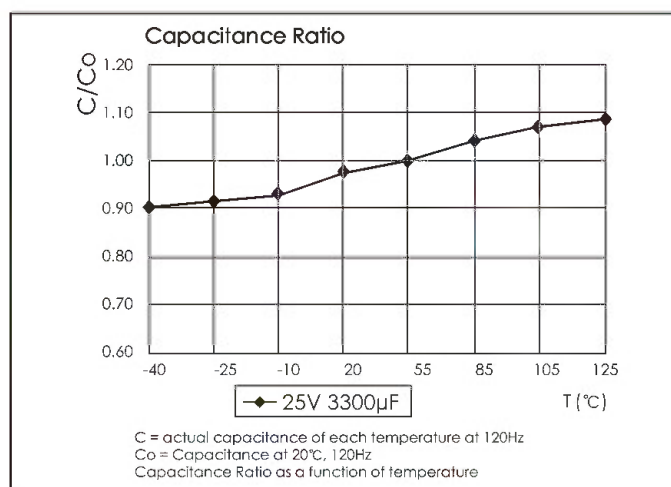
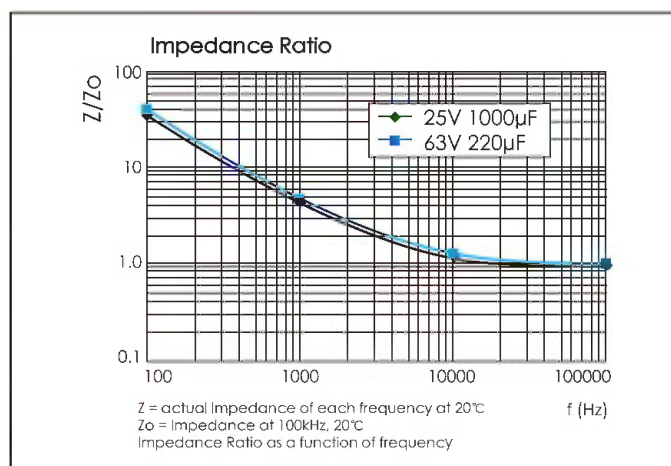
## Ratings for CD 269L HL Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imped- ance 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
10 (13) 1A	330	0.804	0.22	360	8×11.5	ECR1AHL331M□□080011
	470	0.565	0.15	620	10×12.5	ECR1AHL471M□□100012
	1000	0.265	0.073	960	10×20	ECR1AHL102M□□100020
	2200	0.133	0.040	1430	12.5×25	ECR1AHL222M□□125025
	3300	0.097	0.038	1900	16×25	ECR1AHL332M□□160025
	4700	0.073	0.034	2300	16×31.5	ECR1AHL472M□□160031
16 (20) 1C	330	0.643	0.22	360	8×11.5	ECR1CHL331M□□080011
	470	0.452	0.15	620	10×12.5	ECR1CHL471M□□100012
	1000	0.212	0.073	960	10×20	ECR1CHL102M□□100020
	2200	0.109	0.040	1430	12.5×25	ECR1CHL222M□□125025
	3300	0.080	0.034	2300	16×31.5	ECR1CHL332M□□160031
	4700	0.062	0.031	2550	16×35.5	ECR1CHL472M□□160035
25 (32) 1E	220	0.844	0.22	360	8×11.5	ECR1EHL221M□□080011
	330	0.563	0.15	620	10×12.5	ECR1EHL331M□□100012
	470	0.395	0.10	800	10×16	ECR1EHL471M□□100016
	1000	0.186	0.055	1100	12.5×20	ECR1EHL102M□□125020
	2200	0.097	0.034	2300	16×31.5	ECR1EHL222M□□160031
	3300	0.072	0.031	2550	16×35.5	ECR1EHL332M□□160035
35 (44) 1V	100	1.592	0.22	360	8×11.5	ECR1VHL101M□□080011
	220	0.724	0.15	620	10×12.5	ECR1VHL221M□□100012
	330	0.483	0.10	800	10×16	ECR1VHL331M□□100016
	470	0.339	0.073	960	10×20	ECR1VHL471M□□100020
	1000	0.159	0.040	1430	12.5×25	ECR1VHL102M□□125025
	2200	0.084	0.031	2550	16×35.5	ECR1VHL222M□□160035
50 (63) 1H	3300	0.064	0.028	2800	18×36	ECR1VHL332M□□180036
	1	132.6	2.5	35	8×11.5	ECR1HHL010M□□080011
	2.2	60.31	1.8	50	8×11.5	ECR1HHL2R2M□□080011
	3.3	40.21	1.3	70	8×11.5	ECR1HHL3R3M□□080011
	4.7	28.23	0.85	100	8×11.5	ECR1HHL4R7M□□080011
	10	13.27	0.60	200	8×11.5	ECR1HHL100M□□080011
	22	6.032	0.35	260	8×11.5	ECR1HHL220M□□080011
	33	4.021	0.28	300	8×11.5	ECR1HHL330M□□080011
	47	2.823	0.28	300	8×11.5	ECR1HHL470M□□080011
	100	1.327	0.18	520	10×12.5	ECR1HHL101M□□100012
	220	0.603	0.082	890	10×20	ECR1HHL221M□□100020
	330	0.402	0.065	1000	12.5×20	ECR1HHL331M□□125020
63 (79) 1J	470	0.282	0.051	1200	12.5×25	ECR1HHL471M□□125025
	1000	0.133	0.037	2180	16×31.5	ECR1HHL102M□□160031
	2200	0.072	0.029	2800	18×40	ECR1HHL222M□□180040
	33	3.619	0.40	250	8×11.5	ECR1JHL330M□□080011
	47	2.541	0.27	400	10×12.5	ECR1JHL470M□□100012
	100	1.194	0.20	450	10×16	ECR1JHL101M□□100016
	220	0.543	0.10	820	12.5×20	ECR1JHL221M□□125020
	330	0.362	0.072	1000	12.5×25	ECR1JHL331M□□125025
	470	0.254	0.069	1500	16×25	ECR1JHL471M□□160025
	1000	0.119	0.056	1850	16×31.5	ECR1JHL102M□□160031
	1500	0.080	0.043	2350	18×40	ECR1JHL152M□□180040
	4.7	22.58	1.3	100	8×11.5	ECR2AHL4R7M□□080011
100 (125) 2A	10	10.61	1.0	200	8×11.5	ECR2AHL100M□□080011
	22	4.825	0.67	220	8×11.5	ECR2AHL220M□□080011
	33	3.217	0.45	260	10×12.5	ECR2AHL330M□□100012
	47	2.259	0.33	330	10×16	ECR2AHL470M□□100016
	100	1.062	0.17	670	12.5×20	ECR2AHL101M□□125020
	220	0.483	0.13	1100	16×25	ECR2AHL221M□□160025
	330	0.322	0.10	1300	16×31.5	ECR2AHL331M□□160031
	470	0.226	0.092	1600	18×31.5	ECR2AHL471M□□180031

## Lifetime Diagram



## Typical Curves

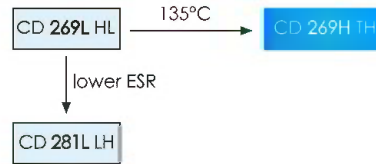


Customer products are available on request.



4000h at 135°C

- High Reliability at High Temperature
- Automotive
- Professional Long-Life Applications

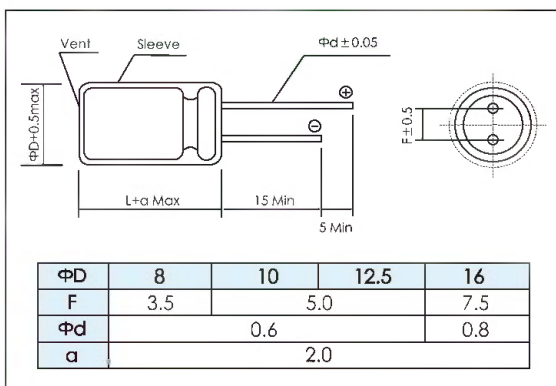


Items	Characteristics																											
Operating Temperature Range(°C)	-55 ~ +135																											
Rated Voltage Range(V)	10 ~ 63																											
Capacitance Range(μF)	10 ~ 4700																											
Capacitance Tolerance (20°C,120Hz)	±20%																											
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.03CV C:Nominal Capacitance(μF) V:Rated Voltage(V)																											
Dissipation Factor (20°C, 120Hz)	<table><tr><td>Rated Voltage (v)</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>tan δ (max)</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.10</td></tr></table>							Rated Voltage (v)	10	16	25	35	50	63	tan δ (max)	0.20	0.16	0.14	0.12	0.10	0.10							
	Rated Voltage (v)	10	16	25	35	50	63																					
	tan δ (max)	0.20	0.16	0.14	0.12	0.10	0.10																					
For Capacitances >1000μF add 0.02 to every 1000μF																												
Low Temperature Stability Impedance Ratio(Max) (20°C, 120Hz)	<table><tr><td>Rated Voltage(V)</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>Z(-25°C)/ Z(+20°C)</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-40°C)/ Z(+20°C)</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td><td>4</td></tr></table>							Rated Voltage(V)	10	16	25	35	50	63	Z(-25°C)/ Z(+20°C)	3	2	2	2	2	2	Z(-40°C)/ Z(+20°C)	4	4	4	4	4	4
	Rated Voltage(V)	10	16	25	35	50	63																					
	Z(-25°C)/ Z(+20°C)	3	2	2	2	2	2																					
Z(-40°C)/ Z(+20°C)	4	4	4	4	4	4																						

	Useful Life		Load Life	Endurance Test	Shelf Life
Life Time	ΦD=8,10: 4000h ΦD≥12.5: 8000h	≥180000h	ΦD=8,10: 2000h ΦD≥12.5: 4000h	ΦD=8,10: 3000h ΦD≥12.5: 5000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ±50% of initial value		Within ± 30% of initial value	Within ± 30% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 500% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 135°C	U <sub>R</sub> 1.4X I <sub>R</sub> 60°C	U <sub>R</sub> I <sub>R</sub> 135°C	U <sub>R</sub> I <sub>R</sub> = 0 135°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 135°C  After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency(Hz)	120	300	1K	10K
CV				
CV<1000	0.50	0.64	0.83	1.00
CV≥1000	0.67	0.79	0.91	1.00

## Temperature Coefficient

Temperature (°C)	+95	+105	+115	+125	+135
≤50V	2.4	2.2	2.0	1.7	1.0
63V	2.0	1.75	1.55	1.3	1.0

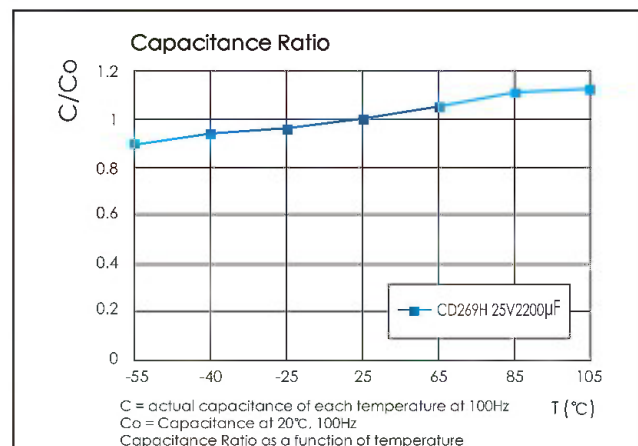
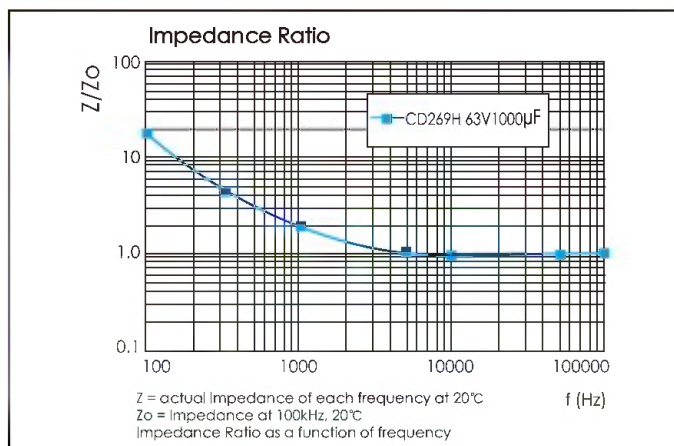


## Ratings for CD 269H TH Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max Impedance 20°C, 100KHz	Rated Ripple Current 135°C, 100KHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
10 (13) 1A	220	0.26	340	8×11.5	ECR1ATH221M □□080011
	330	0.15	620	10×12.5	ECR1ATH331M □□100012
	470	0.10	680	10×12.5	ECR1ATH471M □□100012
	1000	0.057	1100	10×20	ECR1ATH102M □□100020
	2200	0.033	1750	12.5×25	ECR1ATH222M □□125025
	3300	0.024	2300	16×25	ECR1ATH332M □□160025
	4700	0.020	2710	16×31.5	ECR1ATH472M □□160031
16 (20) 1C	100	0.32	340	8×11.5	ECR1CTH101M □□080011
	220	0.15	620	10×12.5	ECR1CTH221M □□100012
	330	0.10	680	10×12.5	ECR1CTH331M □□100012
	470	0.075	945	10×16	ECR1CTH471M □□100016
	1000	0.042	1490	12.5×20	ECR1CTH102M □□125020
	2200	0.024	2300	16×25	ECR1CTH222M □□160025
	3300	0.020	2710	16×31.5	ECR1CTH332M □□160031
25 (32) 1E	100	0.13	500	8×11.5	ECR1ETH101M □□080011
	220	0.10	680	10×12.5	ECR1ETH221M □□100012
	330	0.075	945	10×16	ECR1ETH331M □□100016
	470	0.057	1100	10×20	ECR1ETH471M □□100020
	1000	0.033	1750	12.5×25	ECR1ETH102M □□125025
	2200	0.020	2710	16×31.5	ECR1ETH222M □□160031
	100	0.15	620	10×12.5	ECR1VTH101M □□100012
35 (44) 1V	220	0.094	790	10×16	ECR1VTH221M □□100016
	330	0.075	950	10×20	ECR1VTH331M □□100020
	470	0.058	1330	12.5×20	ECR1VTH471M □□125020
	1000	0.031	2010	16×25	ECR1VTH102M □□160025
50 (63) 1H	4.7	1.15	85	8×11.5	ECR1HTH47M □□080011
	10	0.75	180	8×11.5	ECR1HTH100M □□080011
	22	0.50	250	8×11.5	ECR1HTH220M □□080011
	33	0.45	300	8×11.5	ECR1HTH330M □□080011
	47	0.35	440	8×11.5	ECR1HTH470M □□080011
	100	0.18	555	10×12.5	ECR1HTH101M □□100012
	220	0.098	930	10×20	ECR1HTH221M □□100020
	330	0.07	1330	12.5×20	ECR1HTH331M □□125020
	470	0.055	1650	12.5×25	ECR1HTH471M □□125025
	1000	0.031	2430	16×31.5	ECR1HTH102M □□160031
63 (79) 1J	22	2.00	130	8×11.5	ECR1JTH220M □□080011
	33	1.50	150	8×11.5	ECR1JTH330M □□080011
	47	0.59	530	10×12.5	ECR1JTH470M □□100012
	100	0.41	690	10×16	ECR1JTH101M □□100016
	220	0.16	1050	12.5×20	ECR1JTH221M □□125020
	330	0.12	1290	12.5×25	ECR1JTH331M □□125025
	470	0.097	1460	12.5×31.5	ECR1JTH471M □□125031
	1000	0.055	1900	16×31.5	ECR1JTH102M □□160031

Customer products are available on request.

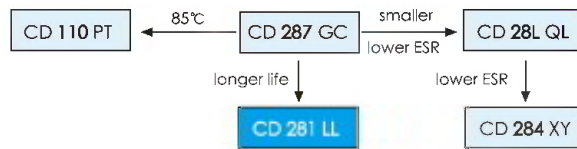
## Typical Curves





2000 - 8000h at 105°C

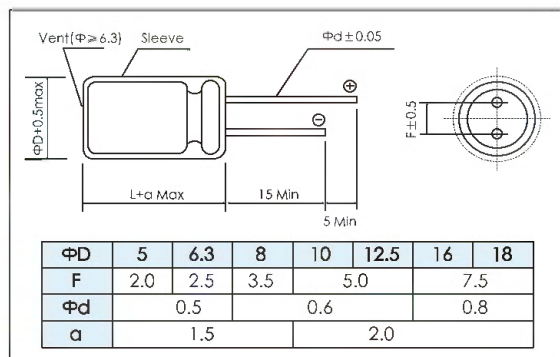
- Longest Lifetime 105°C
- Low Impedance
- Power Supplies
- Smoothing, Buffering, Filtering



Items	Characteristics								
Operating Temperature Range (°C)	-55 ~ +105								
Voltage Range (V)	6.3 ~ 100								
Capacitance Range (μF)	0.47 ~ 15000								
Capacitance Tolerance (20°C, 120Hz)	± 20%								
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.02CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)								
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	For Capacitances >1000μF add 0.02 to every 1000μF								
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3 ~ 100							
	Z <sub>-55℃</sub> / Z <sub>+20℃</sub>	3							

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ 5 : 3000h Φ 6.3 - 8 : 5000h Φ 10 : 7000h Φ 12.5 : 10000h Φ ≥ 16 : 12000h	Φ ≥ 6.3 > 200000h	Φ 5 : 2000h Φ 6.3 - 8 : 3000h Φ 10 : 5000h Φ 12.5 : 7000h Φ ≥ 16 : 8000h	Φ 5 : 3000h Φ 6.3 - 8 : 4000h Φ 10 : 6000h Φ 12.5 : 8000h Φ ≥ 16 : 10000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	After test: U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C for 30min >24h before measurement

## Dimensions



mm

## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
0.47 ~ 4.7	0.40	0.68	0.83	1.00
5.6 ~ 47	0.50	0.76	0.87	1.00
56 ~ 270	0.70	0.85	0.93	1.00
330 ~ 1000	0.80	0.93	0.98	1.00
1200 ~ 15000	0.90	0.95	1.00	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



# CD 281 LL SERIES



## Ratings for CD 281 LL Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA Arms)	(mm)	-
6.3 (7.2) UJ	100	2.919	0.65	1.3	175	5×11.5	ECR0JLL101M□□050011
	150	1.946	0.46	0.92	235	5×15	ECR0JLL151M□□050015
	220	1.327	0.3	0.6	290	6.3×11.5	ECR0JLL221M□□063011
	330	0.885	0.3	0.6	290	6.3×11.5	ECR0JLL331M□□063011
	470	0.621	0.2	0.4	400	6.3×15	ECR0JLL471M□□063015
	680	0.429	0.13	0.26	617	8×11.5	ECR0JLL681M□□080016
	820	0.429	0.12	0.24	613	10×12.5	ECR0JLL821M□□100012
	1000	0.356	0.095	0.19	734	10×16	ECR0JLL102M□□100016
	1200	0.292	0.095	0.19	800	8×20	ECR0JLL122M□□080020
	1500	0.243	0.065	0.13	1010	10×20	ECR0JLL152M□□100025
	2200	0.145	0.045	0.09	1440	10×25	ECR0JLL222M□□100030
	2700	0.118	0.038	0.076	1690	12.5×20	ECR0JLL272M□□125025
	3300	0.118	0.046	0.092	1310	16×15	ECR0JLL332M□□160015
	3900	0.105	0.043	0.086	1460	18×15	ECR0JLL392M□□180015
	4700	0.088	0.032	0.064	1950	12.5×30	ECR0JLL472M□□125030
	5600	0.079	0.028	0.056	2220	12.5×35	ECR0JLL562M□□125035
	6800	0.071	0.026	0.052	2390	16×20	ECR0JLL682M□□160020
	8200	0.071	0.028	0.056	2070	16×25	ECR0JLL822M□□160025
	10000	0.062	0.025	0.05	2350	16×31.5	ECR0JLL102M□□160031
	12000	0.062	0.027	0.054	2120	18×25	ECR0JLL122M□□180025
10 (13) 1A	82	0.058	0.022	0.044	2550	16×35.5	ECR0JLL822M□□160035
	100	0.053	0.023	0.046	2410	18×31.5	ECR0JLL103M□□180031
	15000	0.049	0.02	0.04	2970	16×40	ECR0JLL153M□□160040
	82	0.049	0.02	0.04	2680	18×35.5	ECR0JLL822M□□180035
	100	0.044	0.019	0.038	3010	18×40	ECR0JLL103M□□180040
	180	3.075	0.65	1.3	175	5×11.5	ECR1ALL180M□□050011
	220	2.521	0.46	0.92	235	5×15	ECR1ALL221M□□050015
	330	1.401	0.3	0.6	290	6.3×11.5	ECR1ALL331M□□063011
	470	1.146	0.3	0.6	290	6.3×11.5	ECR1ALL471M□□063011
	680	1.146	0.2	0.4	400	6.3×15	ECR1ALL681M□□063015
	820	0.764	0.17	0.34	488	8×11.5	ECR1ALL821M□□080011
	1000	0.536	0.17	0.34	488	8×11.5	ECR1ALL102M□□080016
	1200	0.536	0.13	0.26	617	8×16	ECR1ALL122M□□080016
	1500	0.536	0.12	0.24	613	10×12.5	ECR1ALL152M□□100012
	2200	0.45	0.095	0.19	734	10×16	ECR1ALL222M□□100016
	2700	0.371	0.095	0.19	800	8×20	ECR1ALL272M□□080020
	3300	0.252	0.095	0.19	734	10×16	ECR1ALL332M□□100016
	3900	0.252	0.065	0.13	1010	10×20	ECR1ALL392M□□100020
	4700	0.252	0.065	0.13	1010	12.5×15	ECR1ALL472M□□125015
	5600	0.21	0.055	0.11	1190	10×25	ECR1ALL562M□□100025
16 (20) 1C	6800	0.168	0.045	0.09	1440	10×30	ECR1ALL682M□□100030
	8200	0.14	0.042	0.084	1400	12.5×20	ECR1ALL822M□□125020
	10000	0.14	0.046	0.092	1310	16×15	ECR1ALL102M□□160015
	12000	0.127	0.042	0.084	1400	12.5×20	ECR1ALL122M□□125020
	15000	0.127	0.038	0.076	1690	12.5×25	ECR1ALL152M□□125025
	22000	0.127	0.043	0.086	1460	18×15	ECR1ALL222M□□180015
	27000	0.103	0.032	0.064	1950	12.5×30	ECR1ALL272M□□125030
	33000	0.092	0.028	0.056	2220	12.5×35	ECR1ALL332M□□125035
	39000	0.092	0.034	0.068	1660	16×20	ECR1ALL392M□□160020
	47000	0.078	0.026	0.052	2390	12.5×40	ECR1ALL472M□□125040
	56000	0.078	0.028	0.056	2070	16×25	ECR1ALL562M□□160025
	68000	0.078	0.03	0.06	1850	18×20	ECR1ALL682M□□180020
	82000	0.071	0.028	0.056	2070	16×25	ECR1ALL822M□□160025
	100000	0.071	0.027	0.054	2120	18×25	ECR1ALL102M□□180025
	120000	0.064	0.025	0.05	2350	16×31.5	ECR1ALL122M□□160031
	150000	0.057	0.022	0.044	2550	16×35.5	ECR1ALL152M□□160035
	220000	0.057	0.023	0.046	2410	18×31.5	ECR1ALL222M□□180031
	270000	0.053	0.02	0.04	2970	16×40	ECR1ALL272M□□160040
	330000	0.053	0.02	0.04	2680	18×35.5	ECR1ALL332M□□180035
	390000	0.049	0.019	0.038	3010	18×40	ECR1ALL392M□□180040
16 (20) 1C	47	4.517	0.65	1.3	140	5×11.5	ECR1VLL470M□□050011
	56	3.791	0.65	1.3	175	5×11.5	ECR1VLL560M□□050011
	82	2.589	0.46	0.92	235	5×15	ECR1VLL820M□□050015
	100	2.123	0.65	1.3	175	5×11.5	ECR1VLL101M□□050011
	120	1.769	0.3	0.6	290	6.3×11.5	ECR1VLL121M□□063011
	180	1.18	0.2	0.4	400	6.3×15	ECR1VLL181M□□063015
	220	1.158	0.3	0.6	290	6.3×11.5	ECR1VLL221M□□063011
	270	1.158	0.28	0.56	380	8×11.5	ECR1VLL271M□□080011
	330	0.786	0.17	0.34	501	8×11.5	ECR1VLL331M□□080011
	390	0.772	0.17	0.34	501	8×11.5	ECR1VLL391M□□080011
	470	0.643	0.13	0.26	575	8×16	ECR1VLL471M□□080016
	560	0.643	0.12	0.24	625	10×12.5	ECR1VLL561M□□100012
	680	0.544	0.095	0.19	795	10×16	ECR1VLL681M□□100016
	820	0.452	0.13	0.26	575	8×16	ECR1VLL821M□□080016
	1000	0.452	0.095	0.19	760	8×20	ECR1VLL102M□□080020
	1200	0.312	0.065	0.13	1010	10×20	ECR1VLL122M□□100020
	1500	0.312	0.065	0.13	1010	12.5×15	ECR1VLL152M□□125015
	2200	0.259	0.055	0.11	1190	10×25	ECR1VLL222M□□100025
	2700	0.212	0.065	0.13	1010	10×20	ECR1VLL272M□□100020
	3300	0.177	0.045	0.09	1430	10×30	ECR1VLL332M□□100030

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA Arms)	(mm)	-
16 (20) 1C	1200	0.177	0.042	0.084	1400	12.5×20	ECR1VLL122M□□125020
	1500	0.142	0.038	0.076	1690	12.5×25	ECR1VLL152M□□125025
	2200	0.142	0.046	0.092	1340	16×15	ECR1VLL222M□□160015
	2700	0.142	0.043	0.086	1490	18×15	ECR1VLL272M□□180015
	3300	0.109	0.038	0.076	1690	12.5×25	ECR1VLL332M□□125025
	3900	0.109	0.032	0.064	1950	12.5×30	ECR1VLL392M□□125030
	4700	0.109	0.034	0.068	1730	16×20	ECR1VLL472M□□160020
	5600	0.088	0.028	0.056	2200	12.5×35	ECR1VLL562M□□125035
	6800	0.088	0.028	0.056	2070	16×25	ECR1VLL682M□□160025
	8200	0.088	0.03	0.06	1870	18×20	ECR1VLL822M□□180020
	10000	0.08	0.026	0.052	2390	12.5×40	ECR1VLL102M□□125040
	12000	0.068	0.025	0.05	2350	16×31.5	ECR1VLL122M□□160031
	15000	0.068	0.027	0.054	2160	18×25	ECR1VLL152M□□180025
	22000	0.062	0.022	0.044	2550	16×35.5	ECR1VLL222M□□160035
	27000	0.062	0.023	0.046	2450	18×31.5	ECR1VLL272M□□180031
	33000	0.057	0.02	0.04	2900	16×40	ECR1VLL332M□□160040
	39000	0.051	0.02	0.04	2730	18×35.5	ECR1VLL392M□□180035
	47000	0.049	0.019	0.038	3060	18×40	ECR1VLL472M□□180040
	56000	0.049	0.019	0.038	3060	18×40	ECR1VLL562M□□180040
	68000	0.049	0.019	0.038	3060	18×40	ECR1VLL682M□□180040
25 (32) 1E	39	4.763	0.65	1.3	175	5×11.5	ECR1VLL390M□□050011
	47	3.953	0.65	1.3	175	5×11.5	ECR1VLL470M□□050011
	56	3.317	0.46	0.92	235	5×15	ECR1VLL560M□□050015
	82	2.266	0.3	0.6	290	6.3×11.5	ECR1VLL820M□□063011
	100	1.858	0.3	0.6	290	6.3×11.5	ECR1VLL101M□□063011
	120	1.548	0.2	0.4	400	6.3×15	ECR1VLL121M□□063015
	180	1.032	0.17	0.34	503	8×11.5	ECR1VLL181M□□080011
	220	0.844	0.17	0.34	503	8×11.5	ECR1VLL221M□□080011
	270	0.844	0.13	0.26	575	8×16	ECR1VLL271M□□080016
	330	0.844	0.12	0.24	629	10×12.5	ECR1VLL331M□□100012
	390	0.688	0.095	0.19	795	10×16	ECR1VLL391M□□100016
	470	0.563	0.12	0.24	629	10×12.5	ECR1VLL471M□□100012
	560	0.563	0.095	0.19	751	8×20	ECR1VLL561M□□080020
	680	0.395	0.12	0.24	760	10×12.5	ECR1VLL681M□□100012
	820	0.395	0.095	0.19	751	8×20	ECR1VLL821M□□080020
	1000	0.395	0.065	0.13	1010	10×20	ECR1VLL102M□□100020
	1200	0.395	0.065	0.13	1010	12.5×15	ECR1VLL122M□□125015
	1500	0.332	0.055	0.11	1190	10×25	ECR1VLL152M□□100025
	2200	0.227	0.045	0.09	1440	10×30	ECR1VLL222M□□100030
	2700	0.227	0.042	0.084	1400	12.5×20	ECR1VLL272M□□125020
35 (44) 1V	3300	0.227	0.046	0.092	1360	16×15	ECR1VLL332M□□160015
	3900	0.186	0.042	0.084	1400	12.5×20	ECR1VLL392M□□125020
	4700	0.186	0.038	0.076	1690	12.5×25	ECR1VLL472M□□125025
	5600	0.155	0.043	0.086	1500	18×15	ECR1VLL562M□□180015
	6800	0.124	0.032	0.064	1950	12.5×30	ECR1VLL682M□□125030
	8200	0.124	0.034	0.068	1730	16×20	



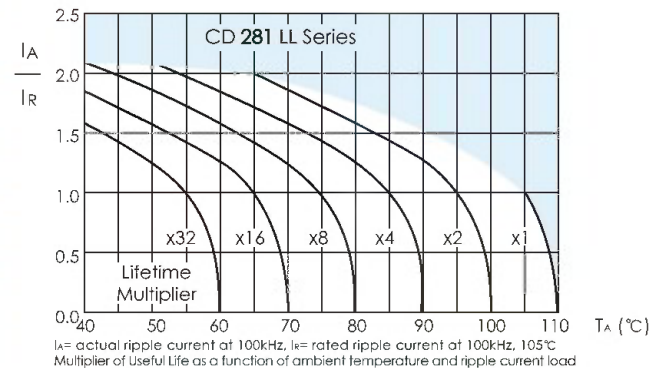
## Ratings for CD 281 LL Series

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cittance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
35 (44) 1V	1800	0.088	0.025	0.05	2350	16×31.5	ECR1VLL182M□□160031
		0.088	0.027	0.054	2200	18×25	ECR1VLL182M□□180025
	2200	0.084	0.022	0.044	2550	16×35.5	ECR1VLL222M□□160035
		0.084	0.023	0.046	2490	18×31.5	ECR1VLL222M□□180031
	2700	0.069	0.02	0.04	2900	16×40	ECR1VLL272M□□160040
		0.069	0.02	0.04	2770	18×35.5	ECR1VLL272M□□180035
	3300	0.064	0.019	0.038	3110	18×40	ECR1VLL332M□□180040
	0.47	283	3.9	7.8	22	5×11.5	ECR1HLL47M□□050011
	1	133	3.5	7	36	5×11.5	ECR1HLL010M□□050011
	2.2	60.3	3	6	54	5×11.5	ECR1HLL282M□□050011
50 (63) 1H	3.3	40.2	2.6	5.2	63	5×11.5	ECR1HLL383M□□050011
	4.7	28.3	2.2	4.4	75	5×11.5	ECR1HLL477M□□050011
	10	13.3	1.4	2.8	110	5×11.5	ECR1HLL100M□□050011
	18	7.372	0.95	1.9	120	5×11.5	ECR1HLL180M□□050011
	27	4.915	0.55	1.1	135	5×15	ECR1HLL270M□□050015
	39	3.402	0.36	0.72	148	6.3×11.5	ECR1HLL390M□□063011
	56	2.37	0.28	0.56	153	6.3×15	ECR1HLL560M□□063015
	68	1.951	0.2	0.4	360	8×11.5	ECR1HLL680M□□080011
	82	1.618	0.18	0.36	460	8×16	ECR1HLL820M□□080016
		1.618	0.18	0.36	443	10×12.5	ECR1HLL820M□□100012
	100	1.327	0.15	0.3	553	10×16	ECR1HLL101M□□100016
	120	1.106	0.13	0.26	670	8×20	ECR1HLL121M□□080020
	180	0.737	0.095	0.19	676	10×20	ECR1HLL181M□□100020
		0.737	0.105	0.21	745	12.5×15	ECR1HLL181M□□125015
	220	0.603	0.08	0.16	876	10×25	ECR1HLL221M□□100025
		0.402	0.065	0.13	1010	10×30	ECR1HLL331M□□100030
	330	0.402	0.07	0.14	979	12.5×20	ECR1HLL331M□□125020
		0.402	0.075	0.15	982	16×15	ECR1HLL331M□□160015
	470	0.282	0.054	0.108	1180	12.5×25	ECR1HLL471M□□125025
		0.282	0.058	0.116	1180	18×15	ECR1HLL471M□□180015
	560	0.237	0.05	0.1	1310	12.5×30	ECR1HLL561M□□125030
	680	0.195	0.046	0.092	1470	12.5×35	ECR1HLL681M□□125035
		0.195	0.05	0.1	1210	16×20	ECR1HLL681M□□160020
	820	0.162	0.044	0.088	1590	12.5×40	ECR1HLL821M□□125040
		0.162	0.048	0.096	1490	16×25	ECR1HLL821M□□160025
	1000	0.162	0.046	0.092	1450	18×20	ECR1HLL821M□□180020
		0.133	0.04	0.08	1890	16×31.5	ECR1HLL102M□□160031
	1200	0.133	0.04	0.08	1720	18×25	ECR1HLL102M□□180025
		0.111	0.032	0.064	2140	16×35.5	ECR1HLL122M□□160035
	1500	0.088	0.026	0.052	2410	16×40	ECR1HLL152M□□160040
		0.088	0.026	0.052	1970	18×31.5	ECR1HLL152M□□180031
	1800	0.074	0.025	0.05	2310	18×35.5	ECR1HLL182M□□180035
	2200	0.072	0.024	0.048	2530	18×40	ECR1HLL222M□□180040
63 (79) 1J	12	9.952	1.2	3.6	120	5×11.5	ECR1JLL120M□□050011
	18	6.635	0.85	2.6	135	5×15	ECR1JLL180M□□050015
	27	4.423	0.55	1.7	148	6.3×11.5	ECR1JLL270M□□063011
	39	3.062	0.38	1.1	153	6.3×15	ECR1JLL390M□□063015
	47	2.541	0.32	0.96	360	8×11.5	ECR1JLL470M□□080011
	56	2.133	0.23	0.69	448	10×12.5	ECR1JLL560M□□100012
	68	1.756	0.24	0.72	469	8×16	ECR1JLL680M□□080016
		1.756	0.17	0.51	553	10×16	ECR1JLL680M□□100016
	82	1.456	0.17	0.51	682	8×20	ECR1JLL820M□□080020
	120	0.995	0.12	0.36	676	10×20	ECR1JLL121M□□100020
	150	0.796	0.1	0.3	876	10×25	ECR1JLL151M□□100025
		0.796	0.11	0.33	745	12.5×15	ECR1JLL151M□□125015
	180	0.663	0.085	0.26	1020	10×30	ECR1JLL181M□□100030
	220	0.543	0.075	0.23	979	12.5×20	ECR1JLL221M□□125020
		0.543	0.08	0.24	928	16×15	ECR1JLL221M□□160015
	270	0.442	0.065	0.2	1180	12.5×25	ECR1JLL271M□□125025
	330	0.362	0.065	0.2	1200	18×15	ECR1JLL331M□□180015
	390	0.306	0.055	0.17	1310	12.5×30	ECR1JLL391M□□125030
		0.306	0.057	0.17	1210	16×20	ECR1JLL391M□□160020
	470	0.254	0.048	0.14	1470	12.5×35	ECR1JLL471M□□125035
		0.254	0.052	0.16	1490	16×25	ECR1JLL471M□□160025
	560	0.254	0.058	0.17	1460	18×20	ECR1JLL471M□□180020
		0.213	0.042	0.13	1590	12.5×40	ECR1JLL561M□□125040
	680	0.176	0.042	0.13	1890	16×31.5	ECR1JLL681M□□160031
		0.176	0.05	0.15	1740	18×25	ECR1JLL681M□□180025
	820	0.146	0.036	0.11	2140	16×35.5	ECR1JLL821M□□160035
		0.146	0.042	0.13	1990	18×31.5	ECR1JLL821M□□180031
	1000	0.119	0.032	0.096	2410	16×40	ECR1JLL102M□□160040
		0.119	0.035	0.11	2340	18×35.5	ECR1JLL102M□□180035
	1200	0.10	0.032	0.096	2560	18×40	ECR1JLL122M□□180040

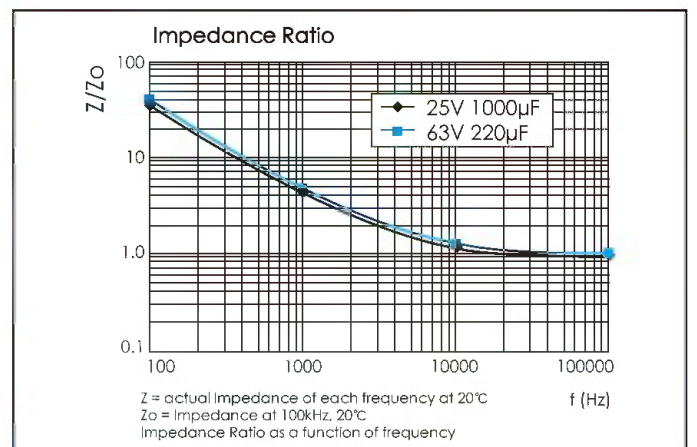
U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cittance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max imp -10°C, 100kHz	Rated Ripple Current 105°C, 100KHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
100 (125) 2A	5.6	18.957	1.9	7.6	57	5×11.5	ECR2ALL5R6M□□050011
	8.2	12.946	1.3	5.2	74	5×15	ECR2ALL8R2M□□050015
	12	8.846	1.1	4.4	78	6.3×11.5	ECR2ALL120M□□063011
	18	5.898	0.62	2.5	85	6.3×15	ECR2ALL180M□□063015
	22	4.825	0.53	2.1	275	8×11.5	ECR2ALL220M□□080011
	27	3.932	0.47	1.9	319	10×12.5	ECR2ALL270M□□100012
	33	3.217	0.35	1.4	360	8×16	ECR2ALL330M□□080016
		3.217	0.32	1.3	424	10×16	ECR2ALL330M□□100016
	39	2.722	0.27	1.1	490	8×20	ECR2ALL390M□□080020
	56	1.896	0.25	1	499	10×20	ECR2ALL560M□□100020
	68	1.561	0.18	0.72	634	10×25	ECR2ALL680M□□100025
		1.561	0.2	0.8	613	12.5×15	ECR2ALL680M□□125015
	100	1.062	0.15	0.6	739	10×30	ECR2ALL101M□□100030
		1.062	0.13	0.52	805	12.5×20	ECR2ALL101M□□125020
	120	0.885	0.11	0.44	857	12.5×25	ECR2ALL121M□□125025
		0.885	0.13	0.5	706	16×15	ECR2ALL121M□□160015
	150	0.708	0.12	0.48	871	18×15	ECR2ALL151M□□180015
	180	0.59	0.09	0.36	1120	12.5×30	ECR2ALL181M□□125030
		0.59	0.11	0.44	916	16×20	ECR2ALL181M□□160020
	220	0.483	0.075	0.3	1240	12.5×35	ECR2ALL221M□□125035
0.483		0.081	0.32	1290	16×25	ECR2ALL221M□□160025	
270	0.393	0.06	0.24	1330	12.5×40	ECR2ALL271M□□125040	
	0.393	0.085	0.34	1170	18×20	ECR2ALL271M□□180020	
330	0.322	0.059	0.23	1630	16×31.5	ECR2ALL331M□□160031	
	0.322	0.071	0.28	1500	18×25	ECR2ALL331M□□180025	
390	0.272	0.052	0.21	1750	16×35.5	ECR2ALL391M□□160035	
	0.272	0.058	0.23	1630	18×31.5	ECR2ALL391M□□180031	
470	0.226	0.045	0.18	1920	16×40	ECR2ALL471M□□160040	
560	0.19	0.054	0.22	1920	18×35.5	ECR2ALL561M□□180035	
680	0.156	0.041	0.16	2100	18×40	ECR2ALL681M□□180040	

Customer products are available on request.

## Lifetime Diagram



## Typical Curves



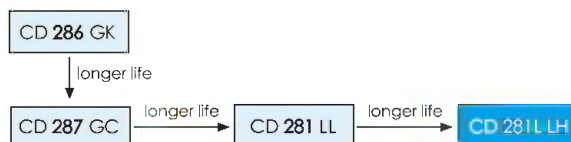


# CD 281L LH SERIES



4000 - 10000h at 105°C

- Load life with ripple current: 105°C 4000 to 10000 hours
- Ultra low impedance
- Switching power supplies
- Excellent ripple current capability
- High reliability at high temperature

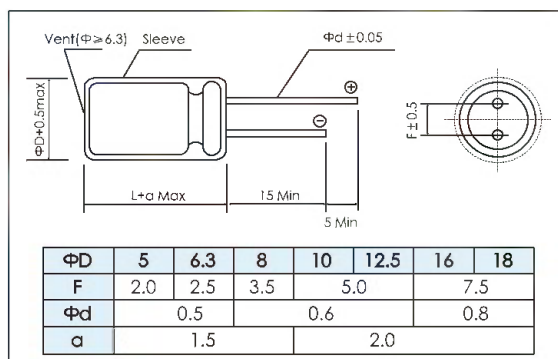


Items	Characteristics																										
Operating Temperature Range (°C)	-55 ~ +105																										
Voltage Range (V)	6.3 ~ 100																										
Capacitance Range (μF)	0.47 ~ 15000																										
Capacitance Tolerance (20°C, 120Hz)	± 20%																										
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.02CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)																										
Dissipation Factor (20°C, 120Hz)	<table><tr><td>Rated Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr><tr><td>Tan δ (max)</td><td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td></tr></table>									Rated Voltage (V)	6.3	10	16	25	35	50	63	100	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	Rated Voltage (V)	6.3	10	16	25	35	50	63	100																		
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																		
For Capacitances >1000μF add 0.02 to every 1000μF																											
Stability at Low Temperature (Impedance Ratio at 120Hz)	<table><tr><td>Rated Voltage (V)</td><td colspan="8">6.3 ~ 100</td></tr><tr><td>Z<sub>-55℃</sub> / Z<sub>+20℃</sub></td><td colspan="8">3</td></tr></table>									Rated Voltage (V)	6.3 ~ 100								Z <sub>-55℃</sub> / Z <sub>+20℃</sub>	3							
	Rated Voltage (V)	6.3 ~ 100																									
Z <sub>-55℃</sub> / Z <sub>+20℃</sub>	3																										

	Useful Life				Load Life		Endurance Test		Shelf Life	
Lifetime		6.3~10V	16~100V	≥ 250000h	6.3~10V	16~100V	6.3~10V	16~100V	1000h	
	Φ 5-6.3	6000	7000		4000	5000	4000	5000		
	Φ 8-10	8000	9000		6000	7000	6000	7000		
	Φ 12.5-18	10000	12000		8000	10000	8000	10000		
Leakage Current	Not more than specified value				Not more than specified value		Not more than specified value		Not more than specified value	
Capacitance Change	Within ± 40% of initial value				Within ± 25% of initial value		Within ± 25% of initial value		Within ± 20% of initial value	
Dissipation Factor	Not more than 300% of specified value				Not more than 200% of specified value		Not more than 200% of specified value		Not more than 200% of specified value	
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105℃		U <sub>R</sub> 1.4 x I <sub>R</sub> 40℃		U <sub>R</sub> I <sub>R</sub> 105℃		U <sub>R</sub> I <sub>R</sub> = 0 105℃		After test: U <sub>R</sub> to be applied for 30min >24h before measurement	

## Dimensions

mm



## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
0.47 ~ 4.7	0.40	0.68	0.78	1.00
5.6 ~ 47	0.50	0.76	0.87	1.00
56 ~ 270	0.70	0.85	0.93	1.00
330 ~ 1000	0.80	0.93	0.98	1.00
1200 ~ 15000	0.90	0.95	1.00	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



## Ratings for CD 281L LH Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	100	2.919	0.65	1.3	175	5×11.5	ECR0JLL101M□□050011
	150	1.946	0.46	0.92	235	5×15	ECR0JLL151M□□050015
	220	1.327	0.3	0.6	290	6.3×11.5	ECR0JLL221M□□063011
	330	0.885	0.3	0.6	290	6.3×11.5	ECR0JLL331M□□063011
	470	0.885	0.2	0.4	400	6.3×15	ECR0JLL471M□□080011
	680	0.621	0.17	0.34	488	8×11.5	ECR0JLL681M□□080016
	820	0.429	0.13	0.26	617	8×16	ECR0JLL821M□□100012
	1000	0.429	0.12	0.24	613	10×12.5	ECR0JLL1021M□□100012
	1200	0.356	0.095	0.19	734	10×16	ECR0JLL1221M□□100016
	1500	0.292	0.095	0.19	800	8×20	ECR0JLL1521M□□080020
	2200	0.243	0.065	0.13	1010	10×20	ECR0JLL2221M□□100020
	2700	0.243	0.065	0.13	1010	12.5×15	ECR0JLL2721M□□125015
	3300	0.195	0.055	0.11	1190	10×25	ECR0JLL3321M□□100025
	3900	0.145	0.045	0.09	1440	10×30	ECR0JLL3921M□□100030
	4700	0.145	0.042	0.084	1400	12.5×20	ECR0JLL4721M□□125020
	5600	0.118	0.038	0.076	1690	12.5×25	ECR0JLL5621M□□125025
	6800	0.118	0.046	0.092	1310	16×15	ECR0JLL6821M□□160015
	8200	0.105	0.043	0.086	1460	18×15	ECR0JLL8221M□□180015
	10000	0.088	0.032	0.064	1950	12.5×30	ECR0JLL10221M□□125030
	12000	0.079	0.028	0.056	2220	12.5×35	ECR0JLL12221M□□125035
	15000	0.079	0.034	0.068	1660	16×20	ECR0JLL15221M□□160020
	18000	0.071	0.026	0.052	2390	12.5×40	ECR0JLL18221M□□125040
	22000	0.071	0.028	0.056	2070	16×25	ECR0JLL22221M□□160025
10 (13) 1A	82	0.071	0.03	0.06	1850	18×20	ECR0JLL82221M□□180020
	100	0.062	0.025	0.05	2350	16×31.5	ECR0JLL102221M□□160031
	120	0.062	0.027	0.054	2120	18×25	ECR0JLL12221M□□180025
	150	0.058	0.022	0.044	2550	16×35.5	ECR0JLL15221M□□160035
	180	0.053	0.023	0.046	2410	18×31.5	ECR0JLL18221M□□180031
	220	0.049	0.02	0.04	2970	16×40	ECR0JLL22221M□□160040
	270	0.049	0.02	0.04	2680	18×35.5	ECR0JLL27221M□□180035
	330	0.044	0.019	0.038	3010	18×40	ECR0JLL33221M□□180040
	390	3.075	0.65	1.3	175	5×11.5	ECR1ALL390M□□050011
	470	2.521	0.46	0.92	235	5×15	ECR1ALL470M□□050015
	560	1.401	0.3	0.6	290	6.3×11.5	ECR1ALL560M□□050011
	680	1.146	0.3	0.6	290	6.3×11.5	ECR1ALL680M□□063011
	820	1.146	0.2	0.4	400	6.3×15	ECR1ALL820M□□063015
	1000	0.764	0.17	0.34	488	8×11.5	ECR1ALL1020M□□080011
	1200	0.536	0.17	0.34	488	8×11.5	ECR1ALL1220M□□080011
	1500	0.536	0.13	0.26	617	8×16	ECR1ALL1520M□□080016
	1800	0.536	0.12	0.24	613	10×12.5	ECR1ALL1820M□□100012
	2200	0.45	0.095	0.19	734	10×16	ECR1ALL2220M□□100016
	2700	0.371	0.095	0.19	800	8×20	ECR1ALL2720M□□080020
	3300	0.252	0.095	0.19	734	10×16	ECR1ALL3320M□□100016
	3900	0.252	0.065	0.13	1010	10×20	ECR1ALL3920M□□100020
	4700	0.252	0.065	0.13	1010	12.5×15	ECR1ALL4720M□□125015
	5600	0.21	0.055	0.11	1190	10×25	ECR1ALL5620M□□100025
	6800	0.168	0.045	0.09	1440	10×30	ECR1ALL6820M□□100030
	8200	0.14	0.042	0.084	1400	12.5×20	ECR1ALL8220M□□125020
	10000	0.14	0.046	0.092	1310	16×15	ECR1ALL10220M□□160015
16 (20) 1C	12000	0.127	0.042	0.084	1400	12.5×20	ECR1ALL12220M□□125020
	15000	0.127	0.038	0.076	1690	12.5×25	ECR1ALL15220M□□125025
	18000	0.127	0.043	0.086	1460	18×15	ECR1ALL18220M□□180015
	22000	0.103	0.032	0.064	1950	12.5×30	ECR1ALL22220M□□125030
	27000	0.092	0.028	0.056	2220	12.5×35	ECR1ALL27220M□□125035
	33000	0.092	0.034	0.068	1660	16×20	ECR1ALL33220M□□160020
	39000	0.078	0.026	0.052	2390	12.5×40	ECR1ALL39220M□□125040
	47000	0.078	0.028	0.056	2070	16×25	ECR1ALL47220M□□160025
	56000	0.078	0.03	0.06	1850	18×20	ECR1ALL56220M□□180020
	68000	0.071	0.028	0.056	2070	16×25	ECR1ALL68220M□□160025
	82000	0.071	0.027	0.054	2120	18×25	ECR1ALL82220M□□180025
	100000	0.064	0.025	0.05	2350	16×31.5	ECR1ALL102220M□□160031
	120000	0.057	0.022	0.044	2550	16×35.5	ECR1ALL122220M□□160035
	150000	0.057	0.023	0.046	2410	18×31.5	ECR1ALL152220M□□180031
	180000	0.053	0.02	0.04	2970	16×40	ECR1ALL182220M□□160040
	220000	0.053	0.02	0.04	2680	18×35.5	ECR1ALL222220M□□180035
	270000	0.049	0.019	0.038	3010	18×40	ECR1ALL272220M□□180040
	330000	4.517	0.65	1.3	140	5×11.5	ECR1VLL330M□□050011
	390000	3.791	0.65	1.3	175	5×11.5	ECR1VLL390M□□050015
	470000	2.589	0.46	0.92	235	5×15	ECR1VLL470M□□050011
	560000	2.123	0.65	1.3	175	5×11.5	ECR1VLL560M□□050011
	680000	1.769	0.3	0.6	290	6.3×11.5	ECR1VLL680M□□063011
	820000	1.18	0.2	0.4	400	6.3×15	ECR1VLL820M□□063015
	1000000	1.158	0.3	0.6	290	6.3×11.5	ECR1VLL1020M□□063011
	1200000	1.158	0.28	0.56	380	8×11.5	ECR1VLL1220M□□080011
	1500000	0.786	0.17	0.34	501	8×11.5	ECR1VLL1520M□□080011
	1800000	0.772	0.17	0.34	501	8×11.5	ECR1VLL1820M□□080011
	2200000	0.643	0.13	0.26	575	8×16	ECR1VLL2220M□□080016
	2700000	0.643	0.12	0.24	625	10×12.5	ECR1VLL2720M□□100012
	3300000	0.544	0.095	0.19	795	10×16	ECR1VLL3320M□□100016
	3900000	0.452	0.13	0.26	575	8×16	ECR1VLL3920M□□080016
	4700000	0.452	0.095	0.19	760	8×20	ECR1VLL4720M□□080020
	5600000	0.312	0.065	0.13	1010	10×20	ECR1VLL5620M□□100020
	6800000	0.312	0.065	0.13	1010	12.5×15	ECR1VLL6820M□□125015
	8200000	0.259	0.055	0.11	1190	10×25	ECR1VLL8220M□□100025
	10000000	0.212	0.045	0.09	1430	10×30	ECR1VLL10220M□□100030

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- ciance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100KHz	Size Φ x L	P/N	
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-	
16 (20) 1C	1200	0.177	0.042	0.084	1400	12.5×20	ECR1CLL122M□□125020	
	1500	0.142	0.038	0.076	1690	12.5×25	ECR1CLL152M□□125025	
		0.142	0.046	0.092	1340	16×15	ECR1CLL152M□□160015	
	2200	0.142	0.043	0.086	1490	18×15	ECR1CLL152M□□180015	
		0.109	0.038	0.076	1690	12.5×25	ECR1CLL222M□□125025	
	2700	0.109	0.032	0.064	1950	12.5×30	ECR1CLL222M□□125030	
		0.109	0.034	0.068	1730	16×20	ECR1CLL222M□□160020	
		0.088	0.028	0.056	2200	12.5×35	ECR1CLL272M□□125035	
		0.088	0.028	0.056	2070	16×25	ECR1CLL272M□□160025	
		0.088	0.03	0.06	1870	18×20	ECR1CLL272M□□180020	
		0.08	0.026	0.052	2390	12.5×40	ECR1CLL332M□□125040	
	3900	0.068	0.025	0.05	2350	16×31.5	ECR1CLL392M□□160031	
		0.068	0.027	0.054	2160	18×25	ECR1CLL392M□□180025	
	4700	0.062	0.022	0.044	2550	16×35.5	ECR1CLL472M□□160035	
		0.062	0.023	0.046	2450	18×31.5	ECR1CLL472M□□180031	
	5600	0.057	0.02	0.04	2900	16×40	ECR1CLL562M□□160040	
	6800	0.051	0.02	0.04	2730	18×35.5	ECR1CLL682M□□180035	
	8200	0.049	0.019	0.038	3060	18×40	ECR1CLL822M□□180040	
	25 (32) 1E	39	4.763	0.65	1.3	175	5×11.5	ECR1ELL390M□□050011
		47	3.953	0.65	1.3	175	5×11.5	ECR1ELL470M□□050011
		56	3.317	0.46	0.92	235	5×15	ECR1ELL560M□□050015
		82	2.266	0.3	0.6	290	6.3×11.5	ECR1ELL820M□□063011
		100	1.858	0.3	0.6	290	6.3×11.5	ECR1ELL101M□□063011
		120	1.548	0.2	0.4	400	6.3×15	ECR1ELL121M□□063015
180		1.032	0.17	0.34	503	8×11.5	ECR1ELL181M□□080011	
220		0.844	0.17	0.34	503	8×11.5	ECR1ELL221M□□080011	
		0.844	0.13	0.26	575	8×16	ECR1ELL221M□□080016	
		0.844	0.12	0.24	629	10×12.5	ECR1ELL221M□□100012	
270		0.688	0.095	0.19	795	10×16	ECR1ELL271M□□100016	
		0.563	0.12	0.24	629	10×12.5	ECR1ELL331M□□100012	
330		0.563	0.095	0.19	751	8×20	ECR1ELL331M□□080020	
		0.395	0.12	0.24	760	10×12.5	ECR1ELL471M□□100012	
470		0.395	0.095	0.19	751	8×20	ECR1ELL471M□□080020	
		0.395	0.065	0.13	1010	10×20	ECR1ELL471M□□100020	
		0.395	0.065	0.13	1010	12.5×15	ECR1ELL471M□□125015	
		0.332	0.055	0.11	1190	10×25	ECR1ELL561M□□100025	
560		0.227	0.045	0.09	1440	10×30	ECR1ELL821M□□100030	
		0.227	0.042	0.084	1400	12.5×20	ECR1ELL821M□□125020	
820		0.227	0.046	0.092	1360	16×15	ECR1ELL821M□□160015	
		0.186	0.042	0.084	1400	12.5×20	ECR1ELL102M□□125020	
1000		0.186	0.038	0.076	1690	12.5×25	ECR1ELL102M□□125025	
		0.155	0.043	0.086	1500	18×15	ECR1ELL122M□□180015	
1200	0.124	0.032	0.064	1950	12.5×30	ECR1ELL152M□□125030		
	0.124	0.034	0.068	1730	16×20	ECR1ELL152M□□160020		
1500	0.103	0.028	0.056	2200	12.5×35	ECR1ELL182M□□125035		
	0.103	0.028	0.056	2070	16×25	ECR1ELL182M□□160025		
1800	0.103	0.03	0.06	1890	18×20	ECR1ELL182M□□180020		
	0.097	0.028	0.056	2200	12.5×35	ECR1ELL222M□□125035		
2200	0.097	0.026	0.052	2390	12.5×40	ECR1ELL222M□□125040		
	0.079	0.025	0.05	2350	16×31.5	ECR1ELL272M□□160031		
2700	0.079	0.027	0.054	2180	18×25	ECR1ELL272M□□180025		
	0.072	0.022	0.044	2550	16×35.5	ECR1ELL332M□□160035		
3300	0.072	0.023	0.046	2470	18×31.5	ECR1ELL332M□□180031		
	0.061	0.02	0.04	2900	16×40	ECR1ELL392M□□160040		
3900	0.061	0.02	0.04	2740	18×35.5	ECR1ELL392M□□180035		
	0.056	0.019	0.038	3070	18×40	ECR1ELL472M□□180040		
35 (44) 1V	27	5.898	0.65	1.3	175	5×11.5	ECR1VLL270M□□050011	
	39	4.083	0.46	0.92	235	5×15	ECR1VLL390M□□050015	
	47	3.388	0.65	1.3	175	5×11.5	ECR1VLL470M□□050011	
	56	2.843	0.3	0.6	290	6.3×11.5	ECR1VLL560M□□063011	
	82	1.942	0.2	0.4	400	6.3×15	ECR1VLL820M□□063015	
	100	1.592	0.2	0.4	420	8×11.5	ECR1VLL101M□□080011	
	120	1.327	0.17	0.34	501	8×11.5	ECR1VLL121M□□080011	
	150	1.062	0.12	0.24	625	10×12.5	ECR1VLL151M□□100012	
	180	0.885	0.13	0.26	575	8×16	ECR1VLL181M□□080016	
		0.885	0.095	0.19	795	10×16	ECR1VLL181M□□100016	
	220	0.724	0.13	0.26	755	8×16	ECR1VLL221M□□080016	
		0.724	0.095	0.19	760	8×20	ECR1VLL221M□□080020	
	330	0.483	0.095	0.19	795	10×16	ECR1VLL331M□□100016	
		0.483	0.065	0.13	1010	10×20	ECR1VLL331M□□100020	
		0.483	0.065	0.13	1010	12.5×15	ECR1VLL331M□□125015	
		0.408	0.055	0.11	1190	10×25	ECR1VLL391M□□100025	
	390	0.284	0.045	0.09	1450	10×30	ECR1VLL561M□□100030	
		0.284	0.065	0.13	1010	10×20	ECR1VLL471M□□100020	
	470	0.284	0.042	0.084	1400	12.5×20	ECR1VLL561M□□125020	
		0.284	0.046	0.092	1360	16×15	ECR1VLL561M□□160015	
	680	0.234	0.038	0.076	1690	12.5×25	ECR1VLL681M□□125025	
		0.234	0.043	0.086	1520	18×15	ECR1VLL681M□□180015	
		0.159	0.042	0.084	1500	12.5×20	ECR1VLL102M□□125020	
		0.159	0.038	0.076	1690	12.5×25	ECR1VLL102M□□125025	
1000	0.159	0.032	0.064	1950	12.5×30	ECR1VLL102M□□125030		
	0.159	0.034	0.068	1730	16×20	ECR1VLL102M□□160020		
	0.133	0.028	0.056	2200	12.5×35	ECR1VLL222M□□125035		
	0.133	0.028	0.056	2070	16×25	ECR1VLL222M□□160025		
1200	0.133	0.03	0.06	1900	18×20	ECR1VLL222M□□180020		
	0.106	0.026	0.052	2390	12.5×40	ECR1VLL152M□□125040		



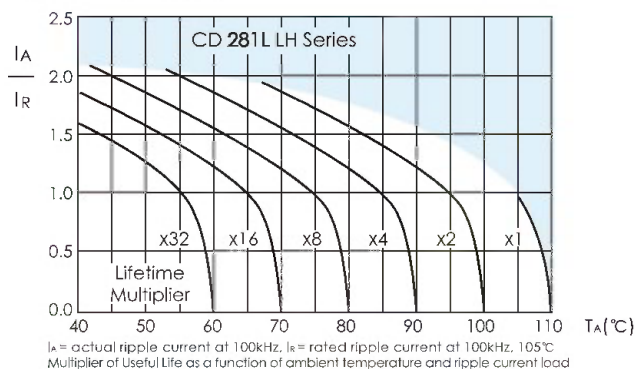
## Ratings for CD 281L LH Series

U <sub>r</sub> (Surge Voltage Code)	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N	
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-	
35 (44) 1V	1800	0.088	0.025	0.05	2350	16×31.5	ECR1VLL182M□□160031	
		0.088	0.027	0.054	2200	18×25	ECR1VLL182M□□180025	
	2200	0.084	0.022	0.044	2550	16×35.5	ECR1VLL222M□□160035	
		0.084	0.023	0.046	2490	18×31.5	ECR1VLL222M□□180031	
	2700	0.069	0.02	0.04	2900	16×40	ECR1VLL272M□□160040	
		0.069	0.02	0.04	2770	18×35.5	ECR1VLL272M□□180035	
	3300	0.064	0.019	0.038	3110	18×40	ECR1VLL332M□□180040	
	0.47	283	3.9	7.8	22	5×11.5	ECR1HLL47M□□050011	
	1	133	3.5	7	36	5×11.5	ECR1HLL010M□□050011	
	2.2	60.3	3	6	54	5×11.5	ECR1HLL2R2M□□050011	
	3.3	40.2	2.6	5.2	63	5×11.5	ECR1HLL3R3M□□050011	
	4.7	28.3	2.2	4.4	75	5×11.5	ECR1HLL4R7M□□050011	
50 (63) 1H	10	13.3	1.4	2.8	110	5×11.5	ECR1HLL100M□□050011	
	18	7.372	0.95	1.9	120	5×11.5	ECR1HLL180M□□050011	
	27	4.915	0.55	1.1	135	5×15	ECR1HLL270M□□050015	
	39	3.402	0.36	0.72	148	6.3×11.5	ECR1HLL390M□□063011	
	56	2.37	0.28	0.56	153	6.3×15	ECR1HLL560M□□063015	
	68	1.951	0.2	0.4	360	8×11.5	ECR1HLL680M□□080011	
	82	1.618	0.18	0.36	460	8×16	ECR1HLL820M□□080016	
		1.618	0.18	0.36	443	10×12.5	ECR1HLL820M□□100012	
	100	1.327	0.15	0.3	553	10×16	ECR1HLL101M□□100016	
	120	1.106	0.13	0.26	670	8×20	ECR1HLL121M□□080020	
	180	0.737	0.095	0.19	676	10×20	ECR1HLL181M□□100020	
		0.737	0.105	0.21	745	12.5×15	ECR1ELL181M□□125015	
	220	0.603	0.08	0.16	876	10×25	ECR1HLL221M□□100025	
		0.402	0.065	0.13	1010	10×30	ECR1HLL331M□□100030	
	330	0.402	0.07	0.14	979	12.5×20	ECR1HLL331M□□125020	
		0.402	0.075	0.15	982	16×15	ECR1HLL331M□□160015	
	470	0.282	0.054	0.108	1180	12.5×25	ECR1HLL471M□□125025	
		0.282	0.058	0.116	1180	18×15	ECR1HLL471M□□180015	
	560	0.237	0.05	0.1	1310	12.5×30	ECR1HLL561M□□125030	
	680	0.195	0.046	0.092	1470	12.5×35	ECR1HLL681M□□125035	
		0.195	0.05	0.1	1210	16×20	ECR1HLL681M□□160020	
	820	0.162	0.044	0.088	1590	12.5×40	ECR1HLL821M□□125040	
		0.162	0.048	0.096	1490	16×25	ECR1HLL821M□□160025	
	1000	0.162	0.046	0.092	1450	18×20	ECR1HLL821M□□180020	
		0.133	0.04	0.08	1890	16×31.5	ECR1HLL102M□□160031	
	1200	0.133	0.04	0.08	1720	18×25	ECR1HLL102M□□180025	
		0.111	0.032	0.064	2140	16×35.5	ECR1HLL122M□□160035	
	1500	0.088	0.026	0.052	2410	16×40	ECR1HLL152M□□160040	
		0.088	0.026	0.052	1970	18×31.5	ECR1HLL152M□□180031	
	1800	0.074	0.025	0.05	2310	18×35.5	ECR1HLL182M□□180035	
	2200	0.072	0.024	0.048	2530	18×40	ECR1HLL222M□□180040	
	63 (79) 1J	12	9.952	1.2	3.6	120	5×11.5	ECR1JLL120M□□050011
		18	6.635	0.85	2.6	135	5×15	ECR1JLL180M□□050015
		27	4.423	0.55	1.7	148	6.3×11.5	ECR1JLL270M□□063011
		39	3.062	0.38	1.1	153	6.3×15	ECR1JLL390M□□063015
		47	2.541	0.32	0.96	360	8×11.5	ECR1JLL470M□□080011
		56	2.133	0.23	0.69	448	10×12.5	ECR1JLL560M□□100012
		68	1.756	0.24	0.72	469	8×16	ECR1JLL680M□□080016
			1.756	0.17	0.51	553	10×16	ECR1JLL680M□□100016
		82	1.456	0.17	0.51	682	8×20	ECR1JLL820M□□080020
120		0.995	0.12	0.36	676	10×20	ECR1JLL121M□□100020	
150		0.796	0.1	0.3	876	10×25	ECR1JLL151M□□100025	
		0.796	0.11	0.33	745	12.5×15	ECR1JLL151M□□125015	
180		0.663	0.085	0.26	1020	10×30	ECR1JLL181M□□100030	
220		0.543	0.075	0.23	979	12.5×20	ECR1JLL221M□□125020	
		0.543	0.08	0.24	928	16×15	ECR1JLL221M□□160015	
270		0.442	0.065	0.2	1180	12.5×25	ECR1JLL271M□□125025	
330		0.362	0.065	0.2	1200	18×15	ECR1JLL331M□□180015	
390		0.306	0.055	0.17	1310	12.5×30	ECR1JLL391M□□125030	
		0.306	0.057	0.17	1210	16×20	ECR1JLL391M□□160020	
470		0.254	0.048	0.14	1470	12.5×35	ECR1JLL471M□□125035	
		0.254	0.052	0.16	1490	16×25	ECR1JLL471M□□160025	
560		0.254	0.058	0.17	1460	18×20	ECR1JLL471M□□180020	
		0.213	0.042	0.13	1590	12.5×40	ECR1JLL561M□□125040	
680		0.176	0.042	0.13	1890	16×31.5	ECR1JLL681M□□160031	
		0.176	0.05	0.15	1740	18×25	ECR1JLL681M□□180025	
820		0.146	0.036	0.11	2140	16×35.5	ECR1JLL821M□□160035	
		0.146	0.042	0.13	1990	18×31.5	ECR1JLL821M□□180031	
1000		0.119	0.032	0.096	2410	16×40	ECR1JLL102M□□160040	
		0.119	0.035	0.11	2340	18×35.5	ECR1JLL102M□□180035	
1200		0.10	0.032	0.096	2560	18×40	ECR1JLL122M□□180040	

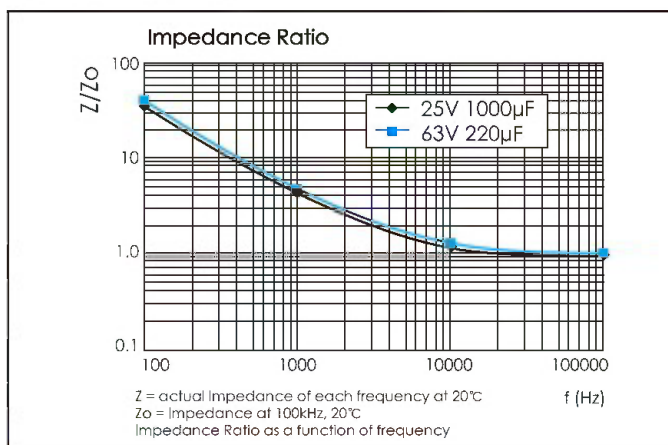
$U_r$ (Surge Voltage Code)	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA rms)	(mm)	-
100 (125) 2A	5.6	18.957	1.9	7.6	57	5×11.5	ECR2ALL5R6M□□050011
	8.2	12.946	1.3	5.2	74	5×15	ECR2ALL8R2M□□050015
	12	8.846	1.1	4.4	78	6.3×11.5	ECR2ALL120M□□063011
	18	5.898	0.62	2.5	85	6.3×15	ECR2ALL180M□□063015
	22	4.825	0.53	2.1	275	8×11.5	ECR2ALL220M□□080011
	27	3.932	0.47	1.9	319	10×12.5	ECR2ALL270M□□100012
	33	3.217	0.35	1.4	360	8×16	ECR2ALL330M□□080016
	39	3.217	0.32	1.3	424	10×16	ECR2ALL330M□□100016
	47	2.722	0.27	1.1	490	8×20	ECR2ALL390M□□080020
	56	1.896	0.25	1	499	10×20	ECR2ALL560M□□100020
	68	1.561	0.18	0.72	634	10×25	ECR2ALL680M□□100025
	82	1.561	0.2	0.8	613	12.5×15	ECR2ALL680M□□125015
100 (125) 2A	100	1.062	0.15	0.6	739	10×30	ECR2ALL101M□□100030
	120	1.062	0.13	0.52	805	12.5×20	ECR2ALL101M□□125020
	150	0.885	0.11	0.44	857	12.5×25	ECR2ALL121M□□125025
	180	0.885	0.13	0.5	706	16×15	ECR2ALL121M□□160015
	220	0.708	0.12	0.48	871	18×15	ECR2ALL151M□□180015
	270	0.59	0.09	0.36	1120	12.5×30	ECR2ALL181M□□125030
	330	0.59	0.11	0.44	916	16×20	ECR2ALL181M□□160020
	390	0.483	0.075	0.3	1240	12.5×35	ECR2ALL221M□□125035
	470	0.483	0.081	0.32	1290	16×25	ECR2ALL221M□□160025
	560	0.393	0.06	0.24	1330	12.5×40	ECR2ALL271M□□125040
	680	0.393	0.085	0.34	1170	18×20	ECR2ALL271M□□180020
	820	0.322	0.059	0.23	1630	16×31.5	ECR2ALL331M□□160031
100 (125) 2A	1000	0.322	0.071	0.28	1500	18×25	ECR2ALL331M□□180025
	1200	0.272	0.052	0.21	1750	16×35.5	ECR2ALL391M□□160035
	1500	0.272	0.058	0.23	1630	18×31.5	ECR2ALL391M□□180031
	1800	0.226	0.045	0.18	1920	16×40	ECR2ALL471M□□160040
	2200	0.19	0.054	0.22	1920	18×35.5	ECR2ALL561M□□180035
	2700	0.156	0.041	0.16	2100	18×40	ECR2ALL681M□□180040

Customer products are available on request.

## Lifetime Diagram



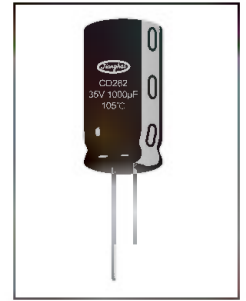
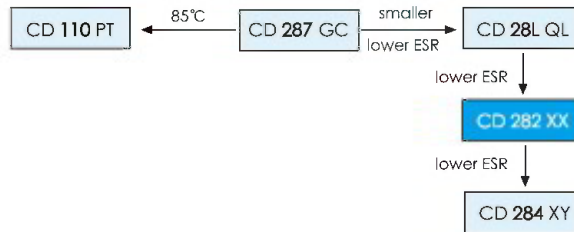
## Typical Curves





3000 - 6000h at 105°C

- Ultra Low Impedance
- Switching power supplies
- High ripple current

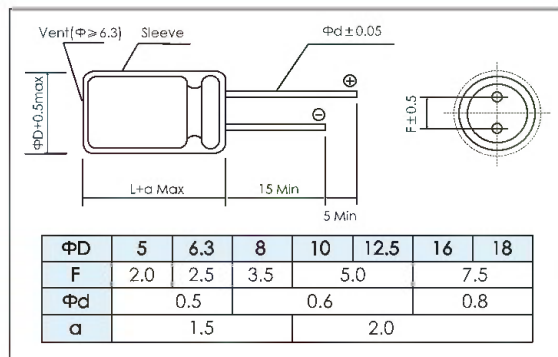


Items	Characteristics								
Operating Temperature Range (°C)	-40 ~ +105								
Voltage Range (V)	6.3 ~ 100								
Capacitance Range (μF)	6.8 ~ 18000								
Capacitance Tolerance (20°C, 120Hz)	± 20%								
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)								
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
For Capacitances >1000μF add 0.02 to every 1000μF									
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	4	3	2	2	2	2	2	2
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	8	6	4	3	3	3	3	3

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	Φ 5 - 6.3 : 4000h Φ 8 : 6000h Φ 10 : 7000h Φ 12.5 - 18: 8000h	Φ ≥ 8: > 250000h	Φ 5 - 6.3 : 3000h Φ 8 : 4000h Φ 10 : 5000h Φ 12.5 - 18: 6000h	Φ 5 - 6.3 : 3500h Φ 8 : 5000h Φ 10 : 6000h Φ 12.5 - 18: 7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 40% of initial value		Within ± 25% of initial value	Within ± 25% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
6.8 ~ 33	0.42	0.70	0.90	1.00
39 ~ 270	0.50	0.73	0.92	1.00
330 ~ 680	0.55	0.77	0.94	1.00
820 ~ 1800	0.60	0.80	0.96	1.00
2200 ~ 18000	0.70	0.85	0.98	1.00

## Temperature Coefficient

Temperature(°C)	+65	+85	+105
Coefficient	2.0	1.7	1.0



# CD 282 XX SERIES



## Ratings for CD 282 XX Series

MINIATURE

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
6.3 (7.2) 0J	150	0.58	2.3	210	5×11.5	ECR0JXX151M□□050011
	220	0.58	2.3	210	5×11.5	ECR0JXX221M□□050011
	330	0.22	0.87	340	6.3×11.5	ECR0JXX331M□□063011
	470	0.22	0.87	210	6.3×11.5	ECR0JXX471M□□063011
	680	0.13	0.52	640	8×11.5	ECR0JXX681M□□080011
	820	0.08	0.32	865	10×12.5	ECR0JXX821M□□100012
	1000	0.13	0.52	640	8×11.5	ECR0JXX102M□□080011
		0.087	0.35	840	8×16	ECR0JXX102M□□080016
	1200	0.069	0.27	1050	8×20	ECR0JXX122M□□080020
		0.06	0.24	1210	10×16	ECR0JXX122M□□100016
	1500	0.046	0.18	1400	10×20	ECR0JXX152M□□100020
	1800	0.046	0.18	1400	10×20	ECR0JXX182M□□100020
		0.049	0.16	1450	12.5×16	ECR0JXX182M□□125016
	2200	0.046	0.18	1400	10×20	ECR0JXX222M□□100020
		0.042	0.17	1650	10×25	ECR0JXX222M□□100025
	2700	0.031	0.12	1910	10×30	ECR0JXX272M□□100030
		0.042	0.12	1940	16×16	ECR0JXX272M□□160016
	3300	0.035	0.12	1900	12.5×20	ECR0JXX332M□□125020
		0.035	0.12	1900	12.5×20	ECR0JXX392M□□125020
	3900	0.027	0.089	2230	12.5×25	ECR0JXX392M□□125025
		0.043	0.11	2210	18×16	ECR0JXX392M□□180016
	4700	0.024	0.078	2650	12.5×30	ECR0JXX472M□□125030
	5600	0.02	0.065	2880	12.5×35	ECR0JXX562M□□125035
		0.027	0.078	2530	16×20	ECR0JXX562M□□160020
10 (13) 1A	6800	0.017	0.056	3350	12.5×40	ECR0JXX682M□□125040
		0.021	0.06	2930	16×25	ECR0JXX682M□□160025
		0.026	0.067	2860	18×20	ECR0JXX682M□□180020
	8200	0.017	0.05	3450	16×31.5	ECR0JXX822M□□160031
	10000	0.015	0.044	3610	16×35.5	ECR0JXX103M□□160035
		0.019	0.049	3140	18×25	ECR0JXX103M□□180025
	12000	0.013	0.038	4080	16×40	ECR0JXX123M□□160040
		0.015	0.040	4170	18×31.5	ECR0JXX123M□□180031
	15000	0.014	0.038	4220	18×35.5	ECR0JXX153M□□180035
	18000	0.012	0.032	4280	18×40	ECR0JXX183M□□180040
	100	0.58	2.3	210	5×11.5	ECR1AXX101M□□050011
	220	0.22	0.87	340	6.3×11.5	ECR1AXX221M□□063011
	470	0.22	0.87	400	6.3×11.5	ECR1AXX471M□□063011
		0.13	0.52	640	8×11.5	ECR1AXX471M□□080011
	680	0.087	0.35	840	8×16	ECR1AXX681M□□080016
		0.08	0.32	865	10×12.5	ECR1AXX681M□□100012
	1000	0.069	0.27	1050	8×20	ECR1AXX102M□□080020
		0.08	0.32	865	10×12.5	ECR1AXX102M□□100012
	1200	0.06	0.24	1210	10×16	ECR1AXX102M□□100016
		0.046	0.18	1400	10×20	ECR1AXX122M□□100020
	1500	0.042	0.17	1650	10×25	ECR1AXX152M□□100025
		0.049	0.16	1450	12.5×16	ECR1AXX152M□□125016
	2200	0.046	0.18	1400	10×20	ECR1AXX222M□□100020
		0.031	0.12	1910	10×30	ECR1AXX222M□□100030
	2700	0.035	0.12	1900	12.5×20	ECR1AXX222M□□125020
		0.042	0.12	1940	16×16	ECR1AXX222M□□160016
	3300	0.043	0.11	2210	18×16	ECR1AXX272M□□180016
	3900	0.027	0.089	2230	12.5×25	ECR1AXX332M□□125025
	4700	0.024	0.078	2650	12.5×30	ECR1AXX392M□□125030
		0.027	0.078	2530	16×20	ECR1AXX392M□□160020
	5600	0.02	0.065	2880	12.5×35	ECR1AXX472M□□125035

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
10 (13) 1A	5600	0.021	0.06	2930	16×25	ECR1AXX562M□□160025
		0.026	0.067	2860	18×20	ECR1AXX562M□□180020
	6800	0.017	0.05	3450	16×31.5	ECR1AXX682M□□160031
		0.019	0.049	3140	18×25	ECR1AXX682M□□180025
	8200	0.015	0.044	3610	16×35.5	ECR1AXX822M□□160035
		0.015	0.04	4170	18×31.5	ECR1AXX822M□□180031
	10000	0.013	0.038	4080	16×40	ECR1AXX103M□□160040
		0.014	0.038	4220	18×35.5	ECR1AXX103M□□180035
	12000	0.012	0.032	4280	18×40	ECR1AXX123M□□180040
	47	0.75	3	170	5×11.5	ECR1CXX470M□□050011
	56	0.58	2.3	210	5×11.5	ECR1CXX560M□□050011
	100	0.58	2.3	250	5×11.5	ECR1CXX101M□□050011
	120	0.22	0.87	340	6.3×11.5	ECR1CXX121M□□063011
	220	0.22	0.87	400	6.3×11.5	ECR1CXX221M□□063011
	330	0.13	0.52	640	8×11.5	ECR1CXX331M□□080011
	470	0.13	0.52	640	8×11.5	ECR1CXX471M□□080011
		0.087	0.35	840	8×16	ECR1CXX471M□□080016
	680	0.08	0.32	865	10×12.5	ECR1CXX471M□□100012
		0.069	0.27	1050	8×20	ECR1CXX681M□□080020
	1000	0.06	0.24	1210	10×16	ECR1CXX681M□□100016
		0.046	0.18	1400	10×20	ECR1CXX102M□□100016
	1200	0.049	0.16	1450	12.5×16	ECR1CXX102M□□125016
		0.042	0.17	1650	10×25	ECR1CXX122M□□100025
	1500	0.031	0.12	1910	10×30	ECR1CXX152M□□100030
		0.035	0.12	1900	12.5×20	ECR1CXX152M□□125020
	2200	0.042	0.12	1940	16×16	ECR1CXX152M□□160016
		0.035	0.12	1900	12.5×20	ECR1CXX152M□□125020
	2700	0.027	0.089	2230	12.5×25	ECR1CXX222M□□125025
		0.043	0.11	2210	18×16	ECR1CXX222M□□180016
16 (20) 1C	2700	0.024	0.078	2650	12.5×30	ECR1CXX272M□□125030
		0.027	0.078	2530	16×20	ECR1CXX272M□□160020
	3300	0.024	0.078	2650	12.5×30	ECR1CXX332M□□125030
		0.02	0.065	2880	12.5×35	ECR1CXX332M□□125035
	3900	0.017	0.056	3350	12.5×40	ECR1CXX392M□□125040
		0.021	0.06	2930	16×25	ECR1CXX392M□□160025
	4700	0.026	0.067	2860	18×20	ECR1CXX392M□□180020
		0.021	0.06	2930	16×25	ECR1CXX472M□□160025
	5600	0.026	0.067	2930	18×20	ECR1CXX472M□□180020
		0.017	0.05	3450	16×31.5	ECR1CXX472M□□160031
	6800	0.019	0.049	3140	18×25	ECR1CXX472M□□180025
		0.015	0.044	3610	16×35.5	ECR1CXX562M□□160035
	8200	0.015	0.04	4170	18×31.5	ECR1CXX562M□□180031
		0.013	0.038	4080	16×40	ECR1CXX682M□□160040
	10000	0.014	0.038	4220	18×35.5	ECR1CXX822M□□180035
		0.012	0.032	4280	18×40	ECR1CXX103M□□180040
25 (32) 1E	47	0.58	2.3	210	5×11.5	ECR1EXX470M□□050011
	100	0.22	0.87	340	6.3×11.5	ECR1EXX101M□□063011
	220	0.22	0.87	400	6.3×11.5	ECR1EXX221M□□063011
		0.13	0.52	640	8×11.5	ECR1EXX221M□□080011
	330	0.13	0.52	640	8×11.5	ECR1EXX331M□□080011
		0.087	0.35	840	8×16	ECR1EXX331M□□080016
	470	0.08	0.32	865	10×12.5	ECR1EXX331M□□100012
		0.087	0.35	840	8×16	ECR1EXX471M□□080016
	5600	0.08	0.32	865	10×12.5	ECR1EXX471M□□100012
		0.069	0.27	1050	8×20	ECR1EXX471M□□080020



## Ratings for CD 282 XX Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
25 (32) 1E	470	0.06	0.24	1210	10×16	ECR1EXX471M□□100016
	680	0.046	0.18	1400	10×20	ECR1EXX681M□□100020
		0.049	0.16	1450	12.5×16	ECR1EXX681M□□125016
	820	0.042	0.17	1650	10×25	ECR1EXX821M□□100025
	1000	0.046	0.18	1400	10×20	ECR1EXX102M□□100020
		0.031	0.12	1910	10×30	ECR1EXX102M□□100030
		0.035	0.12	1900	12.5×20	ECR1EXX102M□□125020
	1200	0.042	0.12	1940	16×16	ECR1EXX102M□□160016
		0.043	0.11	2210	18×16	ECR1EXX122M□□180016
	1500	0.027	0.089	2230	12.5×25	ECR1EXX152M□□125025
	1800	0.024	0.078	2650	12.5×30	ECR1EXX182M□□125030
		0.027	0.078	2530	16×20	ECR1EXX182M□□160020
	2200	0.027	0.089	2230	12.5×25	ECR1EXX222M□□125025
		0.024	0.078	2650	12.5×30	ECR1EXX222M□□125030
		0.02	0.065	2880	12.5×35	ECR1EXX222M□□125035
		0.026	0.067	2860	16×25	ECR1EXX222M□□160025
		0.026	0.067	2860	18×20	ECR1EXX222M□□180020
	2700	0.017	0.056	3350	12.5×40	ECR1EXX272M□□125040
		0.021	0.06	2930	16×25	ECR1EXX272M□□160025
	3300	0.017	0.05	3450	16×31.5	ECR1EXX332M□□160031
		0.019	0.049	3140	18×25	ECR1EXX332M□□180025
	3900	0.015	0.044	3610	16×35.5	ECR1EXX392M□□160035
		0.015	0.04	4170	18×31.5	ECR1EXX392M□□180031
	4700	0.017	0.05	3450	16×31.5	ECR1EXX472M□□160031
		0.015	0.04	4170	18×31.5	ECR1EXX472M□□180031
		0.013	0.038	4080	16×40	ECR1EXX472M□□160040
		0.014	0.038	4220	18×35.5	ECR1EXX472M□□180035
	5600	0.012	0.032	4280	18×40	ECR1EXX562M□□180040
35 (44) 1V	33	0.58	2.3	210	5×11.5	ECR1VXX330M□□050011
	47	0.58	2.3	210	5×11.5	ECR1VXX470M□□050011
		0.4	1.6	260	6.3×11.5	ECR1VXX470M□□063011
	56	0.22	0.87	340	6.3×11.5	ECR1VXX560M□□063011
	100	0.2	0.8	500	8×11.5	ECR1VXX101M□□080011
	150	0.13	0.52	640	8×11.5	ECR1VXX151M□□080011
	220	0.13	0.52	640	8×11.5	ECR1VXX221M□□080011
		0.087	0.35	840	8×16	ECR1VXX221M□□080016
	270	0.08	0.32	865	10×12.5	ECR1VXX221M□□100012
		0.069	0.27	1050	8×20	ECR1VXX271M□□080020
	330	0.060	0.24	1210	10×16	ECR1VXX331M□□100016
	470	0.046	0.18	1400	10×20	ECR1VXX471M□□100020
		0.049	0.16	1450	12.5×16	ECR1VXX471M□□125016
	560	0.042	0.17	1650	10×25	ECR1VXX561M□□100025
	680	0.031	0.12	1910	10×30	ECR1VXX681M□□100030
		0.035	0.12	1900	12.5×20	ECR1VXX681M□□125020
		0.042	0.12	1940	16×16	ECR1VXX681M□□160016
	1000	0.035	0.12	1900	12.5×20	ECR1VXX102M□□125020
		0.027	0.089	2230	12.5×25	ECR1VXX102M□□125025
		0.043	0.11	2210	18×16	ECR1VXX102M□□180016
	1200	0.024	0.078	2650	12.5×30	ECR1VXX122M□□125030
		0.027	0.078	2530	16×20	ECR1VXX122M□□160020
	1500	0.02	0.065	2880	12.5×35	ECR1VXX152M□□125035
	1800	0.017	0.056	3350	12.5×40	ECR1VXX182M□□125040
		0.021	0.06	2930	16×25	ECR1VXX182M□□160025
		0.026	0.067	2860	18×20	ECR1VXX182M□□180020
	2200	0.017	0.05	3450	16×31.5	ECR1VXX222M□□160031
		0.019	0.049	3140	18×25	ECR1VXX222M□□180025
35 (44) 1V	2700	0.015	0.044	3610	16×35.5	ECR1VXX272M□□160035
	3300	0.015	0.04	4170	18×31.5	ECR1VXX272M□□180031
		0.013	0.038	4080	16×40	ECR1VXX332M□□160040
	3900	0.014	0.038	4220	18×35.5	ECR1VXX332M□□180035
		0.012	0.032	4280	18×40	ECR1VXX392M□□180040
	22	0.700	2.8	180	5×11.5	ECR1HXX220M□□050011
	47	0.500	2.0	250	6.3×11.5	ECR1HXX470M□□063011
	56	0.300	1.2	295	6.3×11.5	ECR1HXX560M□□063011
	100	0.17	0.68	555	8×11.5	ECR1HXX101M□□080011
	120	0.12	0.48	730	8×16	ECR1HXX121M□□080016
	150	0.12	0.48	760	10×12.5	ECR1HXX151M□□100012
	180	0.091	0.36	910	8×20	ECR1HXX181M□□080020
	220	0.084	0.34	1050	10×16	ECR1HXX221M□□100016
	270	0.06	0.24	1220	10×20	ECR1HXX271M□□100020
		0.061	0.2	1260	12.5×16	ECR1HXX271M□□125016
	330	0.055	0.22	1440	10×25	ECR1HXX331M□□100025
	470	0.043	0.17	1690	10×30	ECR1HXX471M□□100030
		0.045	0.15	1660	12.5×20	ECR1HXX471M□□125020
	560	0.055	0.17	1690	16×16	ECR1HXX471M□□160016
		0.034	0.11	1950	12.5×25	ECR1HXX561M□□125025
	680	0.054	0.15	1930	18×16	ECR1HXX561M□□180016
		0.03	0.1	2310	12.5×30	ECR1HXX681M□□125030
	820	0.025	0.083	2510	12.5×35	ECR1HXX821M□□125035
		0.034	0.1	2210	16×20	ECR1HXX821M□□160020
	1000	0.021	0.069	2920	12.5×40	ECR1HXX102M□□125040
		0.025	0.075	2555	16×25	ECR1HXX102M□□160025
		0.036	0.097	2490	18×20	ECR1HXX102M□□180020
	1200	0.022	0.066	3010	16×31.5	ECR1HXX122M□□160031
		0.026	0.07	2740	18×25	ECR1HXX122M□□180025
	1500	0.019	0.057	3150	16×35.5	ECR1HXX152M□□160035
	1800	0.016	0.048	3710	16×40	ECR1HXX182M□□160040
		0.021	0.057	3635	18×31.5	ECR1HXX182M□□180031
	2200	0.017	0.046	3680	18×35.5	ECR1HXX222M□□180035
	2700	0.014	0.038	3800	18×40	ECR1HXX272M□□180040
63 (79) 1J	15	2.3	9.3	55	5×11.5	ECR1JXX150M□□050011
	33	1.2	5	115	6.3×11.5	ECR1JXX330M□□063011
	47	1	4.4	205	8×11.5	ECR1JXX470M□□080011
	56	0.63	2.8	232	8×11.5	ECR1JXX560M□□080011
	82	0.45	2.1	300	8×16	ECR1JXX820M□□080016
		0.43	1.8	288	10×12.5	ECR1JXX820M□□100012
	100	0.43	1.8	288	10×12.5	ECR1JXX101M□□100012
	120	0.33	1.6	362	8×20	ECR1JXX121M□□080020
		0.31	1.5	357	10×16	ECR1JXX121M□□100016
	180	0.21	0.94	446	10×20	ECR1JXX181M□□100020
		0.23	1.1	446	12.5×16	ECR1JXX181M□□125016
	220	0.21	0.94	446	10×20	ECR1JXX221M□□100020
		0.2	0.84	531	10×25	ECR1JXX221M□□100025
	270	0.15	0.71	663	10×30	ECR1JXX271M□□100030
		0.16	0.64	690	12.5×20	ECR1JXX271M□□125020
		0.14	0.66	795	16×16	ECR1JXX271M□□160016
	330	0.12	0.45	784	12.5×25	ECR1JXX331M□□125025
	390	0.12	0.5	920	18×16	ECR1JXX391M□□180016
	470	0.12	0.45	784	12.5×25	ECR1JXX471M□□125025
		0.1	0.42	905	12.5×30	ECR1JXX471M□□125030
		0.091	0.38	1040	16×20	ECR1JXX471M□□160020
	560	0.083	0.35	1050	12.5×35	ECR1JXX561M□□125035

MINIATURE



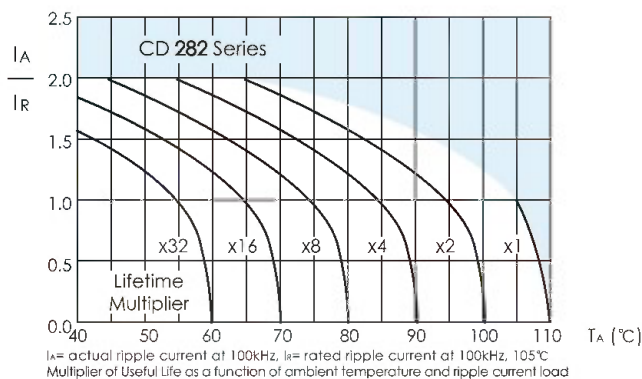
## Ratings for CD 282 XX Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
63 (79) 1J	680	0.073	0.27	1250	16×25	ECR1JXX561M□□160025
		0.071	0.3	1180	12.5×40	ECR1JXX681M□□125040
		0.08	0.3	1240	18×20	ECR1JXX681M□□180020
	820	0.054	0.2	1570	16×31.5	ECR1JXX821M□□160031
		0.057	0.21	1490	18×25	ECR1JXX821M□□180025
		0.045	0.17	1790	16×35.5	ECR1JXX102M□□160035
	1000	0.047	0.17	1630	18×31.5	ECR1JXX102M□□180031
		0.04	0.15	2020	16×40	ECR1JXX122M□□160040
	1200	0.04	0.15	1790	18×35.5	ECR1JXX122M□□180035
		0.036	0.13	2330	18×40	ECR1JXX152M□□180040
100 (125) 2A	6.8	2.3	9.3	55	5×11.5	ECR2AXX68M□□050011
	15	1.2	5	115	6.3×11.5	ECR2AXX150M□□063011
	22	1	4.4	190	8×11.5	ECR2AXX220M□□080011
	27	0.63	2.8	232	8×11.5	ECR2AXX270M□□080011
	39	0.45	2.1	300	8×16	ECR2AXX390M□□080016
	47	0.43	1.8	288	10×12.5	ECR2AXX470M□□100012
	56	0.33	1.6	362	8×20	ECR2AXX560M□□080020
	68	0.31	1.5	357	10×16	ECR2AXX680M□□100016
	82	0.21	0.94	466	10×20	ECR2AXX820M□□100020
		0.23	1.1	466	12.5×16	ECR2AXX820M□□125016

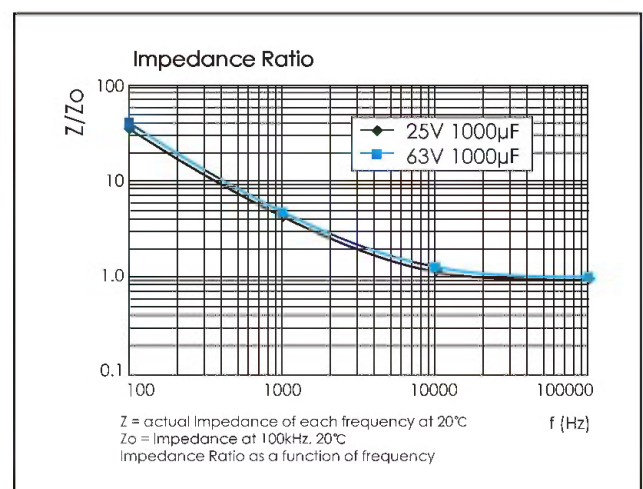
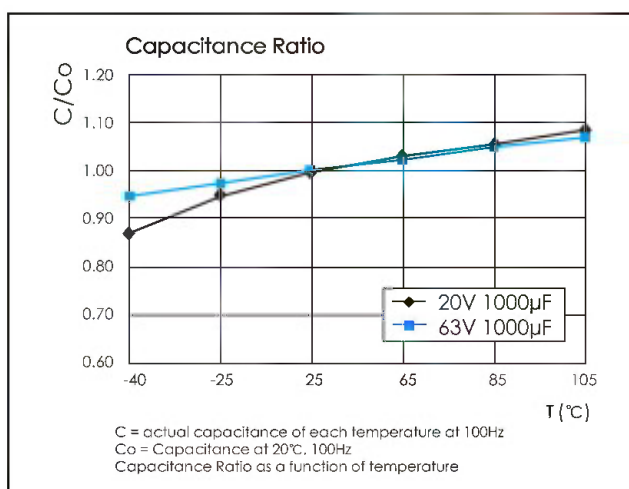
U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	-
100 (125) 2A	100	0.2	0.84	531	10×25	ECR2AXX101M□□100025
	120	0.15	0.71	663	10×30	ECR2AXX121M□□100030
		0.16	0.64	690	12.5×20	ECR2AXX121M□□125020
	150	0.14	0.66	795	16×16	ECR2AXX151M□□160016
	180	0.12	0.45	784	12.5×25	ECR2AXX181M□□125025
		0.12	0.5	920	18×16	ECR2AXX181M□□180016
	220	0.1	0.42	905	12.5×30	ECR2AXX221M□□125030
		0.091	0.38	1040	16×20	ECR2AXX221M□□160020
	270	0.083	0.35	1050	12.5×35	ECR2AXX271M□□125035
		0.073	0.27	1250	16×25	ECR2AXX271M□□160025
	330	0.071	0.3	1180	12.5×40	ECR2AXX331M□□125040
		0.08	0.3	1240	18×20	ECR2AXX331M□□180020
	390	0.054	0.2	1570	16×31.5	ECR2AXX391M□□160031
		0.057	0.21	1490	18×25	ECR2AXX391M□□180025
	470	0.045	0.17	1790	16×35.5	ECR2AXX471M□□160035
		0.047	0.17	1630	18×31.5	ECR2AXX471M□□180031
	560	0.04	0.15	2020	16×40	ECR2AXX561M□□160040
	680	0.04	0.15	1790	18×35.5	ECR2AXX681M□□180035
	820	0.036	0.13	2330	18×40	ECR2AXX821M□□180040

Customer products are available on request.

## Lifetime Diagram



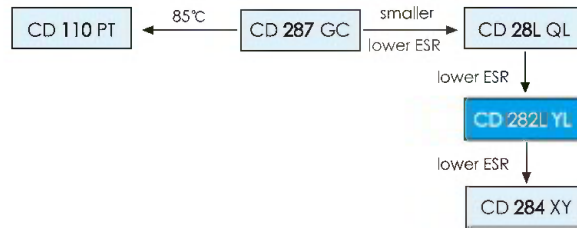
## Typical Curves





4000 - 10000h at 105°C

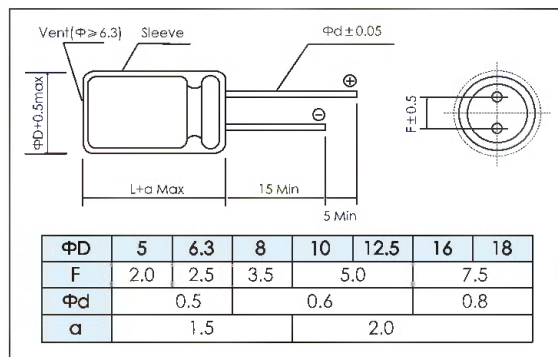
- Ultra Low Impedance
- Switching power supplies
- High ripple current



Items	Characteristics									
Operating Temperature Range (°C)	-40 ~ +105									
Voltage Range (V)	6.3 ~ 100									
Capacitance Range (μF)	6.8 ~ 18000									
Capacitance Tolerance (20°C, 120Hz)	± 20%									
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)									
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
For Capacitances >1000μF add 0.02 to every 1000μF										
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>	4	3	2						
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	8	6	4	3					

	Useful Life					Load Life		Endurance Test		Shelf Life	
Lifetime	Φ 5-6.3 Φ 8-10 Φ 12.5-18	6.3~10V 6000h 8000h 1000h	16~100V 7000h 9000h 12000h	≥250000h		6.3~10V 4000h 6000h 8000h	16~100V 5000h 7000h 10000h	6.3~10V 6000h 8000h 10000h	16~100V 7000h 9000h 12000h	1000h	
Leakage Current	Not more than specified value					Not more than specified value		Not more than specified value		Not more than specified value	
Capacitance Change	Within ± 40% of initial value					Within ± 25% of initial value		Within ± 25% of initial value		Within ± 20% of initial value	
Dissipation Factor	Not more than 300% of specified value					Not more than 200% of specified value		Not more than 200% of specified value		Not more than 200% of specified value	
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105℃			U <sub>R</sub> 1.4 x I <sub>R</sub> 40℃		U <sub>R</sub> I <sub>R</sub> 105℃		U <sub>R</sub> I <sub>R</sub> = 0 105℃		U <sub>R</sub> = 0 I <sub>R</sub> = 0 105℃ After test: U <sub>R</sub> to be applied for 30min >24h before measurement	

## Dimensions



mm

## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
6.8 ~ 33	0.42	0.70	0.90	1.00
39 ~ 270	0.50	0.73	0.92	1.00
330 ~ 680	0.55	0.77	0.94	1.00
820 ~ 1800	0.60	0.80	0.96	1.00
2200 ~ 18000	0.70	0.85	0.98	1.00

## Temperature Coefficient

Temperature(°C)	+65	+85	+105
Coefficient	2.0	1.7	1.0



# CD 282L YL SERIES



## Ratings for CD 282L YL Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	150	0.58	2.3	210	5×11.5	ECR0JYL151M□□050011
	330	0.22	0.87	340	6.3×11.5	ECR0JYL331M□□063011
	680	0.13	0.52	640	8×11.5	ECR0JYL681M□□080011
	820	0.08	0.32	865	10×12.5	ECR0JYL821M□□100012
	1000	0.087	0.35	840	8×16	ECR0JYL102M□□080016
	1200	0.069	0.27	1050	8×20	ECR0JYL122M□□080020
		0.06	0.24	1210	10×16	ECR0JYL122M□□100016
	1500	0.046	0.18	1400	10×20	ECR0JYL152M□□100020
	1800	0.049	0.16	1450	12.5×16	ECR0JYL182M□□125016
	2200	0.042	0.17	1650	10×25	ECR0JYL222M□□100025
	2700	0.031	0.12	1910	10×30	ECR0JYL272M□□100030
		0.042	0.12	1940	16×16	ECR0JYL272M□□160016
	3300	0.035	0.12	1900	12.5×20	ECR0JYL332M□□125020
	3900	0.027	0.089	2230	12.5×25	ECR0JYL392M□□125025
		0.043	0.11	2210	18×16	ECR0JYL392M□□180016
	4700	0.024	0.078	2650	12.5×30	ECR0JYL472M□□125030
	5600	0.02	0.065	2880	12.5×35	ECR0JYL562M□□125035
		0.027	0.078	2530	16×20	ECR0JYL562M□□160020
	6800	0.017	0.056	3350	12.5×40	ECR0JYL682M□□125040
		0.021	0.06	2930	16×25	ECR0JYL682M□□160025
		0.026	0.067	2860	18×20	ECR0JYL682M□□180020
	8200	0.017	0.05	3450	16×31.5	ECR0JYL822M□□160031
	10000	0.015	0.044	3610	16×35.5	ECR0JYL103M□□160035
		0.019	0.049	3140	18×25	ECR0JYL103M□□180025
	12000	0.013	0.038	4080	16×40	ECR0JYL123M□□160040
		0.015	0.04	4170	18×31.5	ECR0JYL123M□□180031
	15000	0.014	0.038	4220	18×35.5	ECR0JYL153M□□180035
	18000	0.012	0.032	4280	18×40	ECR0JYL183M□□180040
10 (13) 1A	100	0.58	2.3	210	5×11.5	ECR1AYL101M□□050011
	220	0.22	0.87	340	6.3×11.5	ECR1AYL221M□□063011
	470	0.13	0.52	640	8×11.5	ECR1AYL471M□□080011
	680	0.087	0.35	840	8×16	ECR1AYL681M□□080016
		0.08	0.32	865	10×12.5	ECR1AYL681M□□100012
	1000	0.069	0.27	1050	8×20	ECR1AYL102M□□080020
		0.06	0.24	1210	10×16	ECR1AYL102M□□100016
	1200	0.046	0.18	1400	10×20	ECR1AYL122M□□100020
	1500	0.042	0.17	1650	10×25	ECR1AYL152M□□100025
		0.049	0.16	1450	12.5×16	ECR1AYL152M□□125016
	2200	0.031	0.12	1910	10×30	ECR1AYL222M□□100030
		0.035	0.12	1900	12.5×20	ECR1AYL222M□□125020
	2700	0.042	0.12	1940	16×16	ECR1AYL222M□□160016
		0.043	0.11	2210	18×16	ECR1AYL272M□□180016
	3300	0.027	0.089	2230	12.5×25	ECR1AYL332M□□125025
	3900	0.024	0.078	2650	12.5×30	ECR1AYL392M□□125030
		0.027	0.078	2530	16×20	ECR1AYL392M□□160020
	4700	0.02	0.065	2880	12.5×35	ECR1AYL472M□□125035
	5600	0.017	0.056	3350	12.5×40	ECR1AYL562M□□125040
		0.021	0.06	2930	16×25	ECR1AYL562M□□160025
		0.026	0.067	2860	18×20	ECR1AYL562M□□180020
	6800	0.017	0.05	3450	16×31.5	ECR1AYL682M□□160031
		0.019	0.049	3140	18×25	ECR1AYL682M□□180025
	8200	0.015	0.044	3610	16×35.5	ECR1AYL822M□□160035
		0.015	0.04	4170	18×31.5	ECR1AYL822M□□180031
	10000	0.013	0.038	4080	16×40	ECR1AYL103M□□160040
		0.014	0.038	4220	18×35.5	ECR1AYL103M□□180035
	12000	0.012	0.032	4280	18×40	ECR1AYL123M□□180040

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
16 (20) 1C	56	0.58	2.3	210	5×11.5	ECR1CYL560M□□050011
	120	0.22	0.87	340	6.3×11.5	ECR1CYL121M□□063011
	330	0.13	0.52	640	8×11.5	ECR1CYL331M□□080011
	470	0.087	0.35	840	8×16	ECR1CYL471M□□080016
		0.08	0.32	865	10×12.5	ECR1CYL471M□□100012
	680	0.069	0.27	1050	8×20	ECR1CYL681M□□080020
		0.06	0.24	1210	10×16	ECR1CYL681M□□100016
	1000	0.046	0.18	1400	10×20	ECR1CYL102M□□100020
		0.049	0.16	1450	12.5×16	ECR1CYL102M□□125016
	1200	0.042	0.17	1650	10×25	ECR1CYL122M□□100025
	1500	0.031	0.12	1910	10×30	ECR1CYL152M□□100030
		0.035	0.12	1900	12.5×20	ECR1CYL152M□□125020
		0.042	0.12	1940	16×16	ECR1CYL152M□□160016
	2200	0.027	0.089	2230	12.5×25	ECR1CYL222M□□125025
		0.043	0.11	2210	18×16	ECR1CYL222M□□180016
	2700	0.024	0.078	2650	12.5×30	ECR1CYL272M□□125030
		0.027	0.078	2530	16×20	ECR1CYL272M□□160020
	3300	0.02	0.065	2880	12.5×35	ECR1CYL332M□□125035
	3900	0.017	0.056	3350	12.5×40	ECR1CYL392M□□125040
		0.021	0.06	2930	16×25	ECR1CYL392M□□160025
		0.026	0.067	2860	18×20	ECR1CYL392M□□180020
	4700	0.017	0.050	3450	16×31.5	ECR1CYL472M□□160031
		0.019	0.049	3140	18×25	ECR1CYL472M□□180025
	5600	0.015	0.044	3610	16×35.5	ECR1CYL562M□□160035
		0.015	0.04	4170	18×31.5	ECR1CYL562M□□180031
	6800	0.013	0.038	4080	16×40	ECR1CYL682M□□160040
	8200	0.014	0.038	4220	18×35.5	ECR1CYL822M□□180035
	10000	0.012	0.032	4280	18×40	ECR1CYL103M□□180040
25 (32) 1E	47	0.58	2.3	210	5×11.5	ECR1EYL470M□□050011
	100	0.22	0.87	340	6.3×11.5	ECR1EYL101M□□063011
	220	0.13	0.52	640	8×11.5	ECR1EYL221M□□080011
	330	0.087	0.35	840	8×16	ECR1EYL331M□□080016
		0.08	0.32	865	10×12.5	ECR1EYL331M□□100012
	470	0.069	0.27	1050	8×20	ECR1EYL471M□□080020
		0.06	0.24	1210	10×16	ECR1EYL471M□□100016
	680	0.046	0.18	1400	10×20	ECR1EYL681M□□100020
		0.049	0.16	1450	12.5×16	ECR1EYL681M□□125016
	820	0.042	0.17	1650	10×25	ECR1EYL821M□□100025
	1000	0.031	0.12	1910	10×30	ECR1EYL102M□□100030
		0.035	0.12	1900	12.5×20	ECR1EYL102M□□125020
	1200	0.042	0.12	1940	16×16	ECR1EYL102M□□160016
		0.043	0.11	2210	18×16	ECR1EYL122M□□180016
	1500	0.027	0.089	2230	12.5×25	ECR1EYL152M□□125025
	1800	0.024	0.078	2650	12.5×30	ECR1EYL182M□□125030
		0.027	0.078	2530	16×20	ECR1EYL182M□□160020
	2200	0.02	0.065	2880	12.5×35	ECR1EYL222M□□125035
		0.026	0.067	2860	18×20	ECR1EYL222M□□180020
	2700	0.017	0.056	3350	12.5×40	ECR1EYL272M□□125040
		0.021	0.06	2930	16×25	ECR1EYL272M□□160025
	3300	0.017	0.05	3450	16×31.5	ECR1EYL332M□□160031
		0.019	0.049	3140	18×25	ECR1EYL332M□□180025
	3900	0.015	0.044	3610	16×35.5	ECR1EYL392M□□160035
		0.015	0.04	4170	18×31.5	ECR1EYL392M□□180031
	4700	0.013	0.038	4080	16×40	ECR1EYL472M□□160040
		0.014	0.038	4220	18×35.5	ECR1EYL472M□□180035
	5600	0.012	0.032	4280	18×40	ECR1EYL562M□□180040



## Ratings for CD 282L YL Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	-
35 (44) 1V	33	0.58	2.3	210	5×11.5	ECR1VYL330M□□050011
	56	0.22	0.87	340	6.3×11.5	ECR1VYL560M□□063011
	150	0.13	0.52	640	8×11.5	ECR1VYL151M□□080011
	220	0.087	0.35	840	8×16	ECR1VYL221M□□080016
		0.08	0.32	865	10×12.5	ECR1VYL221M□□100012
	270	0.069	0.27	1050	8×20	ECR1VYL271M□□080020
	330	0.06	0.24	1210	10×16	ECR1VYL331M□□100016
	470	0.046	0.18	1400	10×20	ECR1VYL471M□□100020
		0.049	0.16	1450	12.5×16	ECR1VYL471M□□125016
	560	0.042	0.17	1650	10×25	ECR1VYL561M□□100025
	680	0.031	0.12	1910	10×30	ECR1VYL681M□□100030
		0.035	0.12	1900	12.5×20	ECR1VYL681M□□125020
		0.042	0.12	1940	16×16	ECR1VYL681M□□160016
	1000	0.027	0.089	2230	12.5×25	ECR1VYL102M□□125025
		0.043	0.11	2210	18×16	ECR1VYL102M□□180016
	1200	0.024	0.078	2650	12.5×30	ECR1VYL122M□□125030
		0.027	0.078	2530	16×20	ECR1VYL122M□□160020
	1500	0.02	0.065	2880	12.5×35	ECR1VYL152M□□125035
	1800	0.017	0.056	3350	12.5×40	ECR1VYL182M□□125040
		0.021	0.06	2930	16×25	ECR1VYL182M□□160025
		0.026	0.067	2860	18×20	ECR1VYL182M□□180020
	2200	0.017	0.05	3450	16×31.5	ECR1VYL222M□□160031
		0.019	0.049	3140	18×25	ECR1VYL222M□□180025
	2700	0.015	0.044	3610	16×35.5	ECR1VYL272M□□160035
		0.015	0.04	4170	18×31.5	ECR1VYL272M□□180031
	3300	0.013	0.038	4080	16×40	ECR1VYL332M□□160040
		0.014	0.038	4220	18×35.5	ECR1VYL332M□□180035
	3900	0.012	0.032	4280	18×40	ECR1VYL392M□□180040
50 (63) 1H	22	0.7	2.8	180	5×11.5	ECR1HYL220M□□050011
	56	0.3	1.2	295	6.3×11.5	ECR1HYL560M□□063011
	100	0.17	0.68	555	8×11.5	ECR1HYL101M□□080011
	120	0.12	0.48	730	8×16	ECR1HYL121M□□080016
	150	0.12	0.48	760	10×12.5	ECR1HYL151M□□100012
	180	0.091	0.36	910	8×20	ECR1HYL181M□□080020
	220	0.084	0.34	1050	10×16	ECR1HYL221M□□100016
	270	0.06	0.24	1220	10×20	ECR1HYL271M□□100020
		0.061	0.2	1260	12.5×16	ECR1HYL271M□□125016
	330	0.055	0.22	1440	10×25	ECR1HYL331M□□100025
	470	0.043	0.17	1690	10×30	ECR1HYL471M□□100030
		0.045	0.15	1660	12.5×20	ECR1HYL471M□□125020
		0.055	0.17	1690	16×16	ECR1HYL471M□□160016
	560	0.034	0.11	1950	12.5×25	ECR1HYL561M□□125025
		0.054	0.15	1930	18×16	ECR1HYL561M□□180016
	680	0.03	0.1	2310	12.5×30	ECR1HYL681M□□125030
	820	0.025	0.083	2510	12.5×35	ECR1HYL821M□□125035
		0.034	0.1	2210	16×20	ECR1HYL821M□□160020
	1000	0.021	0.069	2920	12.5×40	ECR1HYL102M□□125040
		0.025	0.075	2555	16×25	ECR1HYL102M□□160025
		0.036	0.097	2490	18×20	ECR1HYL102M□□180020
	1200	0.022	0.066	3010	16×31.5	ECR1HYL122M□□160031
		0.026	0.07	2740	18×25	ECR1HYL122M□□180025
	1500	0.019	0.057	3150	16×35.5	ECR1HYL152M□□160035
	1800	0.016	0.048	3710	16×40	ECR1HYL182M□□160040
		0.021	0.057	3635	18×31.5	ECR1HYL182M□□180031
	2200	0.017	0.046	3680	18×35.5	ECR1HYL222M□□180035
	2700	0.014	0.038	3800	18×40	ECR1HYL272M□□180040
	3300	0.014	0.038	3800	18×40	ECR1HYL332M□□180040

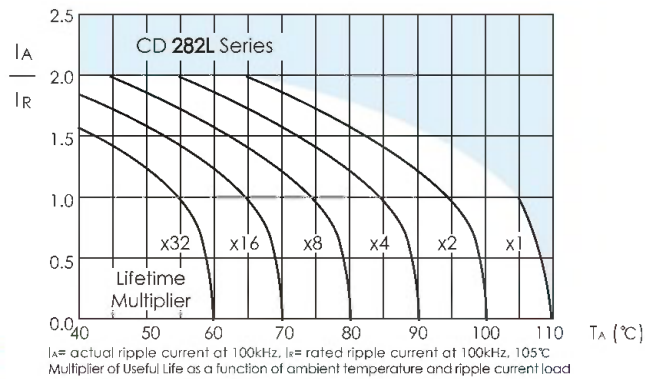
U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	-
63 (79) 1J	15	1.8	7.3	62	5×11.5	ECR1JYL150M□□050011
	33	1	4.1	126	6.3×11.5	ECR1JYL330M□□063011
	56	0.5	2.2	260	8×11.5	ECR1JYL560M□□080011
	82	0.36	1.7	335	8×16	ECR1JYL820M□□080016
		0.34	1.4	325	10×12.5	ECR1JYL820M□□100012
	120	0.26	1.3	408	8×20	ECR1JYL121M□□080020
		0.25	1.2	400	10×16	ECR1JYL121M□□100016
	180	0.17	0.76	518	10×20	ECR1JYL181M□□100020
		0.18	0.86	527	12.5×16	ECR1JYL181M□□125016
	220	0.16	0.67	595	10×25	ECR1JYL221M□□100025
	270	0.12	0.57	740	10×30	ECR1JYL271M□□100030
		0.13	0.52	765	12.5×20	ECR1JYL271M□□125020
		0.11	0.52	895	16×16	ECR1JYL271M□□160016
	330	0.096	0.36	875	12.5×25	ECR1JYL331M□□125025
	390	0.096	0.4	1030	18×16	ECR1JYL391M□□180016
	470	0.08	0.34	1010	12.5×30	ECR1JYL471M□□125030
		0.077	0.32	1130	16×20	ECR1JYL471M□□160020
	560	0.07	0.3	1140	12.5×35	ECR1JYL561M□□125035
		0.062	0.23	1350	16×25	ECR1JYL561M□□160025
	680	0.06	0.25	1280	12.5×40	ECR1JYL681M□□125040
		0.072	0.27	1300	18×20	ECR1JYL681M□□180020
	820	0.049	0.18	1650	16×31.5	ECR1JYL821M□□160031
		0.052	0.19	1560	18×25	ECR1JYL821M□□180025
	1000	0.04	0.15	1900	16×35.5	ECR1JYL102M□□160035
		0.042	0.15	1720	18×31.5	ECR1JYL102M□□180031
	1200	0.036	0.13	2130	16×40	ECR1JYL122M□□160040
		0.036	0.13	1890	18×35.5	ECR1JYL122M□□180035
	1500	0.032	0.12	2470	18×40	ECR1JYL152M□□180040
	2700	0.025	0.1	2900	18×40	ECR1JYL272M□□180040
	3300	0.022	0.1	3200	18×40	ECR1JYL332M□□180040
100 (125) 2A	6.8	1.8	7.3	62	5×11.5	ECR2AYL68M□□050011
	15	1	4.1	126	6.3×11.5	ECR2AYL150M□□063011
	27	0.5	2.2	260	8×11.5	ECR2AYL270M□□080011
	39	0.36	1.7	335	8×16	ECR2AYL390M□□080016
	47	0.34	1.4	325	10×12.5	ECR2AYL470M□□100012
	56	0.26	1.3	408	8×20	ECR2AYL560M□□080020
	68	0.25	1.2	400	10×16	ECR2AYL680M□□100016
	82	0.17	0.76	518	10×20	ECR2AYL820M□□100020
		0.18	0.86	527	12.5×16	ECR2AYL820M□□125016
	100	0.16	0.67	595	10×25	ECR2AYL101M□□100025
	120	0.12	0.57	740	10×30	ECR2AYL121M□□100030
		0.13	0.52	765	12.5×20	ECR2AYL121M□□125020
	150	0.11	0.52	895	16×16	ECR2AYL151M□□160016
	180	0.096	0.36	875	12.5×25	ECR2AYL181M□□125025
		0.096	0.4	1030	18×16	ECR2AYL181M□□180016
	220	0.08	0.34	1010	12.5×30	ECR2AYL221M□□125030
		0.077	0.32	1130	16×20	ECR2AYL221M□□160020
	270	0.07	0.3	1140	12.5×35	ECR2AYL271M□□125035
		0.062	0.23	1350	16×25	ECR2AYL271M□□160025
	330	0.06	0.25	1280	12.5×40	ECR2AYL331M□□125040
		0.072	0.27	1300	18×20	ECR2AYL331M□□180020
	390	0.049	0.18	1650	16×31.5	ECR2AYL391M□□160031
		0.052	0.19	1560	18×25	ECR2AYL391M□□180025
	470	0.04	0.15	1900	16×35.5	ECR2AYL471M□□160035
		0.042	0.15	1720	18×31.5	ECR2AYL471M□□180031
	560	0.036	0.13	2130	16×40	ECR2AYL561M□□160040
	680	0.036	0.13	1890	18×35.5	ECR2AYL681M□□180035
	820	0.032	0.12	2470	18×40	ECR2AYL821M□□180040

MINIATURE

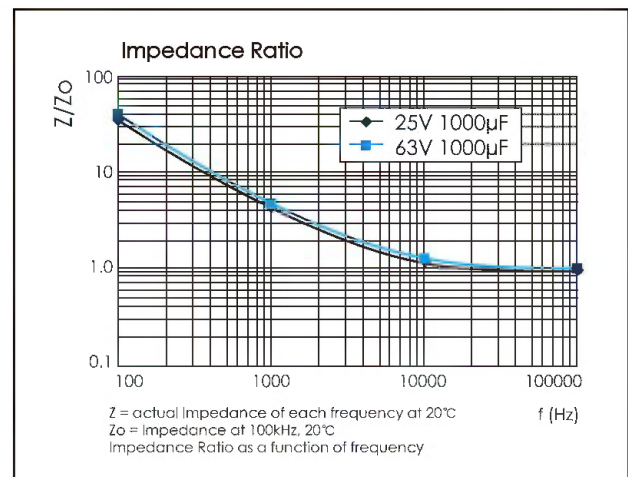
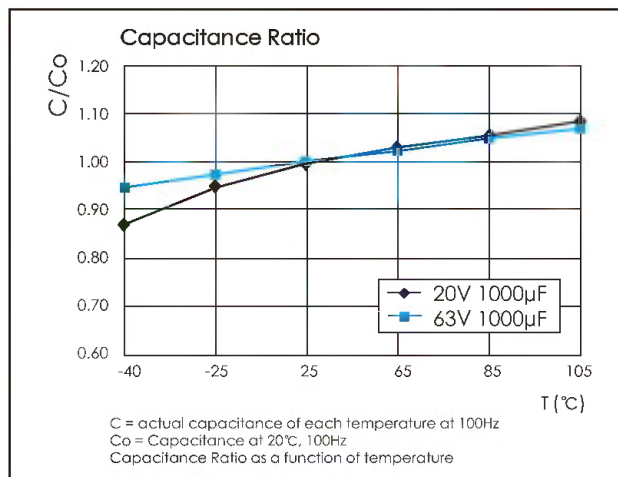
Customer products are available on request.



## Lifetime Diagram



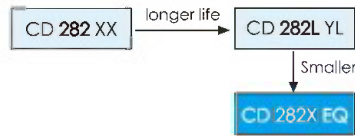
## Typical Curves





4000 - 10000h at 105°C

- Miniaturized
- Ultra Low Impedance
- High ripple current
- Switching power supplies



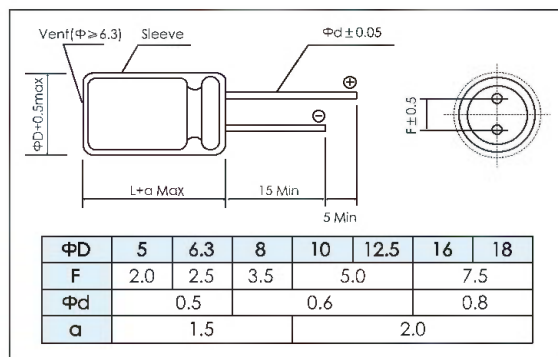
MINIATURE

Items	Characteristics								
Operating Temperature Range (°C)	-40 ~ +105								
Voltage Range (V)	6.3 ~ 100								
Capacitance Range (μF)	1 ~ 15000								
Capacitance Tolerance (20℃, 120Hz)	± 20%								
Leakage Current (μA)	After 2 minutes at 20℃ application of rated voltage, leakage current is not more than 0.01CV or 3μA, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)								
Dissipation Factor (20℃, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	For Capacitances >1000μF add 0.02 to every 1000μF								
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	4	3	2					
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	8	6	4	3				

	Useful Life				Load Life		Endurance Test		Shelf Life
Lifetime	Φ 5 Φ 6.3-8 Φ 10-18	6.3~10V 6000h 8000h 10000h	16~100V 7000h 9000h 12000h	≥ 250000h	6.3~10V 4000h 6000h 8000h	16~100V 5000h 7000h 10000h	6.3~10V 6000h 8000h 10000h	16~100V 7000h 9000h 12000h	1000h
Leakage Current	Not more than specified value				Not more than specified value		Not more than specified value		Not more than specified value
Capacitance Change	Within ± 40% of initial value				Within ± 25% of initial value		Within ± 25% of initial value		Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value				Not more than 200% of specified value		Not more than 200% of specified value		Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C		U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C		U <sub>R</sub> I <sub>R</sub> 105°C		U <sub>R</sub> I <sub>R</sub> = 0 105°C		After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Cap (μF) \ Frequency	120Hz	1kHz	10kHz	100kHz
1	0.35	0.60	0.80	1.00
2.2~10	0.42	0.60	0.80	1.00
22~47	0.55	0.75	0.90	1.00
100~330	0.70	0.85	0.95	1.00
470~1000	0.75	0.90	0.98	1.00
2200~15000	0.80	0.95	1.00	1.00

## Temperature Coefficient

Temperature(°C)	+65	+85	+105
Coefficient	2.0	1.7	1.0



# CD 282X EQ SERIES



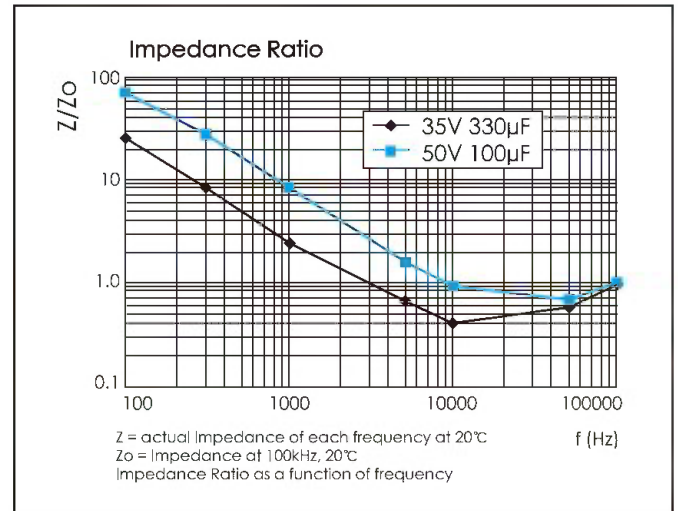
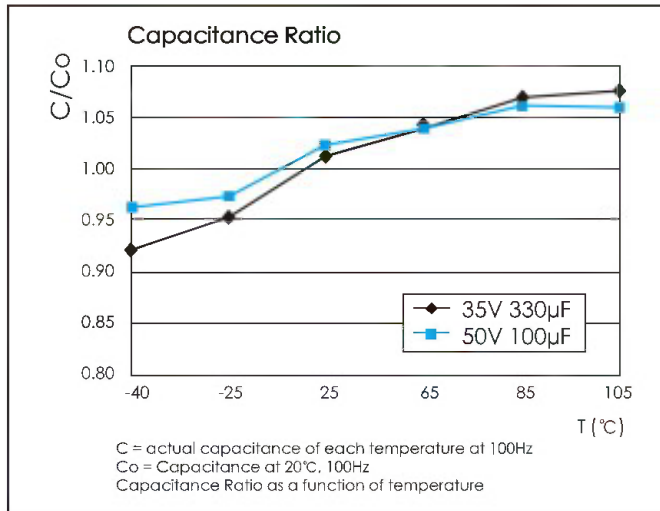
## Ratings for CD 282X EQ Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	100	0.9	3.6	150	5×11.5	ECR0JEQ101M□□050011
	180	0.4	1.2	250	5×11.5	ECR0JEQ181M□□050011
	220	0.4	1.2	250	5×11.5	ECR0JEQ221M□□050011
	330	0.22	0.87	340	6.3×11.5	ECR0JEQ331M□□063011
	470	0.22	0.87	400	6.3×11.5	ECR0JEQ471M□□063011
	1000	0.13	0.52	640	8×11.5	ECR0JEQ102M□□080011
	1200	0.08	0.32	865	10×12.5	ECR0JEQ122M□□100012
	1200	0.087	0.35	840	8×16	ECR0JEQ122M□□080016
	1500	0.069	0.27	1050	8×20	ECR0JEQ152M□□080020
	2200	0.062	0.25	1300	10×16	ECR0JEQ222M□□100016
	3300	0.046	0.18	1400	10×20	ECR0JEQ332M□□100020
	3900	0.041	0.14	1900	12.5×20	ECR0JEQ392M□□125020
	4700	0.032	0.11	2230	12.5×25	ECR0JEQ472M□□125025
	6800	0.032	0.11	2230	12.5×25	ECR0JEQ682M□□125025
	10000	0.021	0.06	2930	16×25	ECR0JEQ103M□□160025
	12000	0.019	0.056	3450	16×31.5	ECR0JEQ123M□□160031
	15000	0.015	0.044	3610	16×35.5	ECR0JEQ153M□□160035
10 (13) 1A	100	0.9	3.6	150	5×11.5	ECR1AEQ101M□□050011
	120	0.4	1.6	250	5×11.5	ECR1AEQ121M□□050011
	330	0.22	0.87	400	6.3×11.5	ECR1AEQ331M□□063011
	560	0.13	0.52	640	8×11.5	ECR1AEQ561M□□080011
	820	0.087	0.35	840	8×16	ECR1AEQ821M□□080016
	820	0.08	0.32	865	10×12.5	ECR1AEQ821M□□100012
	1000	0.08	0.32	865	10×12.5	ECR1AEQ102M□□100012
	1200	0.069	0.27	1050	8×20	ECR1AEQ122M□□080020
	1200	0.062	0.25	1300	10×16	ECR1AEQ122M□□100016
	1800	0.046	0.18	1400	10×20	ECR1AEQ182M□□100020
	2200	0.046	0.18	1400	10×20	ECR1AEQ222M□□100020
	3300	0.041	0.14	1900	12.5×20	ECR1AEQ332M□□125020
	4700	0.032	0.11	2230	12.5×25	ECR1AEQ472M□□125025
	6800	0.021	0.06	2930	16×25	ECR1AEQ682M□□160025
	10000	0.019	0.056	3450	16×31.5	ECR1AEQ103M□□160031
	12000	0.015	0.044	3610	16×35.5	ECR1AEQ123M□□160035
16 (20) 1C	47	0.4	1.2	250	5×11.5	ECR1CEQ470M□□050011
	100	0.4	1.2	250	5×11.5	ECR1CEQ101M□□050011
	220	0.22	0.87	400	6.3×11.5	ECR1CEQ221M□□063011
	330	0.22	0.87	400	6.3×11.5	ECR1CEQ331M□□063011
	470	0.13	0.52	640	8×11.5	ECR1CEQ471M□□080011
	680	0.087	0.35	840	8×16	ECR1CEQ681M□□080016
	680	0.08	0.32	865	10×12.5	ECR1CEQ681M□□100012
	820	0.069	0.27	1050	8×20	ECR1CEQ821M□□080020
	1000	0.062	0.25	1210	10×16	ECR1CEQ102M□□100016
	1500	0.046	0.18	1400	10×20	ECR1CEQ152M□□100020
	1800	0.042	0.17	1650	10×25	ECR1CEQ182M□□100025
	2200	0.041	0.14	1900	12.5×20	ECR1CEQ222M□□125020
	3300	0.032	0.11	2230	12.5×25	ECR1CEQ332M□□125025
	4700	0.021	0.06	2930	16×25	ECR1CEQ472M□□160025
	5600	0.021	0.06	2930	16×25	ECR1CEQ562M□□160025
	6800	0.019	0.056	3450	16×31.5	ECR1CEQ682M□□160031
25 (32) 1E	8200	0.019	0.056	3450	16×31.5	ECR1CEQ822M□□160031
	10000	0.015	0.044	3610	16×35.5	ECR1CEQ103M□□160035
	33	0.4	1.2	250	5×11.5	ECR1EEQ330M□□050011
	47	0.4	1.2	250	5×11.5	ECR1EEQ470M□□050011
	68	0.4	1.2	250	5×11.5	ECR1EEQ680M□□050011
	100	0.4	1.2	250	5×11.5	ECR1EEQ101M□□050011
	150	0.22	0.87	400	6.3×11.5	ECR1EEQ151M□□063011
	220	0.22	0.87	400	6.3×11.5	ECR1EEQ221M□□063011
	330	0.13	0.52	640	8×11.5	ECR1EEQ331M□□080011
	390	0.087	0.35	840	8×16	ECR1EEQ391M□□080016
	470	0.08	0.32	865	10×12.5	ECR1EEQ471M□□100012
	560	0.069	0.27	1050	8×20	ECR1EEQ561M□□080020
	680	0.062	0.25	1300	10×16	ECR1EEQ681M□□100016
	1000	0.046	0.18	1400	10×20	ECR1EEQ102M□□100020
	1200	0.042	0.17	1650	10×25	ECR1EEQ122M□□100025
	1500	0.041	0.14	1900	12.5×20	ECR1EEQ152M□□125020
35 (44) 1V	2200	0.032	0.11	2230	12.5×25	ECR1EEQ222M□□125025
	3300	0.021	0.06	2930	16×25	ECR1EEQ332M□□160025
	3900	0.021	0.06	2930	16×25	ECR1EEQ392M□□160025
	4700	0.019	0.056	3450	16×31.5	ECR1EEQ472M□□160031
	5600	0.015	0.044	3610	16×35.5	ECR1EEQ562M□□160035
	33	0.4	1.2	250	5×11.5	ECR1VEQ330M□□050011
	47	0.4	1.2	250	5×11.5	ECR1VEQ470M□□050011
	100	0.22	0.87	400	6.3×11.5	ECR1VEQ101M□□063011
	220	0.13	0.52	640	8×11.5	ECR1VEQ221M□□080011
	270	0.087	0.35	840	8×16	ECR1VEQ271M□□080016
	330	0.08	0.32	865	10×12.5	ECR1VEQ331M□□100012
	390	0.069	0.27	1050	8×20	ECR1VEQ391M□□080020
	470	0.062	0.25	1210	10×16	ECR1VEQ471M□□100016
	680	0.046	0.18	1400	10×20	ECR1VEQ681M□□100020
	820	0.042	0.17	1650	10×25	ECR1VEQ821M□□100025
	1000	0.041	0.14	1900	12.5×20	ECR1VEQ102M□□125020
	1500	0.032	0.11	2230	12.5×25	ECR1VEQ152M□□125025
	2200	0.021	0.06	2930	16×25	ECR1VEQ222M□□160025
	2700	0.021	0.06	2930	16×25	ECR1VEQ272M□□160025
	3300	0.019	0.056	3450	16×31.5	ECR1VEQ332M□□160031
	3900	0.015	0.044	3610	16×35.5	ECR1VEQ392M□□160035

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
50 (63) 1H	1	4	16	30	5×11.5	ECR1HEQ101M□□050011
	2.2	2.5	10	43	5×11.5	ECR1HEQ221M□□050011
	3.3	2.2	8.8	53	5×11.5	ECR1HEQ331M□□050011
	4.7	1.9	7.6	88	5×11.5	ECR1HEQ471M□□050011
	10	1.5	4	100	5×11.5	ECR1HEQ100M□□050011
	22	0.7	2.8	180	5×11.5	ECR1HEQ220M□□050011
	33	0.7	2.8	250	5×11.5	ECR1HEQ330M□□050011
	47	0.3	1.2	295	6.3×11.5	ECR1HEQ470M□□063011
	56	0.3	1.2	295	6.3×11.5	ECR1HEQ560M□□063011
	100	0.17	0.68	555	8×11.5	ECR1HEQ101M□□080011
	150	0.12	0.48	730	8×16	ECR1HEQ151M□□080016
	180	0.12	0.48	760	10×12.5	ECR1HEQ181M□□100012
	180	0.091	0.36	910	8×20	ECR1HEQ181M□□080020
	220	0.084	0.34	1050	10×16	ECR1HEQ221M□□100016
	330	0.06	0.24	1220	10×20	ECR1HEQ331M□□100020
	470	0.055	0.22	1440	10×25	ECR1HEQ471M□□100025
63 (79) 1J	470	0.045	0.15	1660	12.5×20	ECR1HEQ471M□□125020
	560	0.045	0.15	1660	12.5×20	ECR1HEQ561M□□125020
	820	0.034	0.11	1950	12.5×25	ECR1HEQ821M□□125025
	1000	0.032	0.096	2730	16×25	ECR1HEQ102M□□160025
	1200	0.025	0.075	2730	16×25	ECR1HEQ122M□□160025
	1800	0.022	0.066	3010	16×31.5	ECR1HEQ182M□□160031
	2200	0.019	0.057	3150	16×35.5	ECR1HEQ222M□□160035
	10	0.88	3.5	173	5×11.5	ECR1JEQ100M□□050011
	22	0.88	3.5	173	5×11.5	ECR1JEQ220M□□050011
	33	0.35	1.4	278	6.3×11.5	ECR1JEQ330M□□063011
	56	0.22	0.88	500	8×11.5	ECR1JEQ560M□□080011
	82	0.16	0.64	665	8×16	ECR1JEQ820M□□080016
	100	0.15	0.6	725	10×12.5	ECR1JEQ101M□□100012
	120	0.12	0.48	820	8×20	ECR1JEQ121M□□080020
	220	0.078	0.31	1200	10×20	ECR1JEQ221M□□160020
	330	0.06	0.19	1570	12.5×20	ECR1JEQ331M□□125020
100 (125) 2A	390	0.06	0.19	1570	12.5×20	ECR1JEQ391M□□125020
	470	0.043	0.14	1990	12.5×25	ECR1JEQ471M□□125025
	560	0.043	0.14	1990	12.5×25	ECR1JEQ561M□□125025
	1000	0.032	0.096	2730	16×25	ECR1JEQ102M□□160025
	1200	0.021	0.063	2850	16×31.5	ECR1JEQ122M□□160031
	1500	0.019	0.057	2900	16×35.5	ECR1JEQ152M□□160035
	1	4.5	15	20	5×11.5	ECR2AEQ101M□□050011
	2.2	3	13	30	5×11.5	ECR2AEQ221M□□050011
	3.3	2.7	11	40	5×11.5	ECR2AEQ331M□□050011
	4.7	2.5	10	65	5×11.5	ECR2AEQ471M□□050011
	6.8	1.4	5.6	125	5×11.5	ECR2AEQ681M□□050011
	10	0.57	2.3	267	6.3×11.5	ECR2AEQ100M□□063011
	22	0.57	2.3	267	6.3×11.5	ECR2AEQ220M□□063011
	33	0.36	1.4	462	8×11.5	ECR2AEQ330M□□080011
	47	0.25	1	585	8×16	ECR2AEQ470M□□080016
	56	0.19	0.76	735	8×20	ECR2AEQ560M□□080020
	68	0.11	0.47	780	10×16	ECR2AEQ680M□□100016
	100	0.12	0.52	1040	10×20	ECR2AEQ101M□□100020
	150	0.11	0.47	1170	10×25	ECR2AEQ151M□□100025
	180	0.085	0.31	1430	12.5×20	ECR2AEQ181M□□125020
	220	0.06	0.23	1620	12.5×25	ECR2AEQ221M□□125025
	330	0.044	0.16	2210	16×25	ECR2AEQ331M□□160025
	470	0.032	0.095	2400	16×31.5	ECR2AEQ471M□□160031
	560	0.029	0.086	2600	16×35.5	ECR2AEQ561M□□160035



## Typical Curves



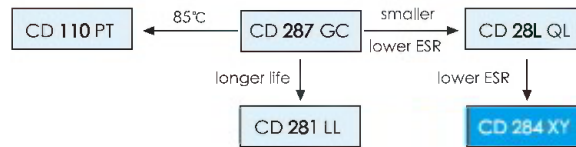


# CD 284 XY SERIES



2000 - 5000h at 105°C

- Lowest Impedance
- High Ripple Current
- Switching Power Supplies

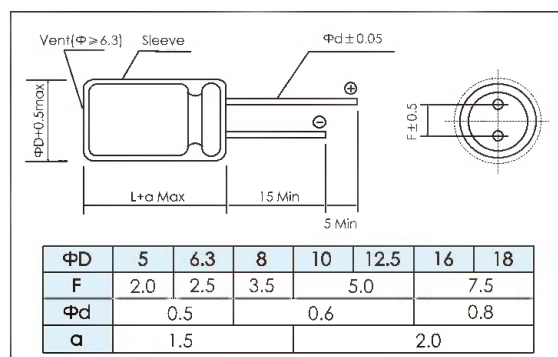


Items	Characteristics									
Operating Temperature Range (°C)	-40 ~ +105									
Voltage Range (V)	6.3 ~ 100									
Capacitance Range (μF)	6.8 ~ 6800									
Capacitance Tolerance (20°C, 120Hz)	± 20%									
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)									
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08
For Capacitances >1000μF add 0.02 to every 1000μF										
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100
	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	4	3	2	2	2	2	2	2	2
	Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	12	10	8	6	4	3	3	3	3

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 6.3$ : 4000h $\Phi 8$ : 6000h $\Phi 10$ : 8000h $\Phi \geq 12.5$ : 10000h	$\Phi \geq 8$ : > 250000h	$\Phi \leq 6.3$ : 2000h $\Phi 8$ : 3000h $\Phi 10$ : 4000h $\Phi \geq 12.5$ : 5000h	$\Phi \leq 6.3$ : 2500h $\Phi 8$ : 3500h $\Phi 10$ : 5000h $\Phi \geq 12.5$ : 6000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 50% of initial value		Within ± 25% of initial value	Within ± 25% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Cap (μF) \ Frequency	120Hz	1kHz	10kHz	100kHz
6.8 ~ 33	0.42	0.70	0.90	1.00
39 ~ 270	0.50	0.73	0.92	1.00
330 ~ 680	0.55	0.88	0.98	1.00
820 ~ 1800	0.66	0.90	0.99	1.00
2200 ~ 6800	0.70	0.92	1.00	1.00

## Temperature Coefficient

Temperature(°C)	≤65	+80	+105
Coefficient	2.0	1.7	1.0



## Ratings for CD 284 XY Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120kHz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
6.3 (7.2) 0J	150	1.946	0.3	1	250	5×11.5	ECR0JXY151M□□050011
	330	0.885	0.13	0.41	405	6.3×11.5	ECR0JXY331M□□063011
	560	0.521	0.072	0.22	760	8×11.5	ECR0JXY561M□□080011
	820	0.356	0.056	0.17	995	8×16	ECR0JXY821M□□080016
	1000	0.292	0.053	0.16	1030	10×12.5	ECR0JXY102M□□100012
	1200	0.243	0.041	0.13	1250	8×20	ECR0JXY122M□□080020
		0.243	0.038	0.12	1430	10×16	ECR0JXY122M□□100016
	1500	0.195	0.023	0.069	1820	10×20	ECR0JXY152M□□100020
	2200	0.145	0.022	0.066	2150	10×25	ECR0JXY222M□□100025
	3300	0.105	0.021	0.053	2360	12.5×20	ECR0JXY332M□□125020
	3900	0.088	0.018	0.045	2770	12.5×25	ECR0JXY392M□□125025
	4700	0.079	0.016	0.041	3290	12.5×30	ECR0JXY472M□□125030
		0.071	0.015	0.039	3400	12.5×35	ECR0JXY562M□□125035
	5600	0.071	0.018	0.045	3140	16×20	ECR0JXY562M□□160020
		0.062	0.016	0.043	3460	16×25	ECR0JXY682M□□160025
10 (13) 1A	100	2.521	0.3	1	250	5×11.5	ECR1AXY101M□□050011
	220	1.146	0.13	0.41	405	6.3×11.5	ECR1AXY221M□□063011
	470	0.536	0.072	0.22	760	8×11.5	ECR1AXY471M□□080011
	680	0.371	0.056	0.17	995	8×16	ECR1AXY681M□□080016
		0.371	0.053	0.16	1030	10×12.5	ECR1AXY681M□□100012
	1000	0.252	0.041	0.13	1250	8×20	ECR1AXY102M□□080020
		0.252	0.038	0.12	1430	10×16	ECR1AXY102M□□100016
	1200	0.21	0.023	0.069	1820	10×20	ECR1AXY122M□□100020
	1500	0.168	0.022	0.066	2150	10×25	ECR1AXY152M□□100025
	2200	0.127	0.021	0.053	2360	12.5×20	ECR1AXY222M□□125020
	3300	0.092	0.018	0.045	2770	12.5×25	ECR1AXY332M□□125025
	3900	0.078	0.016	0.041	3290	12.5×30	ECR1AXY392M□□125030
		0.078	0.018	0.045	3140	16×20	ECR1AXY392M□□160020
	4700	0.071	0.015	0.039	3400	12.5×35	ECR1AXY472M□□125035
	5600	0.064	0.016	0.043	3460	16×25	ECR1AXY562M□□160025
16 (20) 1C	56	3.791	0.3	1	250	5×11.5	ECR1CXY560M□□050011
	120	1.769	0.13	0.41	405	6.3×11.5	ECR1CXY121M□□063011
	330	0.643	0.072	0.22	760	8×11.5	ECR1CXY331M□□080011
	470	0.452	0.056	0.17	995	8×16	ECR1CXY471M□□080016
		0.452	0.053	0.16	1030	10×12.5	ECR1CXY471M□□100012
	680	0.312	0.041	0.13	1250	8×20	ECR1CXY681M□□080020
		0.312	0.038	0.12	1430	10×16	ECR1CXY681M□□100016
	1000	0.212	0.023	0.069	1820	10×20	ECR1CXY102M□□100020
	1200	0.177	0.022	0.066	2150	10×25	ECR1CXY122M□□100025
	1500	0.142	0.021	0.053	2360	12.5×20	ECR1CXY152M□□125020
	2200	0.109	0.018	0.045	2770	12.5×25	ECR1CXY222M□□125025
	2700	0.088	0.016	0.041	3290	12.5×30	ECR1CXY272M□□125030
		0.088	0.018	0.045	3140	16×20	ECR1CXY272M□□160020
	3300	0.08	0.015	0.039	3400	12.5×35	ECR1CXY332M□□125035
	3900	0.068	0.016	0.043	3460	16×25	ECR1CXY392M□□160025
25 (32) 1E	47	3.953	0.3	1	250	5×11.5	ECR1EXY470M□□050011
	100	1.858	0.13	0.41	405	6.3×11.5	ECR1EXY101M□□063011
	220	0.844	0.072	0.22	760	8×11.5	ECR1EXY221M□□080011
	330	0.563	0.056	0.17	995	8×16	ECR1EXY331M□□080016
		0.563	0.053	0.16	1030	10×12.5	ECR1EXY331M□□100012
	470	0.395	0.041	0.13	1250	8×20	ECR1EXY471M□□080020
		0.395	0.038	0.12	1430	10×16	ECR1EXY471M□□100016
	680	0.273	0.023	0.069	1820	10×20	ECR1EXY681M□□100020
	820	0.227	0.022	0.066	2150	10×25	ECR1EXY821M□□100025
	1000	0.186	0.021	0.053	2360	12.5×20	ECR1EXY102M□□125020
	1500	0.124	0.018	0.045	2770	12.5×25	ECR1EXY152M□□125025
	1800	0.103	0.016	0.041	3290	12.5×30	ECR1EXY182M□□125030
		0.103	0.018	0.045	3140	16×20	ECR1EXY182M□□160020

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120kHz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
25 (32) 1E	2200	0.097	0.015	0.039	3400	12.5×35	ECR1EXY222M□□125035
	2700	0.079	0.016	0.043	3460	16×25	ECR1EXY272M□□160025
	33	4.825	0.3	1	250	5×11.5	ECR1VXY330M□□050011
	56	2.843	0.13	0.41	405	6.3×11.5	ECR1VXY560M□□063011
	150	1.062	0.072	0.22	760	8×11.5	ECR1VXY151M□□080011
	220	0.724	0.056	0.17	995	8×16	ECR1VXY221M□□080016
		0.724	0.053	0.16	1030	10×12.5	ECR1VXY221M□□100012
	270	0.590	0.041	0.13	1250	8×20	ECR1VXY271M□□080020
	330	0.483	0.038	0.12	1430	10×16	ECR1VXY331M□□100016
	470	0.339	0.023	0.069	1820	10×20	ECR1VXY471M□□100020
	560	0.284	0.022	0.066	2150	10×25	ECR1VXY561M□□100025
	680	0.234	0.021	0.053	2360	12.5×20	ECR1VXY681M□□125020
	1000	0.159	0.018	0.045	2770	12.5×25	ECR1VXY102M□□125025
	1200	0.133	0.016	0.041	3290	12.5×30	ECR1VXY122M□□125030
		0.133	0.018	0.045	3140	16×20	ECR1VXY122M□□160020
35 (44) 1V	1500	0.106	0.015	0.039	3400	12.5×35	ECR1VXY152M□□125035
	1800	0.088	0.016	0.043	3460	16×25	ECR1VXY182M□□160025
	22	6.032	0.34	1.18	238	5×11.5	ECR1HXY220M□□050011
	56	2.370	0.14	0.5	385	6.3×11.5	ECR1HXY560M□□063011
	100	1.327	0.074	0.22	724	8×11.5	ECR1HXY101M□□080011
	120	1.106	0.061	0.18	950	8×16	ECR1HXY121M□□080016
	150	0.885	0.061	0.18	979	10×12.5	ECR1HXY151M□□100012
	180	0.737	0.046	0.14	1190	8×20	ECR1HXY181M□□080020
	220	0.603	0.042	0.12	1370	10×16	ECR1HXY221M□□100016
	270	0.491	0.03	0.09	1580	10×20	ECR1HXY271M□□100020
	330	0.402	0.028	0.085	1870	10×25	ECR1HXY331M□□100025
	470	0.282	0.027	0.068	2050	12.5×20	ECR1HXY471M□□125020
	560	0.237	0.023	0.059	2410	12.5×25	ECR1HXY561M□□125025
	680	0.195	0.021	0.052	2860	12.5×30	ECR1HXY681M□□125030
	820	0.162	0.019	0.051	2960	12.5×35	ECR1HXY821M□□125035
		0.162	0.023	0.059	2730	16×20	ECR1HXY821M□□160020
50 (63) 1H	1000	0.133	0.021	0.056	3010	16×25	ECR1HXY102M□□160025
	15	7.962	0.88	3.5	165	5×11.5	ECR1JXY150M□□050011
	33	3.619	0.35	1.4	265	6.3×11.5	ECR1JXY330M□□063011
	56	2.133	0.22	0.88	500	8×11.5	ECR1JXY560M□□080011
	82	1.456	0.16	0.64	665	8×16	ECR1JXY820M□□080016
		1.456	0.15	0.6	685	10×12.5	ECR1JXY820M□□100012
	120	0.995	0.12	0.48	820	8×20	ECR1JXY121M□□080020
		0.995	0.11	0.44	945	10×16	ECR1JXY121M□□100016
	180	0.663	0.08	0.32	1100	10×20	ECR1JXY181M□□100020
		0.663	0.082	0.27	1135	12.5×16	ECR1JXY181M□□125016
	220	0.543	0.073	0.29	1300	10×25	ECR1JXY221M□□100025
	270	0.442	0.06	0.2	1495	12.5×20	ECR1JXY271M□□125020
	330	0.362	0.043	0.14	1850	12.5×25	ECR1JXY331M□□125025
	470	0.254	0.039	0.13	2250	12.5×30	ECR1JXY471M□□125030
		0.254	0.045	0.14	1990	16×20	ECR1JXY471M□□160020
	560	0.213	0.024	0.072	2500	12.5×35	ECR1JXY561M□□125035
		0.213	0.032	0.096	2550	16×25	ECR1JXY561M□□160025
63 (79) 1J	680	0.176	0.029	0.096	2780	12.5×40	ECR1JXY681M□□125040
		0.176	0.038	0.100	2450	18×20	ECR1JXY681M□□180020
	820	0.146	0.026	0.078	2810	16×31.5	ECR1JXY821M□□160031
		0.146	0.031	0.084	2780	18×25	ECR1JXY821M□□180025
	1000	0.119	0.021	0.063	2835	16×35.5	ECR1JXY102M□□160035
	1200	0.1	0.018	0.054	3400	16×40	ECR1JXY122M□□160040
		0.1	0.020	0.060	3300	18×31.5	ECR1JXY122M□□180031
	1500	0.08	0.018	0.054	3400	18×35.5	ECR1JXY152M□□180035
	1800	0.08	0.017	0.051	3500	18×40	ECR1JXY182M□□180040

MINIATURE



# CD 284 XY SERIES

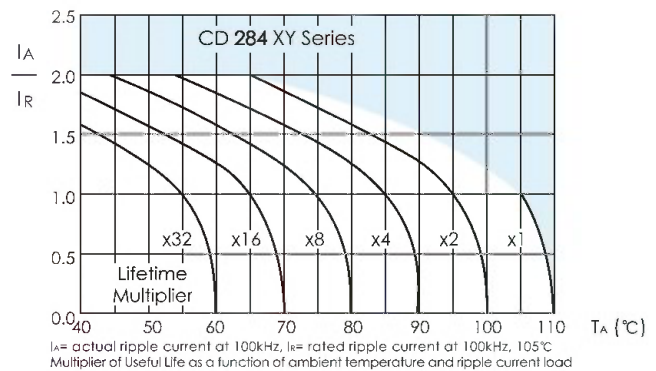


## Ratings for CD 284 XY Series

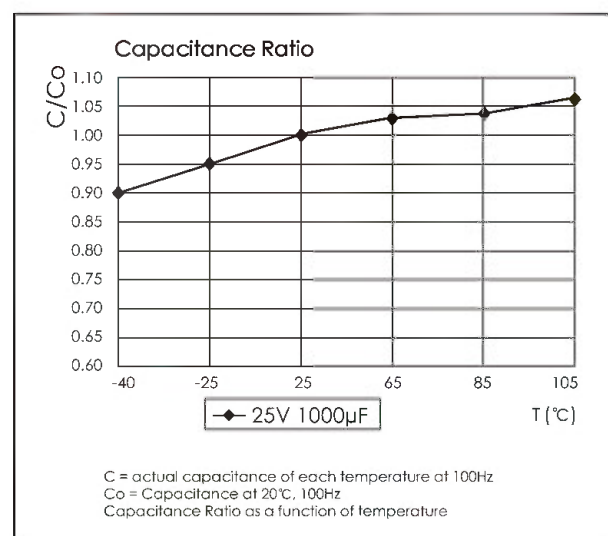
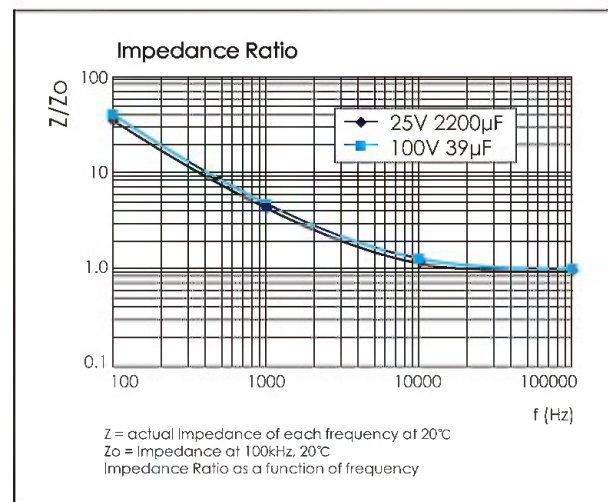
$U_k$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA rms)	(mm)	-
80 (100) 1K	68	1.561	0.17	0.66	480	10×12.5	ECR1KXY680M□□100012
	100	1.062	0.11	0.47	600	10×16	ECR1KXY101M□□100016
	120	0.885	0.084	0.34	800	10×20	ECR1KXY121M□□100020
	150	0.708	0.069	0.28	900	10×25	ECR1KXY151M□□100025
		0.708	0.11	0.34	750	12.5×16	ECR1KXY151M□□125016
	220	0.483	0.062	0.18	1100	12.5×20	ECR1KXY221M□□125020
	330	0.322	0.047	0.14	1250	12.5×25	ECR1KXY331M□□125025
		0.322	0.048	0.15	1350	16×20	ECR1KXY331M□□160020
	390	0.272	0.042	0.13	1500	12.5×30	ECR1KXY391M□□125030
	470	0.226	0.036	0.11	1650	12.5×35	ECR1KXY471M□□125035
		0.226	0.038	0.12	1700	16×25	ECR1KXY471M□□160025
	560	0.226	0.045	0.14	1500	18×20	ECR1KXY471M□□180020
		0.190	0.032	0.095	1800	12.5×40	ECR1KXY561M□□125040
	680	0.156	0.032	0.095	1850	16×31.5	ECR1KXY681M□□160031
		0.156	0.036	0.11	1750	18×25	ECR1KXY681M□□180025
100 (125) 2A	820	0.130	0.029	0.086	2000	16×35.5	ECR1KXY821M□□160035
		0.130	0.030	0.09	1900	18×31.5	ECR1KXY821M□□180031
	1000	0.106	0.027	0.081	2200	16×40	ECR1KXY102M□□160040
		0.106	0.027	0.081	2200	18×35.5	ECR1KXY102M□□180035
	1200	0.089	0.026	0.077	2700	18×40	ECR1KXY122M□□180040
	6.8	15.611	1.4	5.6	125	5×11.5	ECR2AXY688M□□050011
	15	7.077	0.57	2.3	205	6.3×11.5	ECR2AXY150M□□063011
	27	3.932	0.36	1.4	355	8×11.5	ECR2AXY270M□□080011
	39	2.722	0.25	1	450	8×16	ECR2AXY390M□□080016
	47	2.259	0.24	0.96	450	10×12.5	ECR2AXY470M□□100012
	56	1.896	0.19	0.76	565	8×20	ECR2AXY560M□□080020
	68	1.561	0.18	0.72	580	10×16	ECR2AXY680M□□100016
	82	1.295	0.13	0.52	750	10×20	ECR2AXY820M□□100020
	100	1.062	0.11	0.34	750	12.5×16	ECR2AXY101M□□125016
	120	0.885	0.069	0.28	900	10×25	ECR2AXY121M□□100025
	150	0.59	0.062	0.18	1100	12.5×20	ECR2AXY151M□□125020
	220	0.483	0.047	0.14	1250	12.5×25	ECR2AXY221M□□125025
		0.483	0.048	0.15	1350	16×20	ECR2AXY221M□□160020
	270	0.393	0.042	0.13	1500	12.5×30	ECR2AXY271M□□125030
	330	0.393	0.036	0.11	1650	12.5×35	ECR2AXY331M□□125035
		0.322	0.045	0.14	1500	18×20	ECR2AXY331M□□180020
	390	0.272	0.049	0.13	1620	18×25	ECR2AXY391M□□180025
	470	0.226	0.032	0.095	1850	16×31.5	ECR2AXY471M□□160031
		0.226	0.036	0.11	1750	18×25	ECR2AXY471M□□180025
	560	0.19	0.029	0.086	2000	16×35.5	ECR2AXY561M□□160035
		0.19	0.030	0.09	1900	18×31.5	ECR2AXY561M□□180031
	680	0.156	0.027	0.081	2200	16×40	ECR2AXY681M□□160040
		0.156	0.027	0.081	2200	18×35.5	ECR2AXY681M□□180035
	820	0.156	0.026	0.077	2700	18×40	ECR2AXY821M□□180040

Customer products are available on request.

## Lifetime Diagram



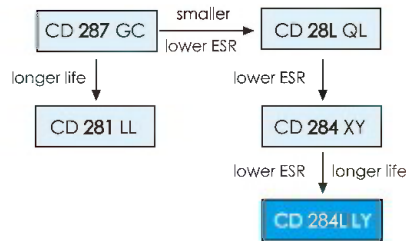
## Typical Curves





6000 - 10000h at 105°C

- Higher ripple current capability and smaller sizes than CD284 series
- Lower Impedance at high frequency
- Load life of 6000 to 10000hrs

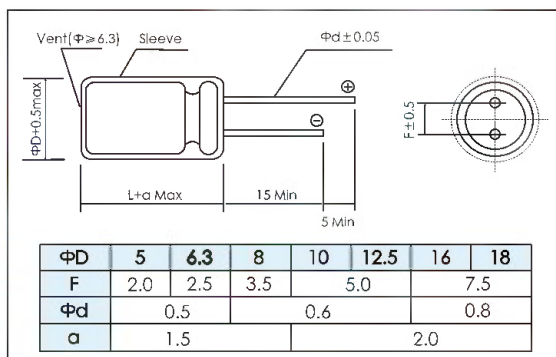


Items	Characteristics										
Operating Temperature Range (°C)	-40 ~ +105										
Voltage Range (V)	6.3 ~ 120										
Capacitance Range (μF)	8.2 ~ 8200										
Capacitance Tolerance (20°C, 120Hz)	± 20%										
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)										
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	120
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	0.08
For Capacitances >1000μF add 0.02 to every 1000μF											
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	80	100	120
	$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	4	3	2							
	$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$	12	10	8	6	4	3				

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 6.3$ : 8000h $\Phi = 8$ : 10000h $\Phi \geq 10$ : 12000h	$\Phi > 8$ : 110000h	$\Phi \leq 6.3$ : 6000h $\Phi = 8$ : 8000h $\Phi \geq 10$ : 10000h	$\Phi \leq 6.3$ : 7000h $\Phi = 8$ : 10000h $\Phi \geq 10$ : 12000h	500h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value (6.3V, 10V, ± 40%)		Within ± 25% of initial value (6.3V, 10V, ± 30%)	Within ± 25% of initial value (6.3V, 10V, ± 30%)	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value (6.3V, 10V, 400%)		Not more than 200% of specified value (6.3V, 10V, 300%)	Not more than 200% of specified value (6.3V, 10V, 300%)	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 60°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R = 0$ $I_R = 0$ 105°C After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
8.2 ~ 33	0.42	0.70	0.90	1.00
47 ~ 270	0.50	0.73	0.92	1.00
330 ~ 680	0.55	0.77	0.94	1.00
820 ~ 1800	0.60	0.80	0.96	1.00
2200 ~ 6800	0.70	0.85	0.98	1.00

## Temperature Coefficient

Temperature(°C)	≤ 65	+85	+105
Coefficient	2.0	1.7	1.0



# CD 284L LY SERIES



## Ratings for CD 284L LY Series

MINIATURE

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	-
6.3 (7.2) 0J	220	1.327	0.22	0.8	345	5×11.5	ECR0JLY221M□□050011
	470	0.621	0.094	0.35	540	6.3×11.5	ECR0JLY471M□□063011
	820	0.356	0.056	0.19	945	8×11.5	ECR0JLY821M□□080011
	1200	0.243	0.045	0.15	1250	8×16	ECR0JLY122M□□080016
	1200	0.243	0.039	0.14	1330	10×12.5	ECR0JLY122M□□100012
	1500	0.195	0.029	0.11	1500	8×20	ECR0JLY152M□□080020
	1800	0.162	0.028	0.1	1760	10×16	ECR0JLY182M□□100016
	2200	0.145	0.02	0.06	1960	10×20	ECR0JLY222M□□100020
	2700	0.118	0.018	0.054	2250	10×25	ECR0JLY272M□□100025
	3900	0.088	0.017	0.043	2480	12.5×20	ECR0JLY392M□□125020
	4700	0.079	0.015	0.038	2900	12.5×25	ECR0JLY472M□□125025
	5600	0.071	0.013	0.033	3450	12.5×30	ECR0JLY562M□□125030
	6800	0.062	0.015	0.038	3250	16×20	ECR0JLY682M□□160020
	6800	0.062	0.012	0.031	3570	12.5×35	ECR0JLY682M□□125035
	8200	0.058	0.013	0.035	3630	16×25	ECR0JLY822M□□160025
10 (13) 1A	150	1.681	0.22	0.8	345	5×11.5	ECR1ALY151M□□050011
	330	0.764	0.094	0.35	540	6.3×11.5	ECR1ALY331M□□063011
	680	0.371	0.056	0.19	945	8×11.5	ECR1ALY681M□□080011
	1000	0.252	0.045	0.15	1250	8×16	ECR1ALY102M□□080016
	1000	0.252	0.039	0.14	1330	10×12.5	ECR1ALY102M□□100012
	1500	0.168	0.029	0.11	1500	8×20	ECR1ALY152M□□080020
	1500	0.168	0.028	0.1	1760	10×16	ECR1ALY152M□□100016
	1800	0.14	0.02	0.06	1960	10×20	ECR1ALY182M□□100020
	2200	0.127	0.018	0.054	2250	10×25	ECR1ALY222M□□100025
	3300	0.092	0.017	0.043	2480	12.5×20	ECR1ALY332M□□125020
	3900	0.078	0.015	0.038	2900	12.5×25	ECR1ALY392M□□125025
	4700	0.071	0.013	0.033	3450	12.5×30	ECR1ALY472M□□125030
	4700	0.071	0.015	0.038	3250	16×20	ECR1ALY472M□□160020
	5600	0.064	0.012	0.031	3570	12.5×35	ECR1ALY562M□□125035
	6800	0.057	0.013	0.035	3630	16×25	ECR1ALY682M□□160025
16 (20) 1C	100	2.123	0.22	0.8	345	5×11.5	ECR1CLY101M□□050011
	220	0.965	0.094	0.35	540	6.3×11.5	ECR1CLY221M□□063011
	470	0.452	0.056	0.19	945	8×11.5	ECR1CLY471M□□080011
	680	0.312	0.045	0.15	1250	8×16	ECR1CLY681M□□080016
	680	0.312	0.039	0.14	1330	10×12.5	ECR1CLY681M□□100012
	1000	0.212	0.029	0.11	1500	8×20	ECR1CLY102M□□080020
	1000	0.212	0.028	0.1	1760	10×16	ECR1CLY102M□□100016
	1500	0.142	0.02	0.06	1960	10×20	ECR1CLY152M□□100020
	1800	0.118	0.018	0.054	2250	10×25	ECR1CLY182M□□100025
	2200	0.109	0.017	0.043	2480	12.5×20	ECR1CLY222M□□125020
	2700	0.088	0.015	0.038	2900	12.5×25	ECR1CLY272M□□125025
	3300	0.08	0.013	0.033	3450	12.5×30	ECR1CLY332M□□125030
	3300	0.08	0.015	0.038	3250	16×20	ECR1CLY332M□□160020
	3900	0.068	0.012	0.031	3570	12.5×35	ECR1CLY392M□□125035
	4700	0.062	0.013	0.035	3630	16×25	ECR1CLY472M□□160025
25 (32) 1E	68	2.732	0.22	0.8	345	5×11.5	ECR1ELY680M□□050011
	150	1.238	0.094	0.35	540	6.3×11.5	ECR1ELY151M□□063011
	330	0.563	0.056	0.19	945	8×11.5	ECR1ELY331M□□080011
	390	0.476	0.045	0.15	1250	8×16	ECR1ELY391M□□080016
	470	0.395	0.039	0.14	1330	10×12.5	ECR1ELY471M□□100012
	560	0.332	0.029	0.11	1500	8×20	ECR1ELY561M□□080020
	680	0.273	0.028	0.1	1760	10×16	ECR1ELY681M□□100016
	820	0.227	0.02	0.06	1960	10×20	ECR1ELY821M□□100020
	1000	0.186	0.018	0.054	2250	10×25	ECR1ELY102M□□100025
	1500	0.124	0.017	0.043	2480	12.5×20	ECR1ELY152M□□125020
	1800	0.103	0.015	0.038	2900	12.5×25	ECR1ELY182M□□125025
	2200	0.097	0.013	0.033	3450	12.5×30	ECR1ELY222M□□125030
	2200	0.097	0.015	0.038	3250	16×20	ECR1ELY222M□□160020
	2700	0.079	0.012	0.031	3570	12.5×35	ECR1ELY272M□□125035
	3300	0.072	0.013	0.035	3630	16×25	ECR1ELY332M□□160025

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	-
35 (44) 1V	47	3.388	0.22	0.8	345	5×11.5	ECR1VLY470M□□050011
	100	1.592	0.094	0.35	540	6.3×11.5	ECR1VLY101M□□063011
	220	0.724	0.056	0.19	945	8×11.5	ECR1VLY221M□□080011
	270	0.59	0.045	0.15	1250	8×16	ECR1VLY271M□□080016
	330	0.483	0.039	0.14	1330	10×12.5	ECR1VLY331M□□100012
	390	0.408	0.029	0.11	1500	8×20	ECR1VLY391M□□080020
	470	0.339	0.028	0.1	1760	10×16	ECR1VLY471M□□100016
	560	0.284	0.02	0.06	1960	10×20	ECR1VLY561M□□100020
	680	0.234	0.018	0.054	2250	10×25	ECR1VLY681M□□100025
	1000	0.159	0.017	0.043	2480	12.5×20	ECR1VLY102M□□125020
	1200	0.133	0.015	0.038	2900	12.5×25	ECR1VLY122M□□125025
	1500	0.106	0.013	0.033	3450	12.5×30	ECR1VLY152M□□125030
	1500	0.106	0.015	0.038	3250	16×20	ECR1VLY152M□□160020
	1800	0.088	0.012	0.031	3570	12.5×35	ECR1VLY182M□□125035
	2200	0.084	0.013	0.035	3630	16×25	ECR1VLY222M□□160025
50 (63) 1H	27	4.915	0.34	1.18	238	5×11.5	ECR1HLY270M□□050011
	56	2.37	0.14	0.5	385	6.3×11.5	ECR1HLY560M□□063011
	100	1.327	0.074	0.22	724	8×11.5	ECR1HLY101M□□080011
	120	1.106	0.061	0.18	950	8×16	ECR1HLY121M□□080016
	150	0.885	0.061	0.18	979	10×12.5	ECR1HLY151M□□100012
	180	0.737	0.046	0.14	1190	8×20	ECR1HLY181M□□080020
	220	0.603	0.042	0.12	1370	10×16	ECR1HLY221M□□100016
	270	0.491	0.03	0.09	1580	10×20	ECR1HLY271M□□100020
	330	0.402	0.028	0.085	1870	10×25	ECR1HLY331M□□100025
	470	0.282	0.027	0.068	2050	12.5×20	ECR1HLY471M□□125020
	560	0.237	0.023	0.059	2410	12.5×25	ECR1HLY561M□□125025
	680	0.195	0.021	0.052	2860	12.5×30	ECR1HLY681M□□125030
	820	0.162	0.023	0.059	2730	16×20	ECR1HLY821M□□160020
	820	0.162	0.019	0.051	2960	12.5×35	ECR1HLY821M□□125035
	1000	0.133	0.021	0.056	3010	16×25	ECR1HLY102M□□160025
63 (79) 1J	15	7.962	0.88	3.5	173	5×11.5	ECR1JLY150M□□050011
	33	3.619	0.35	1.4	278	6.3×11.5	ECR1JLY330M□□063011
	82	1.456	0.22	0.88	525	8×11.5	ECR1JLY820M□□080011
	100	1.194	0.16	0.64	688	8×16	ECR1JLY101M□□080016
	120	0.995	0.15	0.6	725	10×12.5	ECR1JLY121M□□100012
	150	0.796	0.12	0.48	861	8×20	ECR1JLY151M□□080020
	180	0.663	0.11	0.44	998	10×16	ECR1JLY181M□□100016
	220	0.543	0.078	0.31	1200	10×20	ECR1JLY221M□□100020
	330	0.362	0.069	0.28	1410	10×25	ECR1JLY331M□□100025
	390	0.306	0.06	0.19	1570	12.5×20	ECR1JLY391M□□125020
	470	0.254	0.043	0.14	1990	12.5×25	ECR1JLY471M□□125025
	560	0.213	0.035	0.13	2410	12.5×30	ECR1JLY561M□□125030
	560	0.213	0.043	0.14	2100	16×20	ECR1JLY561M□□160020
	680	0.176	0.033	0.11	2620	12.5×35	ECR1JLY681M□□125035
	820	0.146	0.027	0.09	2940	12.5×40	ECR1JLY821M□□125040
	820	0.146	0.032	0.096	2730	16×25	ECR1JLY821M□□160025



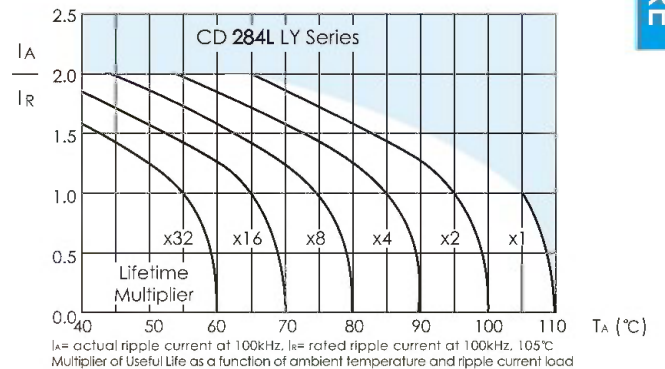
## Ratings for CD 284L LY Series

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
80 (100) 1K	12	8.846	1.4	5.6	163	5×11.5	ECR1KLY120M□□050011
	33	3.217	0.57	2.3	267	6.3×11.5	ECR1KLY330M□□063011
	56	1.896	0.36	1.4	462	8×11.5	ECR1KLY560M□□080011
	68	1.561	0.25	1	585	8×16	ECR1KLY680M□□080016
	82	1.295	0.23	0.96	624	10×12.5	ECR1KLY820M□□100012
	100	1.062	0.19	0.76	735	8×20	ECR1KLY101M□□080020
	120	0.885	0.17	0.72	780	10×16	ECR1KLY121M□□100016
	180	0.59	0.12	0.52	1040	10×20	ECR1KLY181M□□100020
	220	0.483	0.11	0.47	1170	10×25	ECR1KLY221M□□100025
	270	0.393	0.085	0.31	1430	12.5×20	ECR1KLY271M□□125020
	330	0.322	0.06	0.23	1620	12.5×25	ECR1KLY331M□□125025
	390	0.272	0.051	0.21	1950	12.5×30	ECR1KLY391M□□125030
	390	0.272	0.058	0.21	1750	16×20	ECR1KLY391M□□160020
	470	0.226	0.043	0.17	2140	12.5×35	ECR1KLY471M□□125035
	560	0.19	0.036	0.15	2340	12.5×40	ECR1KLY561M□□125040
	560	0.19	0.044	0.16	2210	16×25	ECR1KLY561M□□160025
	560	0.19	0.054	0.18	1950	18×20	ECR1KLY561M□□180020
	680	0.156	0.033	0.12	2400	16×31.5	ECR1KLY681M□□160031
	820	0.129	0.038	0.13	2270	18×25	ECR1KLY821M□□180025
	820	0.129	0.029	0.1	2600	16×35.5	ECR1KLY821M□□160035
	1000	0.106	0.031	0.11	2470	18×31.5	ECR1KLY102M□□180031
	1000	0.106	0.027	0.09	2860	16×40	ECR1KLY102M□□160040
	1200	0.088	0.027	0.084	2860	18×35.5	ECR1KLY122M□□180035
	1500	0.071	0.026	0.076	3510	18×40	ECR1KLY152M□□180040
100 (125) 2A	8.2	12.946	1.4	5.6	163	5×11.5	ECR2ALY8R2M□□050011
	18	5.898	0.57	2.3	267	6.3×11.5	ECR2ALY180M□□063011
	33	3.217	0.36	1.4	462	8×11.5	ECR2ALY330M□□080011
	47	2.259	0.25	1	585	8×16	ECR2ALY470M□□080016
	56	1.896	0.23	0.96	624	10×12.5	ECR2ALY560M□□100012
	68	1.561	0.19	0.76	735	8×20	ECR2ALY68M□□080020
	82	1.295	0.17	0.72	780	10×16	ECR2ALY820M□□100016
	100	1.062	0.12	0.52	1040	10×20	ECR2ALY101M□□100020
	120	0.885	0.11	0.47	1170	10×25	ECR2ALY121M□□100025
	150	0.708	0.085	0.31	1430	12.5×20	ECR2ALY151M□□125020
	220	0.483	0.06	0.23	1620	12.5×25	ECR2ALY221M□□125025
	270	0.393	0.051	0.21	1950	12.5×30	ECR2ALY271M□□125030
	270	0.393	0.058	0.21	1750	16×20	ECR2ALY271M□□160020
	330	0.322	0.043	0.17	2140	12.5×35	ECR2ALY331M□□125035
	390	0.272	0.036	0.15	2340	12.5×40	ECR2ALY391M□□125040
	390	0.272	0.044	0.16	2210	16×25	ECR2ALY391M□□160025
	390	0.272	0.054	0.18	1950	18×20	ECR2ALY391M□□180020
	470	0.226	0.033	0.12	2400	16×31.5	ECR2ALY471M□□160031
	470	0.226	0.038	0.113	2270	18×25	ECR2ALY471M□□180025
	560	0.19	0.029	0.1	2600	16×35.5	ECR2ALY561M□□160035
	560	0.19	0.031	0.11	2470	18×31.5	ECR2ALY561M□□180031
	680	0.156	0.027	0.09	2860	16×40	ECR2ALY681M□□160040
	680	0.156	0.027	0.084	2860	18×35.5	ECR2ALY681M□□180035
	820	0.129	0.026	0.076	3510	18×40	ECR2ALY821M□□180040
120 (150) 2B	33	3.217	0.25	1	585	8×16	ECR2BLY330M□□080016
	47	2.259	0.19	0.76	735	8×20	ECR2BLY470M□□080020
	56	1.896	0.17	0.72	780	10×16	ECR2BLY560M□□100016
	82	1.295	0.12	0.52	1040	10×20	ECR2BLY820M□□100020
	100	1.062	0.1	0.43	1250	10×25	ECR2BLY101M□□100025
	120	0.885	0.09	0.38	1400	10×30	ECR2BLY121M□□100030
	120	0.885	0.085	0.31	1430	12.5×20	ECR2BLY121M□□125020
	150	0.708	0.21	0.84	1620	12.5×25	ECR2BLY151M□□125025
	180	0.59	0.18	0.72	1880	12.5×30	ECR2BLY181M□□125030
	180	0.59	0.17	0.65	1700	16×20	ECR2BLY181M□□160020
	220	0.483	0.15	0.6	2140	12.5×35	ECR2BLY221M□□125035
	270	0.393	0.12	0.48	2340	12.5×40	ECR2BLY271M□□125040

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
120 (150) 2B	270	0.393	0.13	0.49	2100	16×25	ECR2BLY271M□□160025
	270	0.393	0.14	0.52	1850	18×20	ECR2BLY271M□□180020
	330	0.322	0.1	0.38	2400	16×31.5	ECR2BLY331M□□160031
	390	0.272	0.085	0.32	2600	16×35.5	ECR2BLY391M□□160035
	390	0.272	0.1	0.37	2270	18×25	ECR2BLY391M□□180025
	470	0.226	0.075	0.29	2860	16×40	ECR2BLY471M□□160040
	470	0.226	0.08	0.3	2470	18×31.5	ECR2BLY471M□□180031
	560	0.19	0.07	0.26	2860	18×35.5	ECR2BLY561M□□180035
	680	0.156	0.06	0.22	3510	18×40	ECR2BLY681M□□180040

Customer products are available on request.

## Lifetime Diagram



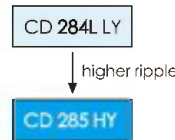


# CD 285 HY SERIES



6000~10000h at 105 °C

- Higher ripple current capability and smaller sizes than CD284L series
- Lower Impedance at high frequency
- Load life of 6000 to 10000hrs

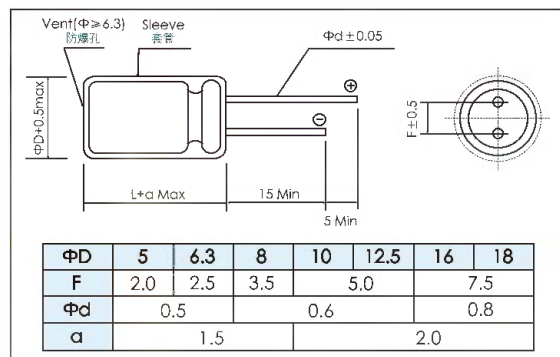


Items	Characteristics										
Operating Temperature Range (°C)	-40 ~ +105										
Rated Voltage Range (V)	6.3 ~ 100										
Capacitance Range (μF)	8.2 ~ 8200										
Capacitance Tolerance (20°C, 120Hz)	± 20%										
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3uA, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)										
Dissipation Factor (20°C, 120Hz)	WV (V)	6.3	10	16	25	35	50	63	80	100	
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08	
For Capacitances >1000μF add 0.02 to every 1000μF											
Stability at Low Temperature (Impedance ratio at 120Hz)	Rated Voltage		6.3	10	16	25	35	50	63	80	100
	Z <sub>-25°C</sub> / Z <sub>+20°C</sub>		2	2	2	2	2	2	2	2	2
	Z <sub>-40°C</sub> / Z <sub>+20°C</sub>	Φ≤6.3	5	5	4	4	4	4	3	3	3
		Φ≥8	3	3	3	3	3	3			

	Useful Life				Load Life				Endurance Life				Shelf Life	
Life Time	Case Size	Life Time			Case Size	Life Time			Case Size	Life Time			500h	
		6.3Vdc	10~50Vdc	60~100Vdc		6.3Vdc	10~50Vdc	60~100Vdc		6.3Vdc	10~50Vdc	60~100Vdc		
	$\Phi \leq 6.3$	8000	9000	8000	$\Phi \leq 6.3$	6000	7000	6000	$\Phi \leq 6.3$	7000	8000	9000		
	8X11.5	10000	11000	10000	8X11.5	8000	9000	8000	8X11.5	10000	11000	10000		
	10X12.5	11000	11000	11000	10X12.5	9000	9000	9000	10X12.5	11000	11000	11000		
	8X16.8X20	11000	12000	11000	8X16.8X20	9000	10000	9000	8X16.8X20	11000	12000	11000		
	10X16,10X20,10X25 $\Phi \geq 12.5$	12000			10X16,10X20,10X25 $\Phi \geq 12.5$	10000			10X16,10X20,10X25 $\Phi \geq 12.5$	12000				
Leakage Current	Not more than specified value				Not more than specified value				Not more than specified value				Not more than specified value	
Capacitance Change	Within $\pm 30\%$ of initial value (6.3V, 10V : $\pm 40\%$ )				Within $\pm 25\%$ of initial value (6.3V, 10V : $\pm 30\%$ )				Within $\pm 25\%$ of initial value (6.3V, 10V : $\pm 30\%$ )				Within $\pm 20\%$ of initial value	
Dissipation Factor	Not more than 300% of specified value (6.3V, 10V: 400%)				Not more than 200% of specified value (6.3V, 10V: 300%)				Not more than 200% of specified value (6.3V, 10V: 300%)				Not more than 200% of specified value	
Condition: Applied Voltage Applied Current Applied Temperature	$U_r$ $I_r$ 105℃				$U_r$ $I_r$ 105℃				$U_r$ $I_r = 0$ 105℃				$U_r$ $I_r = 0$ 105℃ After test: $U_r$ to be applied for 30min >24h before measurement	

## Dimensions

mm



## Frequency Coefficient

Cap (μF)	Freq(Hz)			
	120	1k	10k	100k
8.2 ~ 33	0.42	0.70	0.90	1.00
47 ~ 270	0.50	0.73	0.92	1.00
330 ~ 680	0.55	0.77	0.94	1.00
820 ~ 1800	0.60	0.80	0.96	1.00
2200 ~ 8200	0.70	0.85	0.98	1.00

## Temperature Coefficient

Temperature(°C)	≤ 65	+85	+105
Coefficient	2.0	1.7	1.0



## Ratings for CD 285 HY Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	220	1.327	0.40	1.2	345	5×11.5	ECR0JHY221M□□050011
	470	0.621	0.17	0.51	540	6.3×11.5	ECR0JHY471M□□063011
	820	0.356	0.075	0.23	945	8×11.5	ECR0JHY821M□□080011
	1000	0.292	0.059	0.18	1250	8×16	ECR0JHY102M□□080016
	1200	0.243	0.053	0.16	1330	10×12.5	ECR0JHY122M□□100012
	1500	0.195	0.041	0.13	1500	8×20	ECR0JHY152M□□080020
	1800	0.162	0.038	0.12	1760	10×16	ECR0JHY182M□□100016
	2700	0.118	0.028	0.084	1960	10×20	ECR0JHY272M□□100020
	3300	0.105	0.024	0.072	2250	10×25	ECR0JHY332M□□100025
	3900	0.088	0.025	0.075	2480	12.5×20	ECR0JHY392M□□125020
	4700	0.079	0.019	0.057	2900	12.5×25	ECR0JHY472M□□125025
	5600	0.071	0.018	0.054	3450	12.5×30	ECR0JHY562M□□125030
	6800	0.062	0.021	0.063	3250	16×20	ECR0JHY682M□□160020
		0.062	0.016	0.048	3570	12.5×35	ECR0JHY682M□□125035
10 (13) 1A	8200	0.058	0.017	0.051	3630	16×25	ECR0JHY822M□□160025
	150	1.681	0.40	1.2	450	5×11.5	ECR1AHY151M□□050011
	330	0.764	0.17	0.51	700	6.3×11.5	ECR1AHY331M□□063011
	560	0.450	0.075	0.23	1200	8×11.5	ECR1AHY561M□□080011
	680	0.371	0.059	0.18	1600	8×16	ECR1AHY681M□□080016
	820	0.307	0.053	0.16	1700	10×12.5	ECR1AHY821M□□100012
	1000	0.252	0.041	0.13	1960	8×20	ECR1AHY102M□□080020
	1200	0.210	0.038	0.12	2000	10×16	ECR1AHY122M□□100016
	1800	0.140	0.028	0.084	2500	10×20	ECR1AHY182M□□100020
	2200	0.127	0.024	0.072	2900	10×25	ECR1AHY222M□□100025
	2700	0.103	0.025	0.075	2600	12.5×20	ECR1AHY272M□□125020
	3300	0.092	0.019	0.057	3200	12.5×25	ECR1AHY332M□□125025
	4700	0.071	0.018	0.054	3660	12.5×30	ECR1AHY472M□□125030
		0.071	0.021	0.063	3330	16×20	ECR1AHY472M□□160020
16 (20) 1C	5600	0.064	0.016	0.048	4120	12.5×35	ECR1AHY562M□□125035
	6800	0.064	0.017	0.051	3810	16×25	ECR1AHY562M□□160025
		120	1.769	0.40	1.2	450	5×11.5
	270	0.786	0.17	0.51	700	6.3×11.5	ECR1CHY271M□□063011
	470	0.452	0.075	0.23	1200	8×11.5	ECR1CHY471M□□080011
	560	0.379	0.059	0.18	1600	8×16	ECR1CHY561M□□080016
	680	0.312	0.053	0.16	1700	10×12.5	ECR1CHY681M□□100012
	820	0.259	0.041	0.13	1960	8×20	ECR1CHY821M□□080020
	1000	0.212	0.038	0.12	2000	10×16	ECR1CHY102M□□100016
	1500	0.142	0.028	0.084	2500	10×20	ECR1CHY152M□□100020
	1800	0.118	0.024	0.072	2900	10×25	ECR1CHY182M□□100025
	2200	0.109	0.025	0.075	2600	12.5×20	ECR1CHY222M□□125020
	2700	0.088	0.019	0.057	3200	12.5×25	ECR1CHY272M□□125025
	3300	0.080	0.018	0.054	3660	12.5×30	ECR1CHY332M□□125030
0.080		0.021	0.063	3330	16×20	ECR1CHY332M□□160020	
25 (32) 1E	3900	0.068	0.016	0.048	4120	12.5×35	ECR1CHY392M□□125035
	4700	0.062	0.017	0.051	3810	16×25	ECR1CHY472M□□160025
	680	2.732	0.40	1.2	450	5×11.5	ECR1EHY680M□□050011
	150	1.238	0.17	0.51	700	6.3×11.5	ECR1EHY151M□□063011
	330	0.563	0.075	0.23	1200	8×11.5	ECR1EHY331M□□080011
	390	0.476	0.059	0.18	1600	8×16	ECR1EHY391M□□080016
	470	0.395	0.053	0.16	1700	10×12.5	ECR1EHY471M□□100012
	560	0.332	0.041	0.13	1960	8×20	ECR1EHY561M□□080020
	680	0.273	0.038	0.12	2000	10×16	ECR1EHY681M□□100016
	1000	0.186	0.028	0.084	2500	10×20	ECR1EHY102M□□100020
	1200	0.155	0.024	0.072	2900	10×25	ECR1EHY122M□□100025
	1500	0.124	0.025	0.075	2600	12.5×20	ECR1EHY152M□□125020
	1800	0.103	0.019	0.057	3200	12.5×25	ECR1EHY182M□□125025
	2200	0.097	0.018	0.054	3660	12.5×30	ECR1EHY222M□□125030
0.097		0.021	0.063	3330	16×20	ECR1EHY222M□□160020	
2700	0.079	0.016	0.048	4120	12.5×35	ECR1EHY272M□□125035	
	3300	0.072	0.017	0.051	3810	16×25	ECR1EHY332M□□160025

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120kHz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
35 (44) 1V	47	3.388	0.40	1.2	450	5×11.5	ECR1VHY470M□□050011
	100	1.592	0.17	0.51	700	6.3×11.5	ECR1VHY101M□□063011
	180	0.885	0.075	0.23	1200	8×11.5	ECR1VHY181M□□080011
	220	0.724	0.059	0.18	1600	8×16	ECR1VHY221M□□080016
	270	0.590	0.053	0.16	1700	10×12.5	ECR1VHY271M□□100012
	330	0.483	0.041	0.13	1960	8×20	ECR1VHY331M□□080020
	390	0.408	0.041	0.13	1960	8×20	ECR1VHY391M□□080020
		0.408	0.038	0.12	2000	10×16	ECR1VHY391M□□100016
	470	0.339	0.038	0.12	2000	10×16	ECR1VHY471M□□100016
	560	0.284	0.028	0.084	2500	10×20	ECR1VHY561M□□100020
	680	0.234	0.024	0.072	2900	10×25	ECR1VHY681M□□100025
	820	0.194	0.025	0.075	2600	12.5×20	ECR1VHY821M□□125020
	1000	0.159	0.025	0.075	2600	12.5×20	ECR1VHY102M□□125020
	1200	0.133	0.019	0.057	3200	12.5×25	ECR1VHY122M□□125025
	1500	0.106	0.018	0.054	3660	12.5×30	ECR1VHY152M□□125030
		0.106	0.021	0.063	3330	16×20	ECR1VHY152M□□160020
	1800	0.088	0.016	0.048	4120	12.5×35	ECR1VHY182M□□125035
		0.088	0.017	0.051	3810	16×25	ECR1VHY182M□□160025
50 (63) 1H	27	4.915	0.48	1.5	310	5×11.5	ECR1HHY270M□□050011
	56	2.370	0.22	0.66	500	6.3×11.5	ECR1HHY560M□□063011
	100	1.327	0.12	0.36	950	8×11.5	ECR1HHY101M□□080011
	120	1.106	0.11	0.33	950	8×11.5	ECR1HHY121M□□080011
		1.106	0.082	0.25	1230	8×16	ECR1HHY121M□□080016
	150	0.885	0.073	0.22	1280	10×12.5	ECR1HHY151M□□100012
	180	0.737	0.081	0.24	1700	8×16	ECR1HHY181M□□080016
		0.737	0.058	0.18	1580	8×20	ECR1HHY181M□□080020
	220	0.603	0.071	0.21	1700	10×12.5	ECR1HHY221M□□100012
		0.603	0.053	0.16	1650	10×16	ECR1HHY221M□□100016
	270	0.493	0.058	0.17	2100	8×20	ECR1HHY271M□□080020
	330	0.402	0.052	0.16	2100	10×16	ECR1HHY331M□□100016
		0.402	0.038	0.12	2060	10×20	ECR1HHY331M□□100020
	390	0.340	0.032	0.10	2420	10×25	ECR1HHY391M□□100025
	470	0.282	0.037	0.11	2500	10×20	ECR1HHY471M□□100020
		0.282	0.04	0.12	2200	12.5×16	ECR1HHY471M□□125016
	560	0.282	0.032	0.10	2300	12.5×20	ECR1HHY471M□□125020
		0.238	0.031	0.093	2900	10×25	ECR1HHY561M□□100025
680	0.195	0.029	0.087	2700	12.5×20	ECR1HHY681M□□125020	
	0.195	0.025	0.080	2800	12.5×25	ECR1HHY681M□□125025	
820	0.162	0.023	0.074	3370	12.5×30	ECR1HHY821M□□125030	
	0.162	0.026	0.084	3070	16×20	ECR1HHY821M□□160020	
1000	0.133	0.022	0.066	3000	12.5×25	ECR1HHY102M□□125025	
	0.133	0.02	0.06	3500	12.5×30	ECR1HHY102M□□125030	
	0.133	0.021	0.067	3810	12.5×35	ECR1HHY102M□□125035	
	0.133	0.022	0.070	3510	16×25	ECR1HHY102M□□160025	
1200	0.111	0.017	0.051	4000	12.5×35	ECR1HHY122M□□125035	
	0.111	0.023	0.069	3100	16×20	ECR1HHY122M□□160020	
1500	0.089	0.019	0.057	4500	12.5×40	ECR1HHY152M□□125040	
	0.089	0.018	0.054	3600	16×25	ECR1HHY152M□□160025	
	0.089	0.029	0.087	3200	18×20	ECR1HHY152M□□180020	
2200	0.060	0.018	0.054	4100	16×31.5	ECR1HHY222M□□160031	
	0.060	0.022	0.066	3700	18×25	ECR1HHY222M□□180025	
2700	0.049	0.016	0.048	4400	16×35.5	ECR1HHY272M□□160035	
	0.049	0.014	0.042	4800	16×40	ECR1HHY272M□□160040	
	0.049	0.019	0.057	4200	18×31.5	ECR1HHY272M□□180031	
3300	0.040	0.016	0.048	4600	18×35.5	ECR1HHY332M□□180035	
3900	0.040	0.014	0.042	5000	18×40	ECR1HHY392M□□180040	

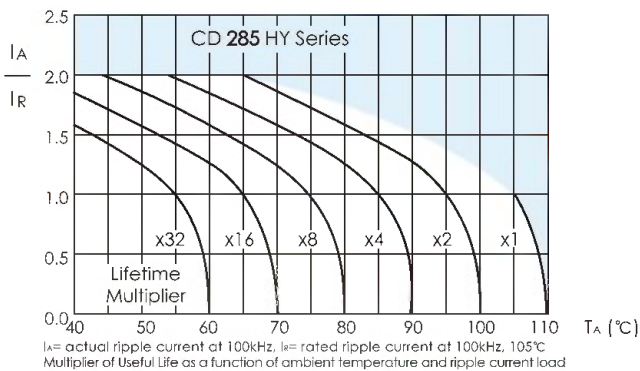
MINIATURE



## Ratings for CD 285 HY Series

U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
63 (79) 1J	18	6.635	0.71	3.2	240	5×11.5	ECR1JHY180M□□050011
	47	2.541	0.28	1.3	420	6.3×11.5	ECR1JHY470M□□063011
	82	1.456	0.18	0.79	720	8×11.5	ECR1JHY820M□□080011
	100	1.194	0.13	0.39	1000	8×11.5	ECR1JHY101M□□080011
		1.194	0.13	0.58	990	8×16	ECR1JHY101M□□080016
	120	0.995	0.095	0.29	1300	8×16	ECR1JHY121M□□080016
		0.995	0.11	0.44	990	10×12.5	ECR1JHY121M□□100012
	150	0.796	0.096	0.43	1200	8×20	ECR1JHY151M□□080020
		0.796	0.08	0.24	1300	10×12.5	ECR1JHY151M□□100012
	180	0.663	0.069	0.21	1600	8×20	ECR1JHY181M□□080020
		0.663	0.076	0.31	1200	10×16	ECR1JHY181M□□100016
	220	0.543	0.058	0.17	1700	10×16	ECR1JHY221M□□100016
		0.442	0.056	0.23	1570	10×20	ECR1JHY271M□□100020
	270	0.442	0.072	0.27	1570	12.5×16	ECR1JHY271M□□125016
		0.362	0.042	0.13	2000	10×20	ECR1JHY331M□□100020
	330	0.362	0.046	0.19	1990	10×25	ECR1JHY331M□□100025
		0.362	0.045	0.14	1900	12.5×16	ECR1JHY331M□□125016
	390	0.306	0.035	0.11	2400	10×25	ECR1JHY391M□□100025
		0.306	0.041	0.13	1990	12.5×20	ECR1JHY391M□□125020
	470	0.254	0.033	0.099	2400	12.5×20	ECR1JHY471M□□125020
		0.254	0.031	0.093	2460	12.5×25	ECR1JHY471M□□125025
	560	0.213	0.028	0.084	2760	12.5×30	ECR1JHY561M□□125030
		0.213	0.032	0.096	2380	16×20	ECR1JHY561M□□160020
	680	0.176	0.025	0.075	2800	12.5×25	ECR1JHY681M□□125025
		0.176	0.024	0.072	3040	12.5×35	ECR1JHY681M□□125035
	820	0.146	0.022	0.066	3200	12.5×30	ECR1JHY821M□□125030
		0.146	0.025	0.075	2900	16×20	ECR1JHY821M□□160020
		0.146	0.025	0.075	2890	16×25	ECR1JHY821M□□160025
	1000	0.120	0.018	0.054	3500	12.5×35	ECR1JHY102M□□125035
		0.120	0.02	0.06	3200	16×25	ECR1JHY102M□□160025
	1200	0.100	0.021	0.063	3800	12.5×40	ECR1JHY122M□□125040
		0.100	0.032	0.096	3000	18×20	ECR1JHY122M□□180020
	1500	0.080	0.02	0.06	3500	16×31.5	ECR1JHY152M□□160031
		0.080	0.024	0.072	3200	18×25	ECR1JHY152M□□180025
	1800	0.067	0.017	0.051	3800	16×35.5	ECR1JHY182M□□160035
		0.067	0.02	0.06	3700	18×31.5	ECR1JHY182M□□180031
	2200	0.055	0.015	0.045	4100	16×40	ECR1JHY222M□□160040
		0.055	0.017	0.051	3900	18×35.5	ECR1JHY222M□□180035
	2700	0.044	0.015	0.045	4300	18×40	ECR1JHY272M□□180040

## Lifetime Diagram



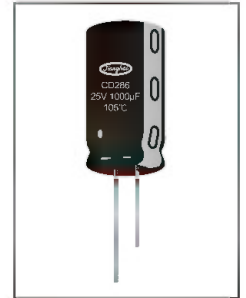
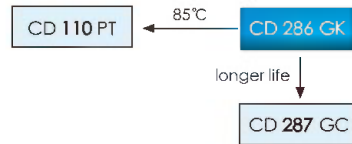
U <sub>r</sub> (Surge Voltage Code)	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
80 (100) 1K	12	8.846	1.2	5.4	220	5×11.5	ECR1KHY120M□□050011
	27	3.932	0.46	2.1	370	6.3×11.5	ECR1KHY270M□□063011
	47	2.259	0.29	1.3	620	8×11.5	ECR1KHY470M□□080011
	56	1.896	0.20	0.9	780	8×16	ECR1KHY560M□□080016
	68	1.561	0.17	0.66	780	10×12.5	ECR1KHY680M□□100012
	82	1.295	0.16	0.66	1040	8×20	ECR1KHY820M□□080020
	100	1.062	0.11	0.47	1040	10×16	ECR1KHY101M□□100016
	150	0.708	0.084	0.34	1430	10×20	ECR1KHY151M□□100020
		0.708	0.11	0.34	1430	12.5×16	ECR1KHY151M□□125016
	180	0.590	0.069	0.28	1620	10×25	ECR1KHY181M□□100025
	220	0.483	0.062	0.18	1750	12.5×20	ECR1KHY221M□□125020
	270	0.393	0.047	0.14	2210	12.5×25	ECR1KHY271M□□125025
	330	0.322	0.042	0.13	2400	12.5×30	ECR1KHY331M□□125030
		0.322	0.048	0.15	1950	16×20	ECR1KHY331M□□160020
	390	0.272	0.036	0.11	2600	12.5×35	ECR1KHY391M□□125035
	470	0.226	0.032	0.095	2860	12.5×40	ECR1KHY471M□□125040
		0.226	0.038	0.12	2430	16×25	ECR1KHY471M□□160025
		0.226	0.045	0.14	2270	18×20	ECR1KHY471M□□180020
		0.190	0.032	0.095	2640	16×31.5	ECR1KHY561M□□160031
	680	0.156	0.029	0.086	2860	16×35.5	ECR1KHY681M□□160035
		0.156	0.036	0.11	2500	18×25	ECR1KHY681M□□180025
	820	0.129	0.027	0.081	3510	16×40	ECR1KHY821M□□160040
		0.129	0.030	0.090	2860	18×31.5	ECR1KHY821M□□180031
	1000	0.106	0.027	0.081	3510	18×35.5	ECR1KHY102M□□180035
	1200	0.088	0.026	0.076	3860	18×40	ECR1KHY122M□□180040
100 (125) 2A	8.2	12.946	1.2	5.4	220	5×11.5	ECR2AHY82M□□050011
	18	5.898	0.46	2.1	370	6.3×11.5	ECR2AHY180M□□063011
	33	3.217	0.29	1.3	620	8×11.5	ECR2AHY330M□□080011
	47	2.259	0.20	0.90	780	8×16	ECR2AHY470M□□080016
	56	1.896	0.17	0.66	780	10×12.5	ECR2AHY560M□□100012
	68	1.561	0.16	0.66	1040	8×20	ECR2AHY680M□□080020
	82	1.295	0.11	0.47	1040	10×16	ECR2AHY820M□□100016
	100	1.062	0.084	0.34	1430	10×20	ECR2AHY101M□□100020
		1.062	0.11	0.34	1430	12.5×16	ECR2AHY101M□□125016
	120	0.885	0.069	0.28	1620	10×25	ECR2AHY121M□□100025
	150	0.708	0.062	0.18	1750	12.5×20	ECR2AHY151M□□125020
	220	0.483	0.047	0.14	2210	12.5×25	ECR2AHY221M□□125025
	270	0.393	0.042	0.13	2400	12.5×30	ECR2AHY271M□□125030
		0.393	0.048	0.15	1950	16×20	ECR2AHY271M□□160020
	330	0.322	0.036	0.11	2600	12.5×35	ECR2AHY331M□□125035
	390	0.272	0.032	0.095	2860	12.5×40	ECR2AHY391M□□125040
		0.272	0.038	0.12	2430	16×25	ECR2AHY391M□□160025
		0.272	0.045	0.14	2270	18×20	ECR2AHY391M□□180020
		0.226	0.032	0.095	2640	16×31.5	ECR2AHY471M□□160031
	470	0.226	0.036	0.11	2500	18×25	ECR2AHY471M□□180025
		0.190	0.029	0.086	2860	16×35.5	ECR2AHY561M□□160035
	560	0.190	0.030	0.090	2860	18×31.5	ECR2AHY561M□□180031
		0.156	0.027	0.081	3510	16×40	ECR2AHY681M□□160040
	680	0.156	0.027	0.081	3510	18×35.5	ECR2AHY681M□□180035
		0.129	0.026	0.076	3860	18×40	ECR2AHY821M□□180040

Customer products are available on request.



2000h at 105°C

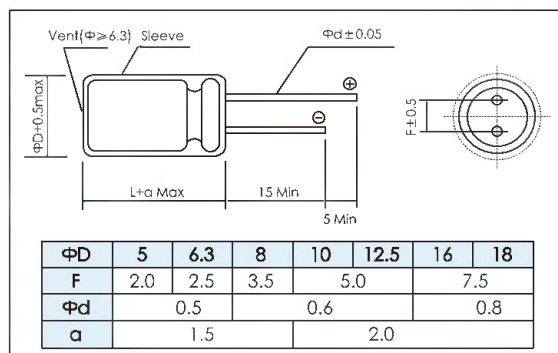
- Low Impedance
- Suited for switching power supplies
- High ripple current capability



Items	Characteristics									
Operating Temperature Range (°C)	-55 ~ +105									
Voltage Range (V)	6.3 ~ 100									
Capacitance Range (μF)	5.6 ~ 18000									
Capacitance Tolerance (20°C, 120Hz)	± 20%									
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.02CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)									
Dissipation Factor (20°C, 120Hz)										
	WV (V)	6.3	10	16	25	35	50	63	100	
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	
	When nominal capacitance is over 1000μF tan δ shall be added 0.02 to the listed value with increase of every 1000μF									
Characteristics of Low Temperature	Impedance at -10°C, 100kHz < 200% of initial specified value at 20°C, 100kHz (Impedance ratio at 100kHz)									

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 8$ : 2000h $\Phi > 8$ : 4000h	$\Phi > 8$ : 200000h	$\Phi \leq 8$ : 1000h $\Phi > 8$ : 2000h	$\Phi \leq 8$ : 1500h $\Phi > 8$ : 3000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 40°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	After test: $U_R$ to be applied for 30min >24h before measurement

## Dimensions



mm

## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
5.6~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~18000	0.85	0.95	0.98	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



# CD 286 GK SERIES



## Ratings for CD 286 GK Series

MINIATURE

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
6.3 (7.2) 0J	150	1.9	0.65	1.3	175	5×11.5	ECR0JGK151M□□050011
	330	0.89	0.30	0.6	290	6.3×11.5	ECR0JGK331M□□063011
	470	0.62	0.20	0.4	400	6.3×15	ECR0JGK471M□□063015
	680	0.43	0.17	0.34	555	8×11.5	ECR0JGK681M□□080011
	820	0.36	0.12	0.24	730	10×12.5	ECR0JGK821M□□100012
	1000	0.29	0.13	0.26	730	8×16	ECR0JGK102M□□080016
	1200	0.24	0.095	0.19	810	8×20	ECR0JGK122M□□080020
	1200	0.24	0.095	0.19	910	10×16	ECR0JGK122M□□100016
	1500	0.20	0.065	0.13	1160	10×20	ECR0JGK152M□□100020
	2200	0.15	0.055	0.11	1360	10×25	ECR0JGK222M□□100025
	2700	0.12	0.045	0.09	1660	10×30	ECR0JGK272M□□100030
	3300	0.11	0.042	0.084	1610	12.5×20	ECR0JGK332M□□125020
	3900	0.088	0.038	0.076	1950	12.5×25	ECR0JGK392M□□125025
	4700	0.079	0.032	0.064	2240	12.5×30	ECR0JGK472M□□125030
	5600	0.071	0.028	0.056	1990	12.5×35	ECR0JGK562M□□125035
	5600	0.071	0.034	0.068	2510	16×20	ECR0JGK562M□□160020
	5600	0.062	0.026	0.052	2750	12.5×40	ECR0JGK682M□□125040
	6800	0.062	0.028	0.056	2380	16×25	ECR0JGK682M□□160025
	6800	0.062	0.030	0.06	2185	18×20	ECR0JGK682M□□180020
	8200	0.058	0.025	0.05	2700	16×31.5	ECR0JGK822M□□160031
	10000	0.053	0.022	0.044	2530	16×35.5	ECR0JGK103M□□160035
	10000	0.053	0.027	0.054	2930	18×25	ECR0JGK103M□□180025
	12000	0.049	0.020	0.04	2860	16×40	ECR0JGK123M□□160040
	12000	0.049	0.023	0.046	3330	18×31.5	ECR0JGK123M□□180031
10 (13) 1A	15000	0.044	0.020	0.04	3180	18×35.5	ECR0JGK153M□□180035
	18000	0.041	0.019	0.038	3570	18×40	ECR0JGK183M□□180040
	100	2.5	0.65	1.3	175	5×11.5	ECR1AGK101M□□050011
	220	1.15	0.30	0.6	290	6.3×11.5	ECR1AGK221M□□063011
	330	0.76	0.20	0.4	400	6.3×15	ECR1AGK331M□□063015
	470	0.54	0.17	0.34	555	8×11.5	ECR1AGK471M□□080011
	680	0.37	0.13	0.26	730	8×16	ECR1AGK681M□□080016
	680	0.37	0.12	0.24	730	10×12.5	ECR1AGK681M□□100012
	1000	0.25	0.095	0.19	810	8×20	ECR1AGK102M□□080020
	1000	0.25	0.095	0.19	910	10×16	ECR1AGK102M□□100016
	1200	0.21	0.065	0.13	1160	10×20	ECR1AGK122M□□100020
	1500	0.17	0.055	0.11	1360	10×25	ECR1AGK152M□□100025
	1800	0.14	0.045	0.09	1660	10×30	ECR1AGK182M□□100030
	2200	0.13	0.042	0.084	1610	12.5×20	ECR1AGK222M□□125020
	3300	0.092	0.038	0.076	1950	12.5×25	ECR1AGK332M□□125025
	3900	0.078	0.032	0.064	2240	12.5×30	ECR1AGK392M□□125030
	3900	0.078	0.034	0.068	1990	16×20	ECR1AGK392M□□160020
	4700	0.071	0.028	0.056	2510	12.5×35	ECR1AGK472M□□125035
	4700	0.064	0.026	0.052	2750	12.5×40	ECR1AGK562M□□125040
	5600	0.064	0.028	0.056	2380	16×25	ECR1AGK562M□□160025
	5600	0.064	0.030	0.06	2185	18×20	ECR1AGK562M□□180020
	5600	0.057	0.025	0.05	2700	16×31.5	ECR1AGK682M□□160031
	6800	0.057	0.027	0.054	2530	18×25	ECR1AGK682M□□180025
	8200	0.053	0.022	0.044	2930	16×35.5	ECR1AGK822M□□160035
	8200	0.053	0.023	0.046	2860	18×31.5	ECR1AGK822M□□180031
16 (20) 1C	10000	0.049	0.020	0.04	3330	16×40	ECR1AGK103M□□160040
	10000	0.049	0.019	0.038	3180	18×35.5	ECR1AGK103M□□180035
	12000	0.045	0.018	0.036	3570	18×40	ECR1AGK123M□□180040
	47	4.5	0.65	1.3	175	5×11.5	ECR1CGK470M□□050011
	100	2.1	0.30	0.6	290	6.3×11.5	ECR1CGK101M□□063011
	220	0.97	0.20	0.4	400	6.3×15	ECR1CGK221M□□063015
	330	0.64	0.17	0.34	555	8×11.5	ECR1CGK331M□□080011
	470	0.45	0.13	0.26	730	8×16	ECR1CGK471M□□080016
	470	0.45	0.12	0.24	730	10×12.5	ECR1CGK471M□□100012
	560	0.38	0.095	0.19	810	8×20	ECR1CGK561M□□080020
	680	0.31	0.095	0.19	910	10×16	ECR1CGK681M□□100016
	1000	0.21	0.065	0.13	1160	10×20	ECR1CGK102M□□100020
	1200	0.18	0.055	0.11	1360	10×25	ECR1CGK122M□□100025
	1500	0.14	0.045	0.09	1660	10×30	ECR1CGK152M□□100030
	1500	0.14	0.042	0.084	1610	12.5×20	ECR1CGK152M□□125020
	2200	0.11	0.038	0.076	1950	12.5×25	ECR1CGK222M□□125025
	2700	0.088	0.032	0.064	2240	12.5×30	ECR1CGK272M□□125030
	2700	0.088	0.034	0.068	1990	16×20	ECR1CGK272M□□160020
	3300	0.080	0.028	0.056	2510	12.5×35	ECR1CGK332M□□125035
	3300	0.068	0.026	0.052	2750	12.5×40	ECR1CGK392M□□125040
	3900	0.068	0.028	0.056	2380	16×25	ECR1CGK392M□□160025
	3900	0.068	0.030	0.06	2185	18×20	ECR1CGK392M□□180020

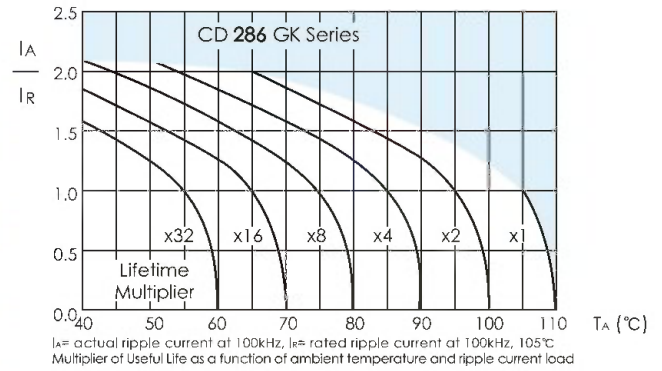
U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
16 (20) 1C	4700	0.062	0.025	0.05	2700	16×31.5	ECR1CGK472M□□160031
	4700	0.062	0.027	0.054	2530	18×25	ECR1CGK472M□□180025
	5600	0.057	0.022	0.044	2930	16×35.5	ECR1CGK562M□□160035
	5600	0.057	0.023	0.046	2860	18×31.5	ECR1CGK562M□□180031
	6800	0.051	0.020	0.04	3330	16×40	ECR1CGK682M□□160040
	8200	0.049	0.019	0.038	3180	18×35.5	ECR1CGK822M□□180035
	10000	0.045	0.018	0.036	3570	18×40	ECR1CGK103M□□180040
	47	4.0	0.65	1.3	175	5×11.5	ECR1EGK470M□□050011
	100	1.86	0.30	0.6	290	6.3×11.5	ECR1EGK101M□□063011
	150	1.24	0.20	0.4	400	6.3×15	ECR1EGK151M□□063015
	220	0.84	0.17	0.34	555	8×11.5	ECR1EGK221M□□080011
	330	0.56	0.13	0.26	730	8×16	ECR1EGK331M□□100016
	330	0.56	0.12	0.24	730	10×12.5	ECR1EGK331M□□100012
	390	0.48	0.095	0.19	810	8×20	ECR1EGK391M□□080020
	470	0.40	0.095	0.19	910	10×16	ECR1EGK471M□□100016
	680	0.27	0.065	0.13	1160	10×20	ECR1EGK681M□□100020
	820	0.23	0.055	0.11	1360	10×25	ECR1EGK821M□□100025
	1000	0.19	0.045	0.09	1660	10×30	ECR1EGK102M□□100030
	1000	0.19	0.042	0.084	1610	12.5×20	ECR1EGK102M□□125020
	1500	0.12	0.038	0.076	1950	12.5×25	ECR1EGK152M□□125025
	1800	0.10	0.032	0.064	2240	12.5×30	ECR1EGK182M□□125030
	1800	0.10	0.034	0.068	1990	16×20	ECR1EGK182M□□160020
	2200	0.097	0.028	0.056	2510	12.5×35	ECR1EGK222M□□125035
	2200	0.097	0.026	0.052	2750	18×20	ECR1EGK222M□□180020
	2700	0.079	0.028	0.056	2380	12.5×40	ECR1EGK272M□□125040
	2700	0.079	0.030	0.06	2185	16×25	ECR1EGK272M□□160025
25 (32) 1E	3300	0.072	0.025	0.05	2700	16×31.5	ECR1EGK332M□□160031
	3300	0.072	0.027	0.054	2530	18×25	ECR1EGK332M□□180025
	3900	0.061	0.022	0.044	2930	16×35.5	ECR1EGK392M□□160035
	3900	0.061	0.023	0.046	2860	18×31.5	ECR1EGK392M□□180031
	4700	0.056	0.020	0.04	3330	16×40	ECR1EGK472M□□160040
	4700	0.056	0.019	0.038	3180	18×35.5	ECR1EGK472M□□180035
	5600	0.052	0.018	0.036	3570	18×40	ECR1EGK562M□□180040
	33	4.8	0.65	1.3	175	5×11.5	ECR1VGK330M□□050011
	56	2.8	0.30	0.6	290	6.3×11.5	ECR1VGK560M□□063011
	100	1.6	0.20	0.4	400	6.3×15	ECR1VGK101M□□063015
	150	1.1	0.17	0.34	555	8×11.5	ECR1VGK151M□□080011
	220	0.72	0.13	0.26	730	8×16	ECR1VGK221M□□080016
	220	0.72	0.12	0.24	730	10×12.5	ECR1VGK221M□□100012
	270	0.59	0.095	0.19	810	8×20	ECR1VGK271M□□080020
	330	0.48	0.095	0.19	910	10×16	ECR1VGK331M□□100016
	470	0.34	0.065	0.13	1160	10×20	ECR1VGK471M□□100020
	560	0.28	0.055	0.11	1360	10×25	ECR1VGK561M□□100025
	680	0.23	0.045	0.09	1660	10×30	ECR1VGK681M□□100030
	680	0.23	0.042	0.084	1610	12.5×20	ECR1VGK681M□□125020
	1000	0.16	0.038	0.076	1950	12.5×25	ECR1VGK102M□□125025
	1200	0.13	0.032	0.064	2240	12.5×30	ECR1VGK122M□□125030
	1200	0.13	0.034	0.068	1990	16×20	ECR1VGK122M□□160020
	1500	0.11	0.028	0.056	2510	12.5×35	ECR1VGK152M□□125035
	1800	0.088	0.026	0.052	2750	12.5×40	ECR1VGK182M□□125040
	1800	0.088	0.028	0.056	2380	16×25	ECR1VGK182M□□160025
	1800	0.088	0.030	0.06	2185	18×20	ECR1VGK182M□□180020
35 (44) 1V	2200	0.084	0.025	0.05	2700	16×31.5	ECR1VGK222M□□160031
	2200	0.084	0.027	0.054	2530	18×25	ECR1VGK222M□□1800



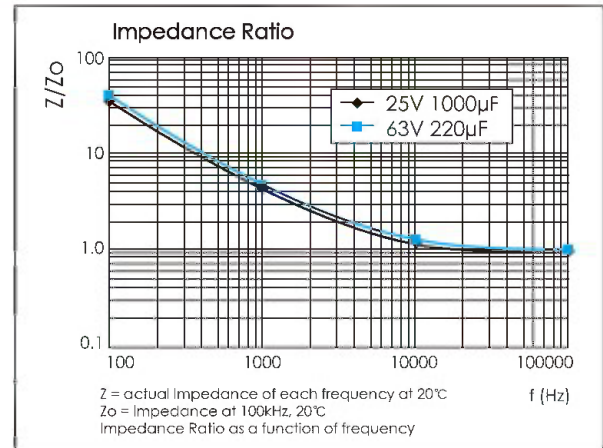
## Ratings for CD 286 GK Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	-
50 (63) 1H	560	0.24	0.054	0.108	1360	12.5 x 25	ECR1HGK561M□□125025
	680	0.20	0.050	0.1	1500	12.5 x 30	ECR1HGK681M□□125030
		0.20	0.050	0.1	1390	16 x 20	ECR1HGK681M□□160020
	820	0.16	0.046	0.092	1690	12.5 x 35	ECR1HGK821M□□125035
		0.16	0.046	0.092	1670	18 x 20	ECR1HGK821M□□180020
	1000	0.13	0.044	0.088	1830	12.5 x 40	ECR1HGK102M□□125040
		0.13	0.048	0.096	1710	16 x 25	ECR1HGK102M□□160025
	1200	0.11	0.040	0.08	2170	16 x 31.5	ECR1HGK122M□□160031
		0.11	0.040	0.08	1980	18 x 25	ECR1HGK122M□□180025
	1500	0.088	0.032	0.064	2460	16 x 35.5	ECR1HGK152M□□160035
	1800	0.074	0.026	0.052	2770	16 x 40	ECR1HGK182M□□160040
		0.074	0.026	0.052	2260	18 x 31.5	ECR1HGK182M□□180031
	2200	0.072	0.025	0.05	2650	18 x 35.5	ECR1HGK222M□□180035
	2700	0.059	0.024	0.048	2900	18 x 40	ECR1HGK272M□□180040
							ECR1JGK100M□□050011
63 (79) 1J	10	11.9	1.9	5.7	145	5 x 11.5	ECR1JGK220M□□063011
	22	5.4	1.0	3.0	192	6.3 x 11.5	ECR1JGK220M□□063011
	33	3.6	0.61	1.8	240	6.3 x 15	ECR1JGK330M□□063015
	47	2.5	0.34	1.1	380	8 x 11.5	ECR1JGK470M□□080011
	100	1.2	0.27	0.81	535	8 x 16	ECR1JGK101M□□080016
		1.2	0.26	0.78	515	10 x 12.5	ECR1JGK101M□□100012
	120	1.0	0.21	0.63	600	8 x 20	ECR1JGK121M□□080020
	150	0.80	0.19	0.57	635	10 x 16	ECR1JGK151M□□100016
	180	0.66	0.15	0.45	770	10 x 20	ECR1JGK181M□□100020
	220	0.54	0.13	0.39	1000	10 x 25	ECR1JGK221M□□100025
	330	0.36	0.090	0.27	1170	10 x 30	ECR1JGK331M□□100030
		0.36	0.085	0.26	1120	12.5 x 20	ECR1JGK331M□□125020
	390	0.31	0.070	0.21	1350	12.5 x 25	ECR1JGK391M□□125025
	470	0.25	0.055	0.17	1500	12.5 x 30	ECR1JGK471M□□125030
		0.25	0.060	0.18	1390	16 x 20	ECR1JGK471M□□160020
100 (125) 2A	680	0.18	0.048	0.15	1690	12.5 x 35	ECR1JGK681M□□125035
		0.18	0.042	0.13	1820	12.5 x 40	ECR1JGK681M□□125040
		0.18	0.052	0.16	1710	16 x 25	ECR1JGK681M□□160025
	820	0.15	0.058	0.18	1680	18 x 20	ECR1JGK821M□□180020
		0.15	0.043	0.13	2170	16 x 31.5	ECR1JGK821M□□160031
		0.15	0.050	0.15	2000	18 x 25	ECR1JGK821M□□180025
	1000	0.12	0.036	0.11	2460	16 x 35.5	ECR1JGK102M□□160035
	1200	0.10	0.042	0.13	2280	18 x 31.5	ECR1JGK122M□□180031
		0.10	0.032	0.096	2770	16 x 40	ECR1JGK122M□□160040
	1500	0.080	0.035	0.105	2690	18 x 35.5	ECR1JGK152M□□180035
	1800	0.066	0.030	0.090	2940	18 x 40	ECR1JGK182M□□180040
	5.6	19.0	1.9	7.6	62	5 x 11.5	ECR2AGK56M□□050011
	10	10.6	1.1	4.4	85	6.3 x 11.5	ECR2AGK100M□□063011
	15	7.1	0.62	2.5	93	6.3 x 15	ECR2AGK150M□□063015
	22	4.8	0.53	2.1	302	8 x 11.5	ECR2AGK220M□□080011
	33	3.2	0.35	1.4	396	8 x 16	ECR2AGK330M□□080016
		3.2	0.47	1.9	350	10 x 12.5	ECR2AGK330M□□100012
	47	2.3	0.27	1.1	540	8 x 20	ECR2AGK470M□□080020
		2.3	0.32	1.3	460	10 x 16	ECR2AGK470M□□100016
	68	1.6	0.25	1.0	548	10 x 20	ECR2AGK680M□□100020
	100	1.1	0.18	0.72	695	10 x 25	ECR2AGK101M□□100025
	120	0.89	0.15	0.60	810	10 x 30	ECR2AGK121M□□100030
		0.89	0.13	0.52	885	12.5 x 20	ECR2AGK121M□□125020
	150	0.71	0.11	0.44	942	12.5 x 25	ECR2AGK151M□□125025
	180	0.59	0.11	0.44	1010	16 x 20	ECR2AGK181M□□160020
	220	0.48	0.090	0.36	1230	12.5 x 30	ECR2AGK221M□□125030
		0.39	0.075	0.30	1360	12.5 x 35	ECR2AGK271M□□125035
		0.39	0.085	0.34	1280	18 x 20	ECR2AGK271M□□180020
	270	0.39	0.060	0.24	1450	12.5 x 40	ECR2AGK271M□□125040
		0.39	0.081	0.32	1390	16 x 25	ECR2AGK271M□□160025
		0.32	0.059	0.24	1750	16 x 31.5	ECR2AGK331M□□160031
	330	0.32	0.071	0.29	1650	18 x 25	ECR2AGK331M□□180025
	470	0.23	0.052	0.21	1925	16 x 35.5	ECR2AGK471M□□160035
	560	0.19	0.045	0.18	2110	16 x 40	ECR2AGK561M□□160040
		0.19	0.058	0.23	1790	18 x 31.5	ECR2AGK561M□□180031
	680	0.16	0.054	0.22	2110	18 x 35.5	ECR2AGK681M□□180035
	820	0.13	0.041	0.17	2300	18 x 40	ECR2AGK821M□□180040

## Lifetime Diagram



## Typical Curves



Customer products are available on request.

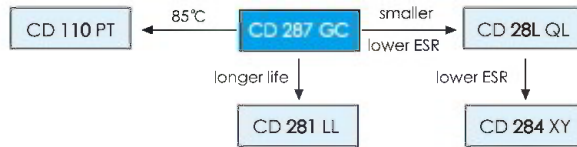


# CD 287 GC SERIES



2000 - 5000h at 105°C

- Low Impedance
- High Ripple Current
- SMPS, UPS

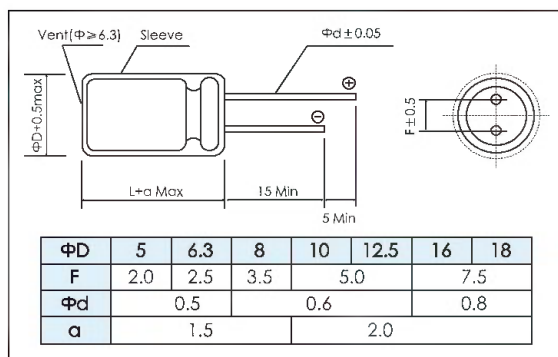


Items	Characteristics								
Operating Temperature Range (°C)	-55 ~ +105								
Voltage Range (V)	6.3 ~ 100								
Capacitance Range (μF)	0.47 ~ 15000								
Capacitance Tolerance (20°C, 120Hz)	± 20%								
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.02CV or 3, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage [V]								
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
For Capacitances >1000μF add 0.02 to every 1000μF									
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3 ~ 100							
	Z <sub>-55℃</sub> / Z <sub>+20℃</sub>	3							

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 6.3$ : 4000h $\Phi 8 - 10$ : 6000h $\Phi \geq 12.5$ : 10000h	$\Phi \geq 8$ : > 250000h	$\Phi \leq 6.3$ : 2000h $\Phi 8 - 10$ : 3000h $\Phi \geq 12.5$ : 5000h	$\Phi \leq 6.3$ : 3000h $\Phi 8 - 10$ : 5000h $\Phi \geq 12.5$ : 7000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Cap (µF) \ Frequency	120Hz	1kHz	10kHz	100kHz
0.47 ~ 4.7	0.40	0.68	0.83	1.00
5.6 ~ 47	0.50	0.76	0.87	1.00
56 ~ 270	0.70	0.85	0.93	1.00
330 ~ 1000	0.80	0.93	0.98	1.00
1200 ~ 15000	0.90	0.95	1.00	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



## Ratings for CD 287 GC Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>RMS</sub> )	(mm)	-
6.3 (7.2) 0J	100	2.919	0.65	1.3	175	5×11.5	ECR0JGC101M□□050011
	150	1.946	0.46	0.92	235	5×15	ECR0JGC151M□□050015
	220	1.327	0.3	0.6	290	6.3×11.5	ECR0JGC221M□□063011
	330	0.885	0.2	0.4	400	6.3×15	ECR0JGC331M□□063015
	470	0.621	0.17	0.34	488	8×11.5	ECR0JGC471M□□080011
	680	0.429	0.13	0.26	617	8×16	ECR0JGC681M□□080016
		0.429	0.12	0.24	613	10×12.5	ECR0JGC681M□□100012
	820	0.356	0.095	0.19	734	10×16	ECR0JGC821M□□100016
	1000	0.292	0.095	0.19	800	8×20	ECR0JGC102M□□080020
	1200	0.243	0.065	0.13	1010	10×20	ECR0JGC122M□□100020
		0.243	0.065	0.13	1010	12.5×15	ECR0JGC122M□□125015
	1500	0.195	0.055	0.11	1190	10×25	ECR0JGC152M□□100025
	2200	0.145	0.045	0.09	1440	10×30	ECR0JGC222M□□100030
		0.145	0.042	0.084	1400	12.5×20	ECR0JGC222M□□125020
	2700	0.118	0.038	0.076	1690	12.5×25	ECR0JGC272M□□125025
		0.118	0.046	0.092	1310	16×15	ECR0JGC272M□□160015
	3300	0.105	0.043	0.086	1460	18×15	ECR0JGC332M□□180015
	3900	0.088	0.032	0.064	1950	12.5×30	ECR0JGC392M□□125030
	4700	0.079	0.028	0.056	2220	12.5×35	ECR0JGC472M□□125035
		0.079	0.034	0.068	1660	16×20	ECR0JGC472M□□160020
	5600	0.071	0.026	0.052	2390	12.5×40	ECR0JGC562M□□125040
		0.071	0.028	0.056	2070	16×25	ECR0JGC562M□□160025
		0.071	0.03	0.06	1850	18×20	ECR0JGC562M□□180020
	6800	0.062	0.025	0.05	2350	16×31.5	ECR0JGC682M□□160031
		0.062	0.027	0.054	2120	18×25	ECR0JGC682M□□180025
	8200	0.058	0.022	0.044	2550	16×35.5	ECR0JGC822M□□160035
	10000	0.053	0.023	0.046	2410	18×31.5	ECR0JGC103M□□180031
	12000	0.049	0.02	0.04	2970	16×40	ECR0JGC123M□□160040
		0.049	0.02	0.04	2680	18×35.5	ECR0JGC123M□□180035
	15000	0.044	0.019	0.038	3010	18×40	ECR0JGC153M□□180040
10 (13) 1A	82	3.075	0.65	1.3	175	5×11.5	ECRIAGC820M□□050011
	100	2.521	0.46	0.92	235	5×15	ECRIAGC101M□□050015
	180	1.401	0.3	0.6	290	6.3×11.5	ECRIAGC181M□□063011
	220	1.146	0.2	0.4	400	6.3×15	ECRIAGC221M□□063015
	330	0.764	0.17	0.34	488	8×11.5	ECRIAGC331M□□080011
	470	0.536	0.13	0.26	617	8×16	ECRIAGC471M□□080016
		0.536	0.12	0.24	613	10×12.5	ECRIAGC471M□□100012
	560	0.45	0.095	0.19	734	10×16	ECRIAGC561M□□100016
	680	0.371	0.095	0.19	800	8×20	ECRIAGC681M□□080020
	1000	0.252	0.065	0.13	1010	10×20	ECRIAGC102M□□100020
		0.252	0.065	0.13	1010	12.5×15	ECRIAGC102M□□125015
	1200	0.21	0.055	0.11	1190	10×25	ECRIAGC122M□□100025
	1500	0.168	0.045	0.09	1440	10×30	ECRIAGC152M□□100030
	1800	0.14	0.042	0.084	1400	12.5×20	ECRIAGC182M□□125020
		0.14	0.046	0.092	1310	16×15	ECRIAGC182M□□160015
	2200	0.127	0.038	0.076	1690	12.5×25	ECRIAGC222M□□125025
		0.127	0.043	0.086	1460	18×15	ECRIAGC222M□□180015
	2700	0.103	0.032	0.064	1950	12.5×30	ECRIAGC272M□□125030
	3300	0.092	0.028	0.056	2220	12.5×35	ECRIAGC332M□□125035
		0.092	0.034	0.068	1660	16×20	ECRIAGC332M□□160020
	3900	0.078	0.026	0.052	2390	12.5×40	ECRIAGC392M□□125040
		0.078	0.028	0.056	2070	16×25	ECRIAGC392M□□160025
		0.078	0.03	0.06	1850	18×20	ECRIAGC392M□□180020
	4700	0.071	0.027	0.054	2120	18×25	ECRIAGC472M□□180025
	5600	0.064	0.025	0.05	2350	16×31.5	ECRIAGC562M□□160031
	6800	0.057	0.022	0.044	2550	16×35.5	ECRIAGC682M□□160035
		0.057	0.023	0.046	2410	18×31.5	ECRIAGC682M□□180031
	8200	0.053	0.02	0.04	2970	16×40	ECRIAGC822M□□160040
		0.053	0.02	0.04	2680	18×35.5	ECRIAGC822M□□180035
	10000	0.049	0.019	0.038	3010	18×40	ECRIAGC103M□□180040
16 (20) 1C	56	3.791	0.65	1.3	175	5×11.5	ECR1CGC560M□□050011
	82	2.589	0.46	0.92	235	5×15	ECR1CGC820M□□050015
	120	1.769	0.3	0.6	290	6.3×11.5	ECR1CGC121M□□063011
	180	1.180	0.2	0.4	400	6.3×15	ECR1CGC181M□□063015
	270	0.786	0.17	0.34	501	8×11.5	ECR1CGC271M□□080011
	330	0.643	0.13	0.26	575	8×16	ECR1CGC331M□□080016
		0.643	0.12	0.24	625	10×12.5	ECR1CGC331M□□100012
	390	0.544	0.095	0.19	795	10×16	ECR1CGC391M□□100016
	470	0.452	0.095	0.19	760	8×20	ECR1CGC471M□□080020
	680	0.312	0.065	0.13	1010	10×20	ECR1CGC681M□□100020
		0.312	0.065	0.13	1010	12.5×15	ECR1CGC681M□□125015
	820	0.259	0.055	0.11	1190	10×25	ECR1CGC821M□□100025
	1200	0.177	0.045	0.09	1430	10×30	ECR1CGC122M□□100030
		0.177	0.042	0.084	1400	12.5×20	ECR1CGC122M□□125020
	1500	0.142	0.038	0.076	1690	12.5×25	ECR1CGC152M□□125025
		0.142	0.046	0.092	1340	16×15	ECR1CGC152M□□160015
	0.142	0.043	0.086	1490	18×15	ECR1CGC152M□□180015	
2200	0.109	0.032	0.064	1950	12.5×30	ECR1CGC222M□□125030	
	0.109	0.034	0.068	1730	16×20	ECR1CGC222M□□160020	
	0.088	0.028	0.056	2200	12.5×35	ECR1CGC272M□□125035	
2700	0.088	0.028	0.056	2070	16×25	ECR1CGC272M□□160025	
	0.088	0.03	0.06	1870	18×20	ECR1CGC272M□□180020	
3300	0.08	0.026	0.052	2390	12.5×40	ECR1CGC332M□□125040	
	0.068	0.025	0.05	2350	16×31.5	ECR1CGC392M□□160031	
3900	0.068	0.027	0.054	2160	18×25	ECR1CGC392M□□180025	
	0.062	0.022	0.044	2550	16×35.5	ECR1CGC472M□□160035	
4700	0.062	0.023	0.046	2450	18×31.5	ECR1CGC472M□□180031	
5600	0.057	0.02	0.04	2900	16×40	ECR1CGC562M□□160040	
6800	0.051	0.02	0.04	2730	18×35.5	ECR1CGC682M□□180035	
8200	0.049	0.019	0.038	3060	18×40	ECR1CGC822M□□180040	
16 (20) 1C	39	4.763	0.65	1.3	175	5×11.5	ECR1EGC390M□□050011
	56	3.317	0.46	0.92	235	5×15	ECR1EGC560M□□050015
	82	2.266	0.3	0.6	290	6.3×11.5	ECR1EGC820M□□063011
	120	1.548	0.2	0.4	400	6.3×15	ECR1EGC121M□□063015
	180	1.032	0.17	0.34	503	8×11.5	ECR1EGC181M□□080011
	220	0.844	0.13	0.26	575	8×16	ECR1EGC221M□□080016
		0.844	0.12	0.24	629	10×12.5	ECR1EGC221M□□100012
	270	0.688	0.095	0.19	795	10×16	ECR1EGC271M□□100016
	330	0.563	0.095	0.19	751	8×20	ECR1EGC331M□□080020
	470	0.395	0.065	0.13	1010	10×20	ECR1EGC471M□□100020
		0.395	0.065	0.13	1010	12.5×15	ECR1EGC471M□□125015
	560	0.332	0.055	0.11	1190	10×25	ECR1EGC561M□□100025
	820	0.227	0.045	0.09	1440	10×30	ECR1EGC821M□□100030
		0.227	0.042	0.084	1400	12.5×20	ECR1EGC821M□□125020
		0.227	0.046	0.092	1360	16×15	ECR1EGC821M□□160015
	1000	0.186	0.038	0.076	1690	12.5×25	ECR1EGC102M□□125025
1200	0.155	0.043	0.086	1500	18×15	ECR1EGC122M□□180015	
1500	0.124	0.032	0.064	1950	12.5×30	ECR1EGC152M□□125030	
	0.124	0.034	0.068	1730	16×20	ECR1EGC152M□□160020	
1800	0.103	0.028	0.056	2200	12.5×35	ECR1EGC182M□□125035	
	0.103	0.028	0.056	2070	16×25	ECR1EGC182M□□160025	
	0.103	0.03	0.06	1890	18×20	ECR1EGC182M□□180020	
2200	0.097	0.026	0.052	2390	12.5×40	ECR1EGC222M□□125040	
2700	0.079	0.025	0.05	2350	16×31.5	ECR1EGC272M□□160031	
	0.079	0.027	0.054	2180	18×25	ECR1EGC272M□□180025	
3300	0.072	0.022	0.044	2550	16×35.5	ECR1EGC332M□□160035	
	0.072	0.023	0.046	2470	18×31.5	ECR1EGC332M□□180031	
3900	0.061	0.02	0.04	2900	16×40	ECR1EGC392M□□160040	
	0.061	0.02	0.04	2740	18×35.5	ECR1EGC392M□□180035	
4700	0.056	0.019	0.038	3070	18×40	ECR1EGC472M□□180040	
35 (44) 1V	27	5.898	0.65	1.3	175	5×11.5	ECR1VGC270M□□050011
	39	4.083	0.46	0.92	235	5×15	ECR1VGC390M□□050015
	56	2.843	0.3	0.6	290	6.3×11.5	ECR1VGC560M□□063011
	82	1.942	0.2	0.4	400	6.3×15	ECR1VGC820M□□063015
	120	1.327	0.17	0.34	501	8×11.5	ECR1VGC121M□□080011
	150	1.062	0.12	0.24	625	10×12.5	ECR1VGC151M□□100012
	180	0.885	0.13	0.26	575	8×16	ECR1VGC181M□□080016
		0.885	0.095	0.19	795	10×16	ECR1VGC181M□□100016
	220	0.724	0.095	0.19	760	8×20	ECR1VGC221M□□080020
	330	0.483	0.065	0.13	1010	10×20	ECR1VGC331M□□100020
		0.483	0.065				



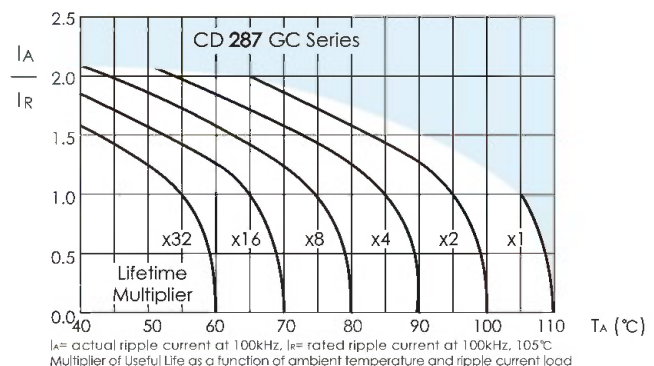
## Ratings for CD 287 GC Series

$U_k$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA rms)	(mm)	-
35 (44) 1V	1800	0.088	0.025	0.050	2350	16×31.5	ECR1VGC182M□□160031
		0.088	0.027	0.054	2200	18×25	ECR1VGC182M□□180025
	2200	0.084	0.022	0.044	2550	16×35.5	ECR1VGC222M□□160035
		0.084	0.023	0.046	2490	18×31.5	ECR1VGC222M□□180031
	2700	0.069	0.020	0.040	2900	16×40	ECR1VGC272M□□160040
		0.069	0.020	0.040	2770	18×35.5	ECR1VGC272M□□180035
	3300	0.064	0.019	0.038	3110	18×40	ECR1VGC332M□□180040
	0.47	282.333	3.9	7.8	22	5×11.5	ECR1HGC47M□□050011
	1	132.696	3.5	7.0	36	5×11.5	ECR1HGC010M□□050011
	2.2	60.317	3.0	6.0	54	5×11.5	ECR1HGC22M□□050011
50 (63) 1H	3.3	40.211	2.6	5.2	63	5×11.5	ECR1HGC33M□□050011
	4.7	28.233	2.2	4.4	75	5×11.5	ECR1HGC47M□□050011
	10	13.270	1.4	2.8	110	5×11.5	ECR1HGC100M□□050011
	18	7.372	0.95	1.9	120	5×11.5	ECR1HGC180M□□050011
	27	4.915	0.55	1.1	135	5×11.5	ECR1HGC270M□□050015
	39	3.402	0.36	0.72	148	6.3×11.5	ECR1HGC390M□□063011
	56	2.370	0.28	0.56	153	6.3×15	ECR1HGC560M□□063015
	68	1.951	0.20	0.40	160	8×11.5	ECR1HGC680M□□080011
	82	1.618	0.18	0.36	160	8×16	ECR1HGC820M□□080016
	100	1.327	0.15	0.30	160	10×12.5	ECR1HGC100M□□100012
	120	1.106	0.13	0.26	160	10×16	ECR1HGC120M□□100016
	180	0.737	0.095	0.19	160	10×20	ECR1HGC180M□□100020
	220	0.737	0.105	0.21	160	12.5×15	ECR1HGC220M□□125015
	270	0.603	0.080	0.16	160	10×25	ECR1HGC270M□□100025
	330	0.402	0.065	0.13	160	10×30	ECR1HGC330M□□100030
	390	0.402	0.070	0.14	160	12.5×20	ECR1HGC390M□□125020
	470	0.282	0.054	0.108	160	16×15	ECR1HGC470M□□160015
	560	0.282	0.058	0.116	160	18×15	ECR1HGC560M□□180015
	680	0.237	0.050	0.1	160	12.5×30	ECR1HGC680M□□125030
	820	0.195	0.046	0.092	160	12.5×35	ECR1HGC820M□□125035
	1000	0.195	0.050	0.1	160	16×20	ECR1HGC1000M□□160020
	1200	0.162	0.044	0.088	160	12.5×40	ECR1HGC1200M□□125040
	1500	0.162	0.048	0.096	160	16×25	ECR1HGC1500M□□160025
	1800	0.162	0.046	0.092	160	18×20	ECR1HGC1800M□□180020
	2200	0.133	0.040	0.08	160	16×31.5	ECR1HGC2200M□□160031
	2700	0.133	0.040	0.08	160	18×25	ECR1HGC2700M□□180025
	3300	0.111	0.032	0.064	160	16×35.5	ECR1HGC3300M□□160035
	3900	0.088	0.026	0.052	160	16×40	ECR1HGC3900M□□160040
	4700	0.088	0.026	0.052	160	18×31.5	ECR1HGC4700M□□180031
	5600	0.074	0.025	0.050	160	18×35.5	ECR1HGC5600M□□180035
	6800	0.072	0.024	0.048	160	18×40	ECR1HGC6800M□□180040
63 (79) 1J	12	9.952	1.2	3.6	120	5×11.5	ECR1JGC120M□□050011
	18	6.635	0.85	2.6	135	5×15	ECR1JGC180M□□050015
	27	4.423	0.55	1.7	148	6.3×11.5	ECR1JGC270M□□063011
	39	3.062	0.38	1.1	153	6.3×15	ECR1JGC390M□□063015
	47	2.541	0.32	0.96	160	8×11.5	ECR1JGC470M□□080011
	56	2.133	0.23	0.69	160	10×12.5	ECR1JGC560M□□100012
	68	1.756	0.24	0.72	160	8×16	ECR1JGC680M□□080016
	82	1.456	0.17	0.51	160	10×16	ECR1JGC820M□□100016
	100	1.456	0.17	0.51	160	10×20	ECR1JGC100M□□100020
	120	0.995	0.12	0.36	160	10×25	ECR1JGC120M□□100025
	150	0.796	0.10	0.30	160	12.5×20	ECR1JGC150M□□125020
	180	0.796	0.11	0.33	160	12.5×25	ECR1JGC180M□□125025
	220	0.663	0.085	0.26	160	10×30	ECR1JGC220M□□100030
	270	0.543	0.075	0.23	160	12.5×30	ECR1JGC270M□□125025
	330	0.543	0.080	0.24	160	16×15	ECR1JGC330M□□160015
	390	0.442	0.065	0.20	160	12.5×25	ECR1JGC390M□□125025
	470	0.362	0.065	0.20	160	18×15	ECR1JGC470M□□180015
	560	0.306	0.055	0.17	160	12.5×30	ECR1JGC560M□□125030
	680	0.306	0.057	0.17	160	16×20	ECR1JGC680M□□160020
	820	0.254	0.048	0.14	160	12.5×35	ECR1JGC820M□□125035
	1000	0.254	0.052	0.16	160	16×25	ECR1JGC1000M□□160025
	1200	0.254	0.058	0.17	160	18×20	ECR1JGC1200M□□180020
	1500	0.213	0.042	0.13	160	12.5×40	ECR1JGC1500M□□125040
	1800	0.176	0.042	0.13	160	16×31.5	ECR1JGC1800M□□160031
	2200	0.176	0.050	0.15	160	18×25	ECR1JGC2200M□□180025
	2700	0.146	0.036	0.11	160	16×35.5	ECR1JGC2700M□□160035
	3300	0.146	0.042	0.13	160	18×31.5	ECR1JGC3300M□□180031
	3900	0.119	0.032	0.096	160	16×40	ECR1JGC3900M□□160040
	4700	0.119	0.035	0.11	160	18×35.5	ECR1JGC4700M□□180035
	5600	0.100	0.032	0.096	160	18×40	ECR1JGC5600M□□180040

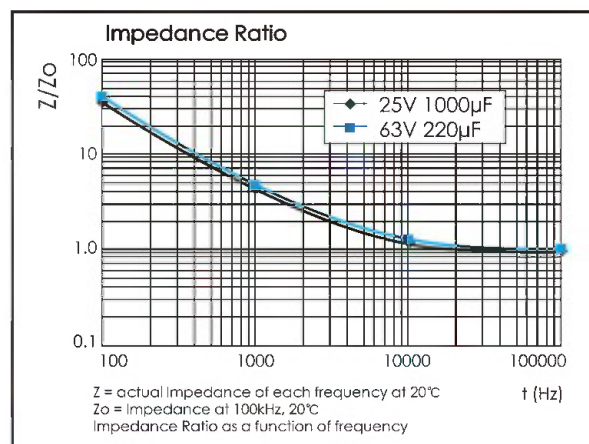
$U_k$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA rms)	(mm)	-
100 (125) 2A	5.6	18.957	1.9	7.6	57	5×11.5	ECR2AGC56M□□050011
	8.2	12.946	1.3	5.2	74	5×15	ECR2AGC82M□□050015
	12	8.846	1.1	4.4	78	6.3×11.5	ECR2AGC120M□□063011
	18	5.898	0.62	2.5	85	6.3×15	ECR2AGC180M□□063015
	22	4.825	0.53	2.1	275	8×11.5	ECR2AGC220M□□080011
	27	3.932	0.47	1.9	319	10×12.5	ECR2AGC270M□□100012
	33	3.217	0.35	1.4	360	8×16	ECR2AGC330M□□080016
	39	3.217	0.32	1.3	424	10×16	ECR2AGC390M□□100016
	47	2.722	0.27	1.1	490	8×20	ECR2AGC470M□□080020
	56	1.896	0.25	1.0	499	10×20	ECR2AGC560M□□100020
100 (125) 2A	68	1.561	0.18	0.72	634	10×25	ECR2AGC680M□□100025
	82	1.561	0.20	0.80	613	12.5×15	ECR2AGC820M□□125015
	100	1.062	0.15	0.60	739	10×30	ECR2AGC100M□□100030
	120	1.062	0.13	0.52	805	12.5×20	ECR2AGC120M□□125020
	150	0.885	0.11	0.44	857	12.5×25	ECR2AGC150M□□125025
	180	0.885	0.13	0.50	706	16×15	ECR2AGC180M□□160015
	220	0.708	0.12	0.48	871	18×15	ECR2AGC220M□□180015
	270	0.590	0.090	0.36	1120	12.5×30	ECR2AGC270M□□125030
	330	0.590	0.11	0.44	916	16×20	ECR2AGC330M□□160020
	390	0.483	0.075	0.30	1240	12.5×35	ECR2AGC390M□□125035
100 (125) 2A	470	0.483	0.081	0.32	1290	16×25	ECR2AGC470M□□160025
	560	0.393	0.060	0.24	1330	12.5×40	ECR2AGC560M□□125040
	680	0.393	0.085	0.34	1170	18×20	ECR2AGC680M□□180020
	820	0.322	0.059	0.23	1630	16×31.5	ECR2AGC820M□□160031
	1000	0.322	0.071	0.28	1500	18×25	ECR2AGC1000M□□180025
	1200	0.272	0.052	0.21	1750	16×35.5	ECR2AGC1200M□□160035
	1500	0.272	0.058	0.23	1630	18×31.5	ECR2AGC1500M□□180031
	1800	0.226	0.045	0.18	1920	16×40	ECR2AGC1800M□□160040
	2200	0.190	0.054	0.22	1920	18×35.5	ECR2AGC2200M□□180035
	2700	0.156	0.041	0.16	2100	18×40	ECR2AGC2700M□□180040

Customer products are available on request.

## Lifetime Diagram



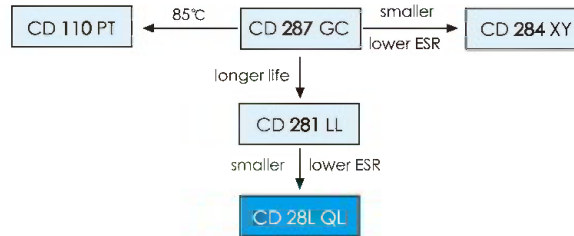
## Typical Curves





2000 - 8000h at 105°C

- Miniaturized
- Low Impedance, High Current
- Switching Power Supply

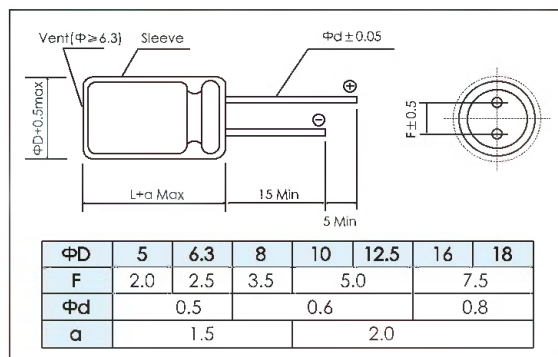


Items	Characteristics							
Operating Temperature Range (°C)	-55 ~ +105							
Voltage Range (V)	6.3 ~ 63							
Capacitance Range (μF)	12 ~ 18000							
Capacitance Tolerance (20°C, 120Hz)	± 20%							
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater. C: Nominal Capacitance (μF)   V: Rated Voltage (V)							
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63
	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.08
	For Capacitances >1000μF add 0.02 to every 1000μF							
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)	6.3 ~ 63						
	Z <sub>-55℃</sub> / Z <sub>+20℃</sub>	3						

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	$\Phi \leq 6.3$ : 4000h $\Phi 8$ : 6000h $\Phi 10$ : 10000h $\Phi 12.5$ : 12000h $\Phi \geq 16$ : 14000h	$\Phi \geq 8$ : > 250000h	$\Phi \leq 6.3$ : 2000h $\Phi 8$ : 3000h $\Phi 10$ : 5000h $\Phi 12.5$ : 7000h $\Phi \geq 16$ : 8000h	$\Phi \leq 6.3$ : 3000h $\Phi 8$ : 5000h $\Phi 10$ : 7000h $\Phi 12.5$ : 9000h $\Phi \geq 16$ : 10000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.4 x I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	After test: U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C >24h before measurement

## Dimensions

mm



## Frequency Coefficient

Frequency	120Hz	1kHz	10kHz	100kHz
Cap (μF)				
12 ~ 180	0.40	0.75	0.90	1.00
220 ~ 560	0.50	0.83	0.93	1.00
680 ~ 1800	0.60	0.86	0.95	1.00
2200 ~ 3900	0.75	0.90	0.97	1.00
4700 ~ 18000	0.85	0.95	0.98	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



## Ratings for CD 28L QL Series

MINIATURE

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
6.3 (7.2) 0J	150	1.946	0.5	1	175	5×11.5	ECR0JQL151M□□050011
	330	0.885	0.25	0.5	290	6.3×11.5	ECR0JQL331M□□063011
	470	0.621	0.18	0.36	400	6.3×15	ECR0JQL471M□□063015
	680	0.429	0.12	0.24	555	8×11.5	ECR0JQL681M□□080011
	820	0.356	0.09	0.18	760	10×12.5	ECR0JQL821M□□100012
	1000	0.292	0.09	0.18	730	8×16	ECR0JQL102M□□080016
	1200	0.243	0.08	0.16	810	8×20	ECR0JQL122M□□080020
		0.243	0.068	0.136	1050	10×16	ECR0JQL122M□□100016
	1500	0.195	0.052	0.104	1220	10×20	ECR0JQL152M□□100020
	2200	0.145	0.045	0.09	1440	10×25	ECR0JQL222M□□100025
	2700	0.118	0.037	0.074	1690	10×30	ECR0JQL272M□□100030
	3300	0.105	0.038	0.076	1660	12.5×20	ECR0JQL332M□□125020
	3900	0.088	0.03	0.06	1950	12.5×25	ECR0JQL392M□□125025
	4700	0.079	0.025	0.05	2310	12.5×30	ECR0JQL472M□□125030
	5600	0.071	0.022	0.044	2510	12.5×35	ECR0JQL562M□□125035
		0.071	0.029	0.058	2210	16×20	ECR0JQL562M□□160020
	6800	0.062	0.017	0.034	2870	12.5×40	ECR0JQL682M□□125040
		0.062	0.022	0.044	2560	16×25	ECR0JQL682M□□160025
		0.062	0.028	0.056	2490	18×20	ECR0JQL682M□□180020
	8200	0.058	0.019	0.038	3010	16×31.5	ECR0JQL822M□□160031
	10000	0.053	0.017	0.034	3150	16×35.5	ECR0JQL103M□□160035
		0.053	0.02	0.04	2740	18×25	ECR0JQL103M□□180025
	12000	0.049	0.015	0.03	3710	16×40	ECR0JQL123M□□160040
		0.049	0.018	0.036	3330	18×31.5	ECR0JQL123M□□180031
	15000	0.044	0.016	0.032	3680	18×35.5	ECR0JQL153M□□180035
	18000	0.041	0.015	0.03	3800	18×40	ECR0JQL183M□□180040
10 (13) 1A	100	2.521	0.5	1	175	5×11.5	ECR1AQL101M□□050011
	220	1.146	0.25	0.5	290	6.3×11.5	ECR1AQL221M□□063011
	330	0.764	0.18	0.36	400	6.3×15	ECR1AQL331M□□063015
	470	0.536	0.12	0.24	555	8×11.5	ECR1AQL471M□□080011
	680	0.371	0.09	0.18	730	8×16	ECR1AQL681M□□080016
		0.371	0.09	0.18	760	10×12.5	ECR1AQL681M□□100012
	1000	0.252	0.08	0.16	810	8×20	ECR1AQL102M□□080020
		0.252	0.068	0.136	1050	10×16	ECR1AQL102M□□100016
	1200	0.21	0.052	0.104	1220	10×20	ECR1AQL122M□□100020
	1500	0.168	0.045	0.09	1440	10×25	ECR1AQL152M□□100025
	1800	0.14	0.037	0.074	1690	10×30	ECR1AQL182M□□100030
	2200	0.127	0.038	0.076	1660	12.5×20	ECR1AQL222M□□125020
	3300	0.092	0.03	0.06	1950	12.5×25	ECR1AQL332M□□125025
	3900	0.078	0.025	0.05	2310	12.5×30	ECR1AQL392M□□125030
		0.078	0.029	0.058	2210	16×20	ECR1AQL392M□□160020
	4700	0.071	0.022	0.044	2510	12.5×35	ECR1AQL472M□□125035
	5600	0.064	0.017	0.034	2870	12.5×40	ECR1AQL562M□□125040
		0.064	0.022	0.044	2560	16×25	ECR1AQL562M□□160025
		0.064	0.028	0.056	2490	18×20	ECR1AQL562M□□180020
	6800	0.057	0.019	0.038	3010	16×31.5	ECR1AQL682M□□160031
		0.057	0.02	0.04	2740	18×25	ECR1AQL682M□□180025
	8200	0.053	0.017	0.034	3150	16×35.5	ECR1AQL822M□□160035
		0.053	0.018	0.036	3330	18×31.5	ECR1AQL822M□□180031
	10000	0.049	0.015	0.03	3710	16×40	ECR1AQL103M□□160040
		0.049	0.016	0.032	3680	18×35.5	ECR1AQL103M□□180035
	12000	0.045	0.015	0.03	3800	18×40	ECR1AQL123M□□180040

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
16 (20) 1C	47	4.517	0.5	1	175	5×11.5	ECR1CQL470M□□050011
	100	2.123	0.25	0.5	290	6.3×11.5	ECR1CQL101M□□063011
	220	0.965	0.18	0.36	400	6.3×15	ECR1CQL221M□□063015
	330	0.643	0.12	0.24	555	8×11.5	ECR1CQL331M□□080011
	470	0.452	0.09	0.18	730	8×16	ECR1CQL471M□□080016
		0.452	0.09	0.18	760	10×12.5	ECR1CQL471M□□100012
	560	0.379	0.08	0.16	810	8×20	ECR1CQL561M□□080020
	680	0.312	0.068	0.136	1050	10×16	ECR1CQL681M□□100016
	1000	0.212	0.052	0.104	1220	10×20	ECR1CQL102M□□100020
	1200	0.177	0.045	0.09	1440	10×25	ECR1CQL122M□□100025
	1500	0.142	0.037	0.074	1690	10×30	ECR1CQL152M□□100030
		0.142	0.038	0.076	1660	12.5×20	ECR1CQL152M□□125020
	2200	0.109	0.03	0.06	1950	12.5×25	ECR1CQL222M□□125025
	2700	0.088	0.025	0.05	2310	12.5×30	ECR1CQL272M□□125030
		0.088	0.029	0.058	2210	16×20	ECR1CQL272M□□160020
	3300	0.08	0.022	0.044	2510	12.5×35	ECR1CQL332M□□125035
	3900	0.068	0.017	0.034	2870	12.5×40	ECR1CQL392M□□125040
		0.068	0.022	0.044	2560	16×25	ECR1CQL392M□□160025
		0.068	0.028	0.056	2490	18×20	ECR1CQL392M□□180020
	4700	0.062	0.019	0.038	3010	16×31.5	ECR1CQL472M□□160031
		0.062	0.02	0.04	2740	18×25	ECR1CQL472M□□180025
	5600	0.057	0.017	0.034	3150	16×35.5	ECR1CQL562M□□160035
		0.057	0.018	0.036	3330	18×31.5	ECR1CQL562M□□180031
	6800	0.051	0.015	0.03	3710	16×40	ECR1CQL682M□□160040
	8200	0.049	0.016	0.032	3680	18×35.5	ECR1CQL822M□□180035
	10000	0.045	0.015	0.03	3800	18×40	ECR1CQL103M□□180040
25 (32) 1E	47	3.953	0.5	1	175	5×11.5	ECR1EQL470M□□050011
	100	1.858	0.25	0.5	290	6.3×11.5	ECR1EQL101M□□063011
	150	1.238	0.18	0.36	400	6.3×15	ECR1EQL151M□□063015
	220	0.844	0.12	0.24	555	8×11.5	ECR1EQL221M□□080011
	330	0.563	0.09	0.18	730	8×16	ECR1EQL331M□□080016
		0.563	0.09	0.18	760	10×12.5	ECR1EQL331M□□100012
	390	0.476	0.08	0.16	810	8×20	ECR1EQL391M□□080020
	470	0.395	0.068	0.136	1050	10×16	ECR1EQL471M□□100016
	680	0.273	0.052	0.104	1220	10×20	ECR1EQL681M□□100020
	820	0.227	0.045	0.09	1440	10×25	ECR1EQL821M□□100025
	1000	0.186	0.037	0.074	1690	10×30	ECR1EQL102M□□100030
		0.186	0.038	0.076	1660	12.5×20	ECR1EQL102M□□125020
	1500	0.124	0.03	0.06	1950	12.5×25	ECR1EQL152M□□125025
	1800	0.103	0.025	0.05	2310	12.5×30	ECR1EQL182M□□125030
		0.103	0.029	0.058	2210	16×20	ECR1EQL182M□□160020
	2200	0.097	0.025	0.05	2310	12.5×30	ECR1EQL222M□□125030
		0.097	0.022	0.044	2510	12.5×35	ECR1EQL222M□□125035
		0.097	0.028	0.056	2490	18×20	ECR1EQL222M□□180020
	2700	0.079	0.017	0.034	2870	12.5×40	ECR1EQL272M□□125040
		0.079	0.022	0.044	2560	16×25	ECR1EQL272M□□160025
	3300	0.072	0.022	0.044	2560	16×25	ECR1EQL332M□□160025
		0.072	0.019	0.038	3010	16×31.5	ECR1EQL332M□□160031
		0.072	0.028	0.056	2490	18×20	ECR1EQL332M□□180020
	3900	0.072	0.02	0.04	2740	18×25	ECR1EQL332M□□180025
		0.061	0.017	0.034	3150	16×35.5	ECR1EQL392M□□160035
	4700	0.061	0.018	0.036	3330	18×31.5	ECR1EQL392M□□180031



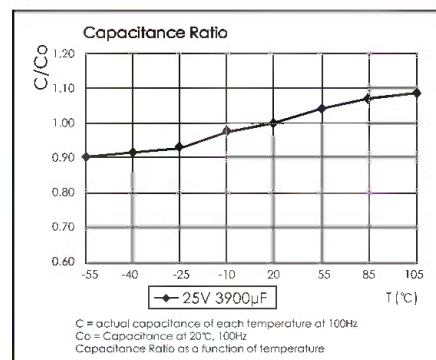
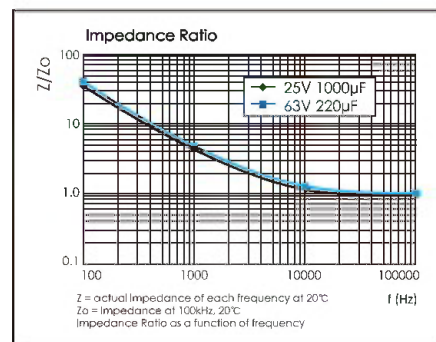
## Ratings for CD 28L QL Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120kHz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	-
25 (32) 1E	4700	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	560	0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	33	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	56	0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
35 (44) 1V	33	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	56	0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	100	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	150	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	220	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	270	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	330	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	470	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	560	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
50 (63) 1H	1000	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	1200	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	1500	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	1800	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	2200	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	2700	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	3300	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	3900	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040
	4700	0.056	0.015	0.03	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
		0.052	0.015	0.03	3800	18×40	ECR1EQL562M□□180040

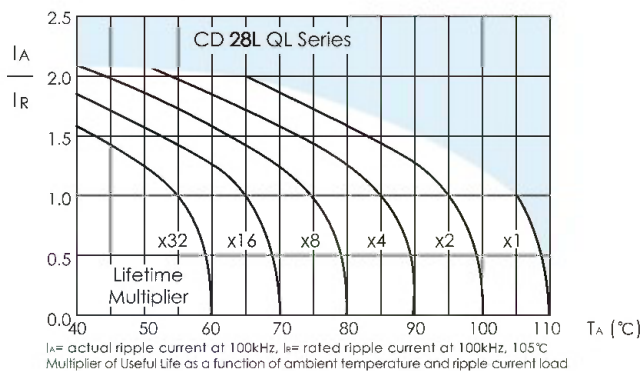
U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120kHz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	-
50 (63) 1H	1000	0.133	0.029	0.058	2500	12.5×40	ECR1HQL102M□□125040
		0.133	0.034	0.068	2240	16×25	ECR1HQL102M□□160025
		0.111	0.028	0.056	2700	16×31.5	ECR1HQL122M□□160031
	1200	0.111	0.029	0.058	2610	18×25	ECR1HQL122M□□180025
		0.088	0.025	0.05	2800	16×35.5	ECR1HQL152M□□160035
		0.074	0.021	0.042	3200	16×40	ECR1HQL182M□□160040
	1500	0.074	0.025	0.05	3000	18×31.5	ECR1HQL182M□□180031
		0.072	0.023	0.046	3100	18×35.5	ECR1HQL222M□□180035
		0.059	0.022	0.044	3400	18×40	ECR1HQL272M□□180040
	1800	0.059	0.022	0.044	3400	18×40	ECR1HQL272M□□180040
		0.059	0.022	0.044	3400	18×40	ECR1HQL272M□□180040
		0.059	0.022	0.044	3400	18×40	ECR1HQL272M□□180040
63 (79) 1J	12	8.846	1.9	4	145	5×11.5	ECR1JQL120M□□050011
		4.825	1	2	240	6.3×11.5	ECR1JQL220M□□063011
		2.722	0.61	1.4	330	6.3×15	ECR1JQL390M□□063015
	39	1.561	0.34	0.75	405	8×11.5	ECR1JQL680M□□080011
		1.062	0.27	0.65	535	8×16	ECR1JQL101M□□080016
		1.062	0.255	0.51	540	10×12.5	ECR1JQL101M□□100012
	68	0.885	0.19	0.38	600	10×16	ECR1JQL121M□□100016
		0.708	0.21	0.52	690	8×20	ECR1JQL151M□□080020
		0.59	0.145	0.29	890	10×20	ECR1JQL181M□□100020
	100	0.483	0.13	0.26	1050	10×25	ECR1JQL221M□□100025
		0.322	0.09	0.18	1300	10×30	ECR1JQL331M□□100030
		0.322	0.085	0.17	1290	12.5×20	ECR1JQL331M□□125020
	120	0.272	0.07	0.14	1720	12.5×25	ECR1JQL391M□□125025
		0.226	0.055	0.11	2090	12.5×30	ECR1JQL471M□□125030
		0.226	0.059	0.12	1770	16×20	ECR1JQL471M□□160020
	150	0.156	0.047	0.094	2270	12.5×35	ECR1JQL681M□□125035
		0.156	0.05	0.1	2160	16×25	ECR1JQL681M□□160025
		0.156	0.055	0.11	2290	18×20	ECR1JQL681M□□180020
	180	0.129	0.042	0.084	2560	12.5×40	ECR1JQL821M□□125040
		0.129	0.043	0.086	2670	16×31.5	ECR1JQL821M□□160031
		0.129	0.043	0.086	2590	18×25	ECR1JQL821M□□180025
	220	0.106	0.043	0.086	2670	16×31.5	ECR1JQL102M□□160031
		0.106	0.036	0.072	2770	16×35.5	ECR1JQL102M□□160035
		0.088	0.03	0.06	2850	16×40	ECR1JQL122M□□160040
	270	0.088	0.032	0.064	2950	18×31.5	ECR1JQL122M□□180031
		0.071	0.03	0.06	3100	18×35.5	ECR1JQL152M□□180035
		0.059	0.025	0.05	3210	18×40	ECR1JQL182M□□180040
	330	0.048	0.025	0.05	3210	18×40	ECR1JQL222M□□180040
		0.048	0.025	0.05	3210	18×40	ECR1JQL222M□□180040
		0.048	0.025	0.05	3210	18×40	ECR1JQL222M□□180040

Customer products are available on request.

## Typical Curves



## Lifetime Diagram





# CD 28XL KL SERIES



10000h at 105°C

- Miniaturized Long Life
- Suited for LED Lighting



MINIATURE

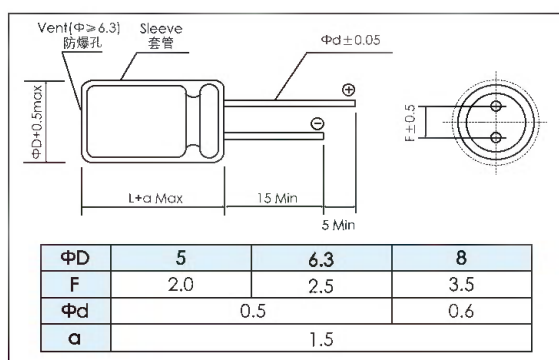
Items	Characteristics							
Operating Temperature Range (°C)	-55 ~ 105							
Rated Voltage Range (V)	10 ~ 100							
Capacitance Range (μF)	0.47 ~ 330							
Capacitance Tolerance (20°C, 120Hz)	± 20%							
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3uA, whichever is greater. C: Nominal Capacitance(μF) V: Rated Voltage(V)							
Dissipation Factor (20°C, 120Hz)	WV (V)	10	16	25	35	50	63	100
	Tan δ (max)	0.19	0.16	0.14	0.12	0.10	0.09	0.08
Characteristics of Low Temperature (120Hz)	Rated Voltage (V)	10	16	25	35	50	63	100
	$Z_{-25^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}}$	3	2	2	2	2	2	2
	$Z_{-40^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}}$	6	4	3	3	3	3	3

	Useful Life		Load Life	Endurance Life	Shelf Life
Lifetime	12000h	≥ 110000h	10000h	10000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 25% of initial value	Within ± 25% of initial value	Within ± 20% of initial value
Dissipation Factor	No more than 300% of specified value		Not more than 300% of specified value	Not more than 300% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 105°C	$U_R$ $1.4 \times I_R$ 60°C	$U_R$ $I_R$ 105°C	$U_R$ $I_R = 0$ 105°C	No voltage applied After test: $U_R$ to be applied for 30min, 24 to 48h before measurement

## Dimensions

mm

## Frequency Coefficient



Cap (μF)	Freq(Hz)			
	120	1k	10k	100k
0.47~10	0.42	0.60	0.80	1.00
22~33	0.55	0.75	0.90	1.00
47~330	0.70	0.85	0.95	1.00

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.96	1.68	1.00



## Ratings for CD 28XL KL Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance 20°C, 120Hz	Rated Ripple Current 105°C, 100KHz	Size ΦD x L	P/N
(V)	(μF)	(mA <sub>rms</sub> )	(mm)	-
10 (13) 1A	100	130	5×11.5	ECR1AKL101M□□050011
	220	210	6.3×11.5	ECR1AKL221M□□063011
	330	330	8×11.5	ECR1AKL331M□□080011
16 (20) 1C	47	130	5×11.5	ECR1CKL470M□□050011
	100	210	6.3×11.5	ECR1CKL101M□□063011
	220	330	8×11.5	ECR1CKL221M□□080011
25 (32) 1E	33	130	5×11.5	ECR1EKL330M□□050011
	47	130	5×11.5	ECR1EKL470M□□050011
	100	210	6.3×11.5	ECR1EKL101M□□063011
35 (44) 1V	33	130	5×11.5	ECR1VKL330M□□050011
	47	210	6.3×11.5	ECR1VKL470M□□063011
	100	330	8×11.5	ECR1VKL101M□□080011
50 (63) 1H	0.47	12	5×11.5	ECR1HKL47M□□050011
	1	25	5×11.5	ECR1HKL010M□□050011
	2.2	35	5×11.5	ECR1HKL2R2M□□050011
	3.3	70	5×11.5	ECR1HKL3R3M□□050011
	4.7	80	5×11.5	ECR1HKL4R7M□□050011
	10	90	5×11.5	ECR1HKL100M□□050011
	22	110	5×11.5	ECR1HKL220M□□050011
	33	190	6.3×11.5	ECR1HKL330M□□063011
	47	190	6.3×11.5	ECR1HKL470M□□063011
63 (79) 1J	100	270	8×11.5	ECR1HKL101M□□080011
	10	80	5×11.5	ECR1JKL100M□□050011
	22	170	6.3×11.5	ECR1JKL220M□□063011
	33	170	6.3×11.5	ECR1JKL330M□□063011
100 (125) 2A	47	240	8×11.5	ECR1JKL470M□□080011
	0.47	20	5×11.5	ECR2AKL47M□□050011
	1	40	5×11.5	ECR2AKL010M□□050011
	2.2	50	5×11.5	ECR2AKL2R2M□□050011
	3.3	60	5×11.5	ECR2AKL3R3M□□050011
	4.7	70	5×11.5	ECR2AKL4R7M□□050011
	10	150	6.3×11.5	ECR2AKL100M□□063011
	22	230	8×11.5	ECR2AKL220M□□080011

MINIATURE

Customer products are available on request.



# CD 117H DH SERIES



2000h at 105°C

- Load life of 2000 hours at 105°C
- Low Leakage Current
- Close Tolerance

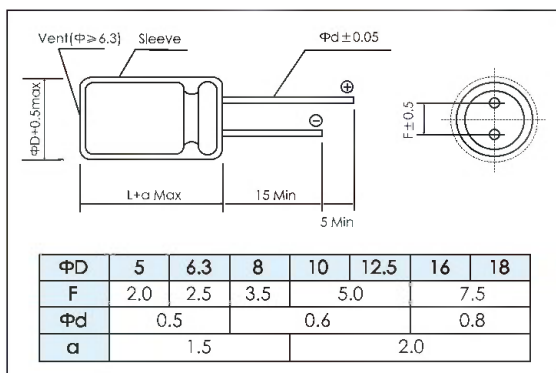


Items	Characteristics									
Operating Temperature Range (°C)	-40 ~ +105									
Capacitance Tolerance (20°C, 120Hz)	± 20% or ± 10%									
Leakage Current (μA)	After 1 minute at 20°C application of rated voltage, leakage current is not more than 0.008CV or 1.0μA, whichever is greater. C: Nominal Capacitance [μF]    V: Rated Voltage [V]									
Dissipation Factor (20°C, 120Hz)	Rated Voltage (V)		6.3	10	16	25	35	50	63	100
	Tan δ (max)	≤ Φ10×12.5	0.18	0.15	0.12	0.08	0.08	0.08	0.07	0.07
		≥ Φ10×16	0.21	0.17	0.14	0.12	0.12	0.1	0.08	0.08
Stability at Low Temperature (Impedance Ratio at 120Hz)	Rated Voltage (V)		6.3	10	16	25	35	50	63	100
	Impedance ratio	Z <sub>-25℃</sub> / Z <sub>+20℃</sub>	4	3	2	1.5				
		Z <sub>-40℃</sub> / Z <sub>+20℃</sub>	8	6	4		3			

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	3000h	200000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 15% of initial value	Within ± 15% of initial value	Within ± 15% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 150% of specified value	Not more than 150% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> 1.2 × I <sub>R</sub> 40°C	U <sub>R</sub> I <sub>R</sub> 105°C	U <sub>R</sub> I <sub>R</sub> = 0 105°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 105°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

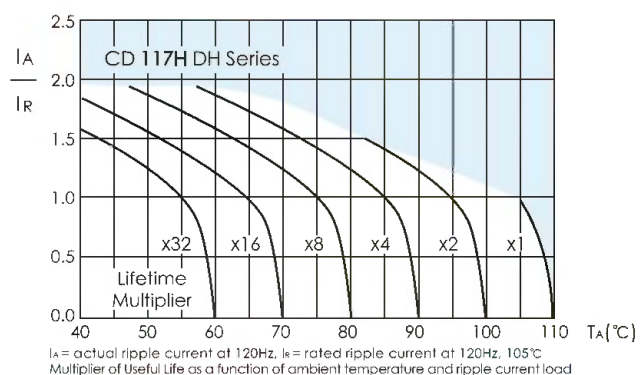
mm



## Frequency Coefficient

Cap (μF)	Frequency	50~60Hz	120Hz	1kHz	≥ 10kHz
10 ~ 68		0.75	1.00	1.57	2.10
100 ~ 680		0.80	1.00	1.34	1.50
1000 ~ 10000		0.85	1.00	1.13	1.15

## Lifetime Diagram



## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.80	1.40	1.00



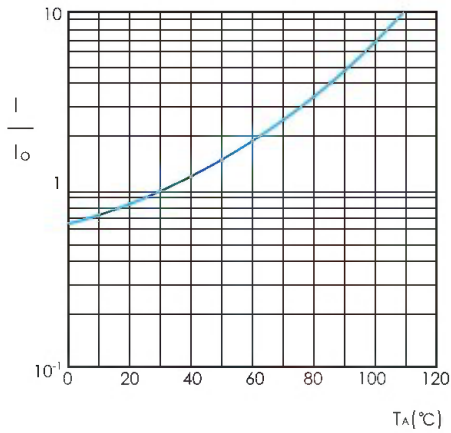
## Ratings for CD 117H DH Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N	U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mAmps)	(mm)	-	(V)	(μF)	(Ω)	(mAmps)	(mm)	-
6.3 (7.2) 0J	470	0.51	390	10×12.5	ECR0JDH471M□□100012	50 (63) 1H	0.1	1061.57	1.1	5×11.5	ECR1HDH0R1M□□050011
	680	0.41	480	10×16	ECR0JDH681M□□100016		0.15	707.71	1.6	5×11.5	ECR1HDH0R15M□□050011
	1000	0.28	650	10×20	ECR0JDH102M□□100020		0.22	482.53	2.3	5×11.5	ECR1HDH0R22M□□050011
	1500	0.19	910	12.5×25	ECR0JDH152M□□125025		0.33	321.69	3.5	5×11.5	ECR1HDH0R33M□□050011
	2200	0.13	1060	12.5×25	ECR0JDH222M□□125025		0.47	225.87	5.0	5×11.5	ECR1HDH0R47M□□050011
	3300	0.08	1270	16×25	ECR0JDH332M□□160025		0.68	156.11	7.3	5×11.5	ECR1HDH0R68M□□050011
	4700	0.06	1500	16×31.5	ECR0JDH472M□□160031		1	106.16	10.7	5×11.5	ECR1HDH0R10M□□050011
	6800	0.04	1760	18×35.5	ECR0JDH682M□□180035		1.5	70.77	16	5×11.5	ECR1HDH0R15M□□050011
	10000	0.03	1900	18×40	ECR0JDH103M□□180040		2.2	48.25	23	5×11.5	ECR1HDH0R22M□□050011
							3.3	32.17	40	5×11.5	ECR1HDH0R33M□□050011
10 (13) 1A	47	4.23	110	5×11.5	ECR1ADH470M□□050011		4.7	22.59	45	5×11.5	ECR1HDH0R47M□□050011
	68	2.93	150	6.3×11.5	ECR1ADH680M□□063011		6.8	15.61	55	5×11.5	ECR1HDH0R68M□□050011
	100	1.99	180	6.3×11.5	ECR1ADH101M□□063011		10	10.62	70	5×11.5	ECR1HDH0R10M□□050011
	150	1.33	250	8×11.5	ECR1ADH151M□□080011		15	7.08	95	6.3×11.5	ECR1HDH0R15M□□063011
	220	0.90	310	8×11.5	ECR1ADH221M□□080011		22	4.83	110	6.3×11.5	ECR1HDH0R22M□□063011
	330	0.60	400	10×12.5	ECR1ADH331M□□100012		33	3.22	165	8×11.5	ECR1HDH0R33M□□080011
	470	0.48	530	10×16	ECR1ADH471M□□100016		47	2.26	190	8×11.5	ECR1HDH0R47M□□080011
	680	0.33	600	10×20	ECR1ADH681M□□100020		68	1.56	250	10×12.5	ECR1HDH0R68M□□100012
	1000	0.23	810	12.5×20	ECR1ADH102M□□125020		100	1.33	320	10×16	ECR1HDH0R10M□□100016
	1500	0.15	1020	12.5×25	ECR1ADH152M□□125025		150	0.88	420	10×20	ECR1HDH0R15M□□100020
16 (20) 1C	2200	0.10	1200	16×25	ECR1ADH222M□□160025		220	0.60	490	12.5×20	ECR1HDH0R22M□□125020
	3300	0.07	1420	16×31.5	ECR1ADH332M□□160031		330	0.40	600	12.5×20	ECR1HDH0R33M□□125020
	4700	0.05	1650	16×35.5	ECR1ADH472M□□160035		470	0.28	760	16×25	ECR1HDH0R47M□□160025
	6800	0.03	1890	18×35.5	ECR1ADH682M□□180035		680	0.20	910	16×25	ECR1HDH0R68M□□160025
	10	15.92	55	5×11.5	ECR1CDH100M□□050011	63 (79) 1J	1000	0.13	1140	16×31.5	ECR1HDH0R10M□□160031
	15	10.62	70	5×11.5	ECR1CDH150M□□050011		1500	0.09	1480	18×40	ECR1HDH0R15M□□180040
	22	7.24	85	5×11.5	ECR1CDH220M□□050011		6.8	13.66	59	5×11.5	ECR1JDH68M□□050011
	33	4.83	100	5×11.5	ECR1CDH330M□□050011		10	9.29	75	6.3×11.5	ECR1JDH100M□□063011
	47	3.39	140	6.3×11.5	ECR1CDH470M□□063011		15	6.19	100	6.3×11.5	ECR1JDH150M□□063011
	68	2.34	160	6.3×11.5	ECR1CDH680M□□063011		22	4.22	115	8×11.5	ECR1JDH220M□□080011
	100	1.59	230	8×11.5	ECR1CDH101M□□080011		33	2.81	170	8×11.5	ECR1JDH330M□□080011
	150	1.06	280	8×11.5	ECR1CDH151M□□080011		47	1.98	200	10×12.5	ECR1JDH470M□□100012
	220	0.72	370	10×12.5	ECR1CDH221M□□100012		68	1.56	270	10×16	ECR1JDH680M□□100016
	330	0.56	420	10×16	ECR1CDH331M□□100016		100	1.06	330	10×20	ECR1JDH101M□□100020
25 (32) 1E	470	0.40	550	10×20	ECR1CDH471M□□100020		150	0.71	450	12.5×20	ECR1JDH151M□□125020
	680	0.27	730	12.5×20	ECR1CDH681M□□125020	100 (125) 2A	220	0.48	550	12.5×20	ECR1JDH221M□□125020
	1000	0.19	910	12.5×25	ECR1CDH102M□□125025		330	0.32	710	12.5×25	ECR1JDH331M□□125025
	1500	0.12	1150	16×25	ECR1CDH152M□□160025		470	0.23	850	16×25	ECR1JDH471M□□160025
	2200	0.08	1300	16×25	ECR1CDH222M□□160025		680	0.16	1050	16×31.5	ECR1JDH681M□□160031
	3300	0.06	1550	16×35.5	ECR1CDH332M□□160035		1000	0.11	1330	18×35.5	ECR1JDH102M□□180035
	4700	0.04	1820	16×35.5	ECR1CDH472M□□160035		0.1	928.87	2.1	5×11.5	ECR2ADH0R1M□□050011
	4.7	22.59	45	5×11.5	ECR1EDH47M□□050011		0.15	619.25	3.2	5×11.5	ECR2ADH0R15M□□050011
	6.8	15.61	55	5×11.5	ECR1EDH68M□□050011		0.22	422.22	4.7	5×11.5	ECR2ADH0R22M□□050011
	10	10.62	70	5×11.5	ECR1EDH100M□□050011		0.33	281.48	7.0	5×11.5	ECR2ADH0R33M□□050011
	15	7.08	85	5×11.5	ECR1EDH150M□□050011		0.47	197.63	10.1	5×11.5	ECR2ADH0R47M□□050011
35 (44) 1V	22	4.83	100	5×11.5	ECR1EDH220M□□050011		0.68	136.60	14.5	5×11.5	ECR2ADH0R68M□□050011
	33	3.22	140	6.3×11.5	ECR1EDH330M□□063011		1	92.89	19	5×11.5	ECR2ADH0R10M□□050011
	47	2.26	170	6.3×11.5	ECR1EDH470M□□063011		1.5	61.92	23	5×11.5	ECR2ADH0R15M□□050011
	68	1.56	230	8×11.5	ECR1EDH680M□□080011		2.2	42.22	28	5×11.5	ECR2ADH0R22M□□050011
	100	1.06	280	8×11.5	ECR1EDH101M□□080011		3.3	28.15	45	5×11.5	ECR2ADH0R33M□□050011
	150	0.71	370	10×12.5	ECR1EDH151M□□100012		4.7	19.76	50	5×11.5	ECR2ADH0R47M□□050011
	220	0.72	400	10×16	ECR1EDH221M□□100016		6.8	13.66	65	6.3×11.5	ECR2ADH0R68M□□063011
	330	0.48	490	10×20	ECR1EDH331M□□100020		10	9.29	90	8×11.5	ECR2ADH0R10M□□080011
	470	0.34	600	12.5×20	ECR1EDH471M□□125020		15	6.19	110	8×11.5	ECR2ADH0R15M□□080011
	680	0.23	810	12.5×25	ECR1EDH681M□□125025		22	4.22	136	10×12.5	ECR2ADH0R22M□□100012
35 (44) 1V	1000	0.16	1010	16×25	ECR1EDH102M□□160025		33	3.22	180	10×16	ECR2ADH0R33M□□100016
	1500	0.11	1270	16×31.5	ECR1EDH152M□□160031		47	2.26	220	10×20	ECR2ADH0R47M□□100020
	2200	0.07	1440	16×35.5	ECR1EDH222M□□160035		68	1.56	290	10×20	ECR2ADH0R68M□□100020
	3300	0.05	1720	18×40	ECR1EDH332M□□180040		100	1.06	370	12.5×20	ECR2ADH0R10M□□125020
	15	7.08	85	5×11.5	ECR1VDH150M□□050011		150	0.71	470	12.5×25	ECR2ADH0R15M□□125025
	22	4.83	110	6.3×11.5	ECR1VDH220M□□063011		220	0.48	580	16×25	ECR2ADH0R22M□□160025
	33	3.22	140	6.3×11.5	ECR1VDH330M□□063011		330	0.32	730	16×31.5	ECR2ADH0R33M□□160031
	47	2.26	190	8×11.5	ECR1VDH470M□□080011		470	0.23	910	16×35.5	ECR2ADH0R47M□□160035
	68	1.56	230	8×11.5	ECR1VDH680M□□080011						
	100	1.06	300	10×12.5	ECR1VDH101M□□100012						

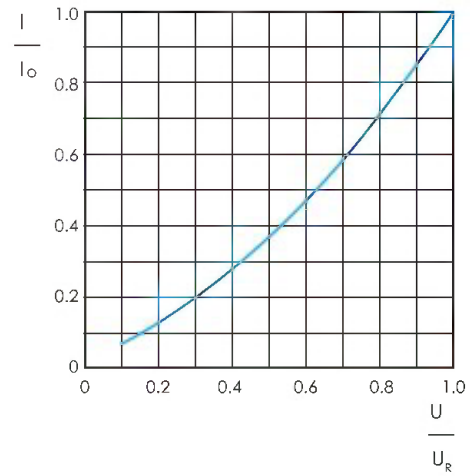
Customer products are available on request.



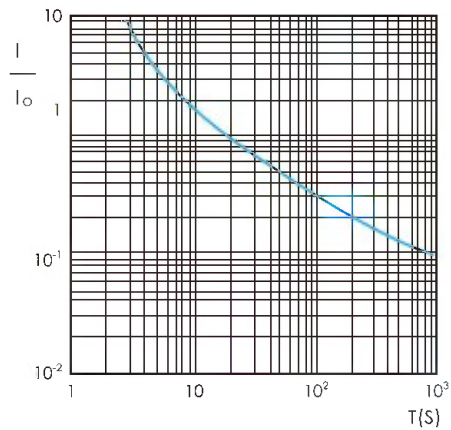
## Typical Curves



$I_0$  = leakage current during continuous operation at 20°C and  $U_R$ .  
Fig.1 Typical multiplier of leakage current as a function of ambient temperature.



$I_0$  = leakage current during continuous operation at 20°C and  $U_R$ .  
Fig.2 Typical multiplier of leakage current as a function of  $U/U_R$ .

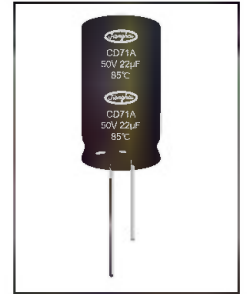
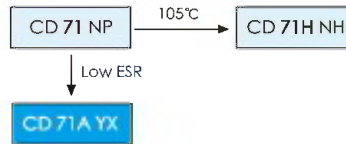


$I_0$  = leakage current.  
Leakage current after 2 minutes (IL2) is specified in Tables 2 and 4.  
Fig.3 Typical multiplier of leakage current as a function of time.



1000h at 85°C

- Load life of 1000 hours at 85°C
- Bi-polar
- low dissipation factor and excellent frequency characteristics
- For speaker crossover networks, Hi-Fi audio.



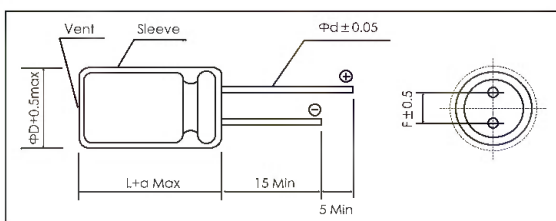
Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +85		
Rated Voltage Range (V)	50		
Capacitance Tolerance (20°C, 120Hz)	P grade: ± 15%; D grade: ± 20%;		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.03CV+4μA, whichever is greater. C: Nominal Capacitance (μF) V: Rated Voltage (V)		
Dissipation Factor (20°C, 120Hz)	F requency	1kHz	10kHz
	P grade	0.05	0.15
	D grade	0.15	0.50

	Useful Life	Load Life	Endurance Test	Shelf Life
Lifetime	2000h	1000h	1000h	500h
Leakage Current	Not more than specified value	Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value	Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 500% of specified value	Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_R$ $I_R$ 85°C	$U_R$ $I_R$ 85°C	$U_R$ $I_R = 0$ 85°C	$U_R = 0$ $I_R = 0$ 85°C After test: $U_R$ to be applied for 30min >24h before measurement

Note: The life test excluding shelf life should be conducted with the polarity inverted every 250hrs.

## Dimensions

mm



## Lead spacing and diameter

ΦD	6.3	8	10	12.5	16	18
F	2.5	3.5	5.0		7.5	
Φd	0.5	0.6			0.8	
a	1.5		2.0			

## Temperature Coefficient

Temperature(°C)	+70	+85
Coefficient	1.35	1



# CD 71A YX SERIES



## Ratings for CD 71A YX Series

### P GRADE

$U_R$ (Surge Voltage) Code	Capacitance 20°C, 120Hz	Max ESR 20°C, 120Hz	Ripple Current 85°C, 1kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
50 (63) 1H	1	66.35	60	10 × 20	ECR1HYX010M□□100020
	1.5	44.23	76	10 × 20	ECR1HYX1R5M□□100020
	2.2	30.16	96	12.5 × 20	ECR1HYX2R2M□□125020
	3.3	20.11	144	16 × 25	ECR1HYX3R3M□□160025
	4.7	14.12	192	16 × 25	ECR1HYX4R7M□□160025
	6.8	9.76	228	16 × 31.5	ECR1HYX6R8M□□160031
	10	6.63	264	18 × 40	ECR1HYX100M□□180040

### D GRADE

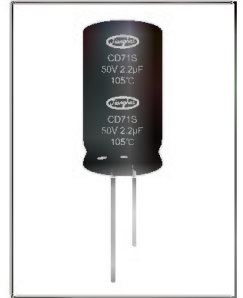
$U_R$ (Surge Voltage) Code	Capacitance 20°C, 120Hz	Max ESR 20°C, 120Hz	Ripple Current 85°C, 1kHz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	-
50 (63) 1H	1	199.04	27	6.3 × 11.5	ECR1HYX010M□□063011
	1.5	132.70	30	6.3 × 11.5	ECR1HYX1R5M□□063011
	2.2	90.47	34	8 × 11.5	ECR1HYX2R2M□□080011
	3.3	60.32	60	8 × 11.5	ECR1HYX3R3M□□080011
	4.7	42.35	76	8 × 11.5	ECR1HYX4R7M□□080011
	6.8	29.27	94	10 × 12.5	ECR1HYX6R8M□□100012
	10	19.90	112	10 × 16	ECR1HYX100M□□100016
	15	13.27	138	10 × 20	ECR1HYX150M□□100020
	22	9.05	234	12.5 × 20	ECR1HYX220M□□125020
	33	6.03	288	12.5 × 25	ECR1HYX330M□□125025
	47	4.23	360	16 × 31.5	ECR1HYX470M□□160031
	68	2.93	450	16 × 31.5	ECR1HYX680M□□160031
	100	1.99	540	16 × 31.5	ECR1HYX101M□□160031

Customer products are available on request.



1000h at 105°C

- Load life of 1000 hours at 105°C
- Bi-polar, For Horizontal deflection circuits
- High and stable quality



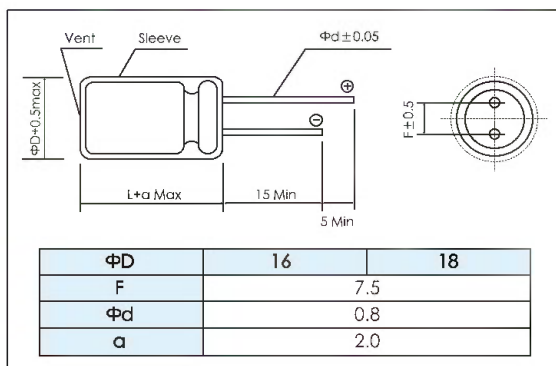
Items	Characteristics
Operating Temperature Range (°C)	-55~+105
Rated Voltage Range (V)	50,100
Capacitance Tolerance (20°C, 120Hz)	±20%
Leakage Current (μA)	After 3 minutes at 20°C application of rated voltage, leakage current is not more than 100. C: Nominal Capacitance (μF) V: Rated Voltage (V)
Dissipation Factor (20°C, 120Hz)	0.05

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	2000h	100000h	1000h	1000h	500h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value		Within ± 15% of initial value	Within ± 15% of initial value	Within ± 15% of initial value
Dissipation Factor	Not more than 500% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	$U_r$ $I_r$ 105°C	$U_r$ $1.4 \times I_r$ 40°C	$U_r$ $I_r$ 105°C	$U_r$ $I_r = 0$ 105°C	$U_r = 0$ $I_r = 0$ 105°C After test: $U_r$ to be applied for 30min >24h before measurement

Note: The life test excluding shelf life should be conducted with the polarity inverted every 250hrs.

## Dimensions

mm



## Ratings for CD 71S HX Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Current Ap-p 15.75kHz			Size Φ D x L	P/N
			105°C	85°C	70°C		
[V]	[μF]	[Ω]	[mA <sub>rms</sub> ]	[mA <sub>rms</sub> ]	[mA <sub>rms</sub> ]	[mm]	-
50 (63) 1H	2.2	30.16	3.4	5.8	7.5	16×25.5	ECR1HHX2R2M□□160025
	3.3	20.11	4.1	7	9.1	16×31.5	ECR1HHX3R3M□□160031
	4.7	14.12	4.5	7.8	10.0	16×35.5	ECR1HHX4R7M□□160035
	6.8	9.76	4.6	8	10.4	16×35.5	ECR1HHX6R8M□□160035
	10	6.63	4.9	8.6	11.1	16×35.5	ECR1HHX100M□□160035
	15	4.42	5.4	9.5	12.2	18×40	ECR1HHX150M□□180040
100 (125) 2A	1	66.35	2.8	4.9	6.8	16×25.5	ECR2AHX010M□□160025
	2.2	30.16	3.4	5.8	7.5	16×25.5	ECR2AHX2R2M□□160025
	3.3	20.11	4.1	7	9.1	16×31.5	ECR2AHX3R3M□□160031
	4.7	14.12	4.5	7.8	10.0	16×35.5	ECR2AHX4R7M□□160035
	6.8	9.76	4.6	8	10.4	16×35.5	ECR2AHX6R8M□□160035
	10	6.63	4.9	8.6	11.1	16×35.5	ECR2AHX100M□□160035

## Temperature Coefficient

Temperature(°C)	+70	+85	+105
Coefficient	1.8	1.4	1.0

Customer products are available on request.



# CD 11A PA SERIES



2000h at 85°C

- Load life of 2000 hours at 85°C
- True audio reproduction by the suppression Of electrical noise due to external vibration



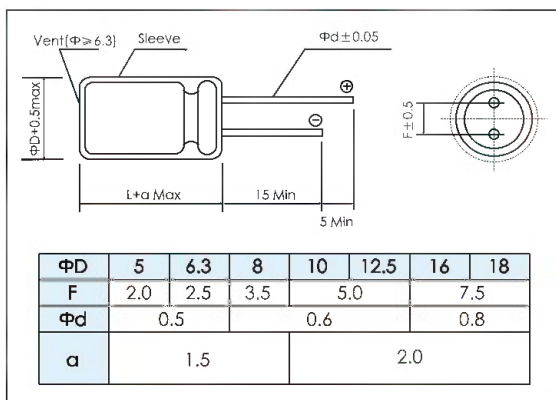
MINIATURE

Items	Characteristics																										
Operating Temperature Range (°C)	-40 ~ +85																										
Voltage Range (V)	6.3 ~ 100																										
Capacitance Tolerance (20°C, 120Hz)	± 20%																										
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.001CV or 4, whichever is greater. C: Nominal Capacitance (μF)    V: Rated Voltage (V)																										
Dissipation Factor (20°C, 120Hz)	<table><tr><td>Rated Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr><tr><td>Tan δ (max)</td><td>0.3</td><td>0.25</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.10</td></tr></table>									Rated Voltage (V)	6.3	10	16	25	35	50	63	100	Tan δ (max)	0.3	0.25	0.19	0.16	0.14	0.12	0.10	0.10
	Rated Voltage (V)	6.3	10	16	25	35	50	63	100																		
	Tan δ (max)	0.3	0.25	0.19	0.16	0.14	0.12	0.10	0.10																		
When nominal capacitance is over 1000μF tan δ shall be added 0.02 to the listed value with increase of every 1000μF																											

	Useful Life	Load Life	Endurance Test	Shelf Life
Lifetime	3000h	2000h	2500h	1000h
Leakage Current	Not more than specified value	Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ± 30% of initial value	Within ± 20% of initial value	Within ± 20% of initial value	Within ± 20% of initial value
Dissipation Factor	Not more than 300% of specified value	Not more than 150% of specified value	Not more than 150% of specified value	Not more than 150% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> I <sub>R</sub> 85°C	U <sub>R</sub> I <sub>R</sub> = 0 85°C	U <sub>R</sub> = 0 I <sub>R</sub> = 0 85°C After test: U <sub>R</sub> to be applied for 30min >24h before measurement

## Dimensions

mm



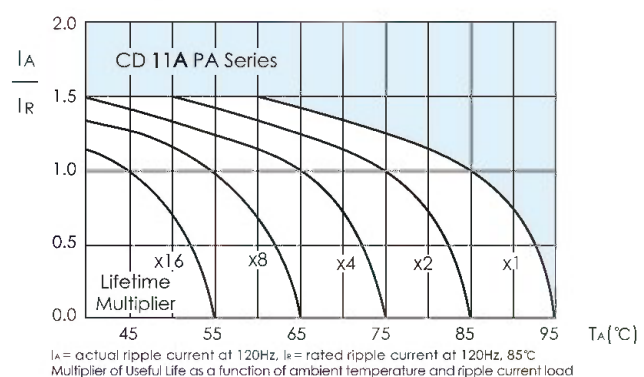
## Frequency Coefficient

Rated Voltage (V)	Frequency	50~60Hz	120Hz	1kHz	10kHz	100kHz
	CV (μFV)					
6.3 ~ 16	ALL CV value	0.80	1.00	1.10	1.20	1.20
25 ~ 35	≤ 1000	0.80	1.00	1.50	1.70	1.70
	> 1000	0.80	1.00	1.20	1.30	1.30
50 ~ 100	≤ 1000	0.80	1.00	1.60	1.90	1.90
	> 1000	0.80	1.00	1.20	1.30	1.30

## Temperature Coefficient

Temperature (°C)	+70	+85
Coefficient	1.35	1

## Lifetime Diagram





## Ratings for CD 11A PA Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mAmps)	(mm)	-
6.3 (7.2) 0J	100	3.98	85	5 × 11.5	ECR0JPA101M□□050011
	220	1.81	150	6.3 × 11.5	ECR0JPA221M□□063011
	330	1.21	180	6.3 × 11.5	ECR0JPA331M□□063011
	470	0.85	260	8 × 11.5	ECR0JPA471M□□080011
	1000	0.40	450	10 × 12.5	ECR0JPA102M□□100012
	2200	0.19	890	12.5 × 20	ECR0JPA222M□□125020
	3300	0.14	1050	12.5 × 20	ECR0JPA332M□□125020
	4700	0.10	1550	16 × 25	ECR0JPA472M□□160025
	6800	0.08	1750	16 × 25	ECR0JPA682M□□160025
	10000	0.06	2150	16 × 31.5	ECR0JPA103M□□160031
	15000	0.05	2700	18 × 35.5	ECR0JPA153M□□180035
10 (13) 1A	33	10.05	55	5 × 11.5	ECR1APA330M□□050011
	47	7.06	65	5 × 11.5	ECR1APA470M□□050011
	100	3.32	95	5 × 11.5	ECR1APA101M□□050011
	220	1.51	165	6.3 × 11.5	ECR1APA221M□□063011
	330	1.01	240	8 × 11.5	ECR1APA331M□□080011
	470	0.71	280	8 × 11.5	ECR1APA471M□□080011
	1000	0.33	540	10 × 16	ECR1APA102M□□100016
	2200	0.16	970	12.5 × 20	ECR1APA222M□□125020
	3300	0.12	1250	12.5 × 25	ECR1APA332M□□125025
	4700	0.09	1650	16 × 25	ECR1APA472M□□160025
	6800	0.07	2050	16 × 31.5	ECR1APA682M□□160031
	10000	0.06	2550	18 × 35.5	ECR1APA103M□□180035
16 (20) 1C	22	11.46	50	5 × 11.5	ECR1CPA220M□□050011
	33	7.64	60	5 × 11.5	ECR1CPA330M□□050011
	47	5.36	75	5 × 11.5	ECR1CPA470M□□050011
	100	2.52	120	6.3 × 11.5	ECR1CPA101M□□063011
	220	1.15	220	8 × 11.5	ECR1CPA221M□□080011
	330	0.76	270	8 × 11.5	ECR1CPA331M□□080011
	470	0.54	390	10 × 12.5	ECR1CPA471M□□100012
	1000	0.25	680	10 × 20	ECR1CPA102M□□100020
	2200	0.13	1200	12.5 × 25	ECR1CPA222M□□125025
	3300	0.10	1600	16 × 25	ECR1CPA332M□□160025
	4700	0.07	2050	16 × 31.5	ECR1CPA472M□□160031
	6800	0.06	2550	18 × 35.5	ECR1CPA682M□□180035
25 (32) 1E	22	9.65	55	5 × 11.5	ECR1EPA220M□□050011
	33	6.43	70	5 × 11.5	ECR1EPA330M□□050011
	47	4.52	80	5 × 11.5	ECR1EPA470M□□050011
	100	2.12	140	6.3 × 11.5	ECR1EPA101M□□063011
	220	0.97	240	8 × 11.5	ECR1EPA221M□□080011
	330	0.64	350	10 × 12.5	ECR1EPA331M□□100012
	470	0.45	460	10 × 16	ECR1EPA471M□□100016
	1000	0.21	850	12.5 × 20	ECR1EPA102M□□125020
	2200	0.11	1500	16 × 25	ECR1EPA222M□□160025
	3300	0.08	1900	16 × 31.5	ECR1EPA332M□□160031
	4700	0.06	2450	18 × 35.5	ECR1EPA472M□□180035
35 (44) 1V	4.7	39.53	25	5 × 11.5	ECR1VPA4R7M□□050011
	10	18.58	40	5 × 11.5	ECR1VPA100M□□050011
	22	8.44	60	5 × 11.5	ECR1VPA220M□□050011
	33	5.63	75	5 × 11.5	ECR1VPA330M□□050011

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cittance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	P/N
(V)	(μF)	(Ω)	(mAmps)	(mm)	-
35 (44) 1V	47	3.95	100	6.3 × 11.5	ECR1VPA470M□□063011
	100	1.86	170	8 × 11.5	ECR1VPA101M□□080011
	220	0.84	310	10 × 12.5	ECR1VPA221M□□100012
	330	0.56	420	10 × 16	ECR1VPA331M□□100016
	470	0.40	540	10 × 20	ECR1VPA471M□□100020
	1000	0.19	990	12.5 × 20	ECR1VPA102M□□125020
	2200	0.10	1750	16 × 31.5	ECR1VPA222M□□160031
	3300	0.07	2250	18 × 35.5	ECR1VPA332M□□180035
	0.47	338.80	9	5 × 11.5	ECR1HPA47M□□050011
50 (63) 1H	1	159.24	14	5 × 11.5	ECR1HPA010M□□050011
	2.2	72.38	20	5 × 11.5	ECR1HPA2R2M□□050011
	3.3	48.25	25	5 × 11.5	ECR1HPA3R3M□□050011
	4.7	33.88	30	5 × 11.5	ECR1HPA4R7M□□050011
	10	15.92	40	5 × 11.5	ECR1HPA100M□□050011
	22	7.24	65	5 × 11.5	ECR1HPA220M□□050011
	33	4.83	90	6.3 × 11.5	ECR1HPA330M□□063011
	47	3.39	110	6.3 × 11.5	ECR1HPA470M□□063011
	100	1.59	190	8 × 11.5	ECR1HPA101M□□080011
	220	0.72	370	10 × 16	ECR1HPA221M□□100016
	330	0.48	490	10 × 20	ECR1HPA331M□□100020
63 (79) 1J	470	0.34	670	12.5 × 20	ECR1HPA471M□□125020
	1000	0.16	1250	16 × 25	ECR1HPA102M□□160025
	2200	0.08	2100	18 × 35.5	ECR1HPA222M□□180035
	4.7	28.23	30	5 × 11.5	ECR1JPA4R7M□□050011
	10	13.27	45	5 × 11.5	ECR1JPA100M□□050011
	22	6.03	80	6.3 × 11.5	ECR1JPA220M□□063011
	33	4.02	100	6.3 × 11.5	ECR1JPA330M□□063011
	47	2.82	140	8 × 11.5	ECR1JPA470M□□080011
	100	1.33	250	10 × 12.5	ECR1JPA101M□□100012
	220	0.60	440	10 × 20	ECR1JPA221M□□100020
	330	0.40	620	12.5 × 20	ECR1JPA331M□□125020
100 (125) 2A	470	0.28	810	12.5 × 25	ECR1JPA471M□□125025
	1000	0.13	1500	16 × 31.5	ECR1JPA102M□□160031
	0.47	282.33	10	5 × 11.5	ECR2APA4R7M□□050011
	1	132.70	15	5 × 11.5	ECR2APA010M□□050011
	2.2	60.32	20	5 × 11.5	ECR2APA2R2M□□050011
	3.3	40.21	25	5 × 11.5	ECR2APA3R3M□□050011
	4.7	28.23	30	5 × 11.5	ECR2APA4R7M□□050011
	10	13.27	55	6.3 × 11.5	ECR2APA100M□□063011
	22	6.03	95	8 × 11.5	ECR2APA220M□□080011
	33	4.02	140	10 × 12.5	ECR2APA330M□□100012
	47	2.82	180	10 × 16	ECR2APA470M□□100016
	100	1.33	340	12.5 × 20	ECR2APA101M□□125020
	220	0.60	640	16 × 25	ECR2APA221M□□160025
	330	0.40	780	16 × 25	ECR2APA331M□□160025
	470	0.28	1000	16 × 31.5	ECR2APA471M□□160031

Customer products are available on request.



# CD 171 SG SERIES



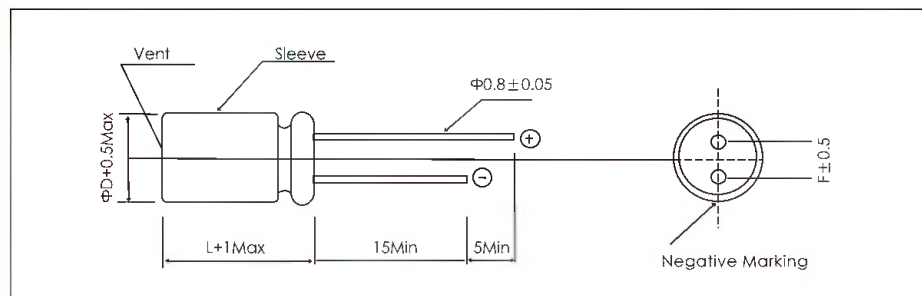
- High stability
- Small capacitance change
- Low dissipation factor, Low leakage current
- For Photoflash Application



Items	Characteristics
Operating Temperature Range (°C)	-20 ~ +55
Rated Voltage (V)	330WV.DC
Voltage Proof (V)	350SV.DC
Capacitance Tolerance (20°C, 120Hz)	-10% ~ +20%
Dissipation Factor (20°C, 120Hz)	0.06MAX
Leakage Current	$I = 1 \times C$ (20°C, 5 minutes) I: Leakage Current (μA) C: Nominal Capacitance (μF)

## Dimensions

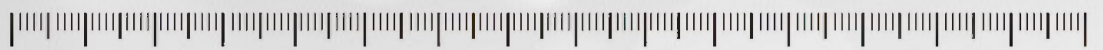
mm



Capacitance (μF)	D(mm)		F(mm)		12.5		13.0		13.5		14.0	
					5.0		5.0		5.0		5.0	
	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N
80	26.5	ECR2USG800V□□125026	24.5	ECR2USG800V□□130024	23.0	ECR2USG800V□□135023						
100	30.5	ECR2USG101V□□125030	28.0	ECR2USG101V□□130028	26.5	ECR2USG101V□□135026	25.0	ECR2USG101V□□140025				
120	35.0	ECR2USG121V□□125035	31.5	ECR2USG121V□□130031	29.5	ECR2USG121V□□135029	28.0	ECR2USG121V□□140028				
140	39.5	ECR2USG141V□□125039	35.5	ECR2USG141V□□130035	33.0	ECR2USG141V□□135033	31.0	ECR2USG141V□□140031				
160	44.0	ECR2USG161V□□125044	39.5	ECR2USG161V□□130039	36.5	ECR2USG161V□□135036	34.0	ECR2USG161V□□140034				
180	48.0	ECR2USG181V□□125048	43.5	ECR2USG181V□□130043	40.5	ECR2USG181V□□135040	37.5	ECR2USG181V□□140037				
200			47.5	ECR2USG201V□□130047	44.0	ECR2USG201V□□135044	40.5	ECR2USG201V□□140040				
220			52.0	ECR2USG221V□□130052	47.0	ECR2USG221V□□135047	44.0	ECR2USG221V□□140044				
250							48.5	ECR2USG251V□□140048				

Capacitance (μF)	D(mm)		F(mm)		14.5		16.0		18.0		20.0	
					7.5		7.5		7.5		7.5	
	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N	L (mm)	P/N
120	26.5	ECR2USG121V□□140026										
140	29.0	ECR2USG141V□□145029	26.0	ECR2USG141V□□160026								
160	32.0	ECR2USG161V□□145032	28.5	ECR2USG161V□□160028	25.0	ECR2USG161V□□180025						
180	35.0	ECR2USG181V□□145035	30.0	ECR2USG181V□□160030	27.0	ECR2USG181V□□180027						
200	38.0	ECR2USG201V□□145038	32.5	ECR2USG201V□□160032	29.0	ECR2USG201V□□180029	26.0	ECR2USG201V□□200026				
220	41.0	ECR2USG221V□□145041	35.0	ECR2USG221V□□160035	30.5	ECR2USG221V□□180030	28.0	ECR2USG221V□□200028				
250	45.0	ECR2USG251V□□145045	38.5	ECR2USG251V□□160038	33.5	ECR2USG251V□□180033	30.0	ECR2USG251V□□200030				
300			44.5	ECR2USG301V□□160044	39.0	ECR2USG301V□□180039	34.0	ECR2USG301V□□200034				





## Axial/Crown Aluminum Electrolytic Capacitors





## Part Number System for Axial / Crown

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21			
E	C	A	1	J	V	F	1	0	2	Q		L	L	1	8	0	0	3	5	S	*		
Capacitor Type Code	Terminal Type Code		Rated Voltage Code (V)		Series Code		Capacitance Code (μF)		Capacitance Tolerance Code(%)		Lead Form Code		Dimension Code						Sleeve Code		Customer Special Requirements Code		
EC= Electrolytic Capacitor	Axial	A	10	1A	CDA220	VA	250	251	+20 -8	A	Taping	TP	16×27				160027				Sleeving	S	—
			16	1C	CDA225	VF	370	371	+20 -3	C	Long Lead	LL	16×35				160035				Nothing	N	
			18	1D	CDA226	VG	470	471	+30 0	F	Lead Cut	CC	18×27				180027						
			25	1E	CDA227	VH	560	561	+20 -5	H	Lead Bend	BD	18×35				180035						
	Crown	C	32	1F	CDA228	VI	680	681	+10 -10	K			18×39				180039						
			40	1G	CDA236	WG	780	781	+15 -15	L			20×27				200027						
			54	1Y	CDC220	VZ	800	801	+20 -20	M			20×35				200035						
			63	1J	CDC225	VU	900	901	+30 -10	Q			20×43				200043						
					CDC226	VT	1000	102	+20 0	R													
					CDC227	VS	1200	122	+50 -20	S													
					CDC228	VR	1500	152	+50 -10	T													
					CDC236	WT	1800	182	+75 -10	U													
							2000	202	+20 -10	V													
							2200	222	+100 0	P													
							2800	282															
							3000	302															
							3300	332															
							4700	472															
				6200	622																		
				7000	702																		
				8100	812																		
				11000	113																		

### Note1:

- 1.The number from 14<sup>th</sup> to 16<sup>th</sup> defines the diameter of capacitor.
- 2.The 14<sup>th</sup> number is the tenth digit.
- 3.The 15<sup>th</sup> number is the single digit.
- 4.The 16<sup>th</sup> number is on the right of the floatpoint.

### Note2:

- 1.The number from 17<sup>th</sup> to 19<sup>th</sup> defines the high of capacitor.
- 2.The 17<sup>th</sup> number is the hundredth digit.
- 3.The 18<sup>th</sup> number is the tenth digit.
- 4.The 19<sup>th</sup> number is the single digit.

For example :

CDA225 63V1000μF -10/+30% LL 18\*35

Code: ECA1JVFI02QLL180035S

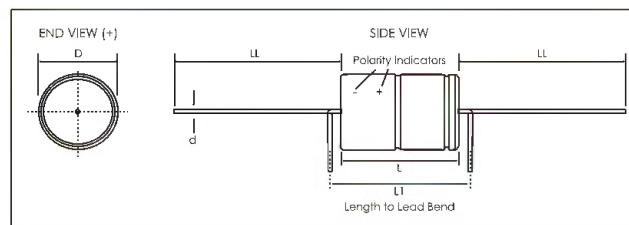


- 2000 hours at +150°C
- Very high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	250 ~ 4700		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed ΔC/C < 5%.		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

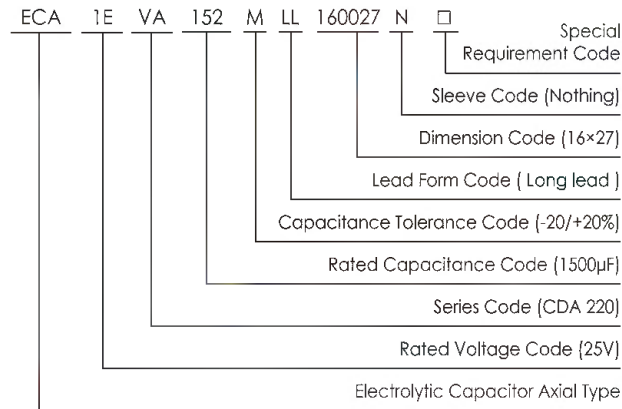


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13
200035	20.2	34.7	41	1.0	40	20
200043	20.2	42.7	49	1.0	40	24

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:25V1500μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 220 VA Series

U <sub>R</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max Tc			Rated Ta	Max Ta		
	20°C, 100Hz	20°C, 100Hz	20°C, 100kHz	125~150°C, 5~100kHz	125°C, ≥5kHz	140°C, ≥5kHz	150°C, ≥5kHz	125°C, ≥5kHz	125°C, ≥5kHz			
[V]	[μF]	[mΩ]	[mΩ]	[mΩ]	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]2*	[Arms]3*	[mm]	-	
25 (1E)	1500	78	42	18.4	13.9	8.8	3.9	4.8	6.1	16x27	ECA1EVA152M□□160027	
	2200	56	31	14.3	15.8	10.0	4.5	5.8	7.4	16x35	ECA1EVA222M□□160027	
	2000	61	34	17.2	15.1	9.5	4.3	5.2	6.6	18x27	ECA1EVA202Q□□180027	
	3000	43	25	15.2	16.0	10.1	4.5	6.0	7.5	18x35	ECA1EVA302Q□□180035	
	3400	38	22	12.2	17.9	11.3	5.1	6.7	8.6	18x39	ECA1EVA342Q□□180039	
	2200	61	36	19.0	16.6	10.5	4.7	5.2	6.6	20x27	ECA1EVA222Q□□200027	
	3300	43	26	14.3	19.1	12.1	5.4	6.4	8.1	20x35	ECA1EVA332Q□□200035	
	4700	32	20	11.8	21.0	13.3	5.9	7.4	9.3	20x43	ECA1EVA472Q□□200043	
40 (1G)	800	108	43	19.2	13.6	8.6	3.9	4.7	5.9	16x27	ECA1GVA801Q□□160027	
	1200	74	31	14.8	15.5	9.8	4.4	5.7	7.2	16x35	ECA1GVA122Q□□160035	
	1200	77	34	17.7	14.9	9.4	4.2	5.1	6.5	18x27	ECA1GVA122Q□□180027	
	1700	55	25	13.7	16.9	10.7	4.8	6.2	7.9	18x35	ECA1GVA172Q□□180035	
	2000	48	22	12.6	17.6	11.1	5.0	6.7	8.5	18x39	ECA1GVA202Q□□180039	
	1500	68	33	17.8	17.1	10.8	4.8	5.4	6.8	20x27	ECA1GVA152Q□□200027	
	2200	49	25	13.9	19.4	12.2	5.5	6.5	8.2	20x35	ECA1GVA222Q□□200035	
	2700	39	20	12.1	20.7	13.1	5.9	7.3	9.2	20x43	ECA1GVA272Q□□200043	
63 (1J)	250	233	59	32.4	10.5	6.6	3.0	3.6	4.5	16x27	ECA1JVA251Q□□160027	
	370	160	42	23.9	12.2	7.7	3.5	4.5	5.7	16x35	ECA1JVA371Q□□160035	
	380	158	44	26.8	12.1	7.6	3.4	4.2	5.3	18x27	ECA1JVA381Q□□180027	
	560	110	32	20.0	14.0	8.8	4.0	5.2	6.6	18x35	ECA1JVA561Q□□180035	
	640	96	28	18.1	14.7	9.3	4.2	5.6	7.1	18x39	ECA1JVA641Q□□180039	
	470	134	41	25.9	14.2	9.0	4.0	4.5	5.7	20x27	ECA1JVA471Q□□200027	
	680	94	30	19.7	16.3	10.3	4.6	5.6	7.0	20x35	ECA1JVA681Q□□200035	
	900	74	25	16.6	17.7	11.2	5.0	6.3	7.9	20x43	ECA1JVA901Q□□200043	

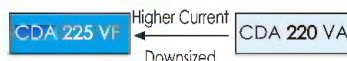
Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).

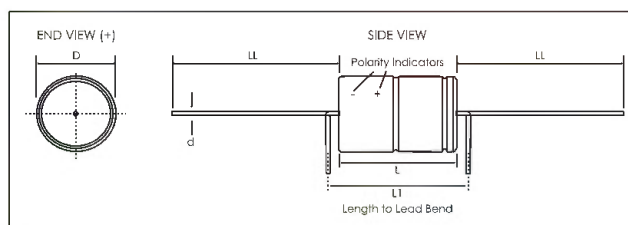


- 2000 hours at +150°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +125, (-40 ~ +150 at derated voltage)		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	470 ~ 6300		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, (± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed ΔC/C < 5%.		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

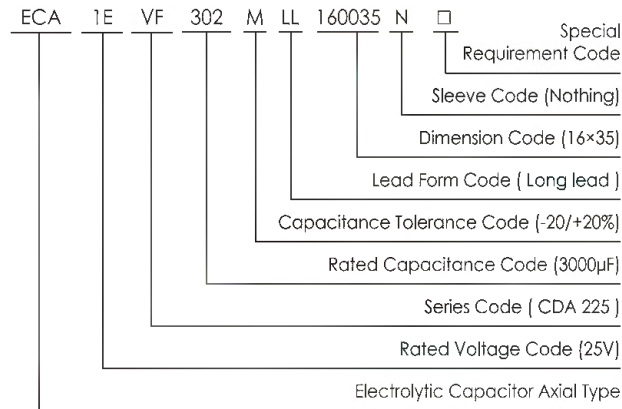


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13
200035	20.2	34.7	41	1.0	40	20
200043	20.2	42.7	49	1.0	40	24

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:25V3000μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 225 VF Series

U <sub>r</sub> Code		Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L (mm)	P/N
125 °C	150 °C		20 °C, 100Hz	20 °C, 100Hz	20 °C, 100kHz	125~150 °C, 5~100kHz	125 °C, ≥5kHz	140 °C, ≥5kHz	150 °C, ≥5kHz	125 °C, ≥5kHz	125 °C, ≥5kHz (derated voltage)		
[V]	[V]	[μF]	(mΩ)	(mΩ)	(mΩ)	(mΩ)	(Arms)1*	(Arms)2*	(Arms)2*	(Arms)3*	(Arms)4*		-
25 (1E)	18 (1D)	2200	60	34	11.9	17.3	11.0	4.9	6.1	7.7	9.4	16x27	ECA1EVF222M □□ 160027
		3000	44	25	9.2	19.7	12.5	5.6	7.4	9.4	9.4	16x35	ECA1EVF302M □□ 160027
		2700	46	26	10.8	19.0	12.0	5.4	6.6	8.3	8.3	18x27	ECA1EVF272Q □□ 180027
		4000	33	19	8.6	21.3	13.5	6.0	7.9	10.0	10.0	18x35	ECA1EVF402Q □□ 180035
		4600	29	17	8.0	22.1	14.0	6.3	8.4	10.6	10.6	18x39	ECA1EVF462Q □□ 180039
		3600	38	22	9.0	23.5	14.9	6.7	7.6	9.6	9.6	20x27	ECA1EVF362Q □□ 200027
		4800	28	16	7.3	26.7	16.9	7.6	9.2	11.7	11.7	20x35	ECA1EVF482Q □□ 200035
		6300	24	14	6.5	28.3	17.9	8.0	10.2	12.9	12.9	20x43	ECA1EVF632Q □□ 200043
40 (1G)	32 (1F)	1200	80	36	13.0	16.6	10.5	4.7	5.8	7.4	7.4	16x27	ECA1GVF122M □□ 160027
		1800	55	25	9.6	19.3	12.2	5.5	7.2	9.2	9.2	16x35	ECA1GVF182M □□ 160035
		1600	59	26	11.2	18.7	11.8	5.3	6.5	8.2	8.2	18x27	ECA1GVF162Q □□ 180027
		2200	44	20	9.1	20.7	13.1	5.9	7.7	9.7	9.7	18x35	ECA1GVF222Q □□ 180035
		2600	37	17	8.3	21.7	13.7	6.1	8.2	10.4	10.4	18x39	ECA1GVF262Q □□ 180039
		2000	50	23	10.0	22.8	14.4	6.5	7.3	9.3	9.3	20x27	ECA1GVF202Q □□ 200027
		3000	35	17	7.8	25.8	16.3	7.3	8.9	11.3	11.3	20x35	ECA1GVF302Q □□ 200035
		3900	28	14	6.8	27.7	17.5	7.8	10.0	12.7	12.7	20x43	ECA1GVF392Q □□ 200043
63 (1J)	54 (1Y)	470	156	52	24.3	12.1	7.7	3.4	4.2	5.3	5.3	16x27	ECA1JVF471Q □□ 160027
		680	109	37	18.7	13.8	8.7	3.9	5.3	6.7	6.7	16x35	ECA1JVF681Q □□ 160035
		720	110	36	18.4	14.6	9.2	4.1	5.0	6.4	6.4	18x27	ECA1JVF721Q □□ 180027
		1000	75	26	14.1	16.6	10.5	4.7	6.2	7.8	7.8	18x35	ECA1JVF102Q □□ 180035
		1200	64	23	12.6	17.6	11.1	5.0	6.7	8.5	8.5	18x39	ECA1JVF122Q □□ 180039
		900	86	31	16.1	18.0	11.4	5.1	5.8	7.3	7.3	20x27	ECA1JVF901Q □□ 200027
		1400	57	22	11.9	20.9	13.2	5.9	7.3	9.2	9.2	20x35	ECA1JVF142Q □□ 200035
		1800	45	18	10.0	22.8	14.4	6.5	8.3	10.5	10.5	20x43	ECA1JVF182Q □□ 200043

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

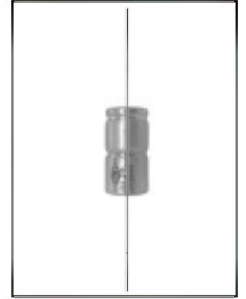
2\* Valid for capacitor supplied with reduced DC voltage, capacitor-mounted with low thermal resistance path.

3\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

4\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).

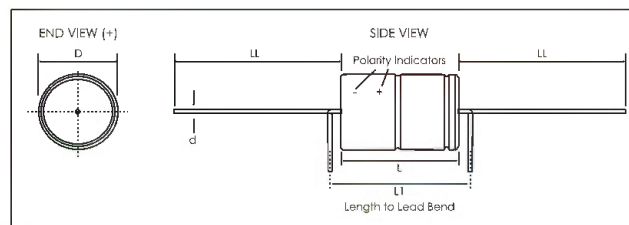


- 2000 hours at +150°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	250 ~ 4700		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

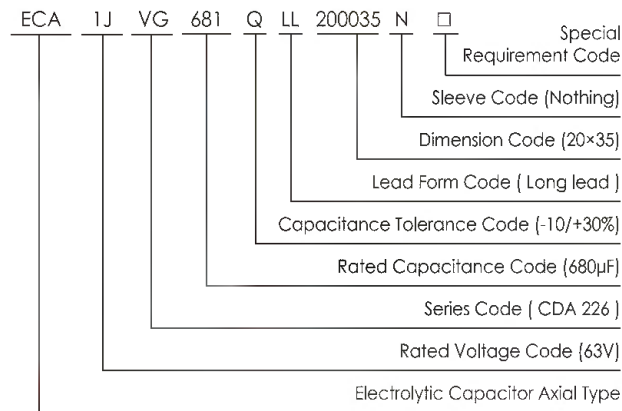


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13
200035	20.2	34.7	41	1.0	40	20
200043	20.2	42.7	49	1.0	40	24

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:63V680μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 226 VG Series

U <sub>r</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
		20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz		
[V]	[μF]	[mΩ]	[mΩ]	[mΩ]	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]2*	[Arms]3*	[mm]	-
25 (1E)	1500	72	36	12.7	16.8	10.6	4.7	5.9	7.4	9.1	16x27	ECA1EVG152M □□ 160027
	2200	51	26	9.7	19.2	12.1	5.4	7.2	9.1	10.5	16x35	ECA1EVG222M □□ 160035
	2000	53	26	11.0	18.8	11.9	5.3	6.5	8.3	10.5	18x27	ECA1EVG202Q □□ 180027
	3000	37	19	8.7	21.2	13.4	6.0	7.9	10.0	10.5	18x35	ECA1EVG302Q □□ 180035
	3400	33	17	8.1	22.0	13.9	6.2	8.3	10.5	10.5	18x39	ECA1EVG342Q □□ 180039
	2200	50	25	10.6	22.2	14.0	6.3	7.1	9.1	9.1	20x27	ECA1EVG222Q □□ 200027
	3300	34	17	7.8	25.8	16.3	7.3	8.9	11.3	11.3	20x35	ECA1EVG332Q □□ 200035
	4700	25	13	6.4	28.5	18.0	8.1	10.3	13.1	13.1	20x43	ECA1EVG472Q □□ 200043
40 (1G)	800	100	36	13.6	16.2	10.2	4.6	5.6	7.2	7.2	16x27	ECA1GVG801Q □□ 160027
	1200	69	26	10.3	18.6	11.8	5.3	7.0	8.8	8.8	16x35	ECA1GVG122Q □□ 160035
	1200	70	27	11.7	18.3	11.6	5.2	6.3	8.0	8.0	18x27	ECA1GVG122Q □□ 180027
	1800	49	20	9.3	20.5	13.0	5.8	7.6	9.6	9.6	18x35	ECA1GVG182Q □□ 180035
	2000	43	17	8.5	21.4	13.6	6.1	8.1	10.3	10.3	18x39	ECA1GVG202Q □□ 180039
	1500	57	22	10.0	22.8	14.4	6.5	7.3	9.3	9.3	20x27	ECA1GVG152Q □□ 200027
	2200	41	17	7.9	25.7	16.2	7.3	8.9	11.2	11.2	20x35	ECA1GVG222Q □□ 200035
	2700	32	13	6.7	27.9	17.6	7.9	10.1	12.8	12.8	20x43	ECA1GVG272Q □□ 200043
63 (1J)	250	227	53	26.9	11.5	7.3	3.3	4.0	5.1	5.1	16x27	ECA1JVG251Q □□ 160027
	370	155	37	19.2	13.6	8.6	3.9	5.1	6.4	6.4	16x35	ECA1JVG371Q □□ 160035
	380	151	36	19.9	14.0	8.9	4.0	4.9	6.1	6.1	18x27	ECA1JVG381Q □□ 180027
	560	104	26	14.9	16.2	10.2	4.6	6.0	7.6	7.6	18x35	ECA1JVG561Q □□ 180035
	640	91	23	13.3	17.1	10.8	4.8	6.5	8.2	8.2	18x39	ECA1JVG641Q □□ 180039
	470	125	32	17.5	17.3	10.9	4.9	5.5	7.0	7.0	20x27	ECA1JVG471Q □□ 200027
	680	87	23	13	20.0	12.7	5.7	6.9	8.7	8.7	20x35	ECA1JVG681Q □□ 200035
	900	67	18	10.6	22.2	14.0	6.3	8.1	10.2	10.2	20x43	ECA1JVG901Q □□ 200043

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 2000 hours at +150°C
- Ultra-high CV
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

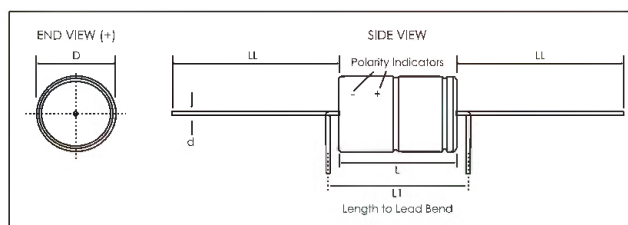
CDA 227 VH Higher CV  
Downsized CDA 225 VF



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +125, (-40 ~ +150 at derated voltage)		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	780 ~ 11000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, (± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed ΔC/C < 5%.		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

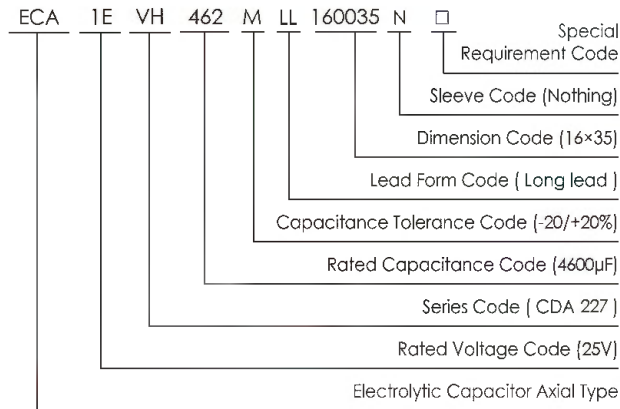


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13
200035	20.2	34.7	41	1.0	40	20
200043	20.2	42.7	49	1.0	40	24

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:25V4600μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 227 VH Series

U <sub>r</sub> Code		Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
125℃	150℃		20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz (derated voltage)		
(V)	(V)	(μF)	(mΩ)	(mΩ)	(mΩ)	(Arms)1*	(Arms)2*	(Arms)2*	(Arms)3*	(Arms)4*	(mm)	-	
25 (1E)	18 (1D)	3200	49	32	12.1	17.2	10.9	4.9	6.2	7.8	16x27	ECA1EVH322M □□160027	
		4600	35	23	9.6	19.3	12.2	5.5	7.4	9.3	16x35	ECA1EVH462M □□160035	
		4300	37	24	10.4	19.4	12.3	5.5	7.0	8.9	18x27	ECA1EVH432Q □□180027	
		6200	27	18	8.4	21.6	13.6	6.1	8.3	10.5	18x35	ECA1EVH622Q □□180035	
		7100	24	16	7.9	22.2	14.1	6.3	8.8	11.1	18x39	ECA1EVH712Q □□180039	
		5600	30	20	9.8	23.1	14.6	6.5	7.6	9.6	20x27	ECA1EVH562Q □□200027	
		8100	22	15	7.9	25.7	16.2	7.3	9.0	11.4	20x35	ECA1EVH812Q □□200035	
		11000	18	13	7.1	27.1	17.1	7.7	9.9	12.5	20x43	ECA1EVH113Q □□200043	
40 (1G)	32 (1F)	1500	67	32	12.6	16.8	10.6	4.8	6.0	7.6	16x27	ECA1GVH152Q□□160027	
		2200	47	23	9.9	19.0	12.0	5.4	7.2	9.1	16x35	ECA1GVH222M□□160035	
		2100	49	24	10.8	19.0	12.0	5.4	6.9	8.7	18x27	ECA1GVH212M□□180027	
		3000	35	18	8.7	21.2	13.4	6.0	8.2	10.4	18x35	ECA1GVH302Q□□180035	
		3500	31	16	8.1	22.0	13.9	6.2	8.7	11.0	18x39	ECA1GVH352Q□□180039	
		2700	40	20	10.1	22.7	14.4	6.4	7.4	9.4	20x27	ECA1GVH272Q□□200027	
		4200	27	14	8.0	25.5	16.1	7.2	9.0	11.4	20x35	ECA1GVH422Q□□200035	
		5200	23	13	7.3	26.7	16.9	7.6	9.8	12.4	20x43	ECA1GVH522Q□□200043	
63 (1J)	54 (1Y)	780	107	45	21.3	12.9	8.2	3.7	4.6	5.9	16x27	ECA1JVH781Q □□160027	
		1100	76	32	16.0	14.9	9.4	4.2	5.7	7.2	16x35	ECA1JVH112Q □□160035	
		1100	77	33	16.9	15.2	9.6	4.3	5.5	6.9	18x27	ECA1JVH112Q □□180027	
		1600	55	24	13.0	17.3	11.0	4.9	6.7	8.5	18x35	ECA1JVH162Q □□180035	
		1900	47	21	11.8	18.2	11.5	5.1	7.2	9.1	18x39	ECA1JVH192Q □□180039	
		1500	60	27	14.8	18.8	11.9	5.3	6.1	7.8	20x27	ECA1JVH152Q □□200027	
		2100	43	20	11.5	21.3	13.5	6.0	7.5	9.5	20x35	ECA1JVH212Q □□200035	
		2800	34	16	9.8	23.4	14.8	6.6	8.5	10.7	20x43	ECA1JVH282Q □□200043	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Valid for capacitor supplied with reduced DC voltage, capacitor-mounted with low thermal resistance path.

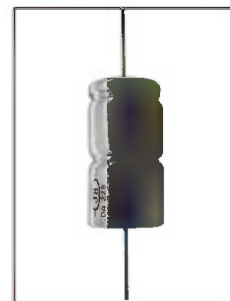
3\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

4\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 2000 hours at +150°C
- Ultra-high CV
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

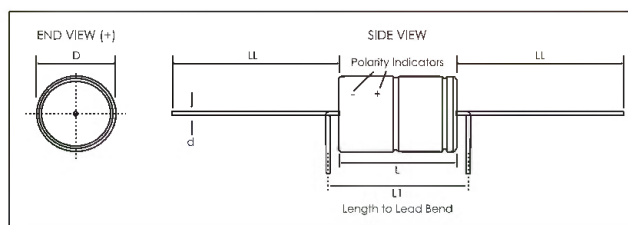
CDA 228 VI Higher CV  
Downsized CDA 226 VG



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	520 ~ 7000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

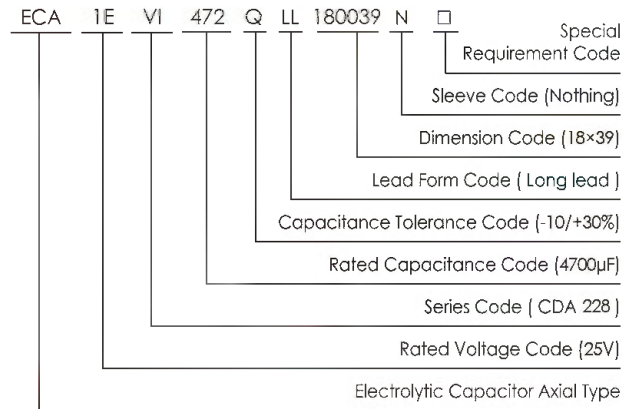


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13
200035	20.2	34.7	41	1.0	40	20
200043	20.2	42.7	49	1.0	40	24

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:25V4700μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 228 VI Series

U <sub>r</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
		20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz		
[V]	(μF)	(mΩ)	(mΩ)	(mΩ)	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]2*	[Arms]3*	(mm)	-	
25 (1E)	2100	58	32	12.3	17.0	10.8	4.8	6.1	7.7	16x27	ECA1EVI212M □□160027	
	3000	41	23	9.8	19.1	12.1	5.4	7.3	9.2	16x35	ECA1EVI302M □□160035	
	2800	43	24	10.6	19.2	12.1	5.4	6.9	8.8	18x27	ECA1EVI282Q □□180027	
	4100	31	18	8.5	21.4	13.6	6.1	8.3	10.4	18x35	ECA1EVI412Q □□180035	
	4700	27	16	8	22.1	14.0	6.3	8.8	11.1	18x39	ECA1EVI472Q □□180039	
	3700	35	20	9.9	22.9	14.5	6.5	7.5	9.5	20x27	ECA1EVI372Q □□200027	
	5300	25	15	8.1	25.4	16.0	7.2	8.9	11.3	20x35	ECA1EVI532Q □□200035	
	7000	20	13	7.2	27.0	17.0	7.6	9.9	12.5	20x43	ECA1EVI702Q □□200043	
40 (1G)	1100	79	32	13.1	16.5	10.4	4.7	5.9	7.5	16x27	ECA1GVI112Q □□160027	
	1700	54	23	10.1	18.8	11.9	5.3	7.2	9	16x35	ECA1GVI172Q □□160035	
	1700	55	24	11	18.8	11.9	5.3	6.8	8.6	18x27	ECA1GVI172Q □□180027	
	2400	39	18	8.8	21.1	13.3	6	8.2	10.3	18x35	ECA1GVI242Q □□180035	
	2800	34	16	8.2	21.8	13.8	6.2	8.6	10.9	18x39	ECA1GVI282Q □□180039	
	2200	44	20	10.2	22.6	14.3	6.4	7.4	9.3	20x27	ECA1GVI222Q □□200027	
	3200	31	15	8.2	25.2	15.9	7.1	8.8	11.1	20x35	ECA1GVI322Q □□200035	
	4200	25	13	7.3	26.7	16.9	7.6	9.8	12.3	20x43	ECA1GVI422Q □□200043	
63 (1J)	520	133	45	22	12.7	8.1	3.6	4.6	5.8	16x27	ECA1JVI521Q □□160027	
	750	93	32	16.4	14.8	9.3	4.2	5.6	7.1	16x35	ECA1JVI751Q □□160035	
	750	94	33	17.3	15	9.5	4.3	5.4	6.9	18x27	ECA1JVI751Q □□180027	
	1100	66	24	13.3	17.1	10.8	4.8	6.6	8.4	18x35	ECA1JVI112Q □□180035	
	1200	60	21	12.1	18	11.4	5.1	7.1	9	18x39	ECA1JVI122Q □□180039	
	990	74	27	15.2	18.5	11.7	5.2	6.1	7.7	20x27	ECA1JVI991Q □□200027	
	1400	53	20	11.7	21.1	13.3	6	7.4	9.4	20x35	ECA1JVI142Q □□200035	
	1800	42	16	10.1	22.7	14.4	6.4	8.4	10.6	20x43	ECA1JVI182Q □□200043	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 1000 hours at +165°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

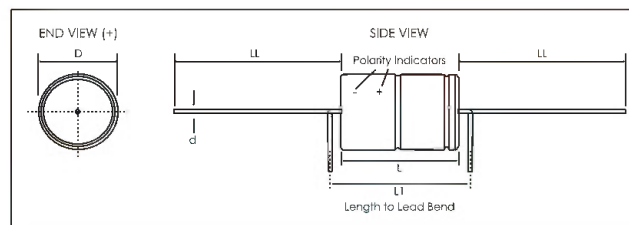
CDA 236 WG



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +165		
Voltage Range (V)	25 ~ 40		
Capacitance Range (μF)	250 ~ 2000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	7400	800
	18/20	9200	1000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

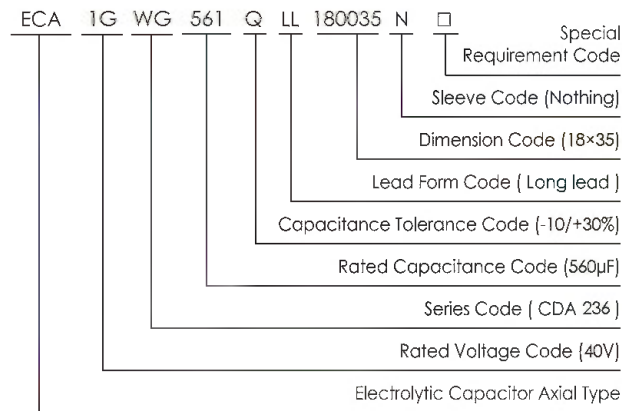


Dimension Code	D	L	L1	d	Bulk LL	Approximate Weight (g)
	±0.5	±1.0	Min.	±0.03	-2/+2	
160027	16.2	26.7	33	1.0	40	8
160035	16.2	34.7	41	1.0	40	11
180027	18.2	26.7	33	1.0	40	11
180035	18.2	34.7	41	1.0	40	14
180039	18.2	38.7	45	1.0	40	16
200027	20.2	26.7	33	1.0	40	13

Note: L1 is Jianghai's recommendation for minimum distance between symmetrical lead bend.



## Part Number System (Ex:40V560 $\mu$ F)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDA 236 WG Series

U <sub>R</sub> Code	Rated Capacitance	Max ESR				Ripple Current				Size $\Phi$ D x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>		
	20°C, 100Hz	20°C, 100Hz	20°C, 100kHz	125~165°C, 5~100kHz	140°C, ≥5kHz	155°C, ≥5kHz	165°C, ≥5kHz	140°C, ≥5kHz	165°C, ≥5kHz		
[V]	( $\mu$ F)	(m $\Omega$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)1*	(Arms)1*	(Arms)1*	(Arms)2*	(Arms)3*	(mm)	-
25 (1E)	800	102	37	14.6	15.6	9.9	4.4	5.8	1.6	16x27	ECA1EWG801Q □□ 160027
	1200	69	26	11.1	17.9	11.3	5.1	7.0	2.0	16x35	ECA1EWG122Q □□ 160035
	1200	70	27	11.8	18.2	11.5	5.1	6.8	1.9	18x27	ECA1EWG122Q □□ 180027
	1800	49	20	9.4	20.4	12.9	5.8	8.0	2.3	18x35	ECA1EWG182Q □□ 180035
	2000	43	17	8.6	21.3	13.5	6.0	8.6	2.4	18x39	ECA1EWG202Q □□ 180039
40 (1G)	1500	57	22	10.7	22.1	14.0	6.2	7.4	2.1	20x27	ECA1EWG152Q □□ 200027
	250	210	36	17.9	14.1	8.9	4.0	5.1	1.4	16x27	ECA1GWG251Q □□ 160027
	370	144	26	13.5	16.3	10.3	4.6	6.3	1.8	16x35	ECA1GWG371Q □□ 160035
	380	141	26	13.9	16.8	10.6	4.7	6.1	1.7	18x27	ECA1GWG381Q □□ 180027
	560	97	19	10.8	19.0	12.0	5.4	7.5	2.1	18x35	ECA1GWG561Q □□ 180035
	640	85	17	9.9	19.9	12.6	5.6	7.9	2.2	18x39	ECA1GWG641Q □□ 180039
	470	116	23	12.7	20.3	12.8	5.7	6.7	1.9	20x27	ECA1GWG471Q □□ 200027

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection ( $\phi$ 18/20 case 2000 h,  $\phi$ 16 case 1600 h).

3\* Max ripple current, at natural convection ( $\phi$ 18/20 case 1000 h,  $\phi$ 16 case 800 h).

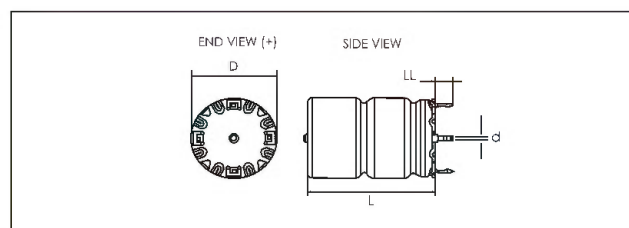


- 2000 hours at +150°C
- Very high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	250 ~ 4700		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

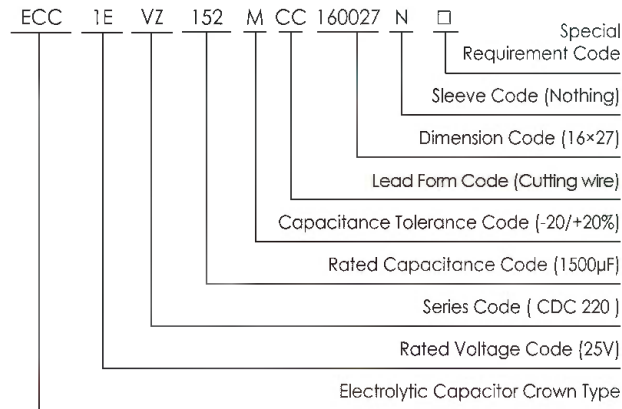


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13
200035	20.2	35.7	1.0	3.3	20
200043	20.2	43.7	1.0	3.3	24

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:25V1500μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 220 VA Series

U <sub>R</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
		20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz		
[V]	(μF)	(mΩ)	(mΩ)	(mΩ)	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]2*	[Arms]3*	(mm)	-	
25 (1E)	1500	78	42	18.4	13.9	8.8	3.9	4.8	6.1	16x27	ECC1EVZ152M □□ 160027	
	2200	56	31	14.3	15.8	10.0	4.5	5.8	7.4	16x35	ECC1EVZ222M □□ 160027	
	2000	61	34	17.2	15.1	9.5	4.3	5.2	6.6	18x27	ECC1EVZ202Q □□ 180027	
	3000	43	25	15.2	16.0	10.1	4.5	6.0	7.5	18x35	ECC1EVZ302Q □□ 180035	
	3400	38	22	12.2	17.9	11.3	5.1	6.7	8.6	18x39	ECC1EVZ342Q □□ 180039	
	2200	61	36	19.0	16.6	10.5	4.7	5.2	6.6	20x27	ECC1EVZ222Q □□ 200027	
	3300	43	26	14.3	19.1	12.1	5.4	6.4	8.1	20x35	ECC1EVZ332Q □□ 200035	
	4700	32	20	11.8	21.0	13.3	5.9	7.4	9.3	20x43	ECC1EVZ472Q □□ 200043	
40 (1G)	800	108	43	19.2	13.6	8.6	3.9	4.7	5.9	16x27	ECC1GVZ801Q □□ 160027	
	1200	74	31	14.8	15.5	9.8	4.4	5.7	7.2	16x35	ECC1GVZ122Q □□ 160035	
	1200	77	34	17.7	14.9	9.4	4.2	5.1	6.5	18x27	ECC1GVZ122Q □□ 180027	
	1700	55	25	13.7	16.9	10.7	4.8	6.2	7.9	18x35	ECC1GVZ172Q □□ 180035	
	2000	48	22	12.6	17.6	11.1	5.0	6.7	8.5	18x39	ECC1GVZ202Q □□ 180039	
	1500	68	33	17.8	17.1	10.8	4.8	5.4	6.8	20x27	ECC1GVZ152Q □□ 200027	
	2200	49	25	13.9	19.4	12.2	5.5	6.5	8.2	20x35	ECC1GVZ222Q □□ 200035	
	2700	39	20	12.1	20.7	13.1	5.9	7.3	9.2	20x43	ECC1GVZ272Q □□ 200043	
63 (1J)	250	233	59	32.4	10.5	6.6	3.0	3.6	4.5	16x27	ECC1JVZ251Q □□ 160027	
	370	160	42	23.9	12.2	7.7	3.5	4.5	5.7	16x35	ECC1JVZ371Q □□ 160035	
	380	158	44	26.8	12.1	7.6	3.4	4.2	5.3	18x27	ECC1JVZ381Q □□ 180027	
	560	110	32	20.0	14.0	8.8	4.0	5.2	6.6	18x35	ECC1JVZ561Q □□ 180035	
	640	96	28	18.1	14.7	9.3	4.2	5.6	7.1	18x39	ECC1JVZ641Q □□ 180039	
	470	134	41	25.9	14.2	9.0	4.0	4.5	5.7	20x27	ECC1JVZ471Q □□ 200027	
	680	94	30	19.7	16.3	10.3	4.6	5.6	7.0	20x35	ECC1JVZ681Q □□ 200035	
	900	74	25	16.6	17.7	11.2	5.0	6.3	7.9	20x43	ECC1JVZ901Q □□ 200043	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 2000 hours at +150°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

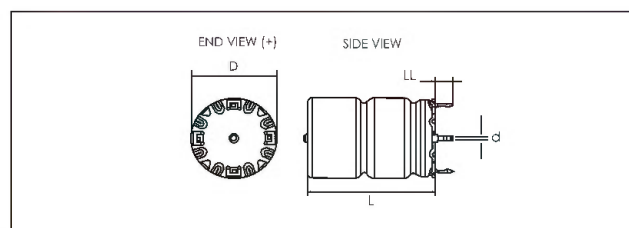
CDC 225 VU ← Higher Current  
Downsized → CDC 220 VZ



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +125, (-40 ~ +150 at derated voltage)		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	470 ~ 6300		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, (± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40 °C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed ΔC/C < 5%.		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

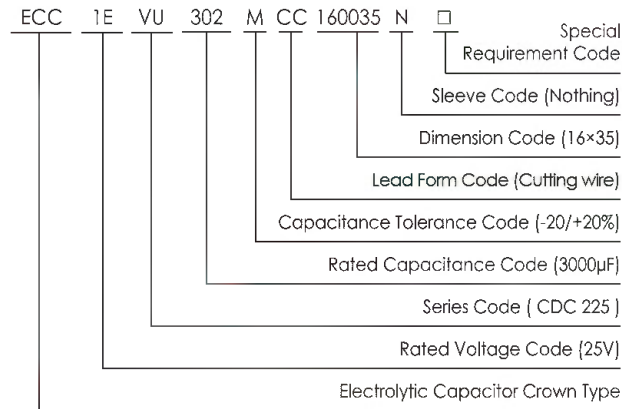


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13
200035	20.2	35.7	1.0	3.3	20
200043	20.2	43.7	1.0	3.3	24

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:25V3000μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 225 VF Series

U <sub>r</sub> Code		Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
							Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
125 °C	150 °C	20 °C, 100Hz	20 °C, 100Hz	20 °C, 100kHz	125~150 °C, 5~100kHz	125 °C, ≥5kHz	140 °C, ≥5kHz	150 °C, ≥5kHz	125 °C, ≥5kHz	125 °C, ≥5kHz (derated voltage)			
[V]	[V]	[μF]	[mΩ]	[mΩ]	[mΩ]	[Arms]1*	[Arms]2*	[Arms]2*	[Arms]3*	[Arms]4*	[mm]		-
25 (1E)	18 (1D)	2200	60	34	11.9	17.3	11.0	4.9	6.1	7.7	16x27	ECC1EVU222M □ □	160027
		3000	44	25	9.2	19.7	12.5	5.6	7.4	9.4	16x35	ECC1EVU302M □ □	160027
		2700	46	26	10.8	19.0	12.0	5.4	6.6	8.3	18x27	ECC1EVU272Q □ □	180027
		4000	33	19	8.6	21.3	13.5	6.0	7.9	10.0	18x35	ECC1EVU402Q □ □	180035
		4600	29	17	8.0	22.1	14.0	6.3	8.4	10.6	18x39	ECC1EVU462Q □ □	180039
		3600	38	22	9.0	23.5	14.9	6.7	7.6	9.6	20x27	ECC1EVU362Q □ □	200027
		4800	28	16	7.3	26.7	16.9	7.6	9.2	11.7	20x35	ECC1EVU482Q □ □	200035
		6300	24	14	6.5	28.3	17.9	8.0	10.2	12.9	20x43	ECC1EVU632Q □ □	200043
40 (1G)	32 (1F)	1200	80	36	13.0	16.6	10.5	4.7	5.8	7.4	16x27	ECC1GVU122M □ □	160027
		1800	55	25	9.6	19.3	12.2	5.5	7.2	9.2	16x35	ECC1GVU182M □ □	160035
		1600	59	26	11.2	18.7	11.8	5.3	6.5	8.2	18x27	ECC1GVU162Q □ □	180027
		2200	44	20	9.1	20.7	13.1	5.9	7.7	9.7	18x35	ECC1GVU222Q □ □	180035
		2600	37	17	8.3	21.7	13.7	6.1	8.2	10.4	18x39	ECC1GVU262Q □ □	180039
		2000	50	23	10.0	22.8	14.4	6.5	7.3	9.3	20x27	ECC1GVU202Q □ □	200027
		3000	35	17	7.8	25.8	16.3	7.3	8.9	11.3	20x35	ECC1GVU302Q □ □	200035
		3900	28	14	6.8	27.7	17.5	7.8	10.0	12.7	20x43	ECC1GVU392Q □ □	200043
63 (1J)	54 (1Y)	470	156	52	24.3	12.1	7.7	3.4	4.2	5.3	16x27	ECC1JVU471Q □ □	160027
		680	109	37	18.7	13.8	8.7	3.9	5.3	6.7	16x35	ECC1JVU681Q □ □	160035
		720	110	36	18.4	14.6	9.2	4.1	5.0	6.4	18x27	ECC1JVU721Q □ □	180027
		1000	75	26	14.1	16.6	10.5	4.7	6.2	7.8	18x35	ECC1JVU102Q □ □	180035
		1200	64	23	12.6	17.6	11.1	5.0	6.7	8.5	18x39	ECC1JVU122Q □ □	180039
		900	86	31	16.1	18.0	11.4	5.1	5.8	7.3	20x27	ECC1JVU901Q □ □	200027
		1400	57	22	11.9	20.9	13.2	5.9	7.3	9.2	20x35	ECC1JVU142Q □ □	200035
		1800	45	18	10.0	22.8	14.4	6.5	8.3	10.5	20x43	ECC1JVU182Q □ □	200043

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Valid for capacitor supplied with reduced DC voltage, capacitor-mounted with low thermal resistance path.

3\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

4\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



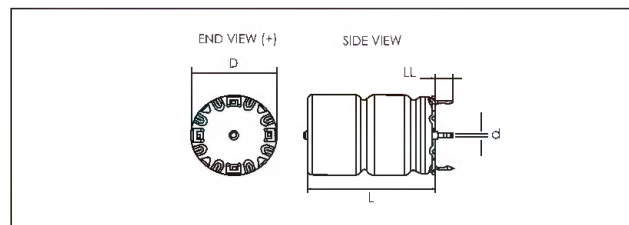
- 2000 hours at +150°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

CDC 220 VZ  $\xrightarrow{\text{Higher Current}}$  CDC 226 VT



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	250 ~ 4700		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

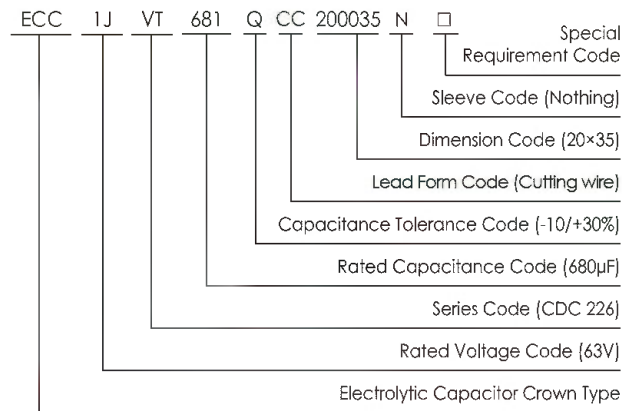


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13
200035	20.2	35.7	1.0	3.3	20
200043	20.2	43.7	1.0	3.3	24

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:63V680μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 226 VT Series

U <sub>r</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
	20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz			
[V]	[μF]	[mΩ]	[mΩ]	[mΩ]	[Arms]1*	[Arms]1*	[Arms]1*	[Arms]2*	[Arms]3*	[mm]	-	
25 (1E)	1500	72	36	12.7	16.8	10.6	4.7	5.9	7.4	16x27	ECC1EVT152M □□ 160027	
	2200	51	26	9.7	19.2	12.1	5.4	7.2	9.1	16x35	ECC1EVT222M □□ 160035	
	2000	53	26	11.0	18.8	11.9	5.3	6.5	8.3	18x27	ECC1EVT202Q □□ 180027	
	3000	37	19	8.7	21.2	13.4	6.0	7.9	10.0	18x35	ECC1EVT302Q □□ 180035	
	3400	33	17	8.1	22.0	13.9	6.2	8.3	10.5	18x39	ECC1EVT342Q □□ 180039	
	2200	50	25	10.6	22.2	14.0	6.3	7.1	9.1	20x27	ECC1EVT222Q □□ 200027	
	3300	34	17	7.8	25.8	16.3	7.3	8.9	11.3	20x35	ECC1EVT332Q □□ 200035	
	4700	25	13	6.4	28.5	18.0	8.1	10.3	13.1	20x43	ECC1EVT472Q □□ 200043	
40 (1G)	800	100	36	13.6	16.2	10.2	4.6	5.6	7.2	16x27	ECC1GVT801Q □□ 160027	
	1200	69	26	10.3	18.6	11.8	5.3	7.0	8.8	16x35	ECC1GVT122Q □□ 160035	
	1200	70	27	11.7	18.3	11.6	5.2	6.3	8.0	18x27	ECC1GVT122Q □□ 180027	
	1800	49	20	9.3	20.5	13.0	5.8	7.6	9.6	18x35	ECC1GVT182Q □□ 180035	
	2000	43	17	8.5	21.4	13.6	6.1	8.1	10.3	18x39	ECC1GVT202Q □□ 180039	
	1500	57	22	10.0	22.8	14.4	6.5	7.3	9.3	20x27	ECC1GVT152Q □□ 200027	
	2200	41	17	7.9	25.7	16.2	7.3	8.9	11.2	20x35	ECC1GVT222Q □□ 200035	
	2700	32	13	6.7	27.9	17.6	7.9	10.1	12.8	20x43	ECC1GVT272Q □□ 200043	
63 (1J)	250	227	53	26.9	11.5	7.3	3.3	4.0	5.1	16x27	ECC1JVT251Q □□ 160027	
	370	155	37	19.2	13.6	8.6	3.9	5.1	6.4	16x35	ECC1JVT371Q □□ 160035	
	380	151	36	19.9	14.0	8.9	4.0	4.9	6.1	18x27	ECC1JVT381Q □□ 180027	
	560	104	26	14.9	16.2	10.2	4.6	6.0	7.6	18x35	ECC1JVT561Q □□ 180035	
	640	91	23	13.3	17.1	10.8	4.8	6.5	8.2	18x39	ECC1JVT641Q □□ 180039	
	470	125	32	17.5	17.3	10.9	4.9	5.5	7.0	20x27	ECC1JVT471Q □□ 200027	
	680	87	23	13	20.0	12.7	5.7	6.9	8.7	20x35	ECC1JVT681Q □□ 200035	
	900	67	18	10.6	22.2	14.0	6.3	8.1	10.2	20x43	ECC1JVT901Q □□ 200043	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



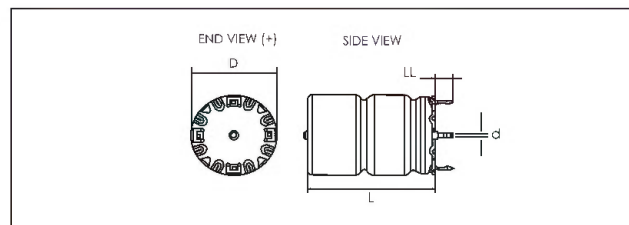
- 2000 hours at +150°C
- Ultra-high CV
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

CDC 227 VS Higher CV  
Downsized CDC 225 VU



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +125, (-40 ~ +150 at derated voltage)		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	780 ~ 11000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, (± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

## Dimensions mm

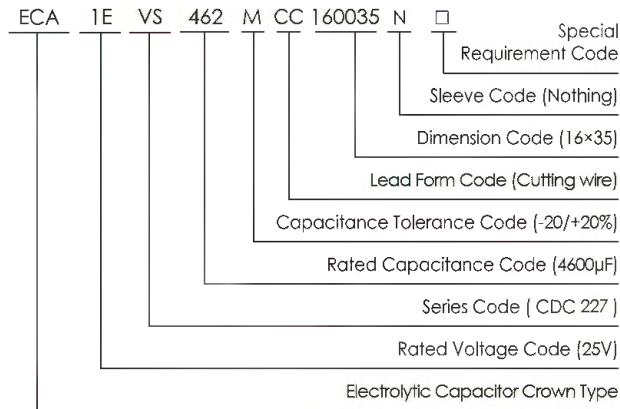


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13
200035	20.2	35.7	1.0	3.3	20
200043	20.2	43.7	1.0	3.3	24

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:25V4600μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 227 VS Series

U <sub>r</sub> Code		Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
							Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
125℃	150℃	20℃, 100Hz	20℃, 100Hz	20℃, 100kHz	125~150℃, 5~100kHz	125℃, ≥5kHz	140℃, ≥5kHz	150℃, ≥5kHz	125℃, ≥5kHz	125℃, ≥5kHz (derated voltage)			
(V)	(V)	(μF)	(mΩ)	(mΩ)	(mΩ)	(Arms)1*	(Arms)2*	(Arms)2*	(Arms)3*	(Arms)4*	(mm)	-	
25 (1E)	18 (1D)	3200	49	32	12.1	17.2	10.9	4.9	6.2	7.8	16x27	ECC1EVS322M □□ 160027	
		4600	35	23	9.6	19.3	12.2	5.5	7.4	9.3	16x35	ECC1EVS462M □□ 160035	
		4300	37	24	10.4	19.4	12.3	5.5	7.0	8.9	18x27	ECC1EVS432Q □□ 180027	
		6200	27	18	8.4	21.6	13.6	6.1	8.3	10.5	18x35	ECC1EVS622Q □□ 180035	
		7100	24	16	7.9	22.2	14.1	6.3	8.8	11.1	18x39	ECC1EVS712Q □□ 180039	
		5600	30	20	9.8	23.1	14.6	6.5	7.6	9.6	20x27	ECC1EVS562Q □□ 200027	
		8100	22	15	7.9	25.7	16.2	7.3	9.0	11.4	20x35	ECC1EVS812Q □□ 200035	
		11000	18	13	7.1	27.1	17.1	7.7	9.9	12.5	20x43	ECC1EVS113Q □□ 200043	
40 (1G)	32 (1F)	1500	67	32	12.6	16.8	10.6	4.8	6.0	7.6	16x27	ECC1GVS152Q □□ 160027	
		2200	47	23	9.9	19.0	12.0	5.4	7.2	9.1	16x35	ECC1GVS222M □□ 160035	
		2100	49	24	10.8	19.0	12.0	5.4	6.9	8.7	18x27	ECC1GVS212M □□ 180027	
		3000	35	18	8.7	21.2	13.4	6.0	8.2	10.4	18x35	ECC1GVS302Q □□ 180035	
		3500	31	16	8.1	22.0	13.9	6.2	8.7	11.0	18x39	ECC1GVS352Q □□ 180039	
		2700	40	20	10.1	22.7	14.4	6.4	7.4	9.4	20x27	ECC1GVS272Q □□ 200027	
		4200	27	14	8.0	25.5	16.1	7.2	9.0	11.4	20x35	ECC1GVS422Q □□ 200035	
		5200	23	13	7.3	26.7	16.9	7.6	9.8	12.4	20x43	ECC1GVS522Q □□ 200043	
63 (1J)	54 (1Y)	780	107	45	21.3	12.9	8.2	3.7	4.6	5.9	16x27	ECC1JVS781Q □□ 160027	
		1100	76	32	16.0	14.9	9.4	4.2	5.7	7.2	16x35	ECC1JVS112Q □□ 160035	
		1100	77	33	16.9	15.2	9.6	4.3	5.5	6.9	18x27	ECC1JVS112Q □□ 180027	
		1600	55	24	13.0	17.3	11.0	4.9	6.7	8.5	18x35	ECC1JVS162Q □□ 180035	
		1900	47	21	11.8	18.2	11.5	5.1	7.2	9.1	18x39	ECC1JVS192Q □□ 180039	
		1500	60	27	14.8	18.8	11.9	5.3	6.1	7.8	20x27	ECC1JVS152Q □□ 200027	
		2100	43	20	11.5	21.3	13.5	6.0	7.5	9.5	20x35	ECC1JVS212Q □□ 200035	
		2800	34	16	9.8	23.4	14.8	6.6	8.5	10.7	20x43	ECC1JVS282Q □□ 200043	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Valid for capacitor supplied with reduced DC voltage, capacitor-mounted with low thermal resistance path.

3\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

4\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 2000 hours at +150°C
- Ultra-high CV
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

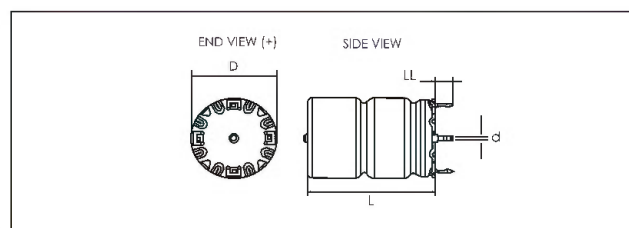
CDC 228 VR Higher CV  
Downsized CDC 226 VT



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +150		
Voltage Range (V)	25 ~ 63		
Capacitance Range (μF)	520 ~ 7000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	6300	1500
	18/20	8400	2000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz (capacitor clamped by body). Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

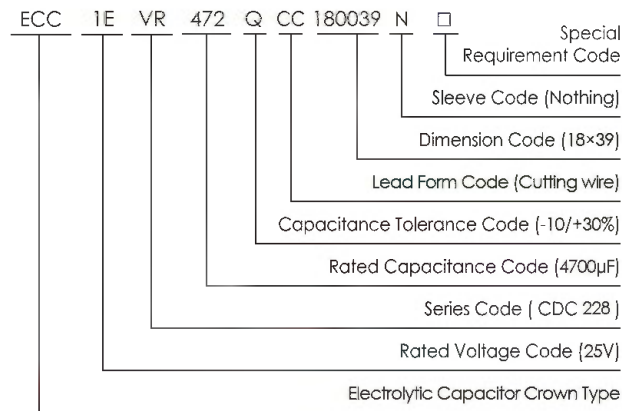


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13
200035	20.2	35.7	1.0	3.3	20
200043	20.2	43.7	1.0	3.3	24

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:25V4700μF)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 228 VR Series

U <sub>r</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size ΦD x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
		20°C, 100Hz	20°C, 100Hz	20°C, 100kHz	125~150°C, 5~100kHz	125°C, ≥5kHz	140°C, ≥5kHz	150°C, ≥5kHz	125°C, ≥5kHz	125°C, ≥5kHz		
[V]	(μF)	(mΩ)	(mΩ)	(mΩ)	(Arms)1*	(Arms)1*	(Arms)1*	(Arms)1*	(Arms)2*	(Arms)3*	(mm)	-
25 (1E)	2100	58	32	12.3	17.0	10.8	4.8	6.1	7.7	9.2	16x27	ECC1EVR212M□□160027
	3000	41	23	9.8	19.1	12.1	5.4	7.3	9.2	9.2	16x35	ECC1EVR302M□□160035
	2800	43	24	10.6	19.2	12.1	5.4	6.9	8.8	8.8	18x27	ECC1EVR282Q□□180027
	4100	31	18	8.5	21.4	13.6	6.1	8.3	10.4	10.4	18x35	ECC1EVR412Q□□180035
	4700	27	16	8	22.1	14.0	6.3	8.8	11.1	11.1	18x39	ECC1EVR472Q□□180039
	3700	35	20	9.9	22.9	14.5	6.5	7.5	9.5	9.5	20x27	ECC1EVR372Q□□200027
	5300	25	15	8.1	25.4	16.0	7.2	8.9	11.3	11.3	20x35	ECC1EVR532Q□□200035
	7000	20	13	7.2	27.0	17.0	7.6	9.9	12.5	12.5	20x43	ECC1EVR702Q□□200043
40 (1G)	1100	79	32	13.1	16.5	10.4	4.7	5.9	7.5	7.5	16x27	ECC1GVR112Q□□160027
	1700	54	23	10.1	18.8	11.9	5.3	7.2	9	9	16x35	ECC1GVR172Q□□160035
	1700	55	24	11	18.8	11.9	5.3	6.8	8.6	8.6	18x27	ECC1GVR172Q□□180027
	2400	39	18	8.8	21.1	13.3	6	8.2	10.3	10.3	18x35	ECC1GVR242Q□□180035
	2800	34	16	8.2	21.8	13.8	6.2	8.6	10.9	10.9	18x39	ECC1GVR282Q□□180039
	2200	44	20	10.2	22.6	14.3	6.4	7.4	9.3	9.3	20x27	ECC1GVR222Q□□200027
	3200	31	15	8.2	25.2	15.9	7.1	8.8	11.1	11.1	20x35	ECC1GVR322Q□□200035
	4200	25	13	7.3	26.7	16.9	7.6	9.8	12.3	12.3	20x43	ECC1GVR422Q□□200043
63 (1J)	520	133	45	22	12.7	8.1	3.6	4.6	5.8	5.8	16x27	ECC1JVR521Q□□160027
	750	93	32	16.4	14.8	9.3	4.2	5.6	7.1	7.1	16x35	ECC1JVR751Q□□160035
	750	94	33	17.3	15	9.5	4.3	5.4	6.9	6.9	18x27	ECC1JVR751Q□□180027
	1100	66	24	13.3	17.1	10.8	4.8	6.6	8.4	8.4	18x35	ECC1JVR112Q□□180035
	1200	60	21	12.1	18	11.4	5.1	7.1	9	9	18x39	ECC1JVR122Q□□180039
	990	74	27	15.2	18.5	11.7	5.2	6.1	7.7	7.7	20x27	ECC1JVR991Q□□200027
	1400	53	20	11.7	21.1	13.3	6	7.4	9.4	9.4	20x35	ECC1JVR142Q□□200035
	1800	42	16	10.1	22.7	14.4	6.4	8.4	10.6	10.6	20x43	ECC1JVR182Q□□200043

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

2\* Rated ripple current, continuous operation at natural convection (φ18/20 case 4000 h, φ16 case 3000 h).

3\* Max ripple current, at natural convection (φ18/20 case 2000 h, φ16 case 1500 h).



- 1000 hours at +165°C
- Extremely high ripple current capability
- High vibration stability
- AEC-Q200 automotive qualified, RoHS Compliant

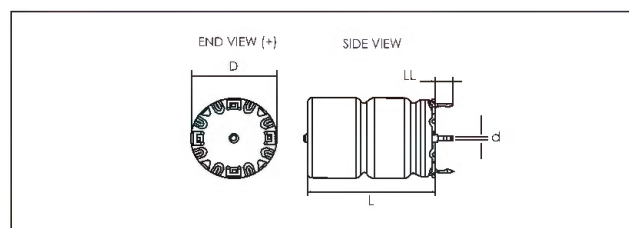
CDC 236 WT



Items	Characteristics		
Operating Temperature Range (°C)	-40 ~ +165		
Voltage Range (V)	25 ~ 40		
Capacitance Range (μF)	250 ~ 2000		
Capacitance Tolerance (20°C, 100Hz)	-10/+30%, ( ± 20% select values)		
Leakage Current (μA)	After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.003CV+4.0 . C: Nominal Capacitance(μF) V: Rated Voltage(V)		
Equivalent Series Resistance (20°C, 100Hz/100kHz)	Less than values shown in the standard ratings.		
Operational Life	D(mm)	Rated voltage, +125°C (hours)	Rated voltage, +150°C (hours)
	16	7400	800
	18/20	9200	1000
	Capacitance Change: Within 15% of the initial value. Equivalent Series Resistance: Not more than 200% of the initial value. Leakage Current: Not more than the initial specified value. (All specifications should be test at +20°C Life ambient temperature. )		
Shelf Life	5000 hours at +105°C or 10 years at +40°C 0 VDC		
Vibration Test	Procedure: Displacement amplitude max.1.5mm, acceleration max.20 g, duration 3×22h, frequency range 10 ~ 2000 Hz {capacitor clamped by body}. Requirements: No leakage of electrolyte or other visible damage. Deviations in capacitance from initial value must not exceed $\Delta C/C < 5\%$ .		
Standards	IEC 60384-4, AEC-Q200		

AXIAL/CROWN

## Dimensions mm

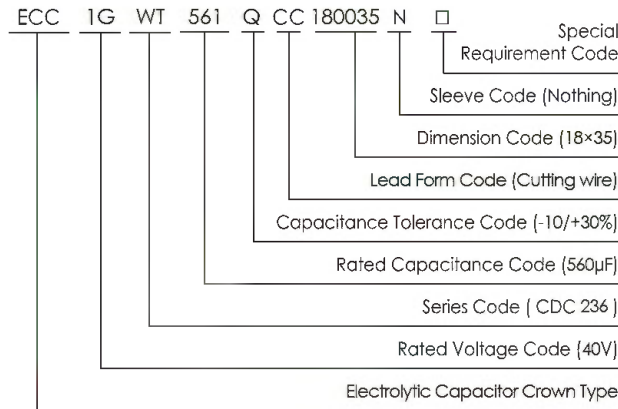


Dimension Code	D	L	d	LL	Approximate Weight (g)
	±0.5	±1.0	±0.03	±0.5	
160027	16.2	27.7	1.0	3.3	8
160035	16.2	35.7	1.0	3.3	11
180027	18.2	27.7	1.0	3.3	11
180035	18.2	35.7	1.0	3.3	14
180039	18.2	39.7	1.0	3.3	16
200027	20.2	27.7	1.0	3.3	13

Note: Catalog parts show the standard design, the new designs need to contact to Jianghai.



## Part Number System (Ex:40V560 $\mu$ F)



## Ripple Current Coefficient

Frequency (Hz)	100	300	1K	5K	100K
Coefficient	0.35	0.57	0.80	1.00	1.04

## Ratings for CDC 236 WT Series

U <sub>R</sub> Code	Rated Capacitance	Max ESR				Ripple Current					Size $\Phi$ D x L	P/N
						Max T <sub>c</sub>			Rated T <sub>a</sub>	Max T <sub>a</sub>		
	20°C, 100Hz	20°C, 100Hz	20°C, 100kHz	125~165°C, 5~100kHz	140°C, ≥5kHz	155°C, ≥5kHz	165°C, ≥5kHz	140°C, ≥5kHz	165°C, ≥5kHz			
[V]	( $\mu$ F)	(m $\Omega$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)1*	(Arms)1*	(Arms)1*	(Arms)2*	(Arms)3*	(mm)	-	
25 (1E)	800	102	37	14.6	15.6	9.9	4.4	5.8	1.6	16x27	ECC1EWT801Q □□ 160027	
	1200	69	26	11.1	17.9	11.3	5.1	7.0	2.0	16x35	ECC1EWT122Q □□ 160035	
	1200	70	27	11.8	18.2	11.5	5.1	6.8	1.9	18x27	ECC1EWT122Q □□ 180027	
	1800	49	20	9.4	20.4	12.9	5.8	8.0	2.3	18x35	ECC1EWT182Q □□ 180035	
	2000	43	17	8.6	21.3	13.5	6.0	8.6	2.4	18x39	ECC1EWT202Q □□ 180039	
40 (1G)	1500	57	22	10.7	22.1	14.0	6.2	7.4	2.1	20x27	ECC1EWT151Q □□ 200027	
	250	210	36	17.9	14.1	8.9	4.0	5.1	1.4	16x27	ECC1GWT251Q □□ 160027	
	370	144	26	13.5	16.3	10.3	4.6	6.3	1.8	16x35	ECC1GWT371Q □□ 160035	
	380	141	26	13.9	16.8	10.6	4.7	6.1	1.7	18x27	ECC1GWT381Q □□ 180027	
	560	97	19	10.8	19.0	12.0	5.4	7.5	2.1	18x35	ECC1GWT561Q □□ 180035	
	640	85	17	9.9	19.9	12.6	5.6	7.9	2.2	18x39	ECC1GWT641Q □□ 180039	
	470	116	23	12.7	20.3	12.8	5.7	6.7	1.9	20x27	ECC1GWT471Q □□ 200027	

Note: 1\* Capacitor-mounted with low thermal resistance path (heat-sink).

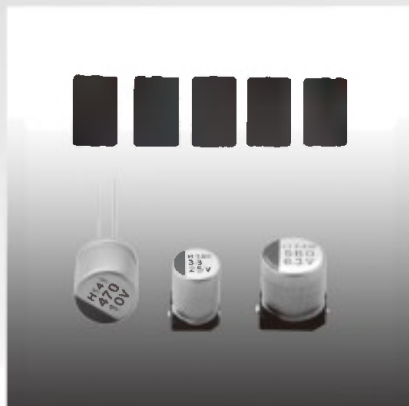
2\* Rated ripple current, continuous operation at natural convection ( $\phi$ 18/20 case 2000 h,  $\phi$ 16 case 1600 h).

3\* Max ripple current, at natural convection ( $\phi$ 18/20 case 1000 h,  $\phi$ 16 case 800 h).





## Conductive Polymer Aluminum Electrolytic Capacitors





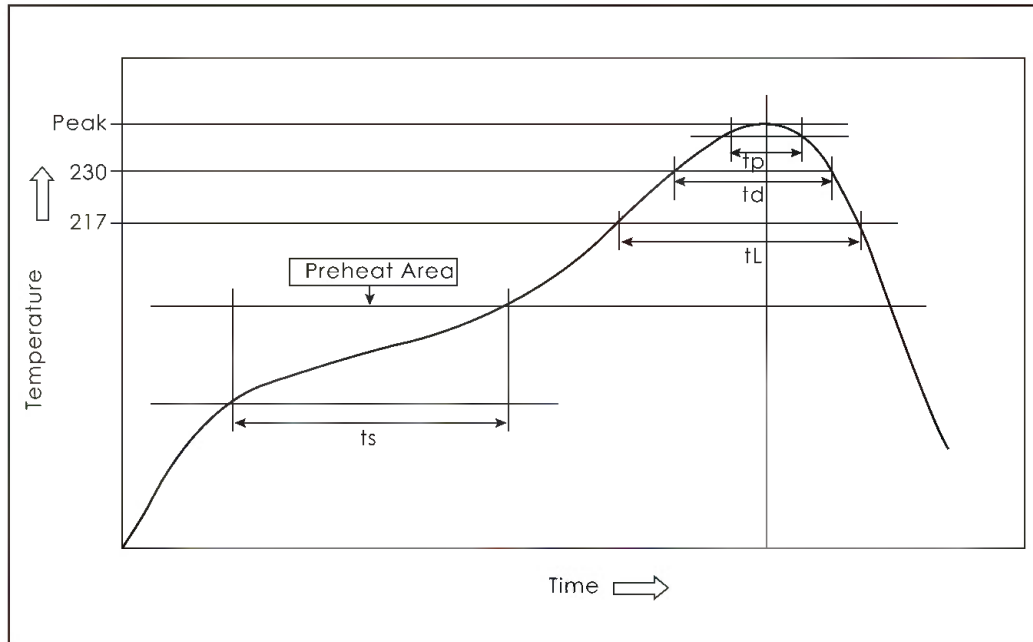
## Part Number System for Polymer Capacitor

PC	R		1C		EN		471		M		CAC		LL		50		W		T					
Capacitor Type	Terminal Type		Rated Voltage Code (V)		Series Code		Capacitance Code (μF)		Capacitance Tolerance(%)		Dimension (mm)		Lead Form		Terminal/ Pitch size		Heat-shrinkable sleeve		Rubber plug shape					
PC=Polymer Capacitor	Vertical	V	2	0D	HCN	CN	□□×10 <sup>n</sup> μF		+10	K	E05	5×5	Taping forming	FA	Pitch/Cutting length (mm)	Code	Laminated	W	Convex rubber plug	T				
			2.5	0E	HEN	EN	0.47	R47	-10		E07	5×7		FB										
	Radial	R	4	0G	HGN	GN	4.7	4R7	+15	L	E08	5×8	Lead cut	CC										
6.3			0J	HEL	EL	47	470	-15	E09		5×9	CC												
			6.8	68	HCS	CS	470	471	+20	M	E10	5×10	Long Lead	LL	2.0	20	Plastic	P	Flat rubber plug	P				
			7	07	HPF	PF	4700	472	-20		E10	5×11		LL	2.0	20								
			7.5	75	HPK	PK					S09	5.5×9	SMD	FV	2.5	25								
			10	1A	HEG	EG					S11	5.5×11			2.5	25								
			12	A2	HET	ET					F05	6.3×5			3.5	35			Mold	M				
			12.5	1B	HVC	VC					F07	6.3×7												
			14	B1	HVM	VM					F08	6.3×8												
			16	1C	HVG	VG					F09	6.3×9									5.0	50		
			20	1D	HVS	SV					F10	6.3×10							Special length	TS				
			25	1E	HVF	VF					F11	6.3×11												
			28	1L	HVK	VK					F12	6.3×12												
			30	30	HVL	VL					B06	8×6												
			32	1F							B08	8×8												
			35	1V							B09	8×9												
			40	1G							BAB	8×11.5												
			50	1H							B14	8×14												
			63	1J							B16	8×16												
			80	1K							B20	8×20												
			100	2A							C08	10×8												
			125	2B							C09	10×9												
			160	2C							C10	10×10												
			200	2D							CAC	10×12.5												
											C14	10×14												
											C16	10×16												
											C20	10×20												
											SMD(Vertical)													
											E60	5.0×5.7												
											F60	6.3×5.7												
											F80	6.3×7.7												
											F10	6.3×10												
											B70	8×6.7												
											B10	8×10												
											B12	8×12.2												
											C10	10×10												
											C12	10×12.2												
											C16	10×16												



## SMD type (Vertical)

### RECOMMENDED REFLOW SOLDERING CONDITIONS

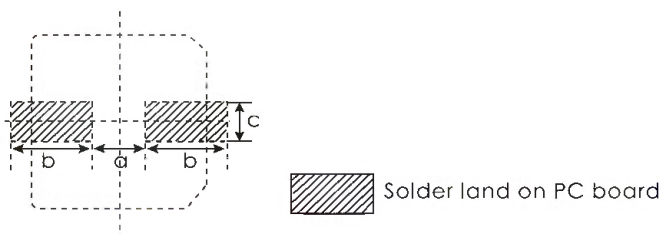


Voltage Range (Vdc)	Preheat	Time maintained above 217°C	Time maintained above 230°C	Peak temperature	Reflow Number
2.5~16V	150~180°C 60~120 seconds	50 seconds max.	40 seconds max.	250°C max.	Twice or less
				260°C max.	Only 1 time
20~200V	150~180°C 60~120 seconds	40 seconds max.	30 seconds max.	250°C max.	Twice or less
		50 seconds max.	40 seconds max.		Only 1 time

\* All temperatures are measured on the topside of the Al-can and terminal surface.

\* Please ensure that the capacitor became cold enough to the room temperature (5 to 35°C) before the second reflow.

### Recommended Solder Land on PC Board



(Unit:mm)

Size ΦD (code)	a	b	c
Φ6.3 (F)	1.9	3.5	1.6
Φ8 (B)	3.1	4.2	2.2
Φ10 (C)	4.5	4.4	2.2

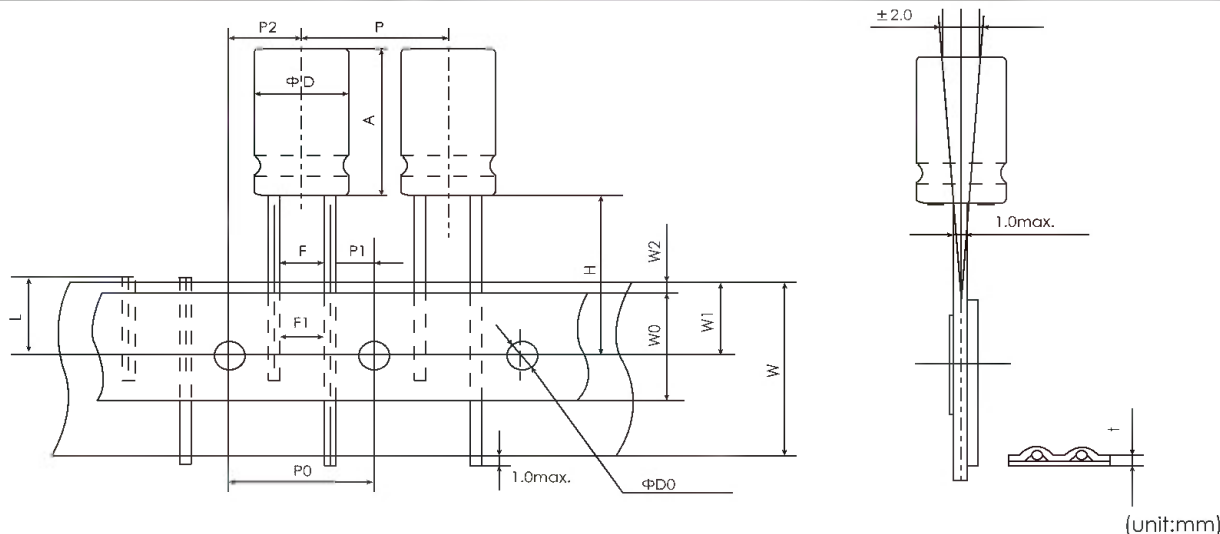
### Lead Cut Dimensions For Radial Lead Type

Lead Cut		Code:CC	
		D	P
		5	2.0
		5.5	2.5
		6.3	2.5
		8	2.5/3.5
		10	5.0



## Taping Dimensions (FA)

Fig 1

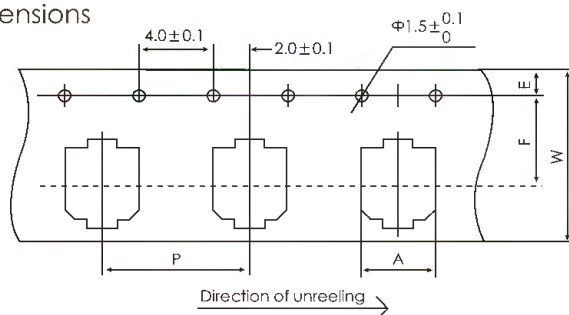


ΦD	A	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	L	ΦD0	t
±0.5		±1.0	±0.2	±0.5	±1.0	+0.8/-0.2	±1.0	±0.5	min	±0.5	max	+0.75/-0.5	max	±0.5	±0.3
5	5~11	12.7	12.7	5.35	6.35	2.0	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
6.3	5~12	12.7	12.7	5.1	6.35	2.5	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
8	6~11.5	12.7	12.7	4.6	6.35	3.5	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
10	8~12.5	12.7	12.7	3.85	6.35	5.0	5.0	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7

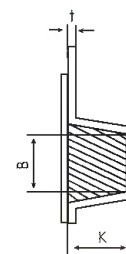
(unit:mm)

## Taping Dimensions For SMD type (Vertical)

Taping Dimensions



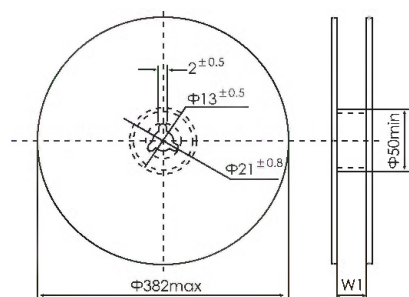
Direction of unreeling →



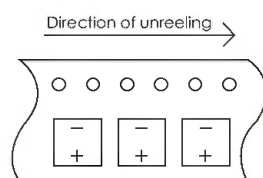
(unit:mm)

Dimension	A	B	W	E	F	P	K	t
Size Code	±0.2	±0.2	±0.3	±0.1	±0.1	±0.1	±0.2	±0.2
F60	7.0	7.0	16.0	1.75	7.5	12.0	6.3	0.4
F80	7.0	7.0	16.0	1.75	7.5	12.0	8.3	0.4
F10	7.0	7.0	24.0	1.75	11.5	16.0	10.5	0.4
B70	8.7	8.7	24.0	1.75	11.5	12.0	7.2	0.4
B10	8.7	8.7	24.0	1.75	11.5	16.0	11.0	0.4
B12	8.7	8.7	24.0	1.75	11.5	16.0	13.0	0.4
C10	10.7	10.7	24.0	1.75	11.5	16.0	11.0	0.4
C12	10.7	10.7	24.0	1.75	11.5	16.0	13.0	0.4

## Reel Dimensions



## Polarity



## Quantity per reel

Size Code	Quantity (pcs/reel)
F60	1000
F80	900
F10	500
B70	1000
B10	500
B12	400
C10	500
C12	400



## Technical note

As aluminum solid capacitor with conductive polymer is different as the common capacitors which use electrolyte as cathode. Please note the following points in order to take full advantages of the aluminum solid capacitor with conductive polymer and ensure the most stable quality possible.

## Crucial precautions

### 1. Polarity

The solid aluminum electrolytic capacitor with positive and negative electrodes.

Do not reverse the polarity when using. If happened, increased leakage current or a decreased life span may result.

### 2. Prohibited circuits

The leakage current may become greater even if the soldering conditions adhere to the specification requirements. Therefore, do not use the capacitors in the following circuits because trouble or failure may occur.

- a) High impedance circuits
- b) Coupling circuits
- c) Time constant circuits
- d) Do not use the capacitors in circuits except those above if changes in the leakage current affects circuit operations.

### 3. Compliance with rated performance

The aluminum solid capacitor with conductive polymer must be used under the rated voltage.

Over-voltage exceeding the rated voltage should not be applied since it may cause a short circuit.

### 4. Considerations when soldering

The soldering conditions are to be within the range prescribed in specifications.

If the specifications are not followed, there is a possibility of the cosmetic deflection, the intensive increase of leakage current, and the capacitance reduction.

### 5. Things to be noted before mounting

The aluminum solid capacitors with conductive polymer is sealed well, because of sealing the rubble may protrude, please conform to the dimensional tolerance stipulated in the specifications.

## Application Guidelines

### 1. Considerations when circuit design

#### (a) Confirm the characteristic before using

Please confirm the using and mounting conditions before circuit design. Please confirm the using and mounting conditions which are to be within the range prescribed in the specification.

#### (b) Operating temperature and ripple current

Please confirm operating temperature is in the specification. Do not apply current that exceeds the rated ripple current. When excessive ripple current is applied, the solid capacitor may result in shorter life due to the internal heat increases.

#### (c) Leakage current

Heat pressure from soldering and mechanical stress from transportation may cause the leakage current to become large.

In such a case, leakage current will gradually decreased by applying voltage less than or to the rated voltage at a temperature within the upper category temperature.

## 使用注意事项

固体铝电解电容器具有不同于一般电解液作为阴极的铝电解电容器。

为使导电性高分子铝电解电容器在电路中发挥其优越的性能，在使用中请特别注意以下内容。

## 使用中需要特别注意的事项

### 1. 极性

导电性高分子型固体铝电解电容器的引出端子有正负极之分。

在电路中使用切勿将正负极接反，否则将会导致电容器漏电流增加并将严重影响电容器的使用寿命。

### 2. 不推荐使用的电路

导电性高分子型固体铝电解电容器在电路使用中由于焊接等原因会导致漏电流增大，因此不推荐应用于以下电路。

- a) 高阻抗电路
- b) 耦合电路
- c) 时间常数电路
- d) 受漏电流影响较大的电路

### 3. 禁止在过电压状态下使用

导电性高分子型固体铝电解电容器必须在低于额定工作电压下使用。

瞬间的超过额定电压的过电压可能会导致电容器的短路。

### 4. 电容器焊接时的注意事项

电容器的焊接条件请在本公司所规定的范围内进行。

强烈的焊接条件，可能会造成电容器电气性能的劣化甚至外观不良，严重时更会导致电容器漏电流的急剧增加和容量急剧下降。

### 5. 线路板焊接时的注意事项

导电性高分子型固体铝电解电容器的封口皮塞具有较好的密封效果，

由于封口的原因皮塞可能会有一定程度的鼓起，电路设计时请考虑本公司规格书的L尺寸和引线的位置公差范围。

## 固体电容器应用指南

### 1. 电路设计的注意事项

#### (a) 额定电性能的使用确认

在电路设计前，请先确认电容器的使用及安装环境，请在本公司的技术手册或者规格书的规定条件范围内正确使用。

#### (b) 使用温度和纹波电流

使用温度请设定在规格书规定的范围之内。

使用电容器过程中切勿施加超过额定纹波电流的电流。如有此现象的发生将会导致电容器内部急剧发热而严重缩短电容器的使用寿命。

#### (c) 漏电流

对于高温无负荷、高温高湿无负荷及温度急剧变化等试验也会导致漏电流的增大。

这种情况下，在最高使用温度范围内施加额定使用电压，漏电流会有一定程度的降低。



**(d) Applied voltage when circuit design**

It can be applied with the rated voltage.

Sum of the DC voltage value and the ripple voltage peak value must not exceed the rated voltage.

When DC voltage is low, negative ripple voltage peak value must not become a reverse voltage that exceeds 10% of the rated voltage.

Using the capacitors within 20% of the rated for applications which may cause the reserve voltage during the transient when the power is turned off or the source is switched.

**(e) Capacitor insulation**

Insulation in the laminate resin is not guaranteed. Be sure to completely separate the case, negative lead terminal, positive lead terminal and PC patterns with each other.

**(f) Prohibited circuits**

The leakage current may become greater even if the soldering conditions adhere to the specification requirements. Therefore, do not use the capacitors in the following circuits because trouble or failure may occur.

a) High impedance circuits

b) Coupling circuits

c) Time constant circuits

d) Do not use the capacitors in circuits except those above if changes in the leakage current affects circuit operations.

**(g) Things to be noted before mounting**

The aluminum solid capacitors with conductive polymer is sealed well, because of sealing the rubble may protrude, please conform to the dimensional tolerance stipulated in the specifications.

**(h) Operating environmental restrictions**

Do not use the capacitors in the following environments:

(1) Places where water, salt water, or oil can directly fall on it.

(2) Places filled with noxious gas such as hydrogen sulfide, sulfide acid, chlorine, ammonia, etc.

(3) Place susceptible to Ozone, ultraviolet rays and radiation.

**(i) others**

Design circuits after checking the following.

Electric characteristics are affected by temperature and frequency fluctuations. Design circuits after checking the following items.

**2. Mounting precautions****(a) Considerations before mounting**

Do not reuse the capacitors that have been assembled and energized.

Leakage current may increase when the capacitors are stored for a period of time. In this case, we recommend that you apply the rated voltage for 1 hour at 60~70°C with a resistor load of 1kΩ.

**(b) Considerations when mounting**

Mount after checking the capacitance and the rated voltage, please confirm the polarity.

Do not drop the capacitors on the floor. Do not use the capacitors that have been dropped.

Mount after checking that radial lead types of the capacitors terminal pitch and diameter of PCB holes.

**(c) Soldering with a soldering iron**

Set the soldering temperature and time in the specifications.

Do not subject the capacitors itself to excessive stress when soldering. Do not let the tip of the soldering iron touch the capacitors itself.

**(d) 电路设计时的施加电压**

可以施加100%的额定电压。请在直流电压与纹波电压的最大值不超过额定电压的范围内使用。

直流电压偏低时，纹波电压的负的最大值不能超过额定电压的10%的反向电压。

在切断电源等造成的过渡现象中产生的反电压，应在额定电压的20%以内使用。

**(e) 电容器的绝缘性**

电容器的表面喷塑涂层不保证完全绝缘。

使用电容器时请将外壳、负极引线、正极引线与周围组件之间的线路完全分开。

**(f) 不推荐使用**

导电性高分子型固体铝电解电容器在电路使用中由于焊接等原因会导致漏电流增大，因此禁止应用于以下电路，防止故障的发生。

a) 高阻抗电路

b) 耦合电路

c) 时间常数电路

d) 受漏电流影响较大的电路

**(g) 关于安装**

导电性高分子型固体铝电解电容器的封口皮塞具有较好的密封效果，由于封口的原因皮塞可能会有一定程度的鼓起，电路设计时请考虑本公司规格书的L尺寸和引线的位置公差范围。

**(h) 工作环境限制**

电容器在下列环境中禁止使用

(1) 在有水、卤水、油的地方

(2) 充满有害气体的地方，如硫化氢、亚硫酸、氯气、氨气等

(3) 容易受臭氧氧化、紫外线及放射线辐射的地方

**(i) 其它**

设计电路前请先确认以下内容

电容器的电性能会受到温度和频率的影响，在设计前请先确认波动量。

**2. 安装注意事项****(a) 安装前的注意事项**

使用过的电容器不能再使用。

长期保存的电容器其漏电流会有不同程度的升高，此情况下请通过1kΩ的电阻进行施加额定电压处理。

处理方法：在60~70°C温度下施加额定电压1h。

**(b) 安装时的注意事项**

安装时注意电容器的标称容量和额定电压，并确认极性。

安装过程中切勿将电容器掉落地面，此电容器不能再使用，安装过程中防止电容器变形。

安装前请确认电容器的引线间距是否与线路板孔间隔吻合。

**(c) 电烙铁焊接**

焊接温度、时间等请保持在本公司规格书规定的范围内。

焊接时不要给电容器施加过度的应力，通电的电烙铁不要触及电容器本身。



The leakage current value after soldering may increase a little, from a few  $\mu\text{A}$  to several hundred  $\mu\text{A}$ , depending on the soldering conditions (preheating and solder temperature and time, PCB material and thickness, etc.). The leakage current can be reduced through self-repair by applying voltage.

#### (d) Handling after soldering

Do not subject the capacitors itself to excessive stress after soldering.

Do not tilt, bend or twist the capacitors after it has been soldered on the PCB.

#### (e) Circuit board cleaning

Check the following items before washing PC board with these detergents: high quality alcohol-based cleaning fluid such as Pine-a ST-100S, clean thru 750H, 750L, 710M, 750K or Techno Care FRW 14 through 17 or detergents including substitute freon as AK-225AES or IPA.

- (1) Use immersion or ultrasonic waves to clean within 2 minutes.
- (2) The temperature of the cleaning fluid should be less than  $60^{\circ}\text{C}$ .
- (3) Watch the contamination of the detergent such as conductivity, pH, specific gravity, water content, etc.
- (4) Do not store the capacitors in a location subject to gases from the cleaning fluid or in an airtight container after cleaning.
- (5) Dry the PCB or OS-CON with hot air that should be less than the upper category temperature.
- (6) Please note that indication may disappear when rubbing print side after washing depending on a cleaner.
- (7) Please contact us for details about detergents, cleaning methods and detergents other than those listed above.

### 3. Precautions with completed board

- (1) Do not touch the lead terminals of the capacitors directly.
- (2) Do not use electric conductive to cause short circuit between the capacitors lead terminal. Do not subject the capacitors to conductive solutions such as acid and alkaline water solutions.
- (3) Check the installation environment of the board the capacitor is installed in.
- (4) Age the board at conditions that fall below the capacitors ratings.

### 4. Contingency failure

The electrolyte, electrolytic paper, sealing rubber, and sleeve used in the capacitors are all combustible. When the current is extraordinarily large after a short circuit, in the worst case, the shorted-out section in the lead terminal or inside the capacitor may ignite the rubber. Pay attention to the capacitor mounting method, mounting position, pattern design, etc.

### 5. Storage conditions

- (1) Do not store the capacitor at high temperature and high humidity. Store it in a location that is not subject to direct sunlight and that has temperatures less than  $5$  to  $35^{\circ}\text{C}$  and a relative humidity less than 75%.
- (2) To keep good solder ability, store the in its plastic under shipping condition.  
Sealed up in specifically designed aluminum laminate bags to prevent deterioration in characteristic and solder ability before and after resulting from moisture absorption.
- (3) To keep good solder ability, store radial lead types packed in bags for not more than one year.  
Radial lead types with SMD type for not more than one year.
- (4) Open the bags just before mounting, and use up all products once opened. In case of leftovers, put the products packed in bags and sealed up with adhesive tape.
- (5) Do not store the capacitors in damp conditions such as water, salt spray, or oil.

焊接后电容器的漏电流因焊接预热条件、焊接温度、时间、线路板的材质及材质不同而发生很大的变化，几十甚至几百微安，但是在施加额定电压后处于稳定状态时电容器由于自愈能力而会使其漏电流逐渐减小。

#### (d) 后处理

电容器焊接在线路板后，请不要施加外力。

禁止将电容器倾斜、弯折、扭曲。

#### (e) 清洗线路板

可以使用Pine-aST-100S, Cleanthru 750H, 750L, 710M, 750K, Techno Care FRW14-17等高级乙醇类清洗剂AK-225AES等氟利昂代替品或IPA等清洗剂清洗，在清洗线路板时请先确认以下内容。

- (1) 采用浸渍，超声波等清洗方法时，导电性高分子型的清洗时间应控制在2分钟以内。
- (2) 洗液温度请控制在 $60^{\circ}\text{C}$ 以下。
- (3) 需要对清洗液进行防污管理，如导电度，pH值，比重，含水量等。
- (4) 清洗后不要在清洗液环境中或密封容器中保管。
- (5) 烘干线路板和电容器是电容器时请在温度范围内进行。
- (6) 清洗后擦拭电容时有可能抹去电容表面的标记应予以注意。
- (7) 关于清洗剂和清洗方法等详细情况或者试用其他清洗剂时请另行咨询。

### 3. 电容器在设备中安装时的注意事项

- (1) 安装过程中切勿直接接触电容器的引线端子。
- (2) 禁止将电容器的正负极之间用导线短路，不要将导电性的酸性或碱性溶液洒落在电容器表面。
- (3) 安装前确认电容器在设备中的安装环境。
- (4) 设备的试验温度要在电容器的额定范围内使用。

### 4. 意外情况的处理

导电性高分子型固体铝电解电容器组成材料包括电解质、电解纸、皮塞和套管属于可燃性物质，电容器短路后电流急剧增加，导致引线端子和电容器内部短路部分会产生电火花，情况严重时会引起皮塞和套管燃烧，所以在电路设计中应对电容器的安装方法和安装位置谨慎对待。

### 5. 电容器的保管条件

- (1) 导电性高分子型固体铝电解电容器的保存要避免高温、高湿的环境，并避免阳光直射。  
常温常湿（一般情况温度为 $35^{\circ}\text{C}$ 以下，湿度保持在75%RH以下）
- (2) 为保持电容器具有良好的可焊性，应在产品出厂状态下（塑料袋包装）保管。  
为防止吸潮而导致焊接性劣化，产品出厂时密封在专用的包装袋内。
- (3) 为保持良好的焊接性，引线式产品保管期限为（购入后）一年，SMD型的保管期限为（购入后）一年，SMD型产品打开包装后，需在4周内使用完。
- (4) 使用时，应在即刻安装前开封，开封后尽量全部用完。出现剩余时，散装产品重新放入原包装袋内，并用胶带封好开口部分。
- (5) 不要将电容器直接保管在有水、卤水及有油等有机物的环境中。



(6) Do not store the capacitor in places filled with hydrogen sulfide, sulfurous acid, chlorine, ammonia, etc.).

(7) Do not store the capacitors in places susceptible to ozone, ultraviolet rays and radiation.

## 6. About RoHS Directive

RoHS Directive

[Restriction of the use of certain hazardous substances in electrical and electrical equipment]

RoHS aims to improve the regulations for hazardous substances in electrical and electrical equipment, and to minimize the hazardous effects on environment and to people's health from the production process up to and including the disposal process.

RoHS prohibits the use of 6 substances including cadmium, lead, hexavalent chromium, mercury, polybrominated biphenyls (PBBs), and polybrominated diphenyl (PBDEs).

(6) 不要将电容器保存在充满有害气体环境中，如硫化氢、亚硫酸、氯气、氨气等。

(7) 不要将电容器保存在易受臭氧氧化、紫外线及放射线辐射的环境中。

## 6. 关于RoHS指令

[RoHS指令]

[电子及电子设备中某些危险物质使用的限制]

[RoHS指令是为了减少电子及电子设备中有毒有害物质的使用，而降低这些物质对人类环境和人体健康的危害而采取的相应程序。

RoHS指令中限制使用的6种有毒有害物质包括镉（Cd）、铅（Pb）、汞（Hg）、六价铬（Cr6+）、聚溴联苯类（PBB）、聚溴二联苯醚类（PBDE）。

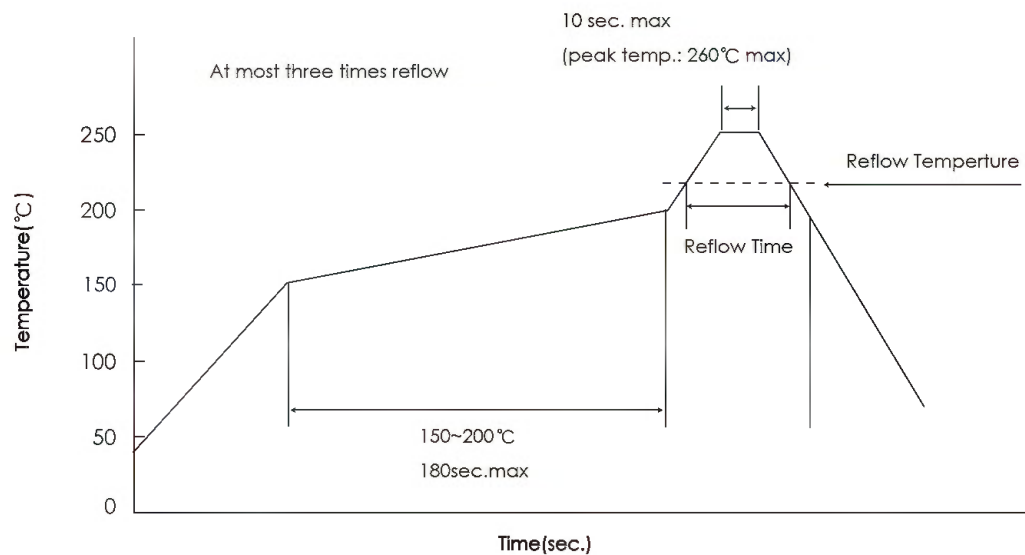
如有特殊需要，可与我公司联系。



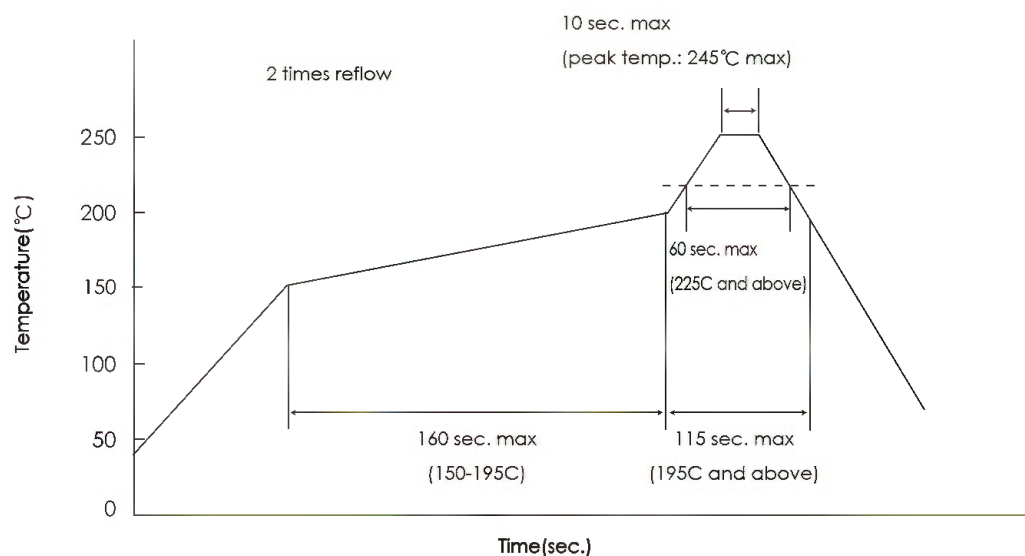
## Recommended Reflow Profile:( $<10V$ )

推荐的回流焊温度曲线  
Recommended Reflow Profile:

Temperature	Time
255°C and above	30sec.max
230°C and above	130sec.max
217°C and above	150sec.max



## Recommended Reflow Profile:( $\geq 10V$ )



※ If the reflow soldering is higher than 245°C, please contact us



## General introduction of polymer capacitors

### Features

- **Long life**

Expected lifespan of 8000h or longer at 85°C (HCN, HEN, HEL, HPN, HPNA, HET, HVC, HVM, HVX, HVL series), suitable for industrial equipment operating for long periods of time

- **Stable temperature characteristics**

Its ESR has stable characteristics from -55°C to 105°C (partly 125°C), suitable for applications used at low temperature (under 0°C)

- **Low ESR obtained by using conductive polymer electrolyte**

Suitable as a smoothing capacitor, enabling miniaturizing switching power supplies, because it allows large ripple current.  
Suitable as a backup capacitor for the circuits that consume large current at a high speed.  
Suitable as a decoupling capacitor, because its impedance has ideal frequency characteristics.

- **RoHS Compliant**

All the models are RoHS compliant products.

- **High safety**

More difficult to ignite and "smoke" than a tantalum electrolytic capacitor.

### Estimation of life time

The lifespan of liquid electrolytic capacitors depends on the drying of the electrolyte. With the change of emperature, solid polymers will enter the interior of the capacitor through the sealing area, and the internal conductive polymer undergoes thermal oxygen degradation, resulting in an increase in the ESR value of the capacitor. The heating of the ripple current leads to an increase in the internal temperature of the capacitor, which affects its lifespan. Just like liquid capacitors, as the temperature changes, the electrolyte inside the capacitor will evaporate outward through the sealing area, affecting the product's lifespan.

So solid state capacitors are like liquid capacitors, where the electrolyte evaporates from the inside out, and oxygen enters the interior to generate thermal oxygen degradation. The ESR value increases, and the penetration rate of oxygen is also dependent on temperature, just like the electrolyte evaporates from the outside.

The calculation method for solid state life is:

$$L_x = L_0 * 2^{\frac{T_0 - T_a}{10}} * 2^{\frac{-\Delta T}{10}} \quad \Delta T = \Delta T_0 * \left( \frac{I_x}{I_0} \right)^2$$

$L_x$ : Expecting operation life time

$L_0$ : Enduance life time under tated voltage at rated temperature

$T_0$ : Rated temperature

$T_a$ : The ambient temperature of the capacitor in actual use, When  $T_a < 40^\circ\text{C}$ , take  $t_a = 40^\circ\text{C}$

$T_0$ : Permissible temperature rise with rated ripple current:

For rated upper temperature  $105^\circ\text{C} : 20^\circ\text{C}$

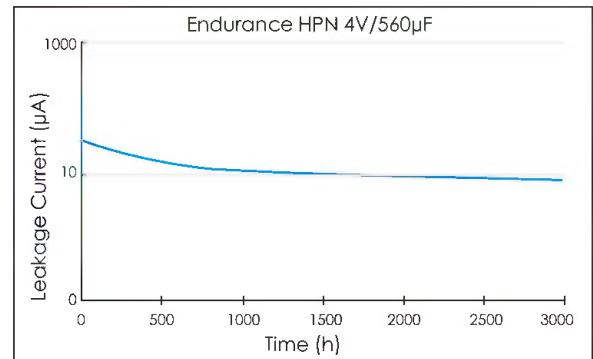
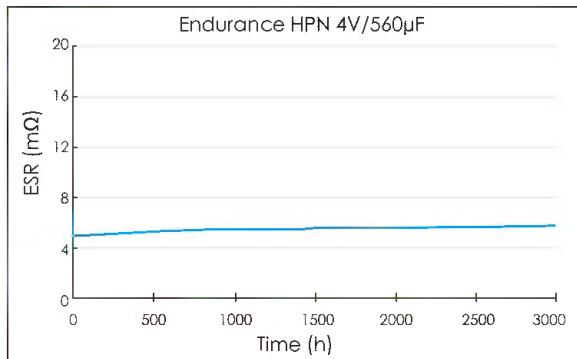
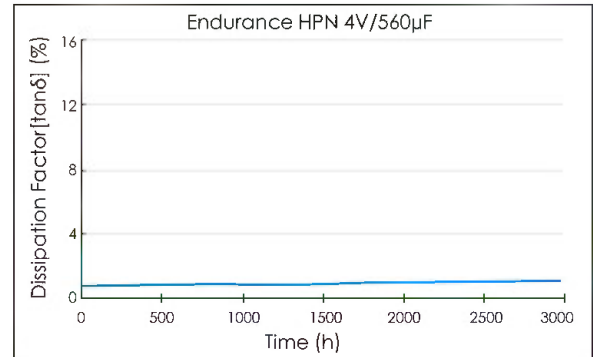
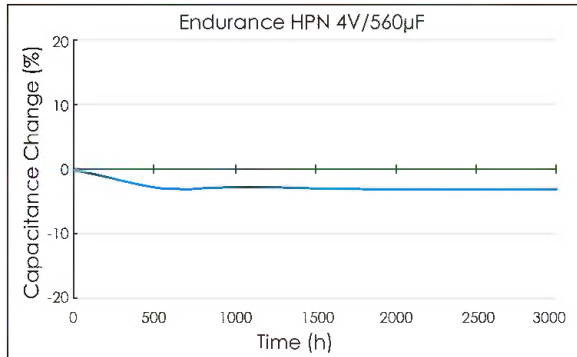
For products with rated upper temperature of  $125^\circ\text{C}$

When the ambient temperature  $T_a \leq 105^\circ\text{C} : 20^\circ\text{C}$

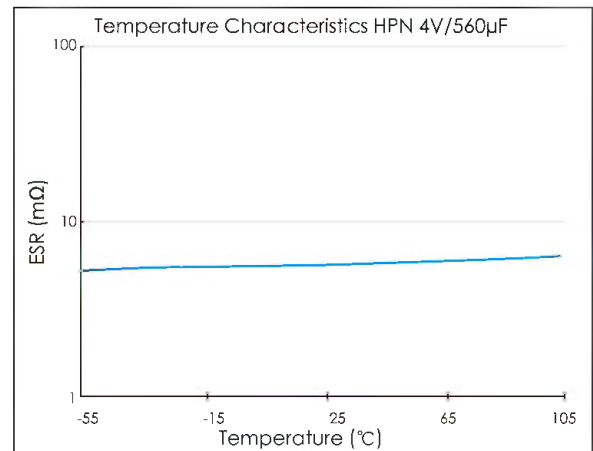
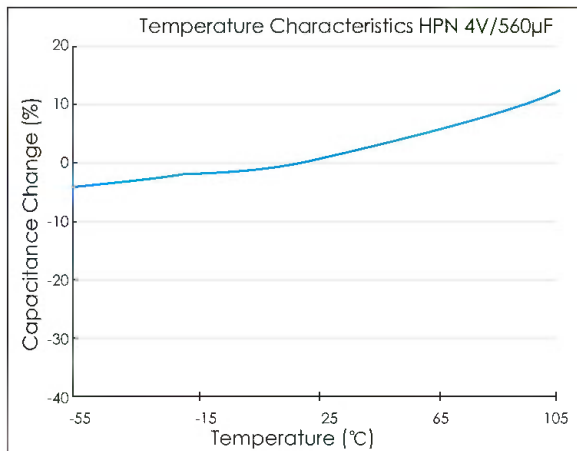
When the ambient temperature  $125 \geq T_a > 105^\circ\text{C} : 3^\circ\text{C}$



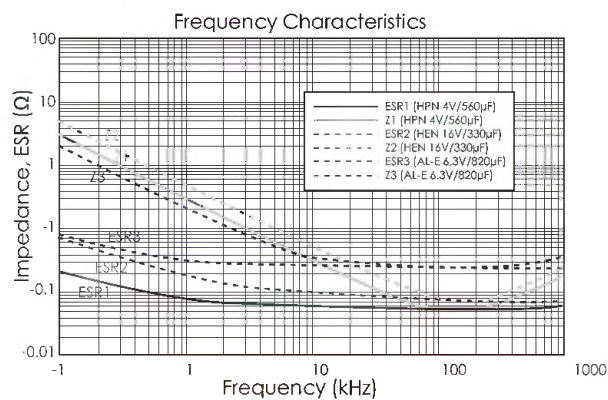
## Endurance (With rated voltage applied at +105°C)



## Temperature Characteristics



## Frequency Characteristics





## 导电性高分子固体铝电解电容器简介

电容器在三个基本无源元件(L-电感、C-电容、R-电阻)中使用量最大, 是任何电子线路不可缺少的充放电、通交隔直的元件。电容器的种类因电介质的不同而各有所长, 根据应用目的不同而被广泛用于滤波、定时、旁路、耦合、改善马达启动功率等方面。

铝电解电容器的电解质以往采用电解液, 随着技术的发展, 将导电性高分子材料技术应用到铝电解电容器中, 由于它的电解质的导电性高, 接近金属导电性能 (见图1), 导电性受温度的影响小, 带来铝电解电容器性能的革新。因而导电性高分子固体铝电解电容器具有卓越的性能:

- 高频下极低的等效串联电阻(ESR)和极低阻抗特性(Z)
- 稳定的温度特性
- 允许通过更大的纹波电流, 降低纹波电压能力强
- 适合片式化表面贴装工艺
- 优越的电压特性
- 工作寿命长, 可靠性高
- 使用安全性高, 不易燃烧或冒烟, 没有爆浆可能
- 卓越的自愈能力

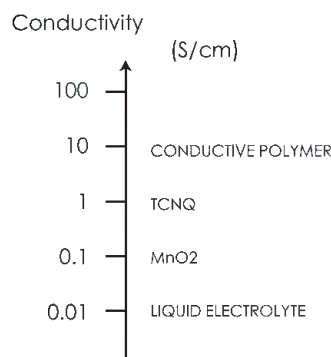
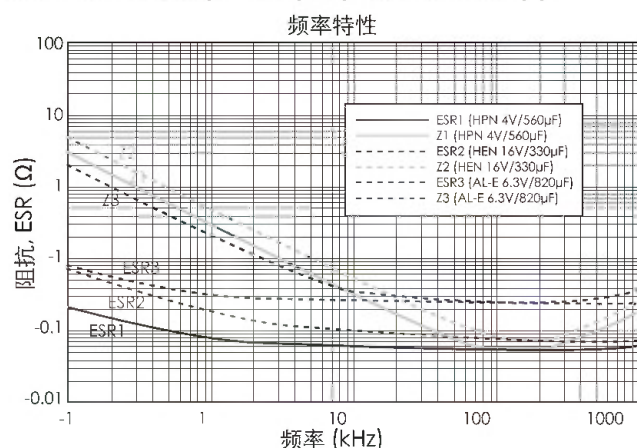


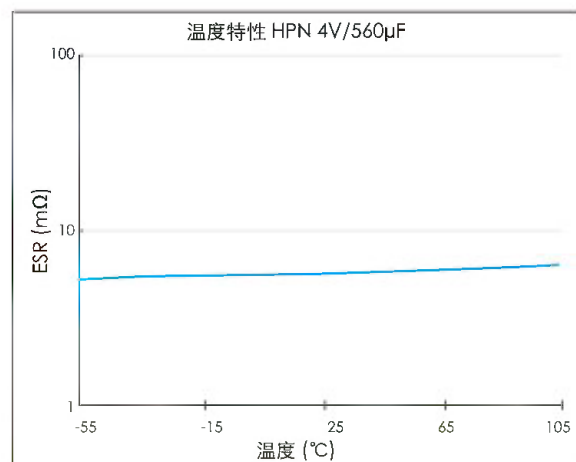
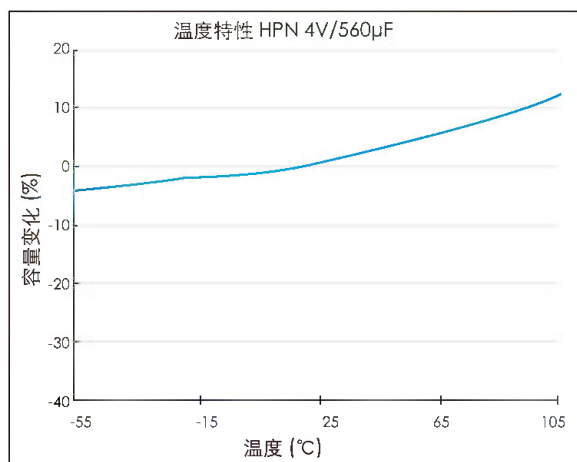
图1

## 高频下极低的等效串联电阻(ESR)和极低阻抗特性(Z)



导电性固体高分子电解电容器, 通过使用高导电性聚合物做电解质, 大幅度地降低了等效串联电阻(ESR), 达到了聚酯电容器那样的卓越频率特性, 又具有电解液式电容器大的容量。

## 稳定的温度特性



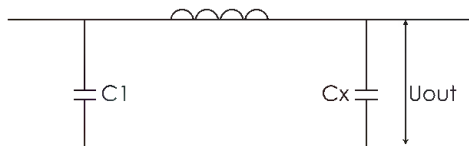


固体铝电解电容器的等效串联电阻(ESR)基本上不受温度的影响, ESR对于高频段的阻抗(振荡点附近)起着决定性的作用, ESR直接关系到降噪的能力, ESR受温度的影响小意味着降噪能力受温度影响小, 可以得到整个保证温度段的稳定的降噪效果, 特别适用于会在低温环境下使用的设备。

## 允许通过更大的纹波电流, 降低纹波电压能力强

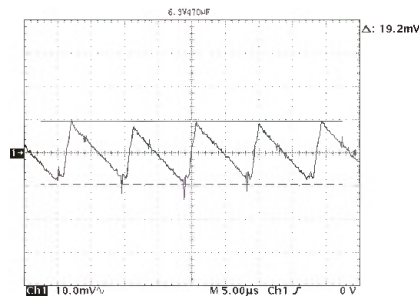
允许通过电容器的纹波电流依电容器的发热量而定, 发热的主要因素取决于ESR。ESR大则发热量大, 使纹波电流受到限制。

固体铝电解电容器在开关电源滤波电路中的应用:

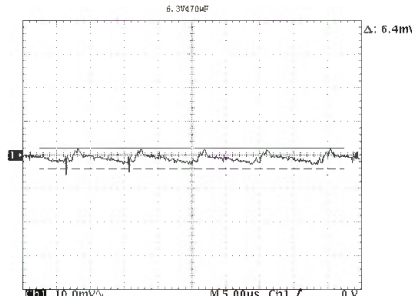


PC机滤波电路简单原理图

选用不同类型的电容器在200kHz的工作频率下,  $\pi$ 型滤波电路的滤波效果比较。



低阻抗铝电解电容器 6.3V/470



HCN 6.3V/470

## 适合片式化表面贴装工艺

导电性高分子材料的耐热性好, 可以达到无铅化回流焊的温度要求, 在通过回流焊时, 电容器不会鼓凸。

## 优越的电压特性

固体铝电解电容器在电压使用下, 容量基本上没有变化, 因而使用固体铝电解电容器不需考虑施加电压后的容值下降问题。

## 工作寿命长, 可靠性高

液体电解电容器, 寿命决定于电解液干涸。固态高分子随着温度的变化, 外界氧气会通过封口部位进入到电容器内部, 内部导电聚合物发生热氧降解而导致电容器的ESR值增加, 纹波电流发热导致电容器内部温升升高, 而影响寿命。就跟液态电容器一样, 随着温度的变化, 电容器内部的电解液会通过封口部位向外蒸发而影响产品寿命。

所以固态电容器跟液态电容器一样, 一个是电解液从里往外蒸发, 一个是氧气进入内部产生热氧降解ESR值增加, 氧气的渗透速度跟电解液往外蒸发一样, 同样依存与温度。

即固态寿命推算法则为:

$$L_x = L_0 * 2^{\frac{T_0 - T_a}{10}} * 2^{\frac{-\Delta T}{10}}$$

$L_x$ : 计算工作寿命/Expecting operation life time

$L_0$ : 额定电压和额定温度下的寿命/Endurance life time under rated voltage at rated temperature

$T_0$ : 额定工作温度/Rated temperature

$T_a$ : 实际环境温度/The ambient temperature of the capacitor in actual use. When  $T_a < 40^\circ\text{C}$ , take  $T_a = 40^\circ\text{C}$

$\Delta T$ : 纹波电流引起的温升/Temperature rise due to ripple current



对于纹波发热温升估算公式/ Approximate estimation for  $\Delta T$

$$\Delta T = \Delta T_0 * \left( \frac{I_x}{I_0} \right)^2$$

$I_x$ : 实际纹波电流 (Arms)/ Actual applied ripple current (Arms)

$I_0$ : 额定纹波电流 (Arms)/ Rated ripple current (Arms)

$\Delta T_0$ : 额定纹波电流下的最大温升/ Permissible temperature rise with rated ripple current

105°C 品/ For rated upper temperature 105°C : 20°C

125°C 品/ For products with rated upper temperature of 125°C

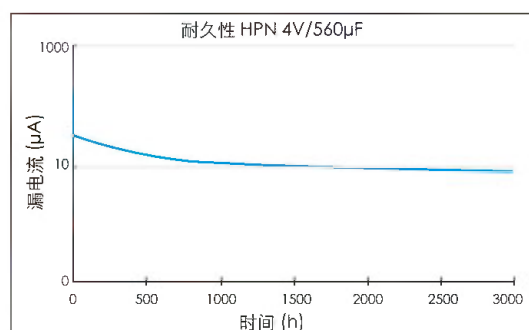
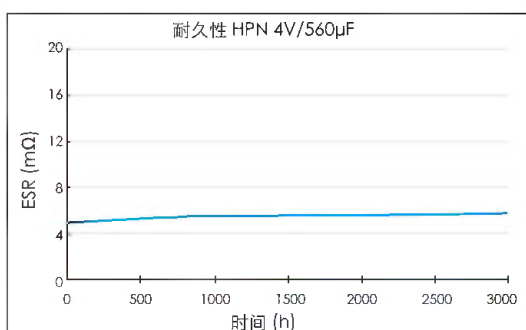
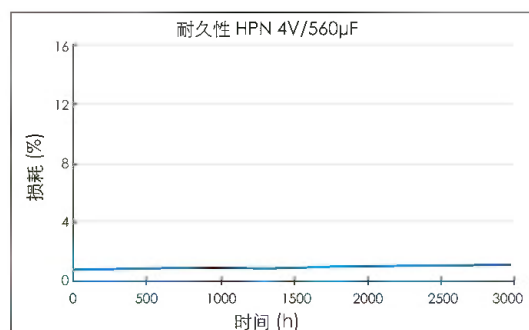
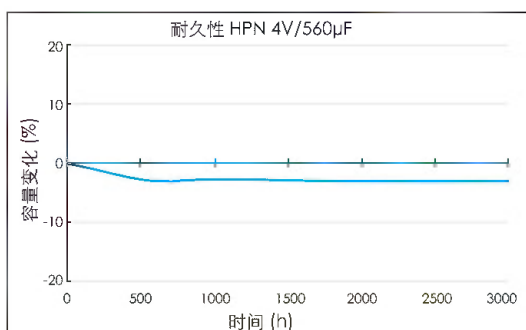
环温  $T_a \leq 105^\circ\text{C}$  时/ when the ambient temperature  $T_a \leq 105^\circ\text{C}$  : 20°C

环温  $105^\circ\text{C} < T_a \leq 125^\circ\text{C}$  时/ when the ambient temperature  $105^\circ\text{C} < T_a \leq 125^\circ\text{C}$  : 3°C

为获取更准确的 $\Delta T$ , 可以通过在电容内部埋热电偶进行测量。

To get more accurate value of  $\Delta T$ , please measure by thermal couples embedded in capacitor.

## 耐久性(105°C 施加额定电压):



## 使用安全性高, 不易燃烧或冒烟, 不易爆炸

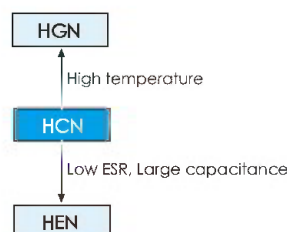
固体铝电解电容器与普通电容器、钽固体电容器的比较, 具有更高的安全性。液体铝电解电容器电解液易干涸; 电解液具有腐蚀性, 易老化, 过负荷的情况下, 电容器内部高温并气压增大, 有爆浆的可能。钽电容器在过负荷的情况下, 电容器产生高温, 二氧化锰被加热到一定的温度时释放出大量的氧, 缺陷上的钽受热吸收氧发生剧烈的氧化还原反应即燃烧。高分子固体铝电解电容器中高分子材料本身具有较高的耐热性、难燃烧, 即使在过负荷的情况下, 过高的温度使高分子材料绝缘化, 不易燃烧, 不易爆炸。

## 卓越的自愈能力

高分子固体电容器与二氧化锰电容器相近有自愈功能, 但是与之不同的是它不会形成氧, 故不会燃烧, 具有更高的可靠性。自愈机理在缺陷处局部较大的漏电流产生热量, 聚合物受热形成高阻抗物或蒸发。固体电容器在自愈过程中不会释放氧气, 故固体电容器很难发生自燃, 具有很高的安全性和可靠性。



- Standard 105°C, 2000 hours
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



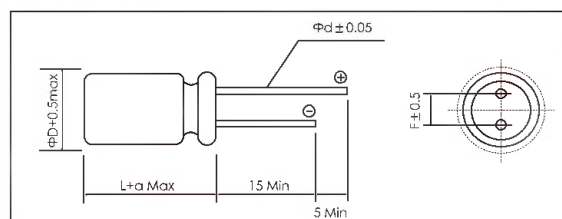
Items	Characteristics		
Category Temperature Range	-55 to +105 °C		
Rated Voltage Range	2.5 to 35Vdc		
Capacitance Range	10 to 1,500μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current*1	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		
Endurance	105°C , 2,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C , 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤±5% of the initial value
		DF (tanδ)	≤The initial specified value
		ESR	≤The initial specified value
		LC	≤The initial specified value(after voltage processing)

\*1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
F08	6.3	8	1.0	2.5	0.5
F10	6.3	10	1.0	2.5	0.5
B08	8.0	8	1.5	3.5	0.6
BAB	8.0	11.5	1.5	3.5	0.6
CAC	10.0	12.5	1.5	5.0	0.6

## Size List

R.V[S.V] (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]	35 [40]
Cap. (μF)								
10							F08	B08
15							F10	
18								BAB
22							B08	
33						F10	BAB	CAC
47				F10		B08	BAB	
56							CAC	
68				F10			BAB	
100				F10	F10, BAB	BAB, CAC	CAC	
150				F10	B08, BAB, CAC	CAC		
180					BAB			
220			F10	F10, CAC	B08, BAB			
270		F10		BAB	CAC			
330			F05, F10	BAB	CAC			
390	F10	F10	BAB					
470			BAB	CAC				
560		BAB		CAC				
680	B08		CAC					
820	BAB	CAC	CAC					
1,000		CAC	CAC					
1,200	CAC	CAC						
1,500	CAC							



## Ratings for HCN Series

U <sub>k</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD × L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 OE	390	20	3,200	12	195.0	6.3×10	PCR0ECN391MF10□□
	680	12	5,230	12	340.0	8×8	PCR0ECN681MB08□□
	820	10	5,230	12	410.0	8×11.5	PCR0ECN821MBAB□□
	1,200	8	5,500	12	600.0	10×12.5	PCR0ECN122MCAC□□
	1,500	8	5,500	12	750.0	10×12.5	PCR0ECN152MCAC□□
4 OG	270	20	3,200	12	216.0	6.3×10	PCR0GCN271MF10□□
	390	20	3,300	12	312.0	6.3×10	PCR0GCN391MF10□□
	560	10	5,230	12	448.0	8×11.5	PCR0GCN561MBAB□□
	820	8	5,500	12	656.0	10×12.5	PCR0GCN821MCAC□□
	1,000	8	5,500	12	800.0	10×12.5	PCR0GCN102MCAC□□
	1,200	8	5,500	12	960.0	10×12.5	PCR0GCN122MCAC□□
6.3 OJ	220	20	3,200	12	277.2	6.3×10	PCR0JCN221MF10□□
	330	20	2,700	12	415.8	6.3×5	PCR0JCN331MF05□□
	330	20	3,300	12	415.8	6.3×10	PCR0JCN331MF10□□
	390	12	4,770	12	491.4	8×11.5	PCR0JCN391MBAB□□
	470	12	4,770	12	592.2	8×11.5	PCR0JCN471MBAB□□
	680	10	5,500	12	642.6	10×12.5	PCR0JCN681MCAC□□
	820	10	5,500	12	774.9	10×12.5	PCR0JCN821MCAC□□
	1,000	10	5,500	12	945.0	10×12.5	PCR0JCN102MCAC□□
10 IA	47	25	2,900	12	94.0	6.3×10	PCR1ACN470MF10□□
	68	25	2,900	12	136.0	6.3×10	PCR1ACN680MF10□□
	100	25	2,900	12	200.0	6.3×10	PCR1ACN101MF10□□
	150	25	2,900	12	300.0	6.3×10	PCR1ACN151MF10□□
	220	25	2,900	12	440.0	6.3×10	PCR1ACN221MF10□□
	270	14	4,420	12	540.0	8×11.5	PCR1ACN271MBAB□□
	330	14	4,420	12	660.0	8×11.5	PCR1ACN331MBAB□□
	220	10	5,500	12	330.0	10×12.5	PCR1ACN221MCAC□□
	470	12	5,500	12	705.0	10×12.5	PCR1ACN471MCAC□□
	560	10	5,300	12	840.0	10×12.5	PCR1ACN561MCAC□□
16 IC	100	24	2,900	12	320.0	6.3×10	PCR1CCN101MF10□□
	150	16	4,000	12	480.0	8×8	PCR1CCN151MB08□□
	220	16	4,000	12	704.0	8×8	PCR1CCN221MB08□□
	100	16	4,360	12	320.0	8×11.5	PCR1CCN101MBAB□□
	150	16	4,360	12	480.0	8×11.5	PCR1CCN151MBAB□□
	180	16	4,360	12	576.0	8×11.5	PCR1CCN181MBAB□□
	220	16	4,360	12	704.0	8×11.5	PCR1CCN221MBAB□□
	150	10	5,500	12	360.0	10×12.5	PCR1CCN151MCAC□□
	270	14	5,050	12	648.0	10×12.5	PCR1CCN271MCAC□□
	330	14	5,050	12	792.0	10×12.5	PCR1CCN331MCAC□□
20 ID	33	48	2,200	12	132.0	6.3×10	PCR1DCN330MF10□□
	47	30	2,800	12	188.0	8×8	PCR1DCN470MB08□□
	100	24	3,320	12	400.0	8×11.5	PCR1DCN101MBAB□□
	100	20	4,320	12	400.0	10×12.5	PCR1DCN101MCAC□□
	150	20	4,320	12	600.0	10×12.5	PCR1DCN151MCAC□□
25 IE	10	50	2,000	12	50.0	6.3×8	PCR1ECN100MF08□□
	15	48	2,200	12	75.0	6.3×10	PCR1ECN150MF10□□
	22	30	2,800	12	110.0	8×8	PCR1ECN220MB08□□
	33	24	3,600	12	165.0	8×11.5	PCR1ECN330MBAB□□
	47	24	3,320	12	235.0	8×11.5	PCR1ECN470MBAB□□
	68	24	3,320	12	340.0	8×11.5	PCR1ECN680MBAB□□
	56	20	3,800	12	280.0	10×12.5	PCR1ECN560MCAC□□
	100	20	4,320	12	500.0	10×12.5	PCR1ECN101MCAC□□
35 IV	10	50	2,300	12	175.0	8×8	PCR1VCN100MB08□□
	18	34	2,830	12	315.0	8×11.5	PCR1VCN180MBAB□□
	33	30	3,270	12	577.5	10×12.5	PCR1VCN330MCAC□□

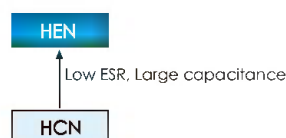
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Low ESR, Large Capacitance 105°C, 2000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



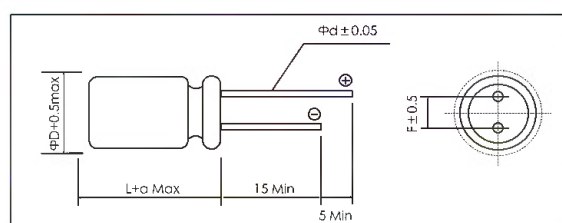
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 16Vdc			
Capacitance Range	180 to 2,700μF			
Capacitance Tolerance	±20% (M)			
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			
Leakage Current*1	Please see the attached ratings list			
Equivalent Series Resistance (ESR)	Please see the attached ratings list			
Temperature Characteristics (Max. Impedance Ratio)	Z(+105°C)/Z(+20°C) ≤ 1.25 Z(-55°C)/Z(+20°C) ≤ 1.25			
Endurance	105°C, 2,000h Rated voltage applied	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤ ±5% of the initial value	
		DF (tanδ)	≤ The initial specified value	
		ESR	≤ The initial specified value	
		LC	≤ The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
CAC	10.0	12.5	1.5	5.0	0.6

## Size List

Cap.(μF)	R.V[S.V] (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]
180						BAB
270					BAB	BAB
330				BAB		BAB.CAC
390				BAB	BAB	
470				BAB	BAB.CAC	CAC
560			BAB	BAB	BAB.CAC	CAC
680		BAB	BAB	BAB, CAC	BAB.CAC	CAC
820		BAB	BAB.CAC	BAB, CAC		CAC
1,000		BAB.CAC	BAB.CAC	BAB, CAC	CAC	CAC
1,200		CAC	BAB.CAC			
1,500		BAB.CAC		BAB, CAC		
1,800			CAC			
2,200			CAC	CAC		
2,700		CAC				



## Ratings for HEN Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 OE	680	7	5,700	8	340.0	8×11.5	PCR0EEN681MBAB□□
	820	7	6,100	8	410.0	8×11.5	PCR0EEN821MBAB□□
	1,000	7	6,100	8	500.0	8×11.5	PCR0EEN102MBAB□□
	1,500	7	6,100	8	750.0	8×11.5	PCR0EEN152MBAB□□
	1,000	6	6,640	8	500.0	10×12.5	PCR0EEN102MCAC□□
	1,200	6	6,640	8	600.0	10×12.5	PCR0EEN122MCAC□□
	1,500	7	6,100	8	750.0	10×12.5	PCR0EEN152MCAC□□
	2,700	7	6,100	8	1,350.0	10×12.5	PCR0EEN272MCAC□□
4 OG	560	7	6,100	8	448.0	8×11.5	PCR0GEN561MBAB□□
	680	7	6,100	8	544.0	8×11.5	PCR0GEN681MBAB□□
	820	7	6,100	8	656.0	8×11.5	PCR0GEN821MBAB□□
	1,000	7	6,100	8	800.0	8×11.5	PCR0GEN102MBAB□□
	1,200	7	6,100	8	960.0	8×11.5	PCR0GEN122MBAB□□
	820	6	6,640	8	656.0	10×12.5	PCR0GEN821MCAC□□
	1,000	6	6,640	8	800.0	10×12.5	PCR0GEN102MCAC□□
	1,200	7	6,100	8	960.0	10×12.5	PCR0GEN122MCAC□□
6.3 OJ	1,800	7	6,100	8	1,440.0	10×12.5	PCR0GEN182MCAC□□
	2,200	7	6,100	8	1,760.0	10×12.5	PCR0GEN222MCAC□□
	330	7	5,700	8	415.8	8×11.5	PCR0JEN331MBAB□□
	390	7	5,700	8	491.4	8×11.5	PCR0JEN391MBAB□□
	470	7	5,700	8	592.2	8×11.5	PCR0JEN471MBAB□□
	560	7	5,700	8	705.6	8×11.5	PCR0JEN561MBAB□□
	680	7	5,700	8	856.8	8×11.5	PCR0JEN681MBAB□□
	820	7	5,700	8	1,033.2	8×11.5	PCR0JEN821MBAB□□
	1,000	7	5,700	8	1,260.0	8×11.5	PCR0JEN102MBAB□□
	1,500	7	5,700	8	1,890.0	8×11.5	PCR0JEN152MBAB□□
	680	7	6,640	8	856.8	10×12.5	PCR0JEN681MCAC□□
	820	7	6,640	8	1,033.2	10×12.5	PCR0JEN821MCAC□□
10 1A	1,000	7	6,100	8	1,260.0	10×12.5	PCR0JEN102MCAC□□
	1,500	10	5,560	8	1,890.0	10×12.5	PCR0JEN152MCAC□□
	2,200	10	5,560	8	2,772.0	10×12.5	PCR0JEN222MCAC□□
	270	8	5,650	8	540.0	8×11.5	PCR1AEN271MBAB□□
	390	8	5,650	8	780.0	8×11.5	PCR1AEN391MBAB□□
	470	8	5,650	8	940.0	8×11.5	PCR1AEN471MBAB□□
	560	8	5,650	8	1,120.0	8×11.5	PCR1AEN561MBAB□□
	680	8	5,650	8	1,360.0	8×11.5	PCR1AEN681MBAB□□
	470	7	6,100	8	940.0	10×12.5	PCR1AEN471MCAC□□
	560	7	6,100	8	1,120.0	10×12.5	PCR1AEN561MCAC□□
16 1C	680	7	6,100	8	1,360.0	10×12.5	PCR1AEN681MCAC□□
	1,000	8	6,100	8	2,000.0	10×12.5	PCR1AEN102MCAC□□
	180	11	5,100	8	576.0	8×11.5	PCR1CEN181MBAB□□
	270	10	5,100	8	864.0	8×11.5	PCR1CEN271MBAB□□
	330	10	5,100	8	1,056.0	8×11.5	PCR1CEN331MBAB□□
	330	10	6,100	8	1,056.0	10×12.5	PCR1CEN331MCAC□□
	470	10	6,100	8	1,504.0	10×12.5	PCR1CEN471MCAC□□
	560	10	6,100	12	1,792.0	10×12.5	PCR1CEN561MCAC□□
	680	10	6,100	12	2,176.0	10×12.5	PCR1CEN681MCAC□□
	820	10	6,100	12	2,624.0	10×12.5	PCR1CEN821MCAC□□
	1,000	10	6,100	12	3,200.0	10×12.5	PCR1CEN102MCAC□□

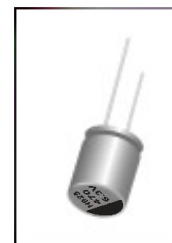
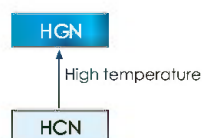
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- High temperature 125°C, 1000 hours
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



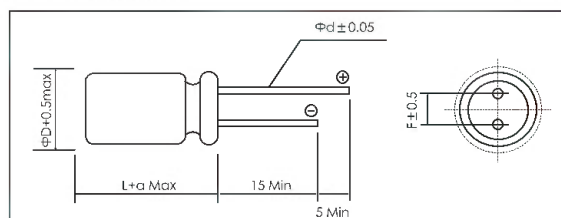
Items	Characteristics			
Category Temperature Range	-55 to +125 °C			
Rated Voltage Range	4 to 25Vdc			
Capacitance Range	47 to 1,200μF			
Capacitance Tolerance	±20% (M)			
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			
Leakage Current <sup>※1</sup>	Please see the attached ratings list			
Equivalent Series Resistance (ESR)	Please see the attached ratings list			
Temperature Characteristics (Max. Impedance Ratio)	$Z(+125^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			
Endurance	125°C, 1,000h Rated voltage applied	$\Delta C/C$ $DF (\tan\delta)$ $ESR$ $LC$	≤±20% of the initial value	
			≤200% of the initial specified value	
			≤200% of the initial specified value	
			≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	$\Delta C/C$ $DF (\tan\delta)$ $ESR$ $LC$	≤±20% of the initial value	
			≤150% of the initial specified value	
			≤150% of the initial specified value	
			≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	$\Delta C/C$ $DF (\tan\delta)$ $ESR$ $LC$	≤±5% of the initial value	
			≤The initial specified value	
			≤The initial specified value	
			≤The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
B06	8.0	6	1.5	3.5	0.5
BAB	8.0	11.5	1.5	3.5	0.6
C07	10.0	7.0	1.0	5.0	0.6
CAC	10.0	12.5	1.5	5.0	0.6

## Size List

Cap.(μF)	R.V[S.V] (V)	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]
47						B06	
68						C07	BAB
82					B06		
100						BAB	CAC
120				B06			
150			B06		C07	CAC	
180					BAB		
220				BAB			
270				C07			
330		B06	C07	BAB	CAC		
470			BAB				
560		BAB		CAC			
680		C07	CAC				
820			CAC				
1,200		CAC					



## Ratings for HGN Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Allowable Ripple Current 100kHz, T ≤ 105°C	Rated Ripple Current 100kHz, 105°C < T ≤ 125°C	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
4 0G	330	35	2,560	810	12	660.0	8×6	PCR0GGN331MB06□□
	680	25	3,700	1170	12	544.0	10×7	PCR0GGN681MC07□□
	560	13	4,520	1430	12	448.0	8×11.5	PCR0GGN561MBAB□□
	1,200	12	5,450	1740	12	960.0	10×12.5	PCR0GGN122MCAC□□
6.3 0J	150	35	2,560	810	12	472.5	8×6	PCR0JGN151MB06□□
	330	25	3,700	1170	12	415.8	10×7	PCR0JGN331MC07□□
	470	15	4,210	1332	12	592.2	8×11.5	PCR0JGN471MBAB□□
	680	12	5,450	1740	12	642.6	10×12.5	PCR0JGN681MCAC□□
	820	12	5,450	1740	12	774.9	10×12.5	PCR0JGN821MCAC□□
10 1A	120	35	2,560	810	12	600.0	8×6	PCR1AGN121MB06□□
	270	25	3,700	1170	12	540.0	10×7	PCR1AGN271MC07□□
	220	17	3,950	1260	12	440.0	8×11.5	PCR1AGN221MBAB□□
	330	17	3,950	1260	12	660.0	8×11.5	PCR1AGN331MBAB□□
	560	13	5,250	1680	12	840.0	10×12.5	PCR1AGN561MCAC□□
16 1C	82	40	2,120	670	12	656.0	8×6	PCR1CGN820MB06□□
	150	30	3,020	955	12	480.0	10×7	PCR1CGN151MC07□□
	180	20	3,640	1151	12	576.0	8×11.5	PCR1CGN181MBAB□□
	330	16	4,750	1520	12	792.0	10×12.5	PCR1CGN331MCAC□□
20 1D	47	45	1,890	598	12	470.0	8×6	PCR1DGN470MB06□□
	68	40	2,400	759	12	272.0	10×7	PCR1DGN680MC07□□
	100	24	3,320	1050	12	400.0	8×11.5	PCR1DGN101MBAB□□
	150	20	4,350	1390	12	600.0	10×12.5	PCR1DGN151MCAC□□
25 1E	68	24	3,320	1050	12	340.0	8×11.5	PCR1EGN680MBAB□□
	100	20	4,350	1390	12	500.0	10×12.5	PCR1EGN101MCAC□□

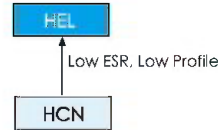
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Low ESL 105°C, 2000 hours
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant

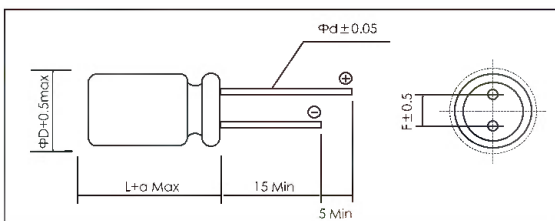


Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 16Vdc			
Capacitance Range	100 to 1,000μF			
Capacitance Tolerance	±20% (M)			(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			(at 20°C , 120Hz)
Leakage Current*1	Please see the attached ratings list			Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list			(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			(at 100kHz)
Endurance	105°C, 2,000h Rated voltage applied	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤±5% of the initial value	
		DF (tanδ)	≤The initial specified value	
		ESR	≤The initial specified value	
		LC	≤The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
E05	5	5	1.0	2.0	0.5
E08	5	8	1.0	2.0	0.5
E09	5	9	1.0	2.0	0.5
E10	5	10	1.0	2.0	0.5
E11	5	11	1.0	2.0	0.5
S09	5.5	9	1.0	2.5	0.5
S11	5.5	11	1.0	2.5	0.5
F05	6.3	5	1.0	2.5	0.5
F08	6.3	8	1.0	2.5	0.5
F09	6.3	9	1.0	2.5	0.5
F11	6.3	11	1.0	2.5	0.5

## Size List

Cap.(μF)	R.V[S.V] (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	6.8 [7.8]	7 [8]	7.5 [8.6]	10 [12]	12 [14]	16 [18]
100								E08		F08
120								E08		
220								F08		E11
270				E08	E08	E08	E08	F08	E10	E11,F09
330		F08		E08	E08	E08	E08	F09	E10,S09	F09,F11
390				E08,E09,E10	E09	E09	E09			F11
470		F08		E11,F08	F08	F08	E10,F08	F09		F11
500							E10			
560		F08	F08	F08	F08	F08	F08	F11		
680				F08,F09	F09	F09	F09	F11		
820		F08		F09,S11,F11						
1,000				F11						



## Ratings for HEL Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 0E	330	7	5,600	10	500.0	6.3×8	PCR0EEL331MF08□□
	470	7	5,600	10	500.0	6.3×8	PCR0EEL471MF08□□
	560	7	5,600	10	500.0	6.3×8	PCR0EEL561MF08□□
	820	7	5,600	10	500.0	6.3×8	PCR0EEL821MF08□□
6.3 0J	560	7	5,600	10	500.0	6.3×8	PCR0GEL561MF08□□
	270	11	3,700	10	340.2	5×8	PCR0JEL271ME08□□
	330	11	3,700	10	415.8	5×8	PCR0JEL331ME08□□
	390	11	3,700	10	491.4	5×8	PCR0JEL391ME08□□
	390	11	3,700	10	491.4	5×9	PCR0JEL391ME09□□
	470	11	3,700	10	592.2	5×10	PCR0JEL471ME11□□
	470	8	5,000	10	592.2	6.3×8	PCR0JEL471MF08□□
	560	8	5,000	10	705.6	6.3×8	PCR0JEL561MF08□□
	680	8	5,000	10	856.8	6.3×8	PCR0JEL681MF08□□
	820	8	5,000	10	1,033.2	6.3×9	PCR0JEL821MF09□□
	820	8	4,500	10	1,033.2	5.5×11	PCR0JEL821MS11□□
	820	8	5,000	10	1,033.2	6.3×11	PCR0JEL821MF11□□
	1,000	8	5,000	10	1,260.0	6.3×11	PCR0JEL102MF11□□
	270	11	3,700	10	367.2	5×8	PCR68EL271ME08□□
	330	11	3,700	10	448.8	5×8	PCR68EL331ME08□□
6.8 68	390	11	3,700	10	530.4	5×9	PCR68EL391ME09□□
	470	8	5,000	10	639.2	6.3×8	PCR68EL471MF08□□
	560	8	5,000	10	761.6	6.3×8	PCR68EL561MF08□□
	680	8	5,000	10	924.8	6.3×9	PCR68EL681MF09□□
	270	11	3,700	10	378.0	5×8	PCR07EL271ME08□□
7 07	330	11	3,700	10	462.0	5×8	PCR07EL331ME08□□
	390	11	3,700	10	546.0	5×8	PCR07EL391ME08□□
	470	8	5,000	10	658.0	6.3×8	PCR07EL471MF08□□
	560	8	5,000	10	784.0	6.3×8	PCR07EL561MF08□□
	680	8	5,000	10	952.0	6.3×9	PCR07EL681MF09□□
7.5 75	270	11	3,700	10	405.0	5×8	PCR75EL271ME08□□
	330	11	3,700	10	495.0	5×8	PCR75EL331ME08□□
	390	11	3,700	10	585.0	5×8	PCR75EL391ME08□□
	470	11	3,100	10	705.0	5×10	PCR75EL471ME10□□
	470	8	5,000	10	705.0	6.3×8	PCR75EL471MF08□□
	500	11	3,100	10	750.0	5×10	PCR75EL501ME10□□
	470	8	5,000	10	705.0	6.3×8	PCR75EL471MF08□□
	560	8	5,000	10	840.0	6.3×8	PCR75EL561MF08□□
	680	8	5,000	10	1,020.0	6.3×9	PCR75EL681MF09□□
	100	24	2,490	10	200.0	5×8	PCR1AEL101ME08□□
10 1A	120	24	2,490	10	240.0	5×8	PCR1AEL121ME08□□
	220	10	4,680	10	500.0	6.3×8	PCR1AEL221MF08□□
	270	10	4,680	10	540.0	6.3×8	PCR1AEL271MF08□□
	330	15	3,600	10	660.0	6.3×9	PCR1AEL331MF09□□
	470	12	4,100	10	940.0	6.3×9	PCR1AEL471MF09□□
	560	12	4,100	10	1,120.0	6.3×11	PCR1AEL561MF11□□
	680	15	3,600	10	1,360.0	6.3×11	PCR1AEL681MF11□□
12 A2	270	11	3,100	10	648.0	5×10	PCRA2EL271ME10□□
	330	11	3,100	10	792.0	5×10	PCRA2EL331ME10□□
	330	15	3,000	10	792.0	5.5×9	PCRA2EL331MS09□□
16 1C	100	15	3,600	12	500.0	6.3×8	PCR1CEL101MF08□□
	220	15	3,000	12	704.0	5×11	PCR1CEL221ME11□□
	270	15	3,000	12	864.0	5×11	PCR1CEL271ME11□□
	270	15	3,600	12	864.0	6.3×9	PCR1CEL271MF09□□
	330	15	3,600	12	1,056.0	6.3×9	PCR1CEL331MF09□□
	330	15	3,600	12	1,056.0	6.3×11	PCR1CEL331MF11□□
	390	15	3,600	12	1,248.0	6.3×11	PCR1CEL391MF11□□
	470	15	3,600	12	1,504.0	6.3×11	PCR1CEL471MF11□□
	470	15	3,600	12	1,504.0	6.3×11	PCR1CEL471MF11□□

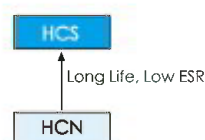
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Long Life, Low ESR, Large Capacitance 105°C, 5000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



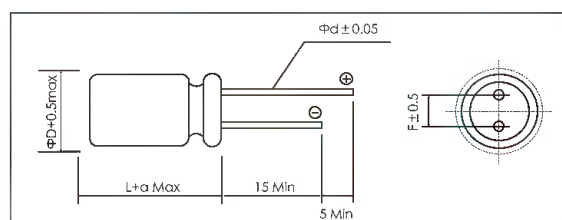
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 100Vdc			
Capacitance Range	47 to 2,700μF			
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)			
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list (at 20°C, 120Hz)			
Leakage Current <sup>※1</sup>	Please see the attached ratings list Rated voltage applied, after 2 minutes.			
Equivalent Series Resistance (ESR)	Please see the attached ratings list (at 20°C, 100kHz)			
Temperature Characteristics (Max. Impedance Ratio)	Z(+105°C)/Z(+20°C) ≤ 1.25 Z(-55°C)/Z(+20°C) ≤ 1.25 (at 100kHz)			
Endurance	105°C, 5,000h Rated voltage applied	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤ ±5% of the initial value	
		DF (tanδ)	≤ The initial specified value	
		ESR	≤ The initial specified value	
		LC	≤ The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
F08	6.3	8	1.0	2.5	0.5
B08	8.0	8	1.5	3.5	0.6
BAB	8	11.5	1.5	3.5	0.6
CAC	10.0	12.5	1.5	5.0	0.6
C16	10.0	16	2.0	5.0	0.6
C20	10.0	20	2.0	5.0	0.6

## Size List

R.V[S.V] (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]	35 [40]	50 [58]	63 [72]	100 [115]
Cap.(μF)											
47											CAC
100					F08			F08	BAB		
150						F08					
180					B08.BAB						
220								BAB	CAC	C20	
270					B08.BAB						
330	F08			F08					C16		
390			B08								
470			F08.B08.BAB	BAB	CAC		BAB.CAC	CAC.C16	C20		
560	F08.B08	F08.B08.BAB	F08.B08	BAB		CAC					
680		BAB	CAC	BAB							
820	F08.B08.BAB	BAB									
1,000	B08			BAB.CAC			C16	C20			
1,500			CAC				C20				
2,200			CAC								
2,700	CAC										



## Ratings for HCS Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 OE	330	7	5,600	12	500.0	6.3×8	PCR0ECS331MF08 □□
	560	7	5,600	12	500.0	6.3×8	PCR0ECS561MF08 □□
	820	7	5,600	12	500.0	6.3×8	PCR0ECS821MF08 □□
	560	8	4,700	12	280.0	8×8	PCR0ECS561MB08 □□
	820	7	6,100	12	500.0	8×8	PCR0ECS821MB08 □□
	820	7	6,100	12	500.0	8×11.5	PCR0ECS821MBAB □□
	1,000	7	6,100	12	500.0	8×8	PCR0ECS102MB08 □□
4 OG	2,700	7	5,560	12	1,350.0	10×12.5	PCR0ECS272MCAC □□
	560	8	5,600	12	500.0	6.3×8	PCR0GCS561MF08 □□
	560	8	6,100	12	500.0	8×8	PCR0GCS561MB08 □□
	560	8	6,100	12	500.0	8×11.5	PCR0GCS561MBAB □□
	680	8	6,100	12	544.0	8×11.5	PCR0GCS681MBAB □□
	820	8	6,640	12	656.0	8×11.5	PCR0GCS821MBAB □□
6.3 OJ	470	10	5,600	12	592.0	6.3×8	PCR0JCS471MF08 □□
	390	15	3,900	12	491.4	8×8	PCR0JCS391MB08 □□
	470	10	5,700	12	592.2	8×8	PCR0JCS471MB08 □□
	560	10	5,600	12	705.0	6.3×8	PCR0JCS561MF08 □□
	560	8	6,100	12	705.6	8×8	PCR0JCS561MB08 □□
	680	8	6,640	12	856.8	10×12.5	PCR0JCS681MCAC □□
	1,500	8	5,560	12	1,890.0	10×12.5	PCR0JCS152MCAC □□
10 IA	2,200	8	5,560	12	2,772.0	10×12.5	PCR0JCS222MCAC □□
	330	10	5,000	12	660.0	6.3×8	PCR1ACS331MF08 □□
	560	10	5,600	12	705.0	6.3×8	PCR0JCS561MF08 □□
	470	10	5,100	12	940.0	8×11.5	PCR1ACS471MBAB □□
	560	10	5,100	12	1,120.0	8×11.5	PCR1ACS561MBAB □□
	680	10	5,650	12	1,360.0	8×11.5	PCR1ACS681MBAB □□
	1,000	10	6,100	12	2,000.0	8×11.5	PCR1ACS102MBAB □□
16 IC	1,000	10	4,950	12	2,000.0	10×12.5	PCR1ACS102MCAC □□
	100	35	4,680	12	500.0	6.3×8	PCR1CCS101MF08 □□
	180	10	5,000	12	576.0	8×8	PCR1CCS181MB08 □□
	270	10	5,000	12	864.0	8×8	PCR1CCS271MB08 □□
	180	16	4,360	12	576.0	8×11.5	PCR1CCS181MBAB □□
	270	11	5,000	12	864.0	8×11.5	PCR1CCS271MBAB □□
	470	10	6,100	12	1,504.0	10×12.5	PCR1CCS471MCAC □□
20 ID	150	25	3,200	12	600.0	6.3×8	PCR1DCS151MF08 □□
	560	10	6,100	12	2,240.0	10×12.5	PCR1DCS561MCAC □□
25 IE	470	20	4,000	12	1,175.0	8×11.5	PCR1ECS471MBAB □□
	470	18	3,200	12	2,350.0	10×12.5	PCR1ECS471MCAC □□
	1,000	20	5,050	12	5,000.0	10×16	PCR1ECS102MC16 □□
	1,500	20	4,000	12	7,500.0	10×20	PCR1ECS152MC20 □□
35 IV	100	35	2,350	12	700.0	6.3×8	PCR1VCS101MF08 □□
	220	20	4,500	12	1,540.0	8×11.5	PCR1VCS221MBAB □□
	470	18	3,200	12	3,290.0	10×12.5	PCR1VCS471MCAC □□
	470	18	5,000	12	3,290.0	10×16	PCR1VCS471MC16 □□
	1,000	19	5,000	12	7,000.0	10×20	PCR1VCS102MC20 □□
50 IH	100	25	5,000	12	1,000.0	8×11.5	PCR1HCS101MBAB □□
	220	20	4,300	12	2,200.0	10×12.5	PCR1HCS221MCAC □□
	330	20	5,000	12	3,300.0	10×16	PCR1HCS331MC16 □□
	470	30	4,300	12	4,700.0	10×20	PCR1HCS471MC20 □□
63 IJ	220	30	4,300	12	2,772.0	10×20	PCR1JCS221MC20 □□
100 2A	47	30	3,600	12	940.0	10×12.5	PCR2ACS470MCAC □□

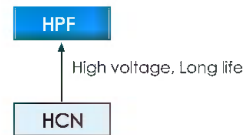
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- High Voltage, Long Life, Low ESR, Large Capacitance 105°C, 3000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, LED power etc.
- RoHS Compliant



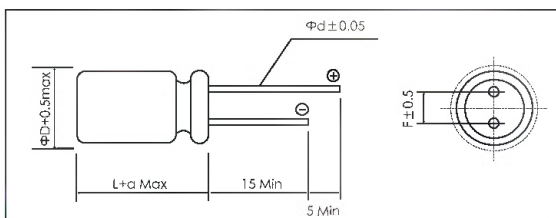
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	16 to 200Vdc			
Capacitance Range	4.7 to 2,700μF			
Capacitance Tolerance	±20% (M)			
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			
Leakage Current <sup>※1</sup>	Please see the attached ratings list			
Equivalent Series Resistance (ESR)	Please see the attached ratings list			
Temperature Characteristics (Max. Impedance Ratio)	Z(+105°C)/Z(+20°C) ≤ 1.25 Z(-55°C)/Z(+20°C) ≤ 1.25			
Endurance	105°C, 3,000h Rated voltage applied	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤ ±5% of the initial value	
		DF (tanδ)	≤ The initial specified value	
		ESR	≤ The initial specified value	
		LC	≤ The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	αmax	F±0.5	ΦD±0.5
E05	5	5	1.0	2.0	0.5
F05	6.3	5	1.0	2.5	0.5
F08	6.3	8	1.0	2.5	0.5
B06	8	6	1.5	3.5	0.5
B08	8	8	1.5	3.5	0.6
BAB	8	11.5	1.5	3.5	0.6
CAC	10	12.5	1.5	5.0	0.6
C16	10	16	2.0	5.0	0.6
C20	10	20	2.0	5.0	0.6

## Size List

R.V[5.V] (V)	16 [18]	20 [23]	2.5 [29]	28 [32]	32 [37]	35 [40]	40 [46]	50 [58]	63 [72]	80 [92]	100 [115]	125 [144]	160 [184]	200 [230]
4.7														BAB
8.2														CAC
10								E05	F05				BAB	CAC
12								E05	F05				BAB	CAC
15											BAB	BAB		
18														
22														
27								E05	F05	F08.B06	B08	CAC	CAC	
33											CAC			
39														
47														
56														
68														
82														
100	E05	F05	F05	F05	F05	F05	F05	B08	BAB.CAC	CAC				
120		F05	F05	F05	F05	F05	F05	B08	BAB.CAC	CAC				
150	F05	B06	F05	F05	F05	F05	F05	B08	BAB.CAC	CAC				
180	F05		F05	F05	F05	F05	F05	B08	BAB.CAC	CAC				
220		F08.B06	F08.B06	B08	B08	BAB	BAB	CAC	C16	C16	C20			
270	F08.B06	B06	B06	B08	BAB	BAB	CAC	C16	C16	C20				
330	F08.B06	B08	B08.BAB	BAB	BAB	CAC	CAC	CAC	C20					
390		B08.BAB	BAB	CAC	CAC	CAC								
470	B08.BAB	BAB	BAB.CAC	CAC	CAC									
560	B08.BAB	BAB.CAC	CAC	CAC										
680	BAB	CAC	CAC											
820		CAC												
1,000	CAC		C16											
1,200	CAC													
2,200			C20											
2,700	C20													



## Ratings for HPF Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120kHz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
16 1C	100	38	1,900	12	320	5×5	PCR1CPF101ME05□□
	150	25	2,800	12	480	6.3×5	PCR1CPF151MF05□□
	180	25	2,800	12	576	6.3×5	PCR1CPF181MF05□□
	270	22	3,300	12	864	6.3×8	PCR1CPF271MF08□□
	330	22	3,300	12	1,056	6.3×8	PCR1CPF331MF08□□
	270	22	3,300	12	864	8×6	PCR1CPF271MB06□□
	330	22	3,300	12	1,056	8×6	PCR1CPF331MB06□□
	470	16	4,400	12	1,504	8×8	PCR1CPF471MB08□□
	560	16	4,400	12	1,782	8×8	PCR1CPF561MB08□□
	470	14	4,950	12	1,504	8×11.5	PCR1CPF471MBAB□□
	560	14	4,950	12	1,792	8×11.5	PCR1CPF561MBAB□□
	680	14	4,950	12	2,176	8×11.5	PCR1CPF681MBAB□□
	1000	12	5,400	12	3,200	10×12.5	PCR1CPF102MCAC□□
20 1D	1200	12	5,400	12	3,840	10×12.5	PCR1CPF122MCAC□□
	2700	16	7,000	12	8,640	10×20	PCR1CPF272MC20□□
	68	40	1,900	12	272	5×5	PCR1DPF680ME05□□
	82	40	1,900	12	328	5×5	PCR1DPF820ME05□□
	120	28	2,650	12	480	6.3×5	PCR1DPF121MF05□□
	150	28	2,650	12	600	6.3×5	PCR1DPF151MF05□□
	220	24	3,200	12	880	6.3×8	PCR1DPF221MF08□□
	220	24	3,200	12	880	8×6	PCR1DPF221MB06□□
	270	24	3,200	12	1,080	8×6	PCR1DPF271MB06□□
	330	17	4,300	12	1,320	8×8	PCR1DPF331MB08□□
	390	17	4,300	12	1,560	8×8	PCR1DPF391MB08□□
	390	14	4,950	12	1,560	8×11.5	PCR1DPF391MBAB□□
	470	14	4,950	12	1,880	8×11.5	PCR1DPF471MBAB□□
25 1E	560	14	4,950	12	2,240	8×11.5	PCR1DPF561MBAB□□
	560	12	5,400	12	2,240	10×12.5	PCR1DPF561MCAC□□
	680	12	5,400	12	2,720	10×12.5	PCR1DPF681MCAC□□
	820	12	5,400	12	3,280	10×12.5	PCR1DPF821MCAC□□
	56	50	1,700	12	280	5×5	PCR1EPF560ME05□□
	68	50	1,700	12	340	5×5	PCR1EPF680ME05□□
	100	30	2,550	12	500	6.3×5	PCR1EPF101MF05□□
	120	30	2,550	12	600	6.3×5	PCR1EPF121MF05□□
	180	24	3,200	12	900	6.3×8	PCR1EPF181MF08□□
	180	24	3,200	12	900	8×6	PCR1EPF181MB06□□
	220	24	3,200	12	1,100	8×6	PCR1EPF221MB06□□
	270	18	4,100	12	1,350	8×8	PCR1EPF271MB08□□
	330	18	4,100	12	1,650	8×8	PCR1EPF331MB08□□
28 1L	330	16	4,650	12	1,650	8×11.5	PCR1EPF331MBAB□□
	390	16	4,650	12	1,950	8×11.5	PCR1EPF391MBAB□□
	470	16	4,650	12	2,350	8×11.5	PCR1EPF471MBAB□□
	470	14	5,000	12	2,350	10×12.5	PCR1EPF471MCAC□□
	560	14	5,000	12	2,800	10×12.5	PCR1EPF561MCAC□□
	680	14	5,000	12	3,400	10×12.5	PCR1EPF681MCAC□□
	1000	14	5,100	12	5,000	10×16	PCR1EPF102MC16□□
	2200	14	5,100	12	11,000	10×20	PCR1EPF222MC20□□
	47	50	1,700	12	263	5×5	PCR1LPF470ME05□□
	82	33	2,450	12	459	6.3×5	PCR1LPF820MF05□□
	150	28	2,950	12	840	6.3×8	PCR1LPF151MF08□□
	150	28	2,950	12	840	8×6	PCR1LPF151MB06□□
	180	22	3,700	12	1,008	8×8	PCR1LPF181MB08□□
32 1F	220	22	3,700	12	1,232	8×8	PCR1LPF221MB08□□
	270	18	4,350	12	1,512	8×11.5	PCR1LPF271MBAB□□
	330	18	4,350	12	1,848	8×11.5	PCR1LPF331MBAB□□
	470	16	4,650	12	2,632	10×12.5	PCR1LPF471MCAC□□
	560	16	4,650	12	3,136	10×12.5	PCR1LPF561MCAC□□
	39	55	1,600	12	250	5×5	PCR1FPF390ME05□□
	68	35	2,350	12	435	6.3×5	PCR1FPF680MF05□□
	120	30	2,800	12	768	6.3×8	PCR1FPF121MF08□□
	120	30	2,800	12	768	8×6	PCR1FPF121MB06□□
	180	24	3,600	12	1,152	8×8	PCR1FPF181MB08□□
	220	20	4,000	12	1,408	8×11.5	PCR1FPF221MBAB□□
	270	20	4,000	12	1,728	8×11.5	PCR1FPF271MBAB□□
	390	18	4,400	12	2,496	10×12.5	PCR1FPF391MCAC□□
35 1V	470	18	4,400	12	3,008	10×12.5	PCR1FPF471MCAC□□
	33	55	1,600	12	231	5×5	PCR1VPF330ME05□□
	47	35	2,350	12	329	6.3×5	PCR1VPF470MF05□□
	56	35	2,350	12	392	6.3×5	PCR1VPF560MF05□□
	100	30	2,800	12	700	6.3×8	PCR1VPF101MF08□□
	100	30	2,800	12	700	8×6	PCR1VPF101MB06□□
	150	24	3,600	12	1,050	8×8	PCR1VPF151MB08□□
	180	20	4,000	12	1,260	8×11.5	PCR1VPF181MBAB□□

POLYMER



## Ratings for HPF Series

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
35 1V	220	20	4,000	12	1,540	8×11.5	PCR1VPF221MBAB □□
	330	18	4,400	12	2,310	10×12.5	PCR1VPF331MCAC □□
	390	18	4,400	12	2,730	10×12.5	PCR1VPF391MCAC □□
	680	18	4,690	12	4,760	10×16	PCR1VPF681MC16 □□
	1000	16	4,650	12	7,000	10×20	PCR1VPF102MC20 □□
40 1G	22	60	1,550	12	176	5×5	PCR1GPF220ME05 □□
	33	40	2,200	12	264	6.3×5	PCR1GPF330MF05 □□
	39	37	2,300	12	312	6.3×5	PCR1GPF390MF05 □□
	82	32	2,700	12	656	6.3×8	PCR1GPF820MF08 □□
	82	32	2,700	12	656	8×6	PCR1GPF820MB06 □□
	120	26	3,500	12	960	8×8	PCR1GPF121MB08 □□
	150	21	3,900	12	1,200	8×11.5	PCR1GPF151MBAB □□
	220	18	4,400	12	1,760	10×12.5	PCR1GPF221MCAC □□
	270	18	4,400	12	2,160	10×12.5	PCR1GPF271MCAC □□
	330	18	4,400	12	2,640	10×12.5	PCR1GPF331MCAC □□
50 1H	10	70	1,400	12	100	5×5	PCR1HPF100ME05 □□
	12	70	1,400	12	120	5×5	PCR1HPF120ME05 □□
	22	40	2,200	12	220	6.3×5	PCR1HPF220MF05 □□
	39	35	2,600	12	390	6.3×8	PCR1HPF390MF08 □□
	33	35	2,600	12	330	8×6	PCR1HPF330MB06 □□
	39	35	2,600	12	390	8×6	PCR1HPF390MB06 □□
	56	29	3,300	12	560	8×8	PCR1HPF560MB08 □□
	68	29	3,300	12	680	8×8	PCR1HPF680MB08 □□
	82	25	3,800	12	820	8×11.5	PCR1HPF820MBAB □□
	100	25	3,800	12	1,000	8×11.5	PCR1HPF101MBAB □□
	100	20	4,300	12	1,000	10×12.5	PCR1HPF101MCAC □□
	120	20	4,300	12	1,200	10×12.5	PCR1HPF121MCAC □□
	150	20	4,300	12	1,500	10×12.5	PCR1HPF151MCAC □□
	220	20	4,300	12	2,200	10×16	PCR1HPF221MC16 □□
63 1J	470	30	4,300	12	4,700	10×20	PCR1HPF471MC20 □□
	10	50	1,950	12	126	6.3×5	PCR1JPF100MF05 □□
	12	50	1,950	12	151	6.3×5	PCR1JPF120MF05 □□
	22	45	2,350	12	277	6.3×8	PCR1JPF220MF08 □□
	22	45	2,350	12	277	8×6	PCR1JPF220MB06 □□
	27	45	2,350	12	340	8×6	PCR1JPF270MB06 □□
	33	30	3,200	12	416	8×8	PCR1JPF330MB08 □□
	39	30	3,200	12	491	8×8	PCR1JPF390MB08 □□
	47	26	3,600	12	592	8×11.5	PCR1JPF470MBAB □□
	56	26	3,600	12	706	8×11.5	PCR1JPF560MBAB □□
	56	22	4,100	12	706	10×12.5	PCR1JPF560MCAC □□
	68	22	4,100	12	857	10×12.5	PCR1JPF680MCAC □□
	82	22	4,100	12	1,033	10×12.5	PCR1JPF820MCAC □□
	100	22	4,100	12	1,260	10×12.5	PCR1JPF101MCAC □□
	120	22	4,100	12	1,512	10×12.5	PCR1JPF121MCAC □□
80 1K	220	20	4,950	12	2,772	10×16	PCR1JPF221MC16 □□
	330	20	4,950	12	4,158	10×20	PCR1JPF331MC20 □□
	22	36	2,900	12	352	8×8	PCR1KPF220MB08 □□
	27	36	2,900	12	432	8×8	PCR1KPF270MB08 □□
	33	32	3,200	12	528	8×11.5	PCR1KPF330MBAB □□
	39	32	3,200	12	624	8×11.5	PCR1KPF390MBAB □□
	47	28	3,600	12	752	10×12.5	PCR1KPF470MCAC □□
	56	28	3,600	12	896	10×12.5	PCR1KPF560MCAC □□
2A 100	220	40	3,500	12	3,520	10×20	PCR1KPF221MC20 □□
	12	36	3,000	12	240	8×11.5	PCR2APF120MBAB □□
	15	36	3,000	12	300	8×11.5	PCR2APF150MBAB □□
	22	32	3,300	12	440	10×12.5	PCR2APF220MCAC □□
	27	32	3,300	12	540	10×12.5	PCR2APF270MCAC □□
2B 125	100	46	3,500	12	2,000	10×20	PCR2APF101MC20 □□
	10	45	2,700	12	250	8×11.5	PCR2BPF100MBAB □□
	12	45	2,700	12	300	8×11.5	PCR2BPF120MBAB □□
	18	40	3,000	12	450	10×12.5	PCR2BPF180MCAC □□
	22	40	3,000	12	550	10×12.5	PCR2BPF220MCAC □□
2C 160	8.2	70	2,100	12	262	8×11.5	PCR2CPF8R2MBAB □□
	10	60	2,400	12	320	10×12.5	PCR2CPF100MCAC □□
	12	60	2,400	12	384	10×12.5	PCR2CPF120MCAC □□
2D 200	4.7	120	1,600	12	188	8×11.5	PCR2DPF4R7MBAB □□
	8.2	100	1,850	12	328	10×12.5	PCR2DPF8R2MCAC □□
	10	100	1,850	12	400	10×12.5	PCR2DPF100MCAC □□

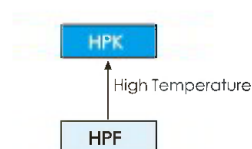
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- High Voltage, Long Life, Low ESR, Large Capacitance 125°C, 2000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, LED power etc.
- RoHS Compliant



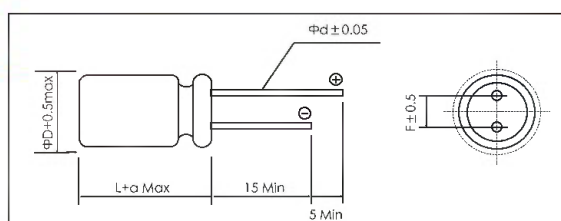
Items	Characteristics		
Category Temperature Range	-55 to +125 °C		
Rated Voltage Range	16 to 80Vdc		
Capacitance Range	10 to 2,200μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current*1	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+125^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		(at 100kHz)
Endurance	125°C , 2,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤200% of the initial specified value
		ESR	≤200% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C , 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤±5% of the initial value
		DF (tanδ)	≤The initial specified value
		ESR	≤The initial specified value
		LC	≤The initial specified value(after voltage processing)

\*1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	a max	F±0.5	Φd±0.05
F05	6.3	5	1.0	2.5	0.5
F08	6.3	8	1.0	2.5	0.5
B06	8	6	1.5	3.5	0.5
B08	8	8	1.5	3.5	0.6
BAB	8	11.5	1.5	3.5	0.6
CAC	10	12.5	1.5	5.0	0.6
C16	10	16	2.0	5.0	0.6
C20	10	20	2.0	5.0	0.6

## Size List

R.V.[S.V] [V]	16 [18]	20 [23]	25 [29]	35 [40]	40 [46]	50 [58]	63 [72]	80 [92]
Cap.(μF)								
10							F05	
12							F05	
18						F05		
22						F05	F08.B06	B08
27							F08.B06	B08
33					F05	F08.B06	B08	BAB
39					F05	F08.B06	B08	BAB
47				F05		B08	BAB	CAC
56				F05		B08	BAB	CAC
68					F08.B06	B08		
82			F05	F08.B06	F08.B06	BAB	CAC	
100			F05	F08.B06	B08.BAB	BAB.CAC	CAC	
120		F05		B08	B08	CAC		
150	F05		F08.B06	B08	BAB	CAC	C16	
180		F08	F08.B06	BAB				
220		F08.B06	B08	BAB	CAC		C20	
270	F08.B06		B08	CAC	CAC			
330		B08	BAB	CAC				
390	B08	BAB	BAB					
470			CAC			C20		
560	BAB		CAC	C16				
680		CAC						
1,000	CAC			C20				
1,800	C16							
2,200	C20		C20					



## Ratings for HPK Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Dissipa- tion Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
16 1C	150	30	1,400	12	480	6.3×5	PCR1CPK151MF05□□
	270	26	1,650	12	864	6.3×8	PCR1CPK271MF08□□
	270	26	1,650	12	864	8×6	PCR1CPK271MB06□□
	390	19	2,200	12	1,248	8×8	PCR1CPK391MB08□□
	560	16	2,500	12	1,792	8×11.5	PCR1CPK561MBAB□□
	1000	14	2,700	12	3,200	10×12.5	PCR1CPK102MCAC□□
	1800	14	3,000	12	5,760	10×16	PCR1CPK102MC16□□
20 1D	2200	14	3,500	12	7,040	10×20	PCR1CPK222MC20□□
	120	34	1,300	12	480	6.3×5	PCR1DPK121MF05□□
	180	29	1,600	12	720	6.3×8	PCR1DPK181MF08□□
	220	29	1,600	12	880	6.3×8	PCR1DPK221MF08□□
	220	29	1,600	12	880	8×6	PCR1DPK221MB06□□
	330	21	2,100	12	1,320	8×8	PCR1DPK331MB08□□
	390	17	2,400	12	1,560	8×11.5	PCR1DPK471MBAB□□
25 1E	680	15	2,600	12	2,720	10×12.5	PCR1DPK681MCAC□□
	82	36	1,255	12	410	6.3×5	PCR1EPK101MF05□□
	100	36	1,255	12	500	6.3×5	PCR1EPK121MF05□□
	150	29	1,600	12	750	6.3×8	PCR1EPK151MF08□□
	180	29	1,600	12	900	6.3×8	PCR1EPK181MF08□□
	150	29	1,600	12	750	8×6	PCR1EPK181MB06□□
	180	29	1,600	12	900	8×6	PCR1EPK221MB06□□
35 1V	220	22	2,050	12	1,100	8×8	PCR1EPK271MB08□□
	270	22	2,050	12	1,350	8×8	PCR1EPK331MB08□□
	330	19	2,325	12	1,650	8×11.5	PCR1EPK331MBAB□□
	390	19	2,325	12	1,950	8×11.5	PCR1EPK391MBAB□□
	470	17	2,500	12	2,350	10×12.5	PCR1EPK471MCAC□□
	560	17	2,500	12	2,800	10×12.5	PCR1EPK561MCAC□□
	2200	15	1,900	12	11,000	10×20	PCR1EPK222MC20□□
40 1G	47	42	1,175	12	329	6.3×5	PCR1VPK470MF05□□
	56	42	1,175	12	392	6.3×5	PCR1VPK560MF05□□
	82	36	1,400	12	574	6.3×8	PCR1VPK820MF08□□
	100	36	1,400	12	700	6.3×8	PCR1VPK101MF08□□
	82	36	1,400	12	574	8×6	PCR1VPK820MB06□□
	100	36	1,400	12	700	8×6	PCR1VPK101MB06□□
	120	29	1,800	12	840	8×8	PCR1VPK121MB08□□
80 1K	150	29	1,800	12	1,050	8×8	PCR1VPK151MB08□□
	180	24	2,000	12	1,260	8×11.5	PCR1VPK181MBAB□□
	220	24	2,000	12	1,540	8×11.5	PCR1VPK221MBAB□□
	270	22	2,200	12	1,890	10×12.5	PCR1VPK271MCAC□□
	330	22	2,200	12	2,310	10×12.5	PCR1VPK331MCAC□□
	560	22	2,200	12	3,920	10×16	PCR1VPK561MC16□□
	1000	24	1,830	12	7,000	10×20	PCR1VPK102MC20□□
40 1G	33	45	1,150	12	264	6.3×5	PCR1GPK330MF05□□
	39	45	1,150	12	312	6.3×5	PCR1GPK390MF05□□
	68	38	1,350	12	544	6.3×8	PCR1GPK680MF08□□
	82	38	1,350	12	656	6.3×8	PCR1GPK820MF08□□
	68	38	1,350	12	544	8×6	PCR1GPK680MB06□□
	82	38	1,350	12	656	8×6	PCR1GPK820MB06□□

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Dissipa- tion Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
40 1G	100	31	1,750	12	800	8×8	PCR1GPK101MB08□□
	120	31	1,750	12	960	8×8	PCR1GPK121MB08□□
	150	25	1,950	12	1,200	8×11.5	PCR1GPK151MBAB□□
	220	22	2,200	12	1,760	10×12.5	PCR1GPK221MCAC□□
	270	22	2,200	12	2,160	10×12.5	PCR1GPK271MCAC□□
	68	35	1,650	12	680	8×8	PCR1HPK680MB08□□
	82	20	1,900	12	820	8×11.5	PCR1HPK820MBAB□□
50 1H	100	30	1,900	12	1,000	8×11.5	PCR1HPK101MBAB□□
	100	24	2,150	12	1,000	10×12.5	PCR1HPK101MCAC□□
	120	24	2,150	12	1,200	10×12.5	PCR1HPK121MCAC□□
	150	24	2,150	12	1,500	10×12.5	PCR1HPK151MCAC□□
	18	48	1,100	12	180	6.3×5	PCR1HPK180MF05□□
	22	48	1,100	12	220	6.3×5	PCR1HPK220MF05□□
	33	42	1,300	12	330	6.3×8	PCR1HPK330MF08□□
63 1J	39	42	1,300	12	390	6.3×8	PCR1HPK390MF08□□
	33	42	1,300	12	330	8×6	PCR1HPK330MB06□□
	39	42	1,300	12	390	8×6	PCR1HPK390MB06□□
	47	35	1,650	12	470	8×8	PCR1HPK470MB08□□
	56	35	1,650	12	560	8×8	PCR1HPK560MB08□□
	68	35	1,650	12	680	8×8	PCR1HPK680MB08□□
	82	20	1,900	12	820	8×11.5	PCR1HPK820MBAB□□
80 1K	100	30	1,900	12	1,000	8×11.5	PCR1HPK101MBAB□□
	100	24	2,150	12	1,000	10×12.5	PCR1HPK101MCAC□□
	120	24	2,150	12	1,200	10×12.5	PCR1HPK121MCAC□□
	150	24	2,150	12	1,500	10×12.5	PCR1HPK151MCAC□□
	470	28	1,700	12	4,700	10×20	PCR1HPK471MC20□□
	10	60	975	12	126	6.3×5	PCR1JPK100MF05□□
	12	60	975	12	151	6.3×5	PCR1JPK120MF05□□
80 1K	22	54	1,175	12	277	6.3×8	PCR1JPK220MF08□□
	27	54	1,175	12	340	6.3×8	PCR1JPK270MF08□□
	22	54	1,175	12	277	8×6	PCR1JPK220MB06□□
	27	54	1,175	12	340	8×6	PCR1JPK270MB06□□
	33	36	1,600	12	416	8×8	PCR1JPK330MB08□□
	39	36	1,600	12	491	8×8	PCR1JPK390MB08□□
	47	31	1,800	12	592	8×11.5	PCR1JPK470MBAB□□
80 1K	56	31	1,800	12	706	8×11.5	PCR1JPK560MBAB□□
	82	27	2,000	12	1,033	10×12.5	PCR1JPK820MCAC□□
	100	27	2,000	12	1,260	10×12.5	PCR1JPK101MCAC□□
	150	30	2,000	12	1,890	10×16	PCR1JPK151MC16□□
	220	25	3,200	12	2,772	10×20	PCR1JPK221MC20□□
	22	43	1,450	12	352	8×8	PCR1KPK220MB08□□
	27	43	1,450	12	432	8×8	PCR1KPK270MB08□□
80 1K	33	38	1,600	12	528	8×11.5	PCR1KPK330MBAB□□
	39	38	1,600	12	624	8×11.5	PCR1KPK390MBAB□□
	47	34	1,800	12	752	10×12.5	PCR1KPK470MCAC□□
	56	34	1,800	12	896	10×12.5	PCR1KPK560MCAC□□

Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Low ESR, Large Capacitance 105°C, 2000 hours.
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, LED power etc.
- RoHS Compliant



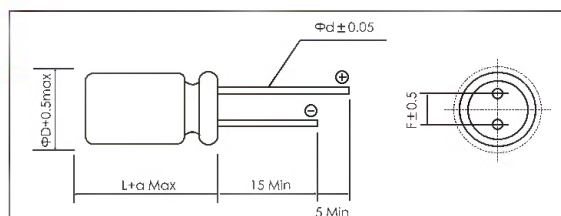
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	16 to 63Vdc			
Capacitance Range	150 to 2,200μF			
Capacitance Tolerance	±20% (M)			
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			
Leakage Current*1	Please see the attached ratings list			
Equivalent Series Resistance (ESR)	Please see the attached ratings list			
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			
Endurance	105°C, 2,000h Rated voltage applied	$\Delta C/C$ $DF(\tan\delta)$ ESR LC	≤±20% of the initial value	
			≤150% of the initial specified value	
			≤150% of the initial specified value	
			≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	$\Delta C/C$ $DF(\tan\delta)$ ESR LC	≤±20% of the initial value	
			≤150% of the initial specified value	
			≤150% of the initial specified value	
			≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	$\Delta C/C$ $DF(\tan\delta)$ ESR LC	≤±5% of the initial value	
			≤The initial specified value	
			≤The initial specified value	
			≤The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	a max	F±0.5	Φd±0.05
B14	8.0	14	1.5	3.5	0.6
B16	8.0	16	1.5	3.5	0.6
C14	10.0	14	2.0	5.0	0.6
C16	10.0	16	2.0	5.0	0.6

## Size List

Cap.(μF)	R.V[S.V] (V)	16 [18]	20 [23]	25 [29]	32 [37]	35 [40]	40 [46]	50 [58]	63 [72]
150									C14
180								C14	C16
220								C14	
270						B14	B14	C14	
330					B14	B16,C14	C14	C16	
390					B14	C14	C14		
470					C14	C14	C16		
560			B14	B14	C14	C16			
680			B14	B16	C16	C16			
820		B14	C14	C14					
1,000		B14	C14	C16					
1,200		C14	C16	C16					
1,500		C14							
1,800		C16							
2,200		C16							



## Ratings for HEG Series

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
16 1C	820	14	4,950	12	2,624	8×14	PCR1CEG821MB14 □□
	1,000	14	4,950	12	3,200	8×14	PCR1CEG102MB14 □□
	1,200	12	6,100	12	3,840	10×14	PCR1CEG122MC14 □□
	1,500	10	6,100	12	4,800	10×14	PCR1CEG152MC14 □□
	1,800	10	7,000	12	5,760	10×16	PCR1CEG182MC16 □□
	2,200	10	7,000	12	7,040	10×16	PCR1CEG222MC16 □□
20 1D	560	18	4,350	12	2,240	8×14	PCR1DEG561MB14 □□
	680	18	4,350	12	2,720	8×14	PCR1DEG681MB14 □□
	820	16	4,650	12	3,280	10×14	PCR1DEG821MC14 □□
	1,000	14	5,100	12	4,000	10×14	PCR1DEG102MC14 □□
	1,200	14	5,000	12	4,800	10×16	PCR1DEG122MC16 □□
25 1E	560	16	4,600	12	2,800	8×14	PCR1EEG561MB14 □□
	680	16	4,650	12	3,400	8×16	PCR1EEG681MB14 □□
	820	14	5,100	12	4,100	10×14	PCR1EEG821MC14 □□
	1,000	14	5,100	12	5,000	10×14	PCR1EEG102MC14 □□
	1,200	14	5,910	12	6,000	10×16	PCR1EEG122MC16 □□
32 1F	330	20	4,000	12	2,112	8×14	PCR1FEG331MB14 □□
	390	18	4,350	12	2,496	8×14	PCR1FEG391MB14 □□
	470	18	4,500	12	3,008	10×14	PCR1FEG471MC14 □□
	560	18	4,500	12	3,584	10×14	PCR1FEG561MC14 □□
	680	18	4,690	12	4,352	10×16	PCR1FEG681MC16 □□
35 1V	270	20	4,000	12	1,890	8×14	PCR1VEG271MB14 □□
	330	20	4,100	12	2,310	8×16	PCR1VEG331MB16 □□
	330	22	4,100	12	2,310	10×14	PCR1VEG331MC14 □□
	390	20	4,300	12	2,730	10×14	PCR1VEG391MC14 □□
	470	18	4,500	12	3,290	10×14	PCR1VEG471MC14 □□
	560	18	4,690	12	3,920	10×16	PCR1VEG561MC16 □□
40 1G	680	18	4,690	12	4,760	10×16	PCR1VEG681MC16 □□
	270	20	4,000	12	2,160	8×14	PCR1GEG271MB14 □□
	330	18	4,500	12	2,640	10×14	PCR1GEG331MC14 □□
	390	18	4,500	12	3,120	10×14	PCR1GEG391MC14 □□
	470	18	4,690	12	3,760	10×16	PCR1GEG471MC16 □□
50 1H	180	22	4,100	12	1,800	10×14	PCR1HEG181MC14 □□
	220	20	4,300	12	2,200	10×14	PCR1HEG221MC14 □□
	270	18	4,500	12	2,700	10×14	PCR1HEG271MC14 □□
	330	20	4,950	12	3,300	10×16	PCR1HEG331MC16 □□
63 1J	150	22	4,100	12	1,890	10×14	PCR1JEG151MC14 □□
	180	20	4,950	12	2,268	10×16	PCR1JEG181MC16 □□

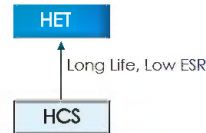
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Long Life, Large Capacitance 105°C, 20,000 hours.
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant

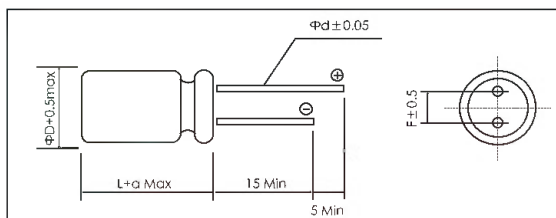


Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 50Vdc			
Capacitance Range	39 to 2,700μF			
Capacitance Tolerance	±20% (M)			(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			(at 20°C , 120Hz)
Leakage Current*1	Please see the attached ratings list			Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list			(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			
Endurance	105 °C, 20,000h Rated voltage applied	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤±5% of the initial value	
		DF (tanδ)	≤The initial specified value	
		ESR	≤The initial specified value	
		LC	≤The initial specified value(after voltage processing)	

\*1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
F08	6.3	8	1.0	2.5	0.5
F09	6.3	9	1.0	2.5	0.5
B08	8	8	1.5	3.5	0.6
BAB	8	11.5	1.5	3.5	0.6
B16	8	16	1.5	3.5	0.6
B20	8	20	2.0	3.5	0.6
C10	10	10	1.5	5.0	0.6
CAC	10	12.5	1.5	5.0	0.6
C20	10	20	2.0	5.0	0.6

## Size list

R.V[S.V] Cap.(μF)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	25 [29]	35 [40]	50 [58]
39								BAB
68								CAC
82							BAB	
100					F08	F08		CAC
120							CAC	
180								
220								
270					F08			
330	F08			B08	B08	CAC		
390			B08					
470	F08	F08	F08		B08.BAB	CAC		
560	F08	F08	F08		BAB	B16		
680				BAB		B16		
820	F08		F09		B16.CAC			
1,000			BAB	CAC	B20.CAC			
1,200		B08			B20			
1,500	BAB	BAB	C10		B20			
2,200			CAC		C20			
2,700	CAC	CAC			C20			



## Ratings for HET Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 0E	330	8	5,000	12	300	6.3×8	PCR0EET331MF08 □□
	470	8	5,000	12	300	6.3×8	PCR0EET471MF08 □□
	560	10	5,000	12	300	6.3×8	PCR0EET561MF08 □□
	820	10	5,000	12	410	6.3×8	PCR0EET821MF08 □□
	1,000	8	5,600	12	500	8×8	PCR0EET102MB08 □□
	1,500	8	5,700	12	750	8×11.5	PCR0EET152MBAB □□
4 0G	2,700	8	6,100	12	1,350	10×12.5	PCR0EET272MCAC □□
	470	8	5,000	12	376	6.3×8	PCR0GET471MF08 □□
	560	8	5,000	12	448	6.3×8	PCR0GET561MF08 □□
	1,200	8	5,400	12	960	8×8	PCR0GET122MB08 □□
	1,500	8	5,700	12	1,200	8×11.5	PCR0GET152MBAB □□
6.3 0J	2,700	8	6,100	12	2,160	10×12.5	PCR0GET272MCAC □□
	390	10	5,000	12	491.4	8×8	PCR0JET391MB08 □□
	470	10	5,000	12	592.2	6.3×8	PCR0JET471MF08 □□
	560	10	5,000	12	705.6	6.3×8	PCR0JET561MF08 □□
	820	10	5,000	12	1033.2	6.3×9	PCR0JET821MF09 □□
	1,000	8	5,700	12	1,260	8×11.5	PCR0JET102MBAB □□
	1,500	8	5,700	12	1,890	10×10	PCR0JET152MC10 □□
10 1A	2,200	8	6,100	12	2,772	10×12.5	PCR0JET222MCAC □□
	330	12	4,500	12	660	8×8	PCR1AET331MB08 □□
	680	10	5,100	12	1,360	8×11.5	PCR1AET681MBAB □□
	1,000	8	5,650	12	2,000	10×12.5	PCR1AET102MCAC □□
16 1C	100	20	3,600	12	320	6.3×8	PCR1CET101MF08 □□
	270	15	3,600	12	864	6.3×8	PCR1CET271MF08 □□
	330	13	4,700	12	1,056	8×8	PCR1CET331MB08 □□
	470	13	4,700	12	1,504	8×8	PCR1CET471MB08 □□
	470	11	5,080	12	1,504	8×11.5	PCR1CET471MBAB □□
	560	11	5,080	12	1,792	8×11.5	PCR1CET561MBAB □□
	820	12	5,400	12	2,624	8×16	PCR1CET821MB16 □□
	820	12	5,400	12	2,624	10×12.5	PCR1CET821MCAC □□
	1000	12	5,400	12	3,200	8×20	PCR1CET102MB20 □□
	1,000	20	5,400	12	3,200	10×12.5	PCR1CET102MCAC □□
	1,200	8	5,400	12	3,840	8×20	PCR1CET122MB20 □□
	1,500	10	7,500	12	4,800	8×20	PCR1CET152MB20 □□
	2,200	12	8,100	12	7,040	10×20	PCR1CET222MC20 □□
	2,700	8	8,100	12	8,640	10×20	PCR1CET272MC20 □□
25 1E	100	28	2,780	12	500	6.3×8	PCR1EET101MF08 □□
	330	14	5,000	12	1,650	10×12.5	PCR1EET331MCAC □□
	470	14	5,000	12	2,350	10×12.5	PCR1EET471MCAC □□
	560	14	4,100	12	2,800	8×16	PCR1EET561MB16 □□
	680	13	5,000	12	3,400	8×16	PCR1EET681MB16 □□
35 1V	82	18	4,380	12	574	8×11.5	PCR1VET820MBAB □□
	120	16	4,670	12	840	10×12.5	PCR1VET121MCAC □□
50 1H	39	25	3,000	12	390	8×11.5	PCR1HET390MBAB □□
	68	20	4,000	12	680	10×12.5	PCR1HET680MCAC □□
	100	20	4,000	12	1,000	10×12.5	PCR1HET101MCAC □□

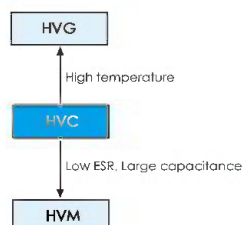
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Chip Type, Standard 105°C, 2000 hours
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



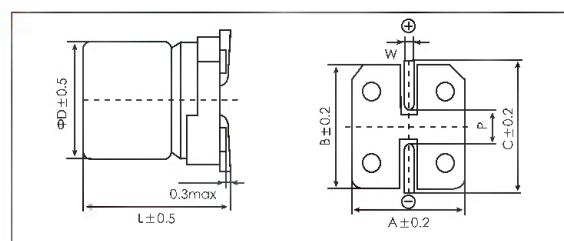
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 25Vdc			
Capacitance Range	10 to 1,500μF			
Capacitance Tolerance	±20% (M)			(at 20°C, 120Hz)
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			(at 20°C, 120Hz)
Leakage Current <sup>※1</sup>	Please see the attached ratings list			Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list			(at 20°C, 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	Z(+105°C)/Z(+20°C) ≤ 1.25 Z(-55°C)/Z(+20°C) ≤ 1.25			(at 100kHz)
Endurance	105°C, 2,000h Rated voltage applied	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤ ±20% of the initial value	
		DF (tanδ)	≤ 150% of the initial specified value	
		ESR	≤ 150% of the initial specified value	
		LC	≤ The initial specified value(after voltage processing)	
Resistance to soldering heat	Flow method (260±5°C × 10s)	ΔC/C	≤ ±10% of the initial value	
		DF (tanδ)	≤ 130% of the initial specified value	
		ESR	≤ 130% of the initial specified value	
		LC	≤ The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

## Size list



(unit:mm)

Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1
C12	10	12.2	10.3	10.3	11.0	0.7~1.1	4.6

R.V[S.V] Cap.(μF) (V)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]
10							F60,B70
22						F60	B70
27						F60	
33					F60	B70	B12
39					F60	B70	
47				F60	F60	B70	B12
56				F60	B70		C12
68			F60	F60			
82			F60		B70		
100		F60	F60		B12	B12	
120			F60	B70			
150		F60	B70	B70	C12	C12	
180			B70		B12		
220	F60	B70	B70		B12,C12		
270		B70		B12			
330		B70		B12	C12		
390			B12				
470		B70	B12	C12			
560		B70	B12	C12			
680		B12	C12				
820			C12				
1,000			C12				
1,200		C12					
1,500	C12						



## Ratings for HVC Series

U <sub>s</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 OE	220	20	2,800	12	110.0	6.3×5.7	PCV0EVC221MF60 □□
	470	20	3,300	12	235.0	8×6.7	PCV0EVC471MB70 □□
	560	20	3,300	12	280.0	8×6.7	PCV0EVC561MB70 □□
	680	12	4,770	12	340.0	8×12.2	PCV0EVC681MB12 □□
	1,500	10	5,500	12	750.0	10×12.2	PCV0EVC152MC12 □□
4 OG	100	22	2,600	12	80.0	6.3×5.7	PCV0GVC101MF60 □□
	150	22	2,800	12	120.0	6.3×5.7	PCV0GVC151MF60 □□
	220	21	3,220	12	176.0	8×6.7	PCV0GVC221MB70 □□
	270	21	3,220	12	216.0	8×6.7	PCV0GVC271MB70 □□
	330	21	3,400	12	264.0	8×6.7	PCV0GVC331MB70 □□
	560	12	4,770	12	448.0	8×12.2	PCV0GVC561MB12 □□
	820	10	5,500	12	656.0	10×12.2	PCV0GVC821MC12 □□
	1,200	10	5,500	12	960.0	10×12.2	PCV0GVC122MC12 □□
6.3 OJ	68	27	2,400	12	85.7	6.3×5.7	PCV0JVC680MF60 □□
	82	23	2,600	12	103.3	6.3×5.7	PCV0JVC820MF60 □□
	100	23	2,800	12	126.0	6.3×5.7	PCV0JVC101MF60 □□
	120	17	3,000	12	151.2	6.3×5.7	PCV0JVC121MF60 □□
	150	22	3,200	12	189.0	8×6.7	PCV0JVC151MB70 □□
	180	22	3,200	12	226.8	8×6.7	PCV0JVC181MB70 □□
	220	22	3,400	12	277.2	8×6.7	PCV0JVC221MB70 □□
	390	12	4,770	12	491.4	8×12.2	PCV0JVC391MB12 □□
	470	12	4,770	12	592.2	8×12.2	PCV0JVC471MB12 □□
	560	12	4,770	12	705.6	8×12.2	PCV0JVC561MB12 □□
	680	10	5,500	12	642.6	10×12.2	PCV0JVC681MC12 □□
	820	10	5,500	12	774.9	10×12.2	PCV0JVC821MC12 □□
	1,000	10	5,500	12	945.0	10×12.2	PCV0JVC102MC12 □□
10 1A	47	31	2,250	12	94.0	6.3×5.7	PCV1AVC470MF60 □□
	56	28	2,300	12	112.0	6.3×5.7	PCV1AVC560MF60 □□
	68	25	2,500	12	136.0	6.3×5.7	PCV1AVC680MF60 □□
	120	23	3,000	12	240.0	8×6.7	PCV1AVC121MB70 □□
	150	23	3,000	12	300.0	8×6.7	PCV1AVC151MB70 □□
	270	13	4,500	12	540.0	8×12.2	PCV1AVC271MB12 □□
	330	14	4,420	12	660.0	8×12.2	PCV1AVC331MB12 □□
	470	12	5,300	12	705.0	10×12.2	PCV1AVC471MC12 □□
16 1C	560	12	5,300	12	840.0	10×12.2	PCV1AVC561MC12 □□
	33	31	2,400	12	105.6	6.3×5.7	PCV1CVC330MF60 □□
	39	24	2,500	12	124.8	6.3×5.7	PCV1CVC390MF60 □□
	47	24	2,500	12	150.4	6.3×5.7	PCV1CVC470MF60 □□
	56	30	2,900	12	179.2	8×6.7	PCV1CVC560MB70 □□
	82	28	3,200	12	262.4	8×6.7	PCV1CVC820MB70 □□
	100	25	3,000	12	320.0	8×12.2	PCV1CVC101MB12 □□
	180	16	4,400	12	576.0	8×12.2	PCV1CVC181MB12 □□
	220	16	4,400	12	704.0	8×12.2	PCV1CVC221MB12 □□
	150	20	4,320	12	480.0	10×12.2	PCV1CVC151MC12 □□
20 1D	220	14	5,050	12	528.0	10×12.2	PCV1CVC221MC12 □□
	330	14	5,050	12	792.0	10×12.2	PCV1CVC331MC12 □□
	22	35	2,040	12	88.0	6.3×5.7	PCV1DVC220MF60 □□
	27	35	2,040	12	108.0	6.3×5.7	PCV1DVC270MF60 □□
	33	45	2,000	12	132.0	8×6.7	PCV1DVC330MB70 □□
	39	45	2,000	12	156.0	8×6.7	PCV1DVC390MB70 □□
	47	33	2,630	12	188.0	8×6.7	PCV1DVC470MB70 □□
	100	22	3,320	12	400.0	8×12.2	PCV1DVC101MB12 □□
25 1E	150	20	4,320	12	600.0	10×12.2	PCV1DVC151MC12 □□
	10	65	1,500	12	50.0	6.3×5.7	PCV1EVC100MF60 □□
	10	60	1,600	12	50.0	8×6.7	PCV1EVC100MB70 □□
	22	50	1,800	12	110.0	8×6.7	PCV1EVC220MB70 □□
	33	30	3,000	12	412.5	8×12.2	PCV1EVC330MB12 □□
	47	30	3,000	12	587.5	8×12.2	PCV1EVC470MB12 □□
	56	28	3,800	12	700.0	10×12.2	PCV1EVC560MC12 □□

POLYMER

Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Chip Type, Low ESR, Large Capacitance 105°C, 2000 hours
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



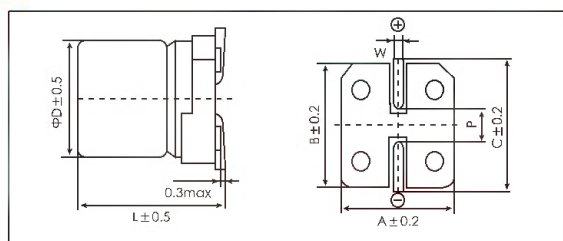
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 16Vdc			
Capacitance Range	56 to 2,700μF			
Capacitance Tolerance	±20% (M)			(at 20°C, 120Hz)
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			(at 20°C, 120Hz)
Leakage Current <sup>※1</sup>	Please see the attached ratings list			Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list			(at 20°C, 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			
Endurance	105°C, 2,000h Rated voltage applied	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Reflow method (260°C × 5s)	ΔC/C	≤±10% of the initial value	
		DF (tanδ)	≤130% of the initial specified value	
		ESR	≤130% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

## Size list



(unit:mm)

Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
F80	6.3	7.7	6.6	6.6	7.3	0.5~0.8	2.0
F10	6.3	10	6.6	6.6	7.3	0.7~1.1	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B80	8	7.7	8.3	8.3	9.0	0.7~1.1	3.1
B10	8	9.7	8.3	8.3	9.0	0.7~1.1	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1
C80	10	7.7	10.3	10.3	11.0	0.7~1.1	4.6
C10	10	9.7	10.3	10.3	11.0	0.7~1.1	4.6
C12	10	12.2	10.3	10.3	11.0	0.7~1.1	4.6

R.V[S.V] Cap.(μF)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]
56					F60
68					F60
82					F80
100					F60,F80,B70
120				F60	B70
150				F60,F80	B70,B80
180				F60	B70,B10
220			F60	F60,B70	B10,C80
270		F60	F60,F80	B70	B12
330	F60	F60	F60,F80,F10,B70	B70,B80	B12,C10
390	F60	F60,F80	B70	B10	
470	F60,F80	B70	B70,B80	C80	C12
560	F60,F80,B70	B70,B12	B70		
680	B70	B80	B70,B10	C10	
820	B80,B12		B10,B12,C80		C12
1,000	B80	B10,C80	B12		C12
1,200	C80	B12,C10	C10		
1,500	B10,B12	B12,C10	C10,C12		
1,800		C10,C12			
2,200	C10				
2,700	C12				



## Ratings for HVM Series

U <sub>s</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 OE	330	14	3,160	12	165.0	6.3×5.7	PCV0EVM331MF60□□
	390	14	3,160	12	195.0	6.3×5.7	PCV0EVM391MF60□□
	470	13	3,600	12	235.0	6.3×5.7	PCV0EVM471MF60□□
	560	13	3,600	12	280.0	6.3×5.7	PCV0EVM561MF60□□
	470	13	3,600	12	235.0	6.3×7.7	PCV0EVM471MF80□□
	560	13	3,600	12	280.0	6.3×7.7	PCV0EVM561MF80□□
	560	13	4,100	12	280.0	8×6.7	PCV0EVM561MB70□□
	680	13	4,100	12	340.0	8×6.7	PCV0EVM681MB70□□
	820	12	4,260	12	410.0	8×7.7	PCV0EVM821MB80□□
	1,000	12	4,260	12	500.0	8×7.7	PCV0EVM102MB80□□
	1,500	10	5,220	12	750.0	8×10	PCV0EVM152MB10□□
	820	9	5,400	12	410.0	8×12.2	PCV0EVM821MB12□□
	1,200	13	4,450	12	600.0	10×7.7	PCV0EVM122MC80□□
	1,500	10	5,220	12	750.0	8×10	PCV0EVM152MB10□□
	1,500	10	5,400	12	750.0	8×12.2	PCV0EVM152MB12□□
	1,200	13	4,450	12	600.0	10×7.7	PCV0EVM122MC80□□
	2,200	10	5,500	12	1,100.0	10×10	PCV0EVM222MC10□□
	2,700	9	5,600	12	1,350.0	10×12.2	PCV0EVM272MC12□□
4 OG	270	15	3,160	12	216.0	6.3×5.7	PCV0GVM271MF60□□
	330	14	3,160	12	264.0	6.3×5.7	PCV0GVM331MF60□□
	390	14	3,160	12	312.0	6.3×5.7	PCV0GVM391MF60□□
	390	14	3,470	12	312.0	6.3×7.7	PCV0GVM391MF80□□
	470	14	3,950	12	376.0	8×6.7	PCV0GVM471MB70□□
	560	14	3,950	12	448.0	8×6.7	PCV0GVM561MB70□□
	680	13	3,950	12	544.0	8×7.7	PCV0GVM681MB80□□
	1,000	13	5,220	12	800.0	8×10	PCV0GVM102MB10□□
	1,000	13	4,300	12	800.0	10×7.7	PCV0GVM102MC80□□
	560	9	5,400	12	448.0	8×12.2	PCV0GVM561MB12□□
	1,200	9	5,400	12	960.0	8×12.2	PCV0GVM122MB12□□
	1,500	10	5,400	12	1,200.0	8×12.2	PCV0GVM152MB12□□
	1,000	14	4,300	12	800.0	10×7.7	PCV0GVM102MC80□□
	1,200	10	5,500	12	960.0	10×10	PCV0GVM122MC10□□
	1,500	10	5,500	12	1,200.0	10×10	PCV0GVM152MC10□□
	1,800	10	5,500	12	1,440.0	10×10	PCV0GVM182MC10□□
	1,800	9	5,600	12	1,440.0	10×12.2	PCV0GVM182MC12□□
6.3 OJ	220	15	3,160	12	277.2	6.3×5.7	PCV0JVM221MF60□□
	270	14	3,160	12	340.2	6.3×5.7	PCV0JVM271MF60□□
	330	14	3,390	12	415.8	6.3×5.7	PCV0JVM331MF60□□
	270	14	3,470	12	340.2	6.3×7.7	PCV0JVM271MF80□□
	330	14	3,470	12	415.8	6.3×7.7	PCV0JVM331MF80□□
	330	14	3,950	12	415.8	6.3×10	PCV0JVM331MF10□□
	330	14	3,950	12	415.8	8×6.7	PCV0JVM331MB70□□
	390	14	3,950	12	491.4	8×6.7	PCV0JVM391MB70□□
	470	14	3,950	12	592.2	8×6.7	PCV0JVM471MB70□□
	560	14	3,950	12	705.6	8×6.7	PCV0JVM561MB70□□
	680	14	3,950	12	856.8	8×6.7	PCV0JVM681MB70□□
	470	13	3,950	12	592.2	8×7.7	PCV0JVM471MB80□□
	680	12	4,770	12	856.8	8×10	PCV0JVM681MB10□□
	820	12	4,770	12	1,033.2	8×10	PCV0JVM821MB10□□
	820	10	5,150	12	1,033.2	8×12.2	PCV0JVM821MB12□□
	820	12	4,300	12	1,033.2	10×7.7	PCV0JVM821MC80□□
	1,000	10	5,150	12	1,260.0	8×12.2	PCV0JVM102MB12□□



## Ratings for HVM Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
6.3 0J	820	14	4,300	12	1,033.2	10×7.7	PCV0JVM821MC80□□
	1,200	10	5,025	12	1,512.0	10×10	PCV0JVM122MC10□□
	1,500	10	5,025	12	1,890.0	10×10	PCV0JVM152MC10□□
	1,500	10	5,500	12	1,890.0	10×12.2	PCV0JVM152MC12□□
10 1A	120	18	2,900	12	240.0	6.3×5.7	PCV1AVM121MF60□□
	150	18	2,900	12	300.0	6.3×5.7	PCV1AVM151MF60□□
	180	18	2,900	12	360.0	6.3×5.7	PCV1AVM181MF60□□
	220	18	2,900	12	440.0	6.3×5.7	PCV1AVM221MF60□□
	150	21	2,880	12	300.0	6.3×7.7	PCV1AVM151MF80□□
	220	21	3,220	12	440.0	8×6.7	PCV1AVM221MB70□□
	270	21	3,220	12	540.0	8×6.7	PCV1AVM271MB70□□
	330	21	3,220	12	660.0	8×6.7	PCV1AVM331MB70□□
	330	19	3,390	12	660.0	8×7.7	PCV1AVM331MB80□□
	390	17	4,000	12	780.0	8×10	PCV1AVM391MB10□□
	470	17	3,800	12	940.0	10×7.7	PCV1AVM471MC80□□
	680	13	4,820	12	1,360.0	10×10	PCV1AVM681MC10□□
16 1C	56	25	2,440	12	179.2	6.3×5.7	PCVICVM560MF60□□
	68	25	2,440	12	217.6	6.3×5.7	PCVICVM680MF60□□
	100	24	2,490	12	320.0	6.3×5.7	PCVICVM101MF60□□
	82	24	2,700	12	262.4	6.3×7.7	PCVICVM820MF80□□
	100	24	2,700	12	320.0	6.3×7.7	PCVICVM101MF80□□
	100	24	3,010	12	320.0	8×6.7	PCVICVM101MB70□□
	120	24	3,010	12	384.0	8×6.7	PCVICVM121MB70□□
	150	22	3,220	12	480.0	8×6.7	PCVICVM151MB70□□
	180	22	3,220	12	576.9	8×6.7	PCVICVM151MB70□□
	220	22	3,220	12	704.0	8×6.7	PCVICVM151MB70□□
	150	22	3,150	12	480.0	8×7.7	PCVICVM151MB80□□
	180	22	3,890	12	576.0	8×10	PCVICVM181MB10□□
	220	22	3,220	12	704.0	8×6.7	PCVICVM151MB70□□
	220	18	3,890	12	704.0	8×10	PCVICVM221MB10□□
	270	16	4,070	12	864.0	8×12.2	PCVICVM271MB12□□
	330	16	4,070	12	1,056.0	8×12.2	PCVICVM331MB12□□
	220	22	3,450	12	704.0	10×7.7	PCVICVM221MC80□□
	330	16	4,350	12	1,056.0	10×10	PCVICVM331MC10□□
	470	14	5,050	12	1,504.0	10×12.2	PCVICVM471MC12□□
	820	14	5,050	12	2,624.0	10×12.2	PCVICVM821MC12□□
	1,000	14	5,050	12	3,200.0	10×12.2	PCVICVM102MC12□□

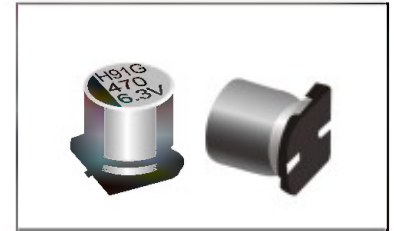
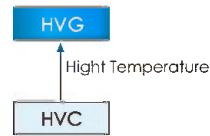
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Chip Type, Higher Temperature 125°C, 1000 hours
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



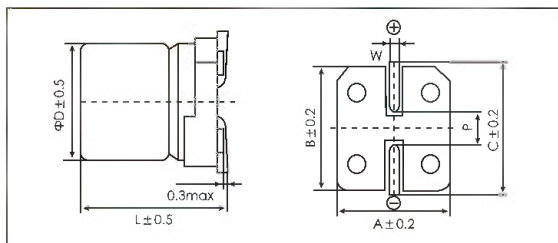
Items	Characteristics		
Category Temperature Range	-55 to +125 °C		
Rated Voltage Range	2.5 to 20Vdc		
Capacitance Range	22 to 560μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current*	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		(at 100kHz)
Endurance	125°C, 1,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤200% of the initial specified value
		ESR	≤200% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Reflow method (260±5°C × 10s)	ΔC/C	≤±10% of the initial value
		DF (tanδ)	≤130% of the initial specified value
		ESR	≤130% of the initial specified value
		LC	≤The initial specified value(after voltage processing)

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

## Size list



(unit:mm)

Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1

R.V[S.V] [V]	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]
Cap.(μF)						
22						F60
39					F60	
47						B70
56				F60		
82			F60		B70	
100			F60			
120				B70		
150		F60	B70	B70		
180						
220	F60	B70	B70			
330				B70		
470						
560	B70					



## Ratings for HVG Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Allowable Ripple Current 100kHz, T ≤ 105°C *1	Rated Ripple Current 100kHz, 105°C < T ≤ 125°C	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 0E	220	35	2,500	770	12	110.0	6.3 × 5.7	PCV0EVG221MF60□□
	560	30	3,100	960	12	280.0	8 × 6.7	PCV0EVG561MB70□□
4 0G	150	35	2,450	770	12	120.0	6.3 × 5.7	PCV0GVG151MF60□□
	220	30	3,020	960	12	176.0	8 × 6.7	PCV0GVG221MB70□□
6.3 0J	82	40	2,400	720	12	103.0	6.3 × 5.7	PCV0JVG820MF60□□
	100	40	2,400	720	12	126.0	6.3 × 5.7	PCV0JVG101MF60□□
	150	30	3,020	960	12	189.0	8 × 6.7	PCV0JVG151MB70□□
	220	30	3,020	960	12	277.0	8 × 6.7	PCV0JVG221MB70□□
10 1A	56	45	2,250	680	12	112.0	6.3 × 5.7	PCV1AVG560MF60□□
	120	35	2,800	880	12	240.0	8 × 6.7	PCV1AVG121MB70□□
	150	35	2,800	880	12	300.0	8 × 6.7	PCV1AVG151MB70□□
	330	35	2,800	880	12	660.0	8 × 6.7	PCV1AVG331MB70□□
16 1C	39	50	2,050	650	12	125.0	6.3 × 5.7	PCV1CVG390MF60□□
	82	40	2,700	830	12	262.0	8 × 6.7	PCV1CVG820MB70□□
20 1D	22	60	1,650	590	12	88.0	6.3 × 5.7	PCV1DVG220MF60□□
	47	45	2,000	780	12	188.0	8 × 6.7	PCV1DVG470MB70□□

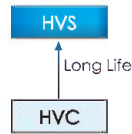
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Chip Type, Long Life 105°C, 5000 hours
- Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



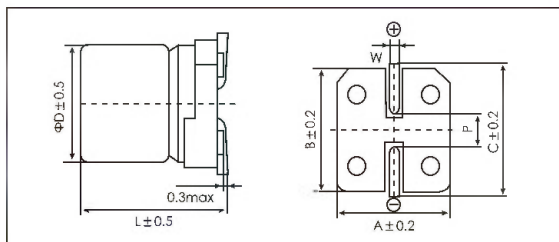
Items	Characteristics		
Category Temperature Range	-55 to +105 °C		
Rated Voltage Range	4 to 25Vdc		
Capacitance Range	10 to 560μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current <sup>※1</sup>	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		(at 100kHz)
Endurance	105°C, 5,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Reflow method (260°C× 5s)	ΔC/C	≤±10% of the initial value
		DF (tanδ)	≤130% of the initial specified value
		ESR	≤130% of the initial specified value
		LC	≤The initial specified value(after voltage processing)

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

## Size list



(unit:mm)

Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1

R.V[S.V] [V]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]
Cap.(μF)						
10						F60
22					F60	
39				F60		
47					B70	
68			F60	F60		
82				B70		
100						
120		F60	F60	B70		
150	F60		B70			
180						
220		F60.B70				
270	B70			B12		
330						
390		B70				
470						
560	B70					



## Ratings for HVS Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor(Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
4 0G	150	22	2,570	12	120.0	6.3×5.7	PCV0GSV151MF60□□
	270	22	3,220	12	216.0	8×6.7	PCV0GSV271MB70□□
	560	22	3,220	12	448.0	8×6.7	PCV0GSV561MB70□□
6.3 0J	120	22	2,570	12	151.2	6.3×5.7	PCV0JSV121MF60 □□
	220	22	2,570	12	277.2	6.3×5.7	PCV0JSV221MF60 □□
	220	22	3,220	12	277.2	8×6.7	PCV0JSV221MB70 □□
	390	22	3,220	12	491.4	8×6.7	PCV0JSV391MB70 □□
10 1A	68	30	2,200	12	136.0	6.3×5.7	PCV1ASV680MF60□□
	120	27	2,320	12	240.0	6.3×5.7	PCV1ASV121MF60□□
	150	30	2,760	12	300.0	8×6.7	PCV1ASV151MB70□□
16 1C	39	37	2,050	12	124.8	6.3×5.7	PCV1CSV390MF60□□
	68	30	2,200	12	217.6	6.3×5.7	PCV1CSV680MF60□□
	82	30	2,760	12	262.4	8×6.7	PCV1CSV820MB70□□
	120	27	2,900	12	384.0	8×6.7	PCV1CSV121MB70□□
	270	14	4,350	12	864.0	8×12.2	PCV1CSV271MB12□□
20 1D	22	60	1,450	10	88.0	6.3×5.7	PCV1DSV220MF60□□
	47	45	1,890	12	188.0	8×6.7	PCV1DSV470MB70□□
25 1E	10	60	1,500	10	125.0	8×6.7	PCV1ESV100MB70 □□

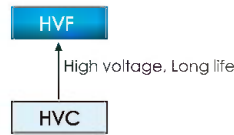
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- High Voltage, Long Life, Low ESR, Large Capacitance 105°C, 3000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, LED power etc.
- RoHS Compliant



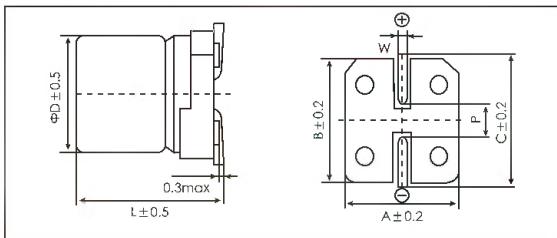
Items	Characteristics		
Category Temperature Range	-55 to +105 °C		
Rated Voltage Range	16 to 200Vdc		
Capacitance Range	4.7 to 1,200μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current*1	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		(at 100kHz)
Endurance	105°C, 3,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Reflow method (260 °C× 5s)	ΔC/C	≤±10% of the initial value
		DF (tanδ)	≤130% of the initial specified value
		ESR	≤130% of the initial specified value
		LC	≤The initial specified value(after voltage processing)

\*1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1
C12	10	12.2	10.3	10.3	11.0	0.7~1.1	4.6

## Size List

R.V[S.V] [V]	16	20	25	28	32	35	40	50	63	80	100	125	160	200
Cap.(μF)	[18]	[23]	[29]	[32]	[37]	[40]	[46]	[58]	[72]	[92]	[115]	[144]	[184]	[230]
4.7														B12
8.2														C12
10									F60			B12	B12	C12
12									F60			B12	C12	C12
15											B12	B12	C12	
18												C12		
22								F60	B70		C12	C12		
27									B70					
33							F60	B70		B12				
39							F60	B70		B12				
47						F60			B12	C12				
56						F60			B12,C12	C12				
68					F60				C12					
82				F60			B70	B12	C12					
100			F60			B70		B12,C12	C12					
120		F60	F60		B70			C12						
150	F60	B70		B70			B12	C12						
180	F60		B70			B12								
220		B70	B70		B12	B12	C12							
270	B70	B70		B12	B12		C12							
330	B70		B12	B12		C12	C12							
390		B12	B12		C12	C12								
470	B12	B12	B12,C12	C12	C12									
560	B12	B12,C12	C12	C12										
680	B12	C12	C12											
820		C12												
1,000	C12													
1,200	C12													



## Ratings for HVF Series

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
16 1C	150	25	2,800	12	480	6.3×5.7	PCV1CVF151MF60□□
	180	25	2,800	12	576	6.3×5.7	PCV1CVF181MF60□□
	270	22	3,300	12	864	8×6.7	PCV1CVF271MB70□□
	330	22	3,300	12	1,056	8×6.7	PCV1CVF331MB70□□
	470	14	4,950	12	1,504	8×12.2	PCV1CVF471MB12□□
	560	14	4,950	12	1,792	8×12.2	PCV1CVF561MB12□□
	680	14	4,950	12	2,176	8×12.2	PCV1CVF681MB12□□
	1000	12	5,400	12	3,200	10×12.2	PCV1CVF102MC12□□
	1200	12	5,400	12	3,840	10×12.2	PCV1CVF122MC12□□
20 1D	120	28	2,650	12	480	6.3×5.7	PCV1DVF121MF60□□
	150	28	2,650	12	600	6.3×5.7	PCV1DVF151MF60□□
	220	24	3,200	12	880	8×6.7	PCV1DVF221MB70□□
	270	24	3,200	12	1,080	8×6.7	PCV1DVF271MB70□□
	390	14	4,950	12	1,560	8×12.2	PCV1DVF391MB12□□
	470	14	4,950	12	1,880	8×12.2	PCV1DVF471MB12□□
	560	14	4,950	12	2,240	8×12.2	PCV1DVF561MB12□□
	560	12	5,400	12	2,240	10×12.2	PCV1DVF561MC12□□
	680	12	5,400	12	2,720	10×12.2	PCV1DVF681MC12□□
25 1E	820	12	5,400	12	3,280	10×12.2	PCV1DVF821MC12□□
	100	30	2,550	12	500	6.3×5.7	PCV1EVF101MF60□□
	120	30	2,550	12	600	6.3×5.7	PCV1EVF121MF60□□
	180	24	3,200	12	900	8×6.7	PCV1EVF181MB70□□
	220	24	3,200	12	1,100	8×6.7	PCV1EVF221MB70□□
	330	16	4,650	12	1,650	8×12.2	PCV1EVF331MB12□□
	390	16	4,650	12	1,950	8×12.2	PCV1EVF391MB12□□
	470	16	4,650	12	2,350	8×12.2	PCV1EVF471MB12□□
	470	14	5,000	12	2,350	10×12.2	PCV1EVF471MC12□□
28 1L	560	14	5,000	12	2,800	10×12.2	PCV1EVF561MC12□□
	680	14	5,000	12	3,400	10×12.2	PCV1EVF681MC12□□
	82	33	2,450	12	459	6.3×5.7	PCV1LVF820MF60□□
	150	28	2,950	12	840	8×6.7	PCV1LVF151MB70□□
	270	18	4,350	12	1,512	8×12.2	PCV1LVF271MB12□□
	330	18	4,350	12	1,848	8×12.2	PCV1LVF331MB12□□
	470	16	4,650	12	2,632	10×12.2	PCV1LVF471MC12□□
	560	16	4,650	12	3,136	10×12.2	PCV1LVF561MC12□□
	68	35	2,350	12	435	6.3×5.7	PCV1FVF680MF60□□
32 1F	120	30	2,800	12	768	8×6.7	PCV1FVF121MB70□□
	220	20	4,000	12	1,408	8×12.2	PCV1FVF221MB12□□
	270	20	4,000	12	1,728	8×12.2	PCV1FVF271MB12□□
	390	18	4,400	12	2,496	10×12.2	PCV1FVF391MC12□□
	470	18	4,400	12	3,008	10×12.2	PCV1FVF471MC12□□
35 1V	47	35	2,350	12	329	6.3×5.7	PCV1VVF470MF60□□
	56	35	2,350	12	392	6.3×5.7	PCV1VVF560MF60□□
	100	30	2,800	12	700	8×6.7	PCV1VVF101MB70□□
	180	20	4,000	12	1,260	8×12.2	PCV1VVF181MB12□□
	220	20	4,000	12	1,540	8×12.2	PCV1VVF221MB12□□
	330	18	4,400	12	2,310	10×12.2	PCV1VVF331MC12□□
	390	18	4,400	12	2,730	10×12.2	PCV1VVF391MC12□□

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
40 1G	33	40	2,200	12	264	6.3×5.7	PCV1GVF330MF60□□
	39	37	2,300	12	312	6.3×5.7	PCV1GVF390MF60□□
	82	32	2,700	12	656	8×6.7	PCV1GVF820MB70□□
	150	21	3,900	12	1,200	8×12.2	PCV1GVF151MB12□□
	220	18	4,400	12	1,760	10×12.2	PCV1GVF221MC12□□
	270	18	4,400	12	2,160	10×12.2	PCV1GVF271MC12□□
	330	18	4,400	12	2,640	10×12.2	PCV1GVF331MC12□□
50 1H	22	40	2,200	12	220	6.3×5.7	PCV1HVF220MF60□□
	33	35	2,600	12	330	8×6.7	PCV1HVF330MB70□□
	39	35	2,600	12	390	8×6.7	PCV1HVF390MB70□□
	82	25	3,800	12	820	8×12.2	PCV1HVF820MB12□□
	100	25	3,800	12	1,000	8×12.2	PCV1HVF101MB12□□
	100	20	4,300	12	1,000	10×12.2	PCV1HVF101MC12□□
	120	20	4,300	12	1,200	10×12.2	PCV1HVF121MC12□□
63 1J	150	20	4,300	12	1,500	10×12.2	PCV1HVF151MC12□□
	10	50	1,950	12	126	6.3×5.7	PCV1JVF100MF60□□
	12	50	1,950	12	151	6.3×5.7	PCV1JVF120MF60□□
	22	45	2,350	12	277	8×6.7	PCV1JVF220MB70□□
	27	45	2,350	12	340	8×6.7	PCV1JVF270MB70□□
	47	26	3,600	12	592	8×12.2	PCV1JVF470MB12□□
	56	26	3,600	12	706	8×12.2	PCV1JVF560MB12□□
	56	22	4,100	12	706	10×12.2	PCV1JVF560MC12□□
	68	22	4,100	12	857	10×12.2	PCV1JVF680MC12□□
80 1K	82	22	4,100	12	1,033	10×12.2	PCV1JVF820MC12□□
	100	22	4,100	12	1,260	10×12.2	PCV1JVF101MC12□□
	33	32	3,200	12	528	8×12.2	PCV1KVF330MB12□□
	39	32	3,200	12	624	8×12.2	PCV1KVF390MB12□□
	47	28	3,600	12	752	10×12.2	PCV1KVF470MC12□□
100 2A	56	28	3,600	12	896	10×12.2	PCV1KVF560MC12□□
	12	36	3,000	12	240	8×12.2	PCV2AVF120MB12□□
	15	36	3,000	12	300	8×12.2	PCV2AVF150MB12□□
	22	32	3,300	12	440	10×12.2	PCV2AVF220MC12□□
125 2B	27	32	3,300	12	540	10×12.2	PCV2AVF270MC12□□
	10	45	2,700	12	250	8×12.2	PCV2BVF100MB12□□
	12	45	2,700	12	300	8×12.2	PCV2BVF120MB12□□
	18	40	3,000	12	450	10×12.2	PCV2BVF180MC12□□
160 2C	22	40	3,000	12	550	10×12.2	PCV2BVF220MC12□□
	8.2	70	2,100	12	262	8×12.2	PCV2CVF8R2MB12□□
	10	60	2,400	12	320	10×12.2	PCV2CVF100MC12□□
	12	60	2,400	12	384	10×12.2	PCV2CVF120MC12□□
200 2D	4.7	120	1,600	12	188	8×12.2	PCV2DVF4R7MB12□□
	8.2	100	1,850	12	328	10×12.2	PCV2DVF8R2MC12□□
	10	100	1,850	12	400	10×12.2	PCV2DVF100MC12□□

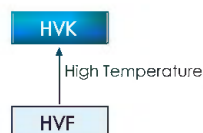
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- High Voltage, Long Life, Low ESR, Large Capacitance 125°C, 2000 hours.
- Ultra Low ESR, high ripple current capability
- Applications: DC/DC Converter, Switching Power Supply, LED power etc.
- RoHS Compliant



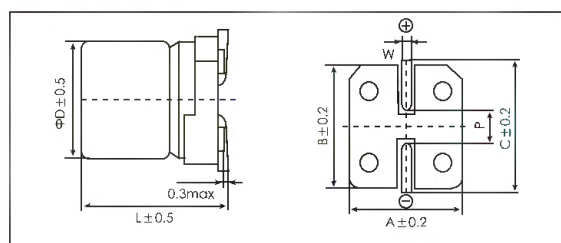
Items	Characteristics		
Category Temperature Range	-55 to +125 °C		
Rated Voltage Range	16 to 80Vdc		
Capacitance Range	18 to 1,000μF		
Capacitance Tolerance	±20% (M)		(at 20°C , 120Hz)
Surge Voltage	Rated Voltage(V)×1.15		
Dissipation Factor (tanδ)	Please see the attached ratings list		(at 20°C , 120Hz)
Leakage Current <sup>※1</sup>	Please see the attached ratings list		Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list		(at 20°C , 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+125^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$		(at 100kHz)
Endurance	125°C, 2,000h Rated voltage applied	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤200% of the initial specified value
		ESR	≤200% of the initial specified value
		LC	≤The initial specified value
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value
		DF (tanδ)	≤150% of the initial specified value
		ESR	≤150% of the initial specified value
		LC	≤The initial specified value(after voltage processing)
Resistance to soldering heat	Reflow method (260 °C× 5s)	ΔC/C	≤±10% of the initial value
		DF (tanδ)	≤130% of the initial specified value
		ESR	≤130% of the initial specified value
		LC	≤The initial specified value(after voltage processing)

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

(unit:mm)



Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F60	6.3	5.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1
C12	10	12.2	10.3	10.3	11.0	0.7~1.1	4.6

## Size List

R.V[S.V] (V)	16 [18]	20 [23]	25 [29]	35 [40]	40 [46]	50 [58]	63 [72]	80 [92]
Cap.(μF)								
18						F60		
22						F60	B70	
27							B70	
33					F60	B70		B12
39					F60	B70		B12
47			F60	F60			B12	C12
56				F60			B12	C12
68					B70			
82			F60	B70	B70	B12	C12	
100			F60	B70		B12,C12	C12	
120		F60				C12		
150			B70		B12	C12		
180		B70	B70	B12				
220		B70		B12	C12			
270				C12	C12			
330			B12	C12				
390		B12	B12					
470	B12		C12					
560	B12		C12					
680		C12						
1,000	C12							



## Ratings for HVK Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Dissipation Factor(Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
16 1C	470	17	2,500	12	1,504	8×12.2	PCV1CVK471MB12□□
	560	17	2,500	12	1,792	8×12.2	PCV1CVK561MB12□□
	1000	15	2,700	12	3,200	10×12.2	PCV1CVK102MC12□□
20 1D	120	34	1,300	12	480	6.3×5.7	PCV1DVK121MF60□□
	180	29	1,600	12	720	8×6.7	PCV1DVK181MB70□□
	220	29	1,600	12	880	8×6.7	PCV1DVK221MB70□□
	390	17	2,400	12	1,560	8×12.2	PCV1DVK391MB12□□
	680	15	2,600	12	2,720	10×12.2	PCV1DVK681MC12□□
25 1E	47	42	1,175	12	235	6.3×5.7	PCV1EVK470MF60□□
	82	36	1,255	12	410	6.3×5.7	PCV1EVK820MF60□□
	100	36	1,255	12	500	6.3×5.7	PCV1EVK101MF60□□
	150	29	1,600	12	750	8×6.7	PCV1EVK151MB70□□
	180	29	1,600	12	900	8×6.7	PCV1EVK181MB70□□
	330	19	2,325	12	1,650	8×12.2	PCV1EVK331MB12□□
	390	19	2,325	12	1,950	8×12.2	PCV1EVK391MB12□□
	470	17	2,500	12	2,350	10×12.2	PCV1EVK471MC12□□
35 1V	560	17	2,500	12	2,800	10×12.2	PCV1EVK561MC12□□
	47	42	1,175	12	329	6.3×5.7	PCV1VVK560MF60□□
	56	42	1,175	12	392	6.3×5.7	PCV1VVK680MF60□□
	82	36	1,400	12	574	8×6.7	PCV1VVK820MB70□□
	100	36	1,400	12	700	8×6.7	PCV1VVK101MB70□□
	180	24	2,000	12	1,260	8×12.2	PCV1VVK181MB12□□
	220	24	2,000	12	1,540	8×12.2	PCV1VVK221MB12□□
	270	22	2,200	12	1,890	10×12.2	PCV1VVK271MC12□□
40 1G	330	22	2,200	12	2,310	10×12.2	PCV1VVK331MC12□□
	33	45	1,150	12	264	6.3×5.7	PCV1GVK330MF60□□
	39	45	1,150	12	312	6.3×5.7	PCV1GVK390MF60□□
	68	38	1,350	12	544	8×6.7	PCV1GVK680MB70□□
	82	38	1,350	12	656	8×6.7	PCV1GVK820MB70□□
	150	25	1,950	12	1,200	8×12.2	PCV1GVK151MB12□□
	220	22	2,200	12	1,760	10×12.2	PCV1GVK221MC12□□
	270	22	2,200	12	2,160	10×12.2	PCV1GVK271MC12□□
50 1H	18	48	1,100	12	180	6.3×5.7	PCV1HVK180MF60□□
	22	48	1,100	12	220	6.3×5.7	PCV1HVK220MF60□□
	33	42	1,300	12	330	8×6.7	PCV1HVK330MB70□□
	39	42	1,300	12	390	8×6.7	PCV1HVK390MB70□□
	82	20	1,900	12	820	8×12.2	PCV1HVK820MB12□□
	100	30	1,900	12	1,000	8×12.2	PCV1HVK101MB12□□
	100	24	2,150	12	1,000	10×12.2	PCV1HVK101MC12□□
	120	24	2,150	12	1,200	10×12.2	PCV1HVK121MC12□□
63 1J	150	24	2,150	12	1,500	10×12.2	PCV1HVK151MC12□□
	22	54	1,175	12	277	8×6.7	PCV1JVK220MB70□□
	27	54	1,175	12	340	8×6.7	PCV1JVK270MB70□□
	47	31	1,800	12	592	8×12.2	PCV1JVK470MB12□□
	56	31	1,800	12	706	8×12.2	PCV1JVK560MB12□□
	82	27	2,000	12	1,033	10×12.2	PCV1JVK820MC12□□
80 1K	100	27	2,000	12	1,260	10×12.2	PCV1JVK101MC12□□
	33	38	1,600	12	528	8×12.2	PCV1KVK330MB12□□
	39	38	1,600	12	624	8×12.2	PCV1KVK390MB12□□
	47	34	1,800	12	752	10×12.2	PCV1KVK470MC12□□
	56	34	1,800	12	896	10×12.2	PCV1KVK560MC12□□

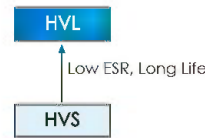
Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



- Chip Type, Low ESR, Long Life 105°C, 20,000 hours
- Applications: DC/DC Converter, Switching Power Supply, Back up Power Supplies for CPU etc.
- RoHS Compliant



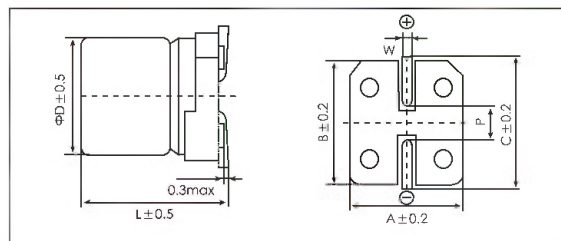
Items	Characteristics			
Category Temperature Range	-55 to +105 °C			
Rated Voltage Range	2.5 to 50Vdc			
Capacitance Range	33 to 2,700μF			
Capacitance Tolerance	±20% (M)			(at 20°C, 120Hz)
Surge Voltage	Rated Voltage(V)×1.15			
Dissipation Factor (tanδ)	Please see the attached ratings list			(at 20°C, 120Hz)
Leakage Current <sup>※1</sup>	Please see the attached ratings list			Rated voltage applied, after 2 minutes.
Equivalent Series Resistance (ESR)	Please see the attached ratings list			(at 20°C, 100kHz)
Temperature Characteristics (Max. Impedance Ratio)	$Z(+105^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ $Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$			
Endurance	105°C, 20,000h Rated voltage applied	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value	
Damp heat(Steady state)	60°C, 90 to 95%RH 1,000h No-applied voltage	ΔC/C	≤±20% of the initial value	
		DF (tanδ)	≤150% of the initial specified value	
		ESR	≤150% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	
Resistance to soldering heat	Reflow method (260°C× 5s)	ΔC/C	≤±10% of the initial value	
		DF (tanδ)	≤130% of the initial specified value	
		ESR	≤130% of the initial specified value	
		LC	≤The initial specified value(after voltage processing)	

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm

## Size list



(unit:mm)

Size Code	ΦD±0.5	L	A±0.2	B±0.2	C±0.2	W	P±0.2
F80	6.3	7.7	6.6	6.6	7.3	0.5~0.8	2.0
B70	8	6.7	8.3	8.3	9.0	0.5~0.8	3.1
B80	8	7.7	8.3	8.3	9.0	0.7~1.1	3.1
B10	8	10	8.3	8.3	9.0	0.7~1.1	3.1
B12	8	12.2	8.3	8.3	9.0	0.7~1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7~1.1	4.6
C12	10	12.2	10.3	10.3	11.0	0.7~1.1	4.6

R.V[S.V] Cap.(μF)	2.5 [2.9]	4 [4.6]	6.3 [7.2]	10 [12]	16 [18]	20 [23]	25 [29]	35 [40]	50 [58]
33							B10		
39						B70			B12
56									
68									C10
82					B70			B12	
100					B70	B12			C12
120			F80	F80	B70				C12
150				B70					
180						C12			
220			F80		B10		B12C10		
270					B10				
330			F80				C12		
390			B70		B12				
470				B10	C10		C12		
560		B70	B80	B12		C12			
680			B10	B12	C12				
820				C10					
1,000			B12		C12				
1,200		B10		C12					
1,500	B12	B12							
1,800			C12						
2,700	C12	C12							



## Ratings for HVL Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Dissipation Factor (Tanδ) (max) 20°C, 120Hz	Leakage Current (max) 20°C, 2min	Size ΦD x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(%)	(μA)	(mm)	-
2.5 0E	1,500	10	5,150	12	750	8×12.2	PCV0EVL152MB12□□
	2,700	12	5,070	12	1,350	10×12.2	PCV0EVL272MC12□□
4 0G	560	22	3,220	12	448	8×6.7	PCV0GVL561MB70□□
	1,200	15	5,400	12	960	8×10	PCV0GVL122MB10□□
	1,500	14	5,500	12	1,200	8×12.2	PCV0GVL152MB12□□
	2,700	11	5,600	12	2,160	10×12.2	PCV0GVL272MC12□□
6.3 0J	120	22	2,570	12	300	6.3×7.7	PCV0JVL121MF80□□
	220	22	2,570	12	300	6.3×7.7	PCV0JVL221MF80□□
	330	15	3,390	12	415	6.3×7.7	PCV0JVL331MF80□□
	390	22	3,220	12	491	8×6.7	PCV0JVL391MB70□□
	560	32	3,220	12	500	8×7.7	PCV0JVL561MB80□□
	680	12	4,600	12	856	8×10	PCV0JVL681MB10□□
	1,000	11	4,800	12	1,260	8×12.2	PCV0JVL102MB12□□
	1,800	10	5,500	12	2,268	10×12.2	PCV0JVL182MC12□□
	120	30	2,700	12	300	6.3×7.7	PCV1AVL121MF80□□
10 1A	150	25	2,800	12	300	8×6.7	PCV1AVL151MB70□□
	470	17	3,800	12	940	8×10	PCV1AVL471MB10□□
	560	17	3,860	12	1,120	8×12.2	PCV1AVL561MB12□□
	680	16	3,900	12	1,360	8×12.2	PCV1AVL681MB12□□
	820	15	4,300	12	1,640	10×10	PCV1AVL821MC10□□
	1,200	13	4,800	12	2,400	10×12.2	PCV1AVL122MC12□□
16 1C	82	35	2,490	12	500	8×6.7	PCV1CVL820MB70□□
	100	24	2,490	12	320	8×6.7	PCV1CVL101MB70□□
	120	37	2,900	12	384	8×6.7	PCV1CVL121MB70□□
	220	28	2,900	12	704	8×10	PCV1CVL221MB10□□
	270	20	3,600	12	864	8×10	PCV1CVL271MB10□□
	390	18	3,900	12	1,248	8×12.2	PCV1CVL391MB12□□
	470	16	4,200	12	1,504	10×10	PCV1CVL471MC10□□
	680	14	4,700	12	2,176	10×12.2	PCV1CVL681MC12□□
	1,000	12	5,400	12	3,200	10×12.2	PCV1CVL102MC12□□
20 1D	39	45	2,000	12	300	8×6.7	PCV1DVL390MB70□□
	100	22	3,200	12	400	8×12.2	PCV1DVL101MB12□□
	180	20	4,300	12	720	10×12.2	PCV1DVL181MC12□□
	560	12	5,200	12	2,240	10×12.2	PCV1DVL561MC12□□
25 1E	33	50	2,000	12	300	8×10	PCV1EVL330MB10□□
	220	32	3,200	12	1,100	8×12.2	PCV1EVL221MB12□□
	220	20	4,100	12	1,100	10×10	PCV1EVL221MC10□□
	330	45	2,200	12	2,350	10×12.2	PCV1EVL471MC12□□
	470	14	4,800	12	1,650	10×12.2	PCV1EVL331MC12□□
35 1V	82	20	3,350	12	574	8×12.2	PCV1VVL820MB12□□
	120	18	4,200	12	840	10×12.2	PCV1VVL121MC12□□
50 1H	39	25	3,000	12	390	8×12.2	PCV1HVL390MB12□□
	68	24	4,350	12	1,000	10×10	PCV1HVL101MC10□□
	100	20	4,000	12	680	10×12.2	PCV1HVL680MC12□□

Customer products are available on request.

## Frequency coefficient for ripple current

Frequency	120Hz ≤ f < 1kHz	1kHz ≤ f < 10kHz	10kHz ≤ f < 100kHz	100kHz ≤ f < 500kHz
Coefficient	0.05	0.3	0.7	1



## Solid conductive polymer multi-layers aluminum electrolytic capacitor

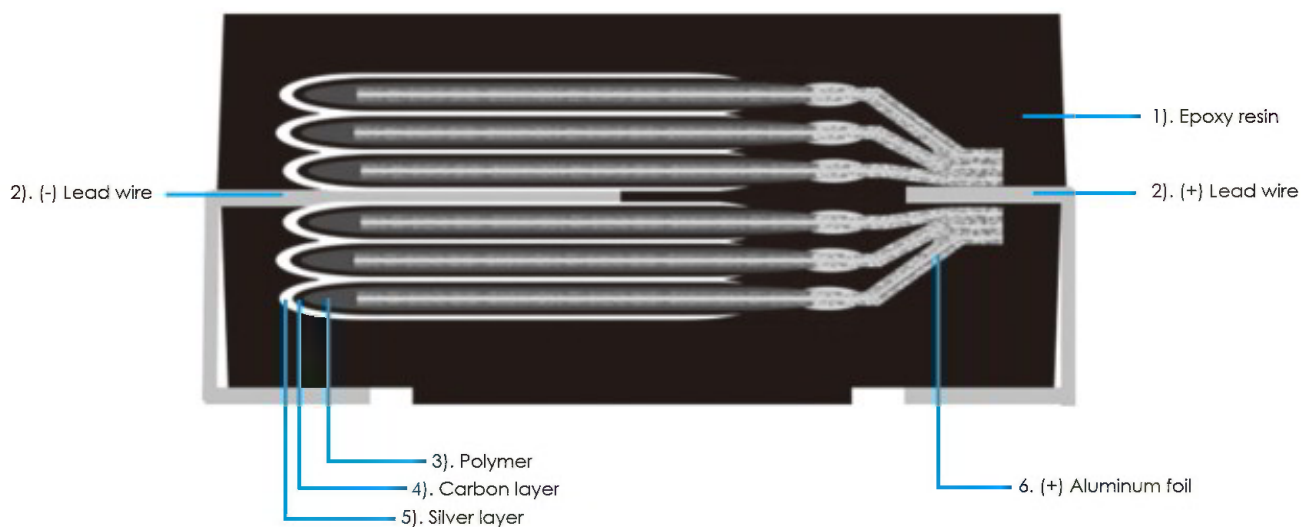
Series	Feature	Rated Voltage Range(V)	Nominal Capacitance Range( $\mu$ F)	Operating Temperature Range( $^{\circ}$ C)	Load Life Time	Page
HPA	Flat, low ESR, low ESL	2~25	6.8~560	-55~105	105 $^{\circ}$ C, 2000H	6
HPS	Low profile	2~10	47~330	-55~105	105 $^{\circ}$ C, 2000H	10
HPE	85 $^{\circ}$ C standard product	4,6,3	330~470	-55~85	85 $^{\circ}$ C, 2000H	12
HPG	125 $^{\circ}$ C standard product	2,8~20	15~470	-55~125	125 $^{\circ}$ C, 1000H	14



## 代码编制规则 Part Number

1		2		3		4		5			6		7		8		9		
P	C	P		0	D	P	A	4	7	1	M		0	6	V		*	*	
Capacitor type		Terminal type		Rated Voltage(V)		Series code		Capacitance code(μF)			Capacitance Tolerance(%)		ESR code(mOhm)		Dimension code		Customer special requirement		
PC=Polymer Capacitor		Flat	P	2	0D	HPA	PA	□□ x10 <sup>0</sup> μf			±10%	K	4.5	04	7.3*4.3*1.9	V			
				2.5	0E	HPS	PS	6.8	688	±20%	M	6	06	7.3*4.3*2.8	D				
				4	0G	HPE	PE	68	680	-30~+10%	X	16	16	7.3*4.3*1.1	E				
				6.3	0J	HPG	PG	470	471	-35~+10%	W	60	60	7.3*4.3*1.4	B				
				8	0K						-35~+20%	Y							
				10	1A														
				12.5	1B														
				16	1C														
				20	1D														
				25	1E														
35	1V																		

## Internal Structure



The internal structure description:

- 1).Epoxy Resin: Epoxy resin is used for sealing.
- 2).Leads:Solid copper leads plated with tin.
- 3).Conductive polymer film.
- 4).Carbon paste layer: fill in the interspace on polymer surface and reducing ESR.
- 5).Silver paste layer: connecting between element and element / lead frame, reducing ESR.
- 6).Aluminum foil (Anode) : Highly purified aluminum.



## Marking



## Manufacturing Code:

H	9	T	P
Company code	Year code	Week code	Series code

### 1) Company code

Code	H
Company	Haicheng

### 2) Year code

Code	8	9	0	1	2	3	4	5	6	7
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027

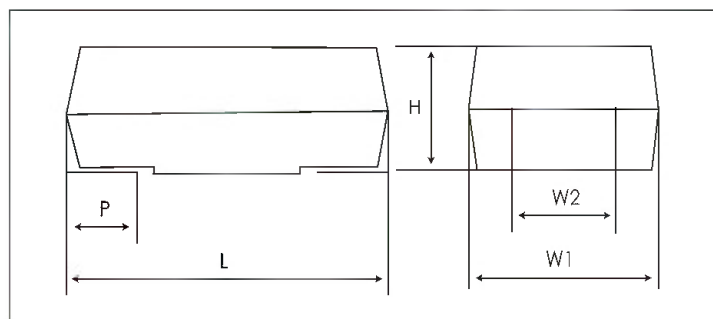
### 3) Week code

Code	A	B	C	...	E	...	J	...	O	...	T	...
Week	1	2	3	...	5	...	10	...	15	...	20	...
Code	Y	Z	A	...	D	...	I	...	N	...	S	...
Week	25	26	27	...	30	...	35	...	40	...	45	...
Code	X	Y	Z									
Week	50	51	52									

### 4) Series code

Code	P	S	E	G
Series	HPA	HPS	HPE	HPG

## Dimensions mm



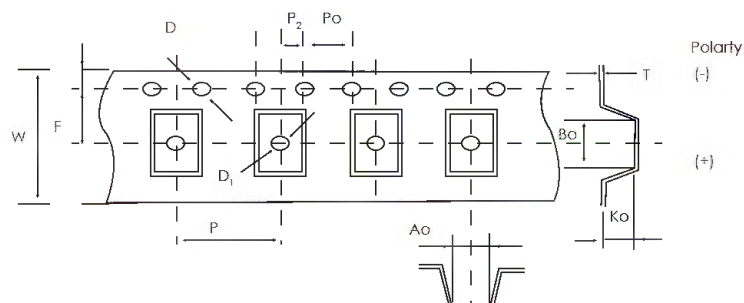
(unit:mm)

Size Code		L	+0.3	W1	+0.3	H	+0.3	P±0.3	W2±0.1
Jianghai	EIA		-0.1		-0.1		-0.1		
E	7343-12	7.3		4.3		1.1±0.1		1.3	2.4
B	7343-15	7.3		4.3		1.4±0.1		1.3	2.4
V	7343-22	7.3		4.3		1.9		1.3	2.4
D	7343-31	7.3		4.3		2.8		1.3	2.4



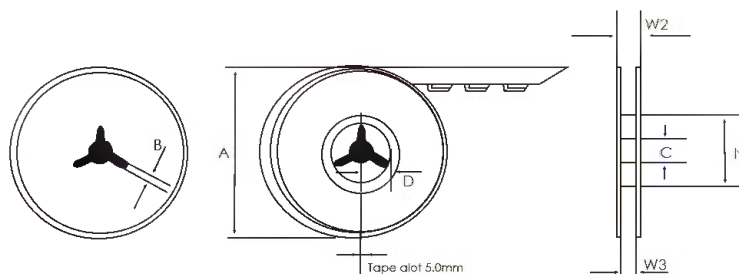
## Packaging

Outer dimension (Unit: mm)



Series Code	W	P	A0	B0	K0	D	D1	E	F	P0	T	P2
	±0.2	±0.2	±0.1	±0.1	±0.1	±0.1	0~0.25	±0.05	±0.05	±0.1	±0.005	±0.1
7.3*4.3*1.1~7.3*4.3*1.9	12.0	8.0	4.6	7.6	2.16	1.5	1.5	1.75	5.5	4.0	0.229	2.0
7.3*4.3*2.8	12.0	8.0	4.6	7.6	3.10	1.5	1.5	1.75	5.5	4.0	0.267	2.0

Disc structure and dimensions (Unit: mm)



product size	A±MAX	B±0.18	C±0.2	D±0.1	N±1.0	W2±1.0	W3±1.5
7.3*4.3*1.1~7.3*4.3*1.9	330	2.0	13.0	11.9	100	17.5	13.5
7.3*4.3*2.8							

Number of packager

Size	Pcs
E	3500
B	3500
V	3500
D	2500

## Reflow

Reflow soldering is carried out according to the following conditions, The cycles of reflow soldering: Twice (max)

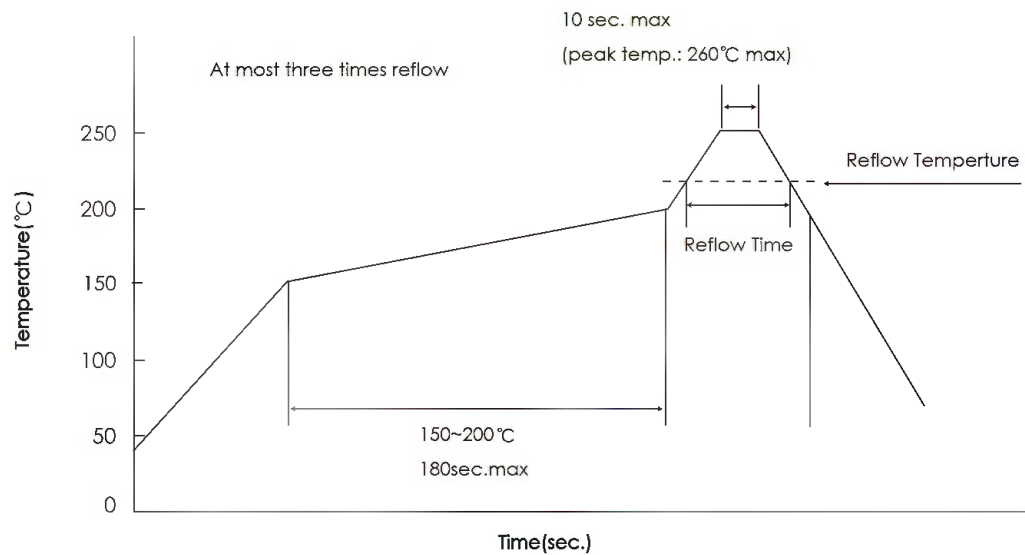
When the reflow test is carried out, the capacitor cannot be under extreme thermal stress, which will damage the electrode end, causing changes of electrical performance.



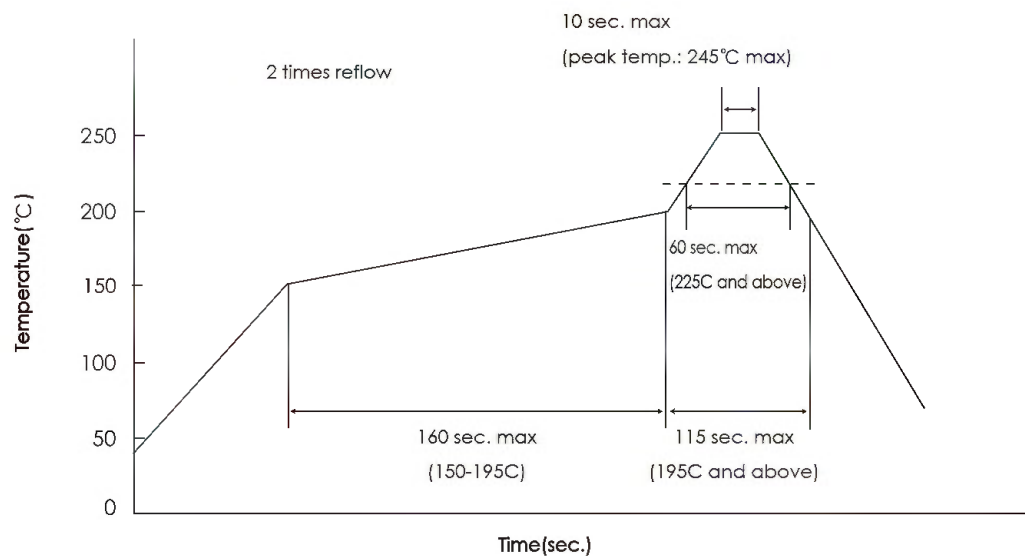
## Recommended Reflow Profile:( $<10V$ )

推荐的回流焊温度曲线  
Recommended Reflow Profile:

Temperature	Time
255°C and above	30sec.max
230°C and above	130sec.max
217°C and above	150sec.max



## Recommended Reflow Profile:( $\geq 10V$ )

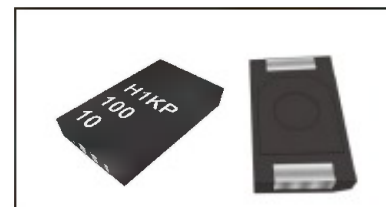


※ If the reflow soldering is higher than 245°C, please contact us



## Scope

Multi-layers conductive polymer aluminum solid capacitor  
(plastic mold)



## Product Introduction

Reliability: 105°C, 2000H  
Low ESR, High ripple current capability, Low ESL  
RoHS Compliant and lead-free  
Application: Notebook, DC/DC Converter, Switching  
Power Supply, Backup Power Supplies for CPU etc.

## Specifications

Items	Characteristics
Operating Temperature Range (°C)	-55 ~ +105
Voltage Range (V)	2 ~ 25
Capacitance Range (μF) (20°C, 120Hz)	6.8 ~ 560
Capacitance Tolerance (20°C, 120Hz)	± 20%
Surge Voltage	$U_R \times 1.25$
Leakage Current (μA) ※1	$I \leq 0.1CV [ < 8Vdc ], I \leq 0.3CV [ \geq 8Vdc ]$
Dissipation Factor Tanδ (20°C, 120Hz)	≤ 6%
Equivalent Series Resistance (20°C, 100kHz)	Please see attached rating lists
Temperature Characteristics (Max Impedance Ratio at 100kHz)	$Z_{+105^\circ C} / Z_{+20^\circ C} \leq 1.25$ $Z_{-55^\circ C} / Z_{+20^\circ C} \leq 1.25$
Endurance	<b>2000h, applied rated voltage at 105°C</b> Capacitance change: within ± 20% of the initial measured value Dissipation Factor (Tanδ): ≤ 200% of the initial specified value LC: ≤ 300% of the initial specified value [ < 8Vdc ] ≤ the initial specified value [ ≥ 8Vdc ]
Humidity Test	<b>500h, applied rated voltage at 60°C, 90~95% RH</b> $\Delta C/C$ : -20%~+70% of the initial value (2-2.5 Vdc) -20%~+60% of the initial value (4 Vdc) -20%~+50% of the initial value (6.3 Vdc) -20%~+60% of the initial value (8 to 25 Vdc) Dissipation Factor (Tanδ): ≤ 200% of initial specified value LC: ≤ the initial specified value [ < 8Vdc ] ≤ 300% of the initial specified value [ ≥ 8Vdc ]

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.



Ratings for HPA Series

Size: 7.3\*4.3\*1.9 (V)

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current*2	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
2	100	16	4900	6	20.0	V	PCP0DPA101M16V □□
2	150	9	6300	6	30.0	V	PCP0DPA151M09V □□
2	220	9	6300	6	44.0	V	PCP0DPA221M09V □□
2	270	9	6300	6	54.0	V	PCP0DPA271M09V □□
2	330	6	7500	6	66.0	V	PCP0DPA331W06V □□
2	330	7	7000	6	66.0	V	PCP0DPA331M07V □□
2	330	9	6300	6	66.0	V	PCP0DPA331M09V □□
2	470	3	10200	6	94.0	V	PCP0DPA471M03V □□
2	470	4.5	8500	6	94.0	V	PCP0DPA471M04V □□
2	470	6	7500	6	94.0	V	PCP0DPA471M06V □□
2	470	9	6300	6	94.0	V	PCP0DPA471M09V □□
2	560	4.5	8500	6	112.0	V	PCP0DPA561M04V □□
2	560	6	7500	6	112.0	V	PCP0DPA561M06V □□
2	560	9	6300	6	112.0	V	PCP0DPA561M09V □□
2.5	100	16	4900	6	25.0	V	PCP0EPA101M16V □□
2.5	150	9	6300	6	37.5	V	PCP0EPA151M09V □□
2.5	150	15	5100	6	37.5	V	PCP0EPA151M15V □□
2.5	220	9	6300	6	55.0	V	PCP0EPA221M09V □□
2.5	270	9	6300	6	67.5	V	PCP0EPA271M09V □□
2.5	330	6	7500	6	82.5	V	PCP0EPA331M06V □□
2.5	330	9	6300	6	82.5	V	PCP0EPA331W09V □□
2.5	330	9	6300	6	82.5	V	PCP0EPA331M09V □□
2.5	470	3	10200	6	117.5	V	PCP0DPA471M03V □□
2.5	470	4.5	8500	6	117.5	V	PCP0DPA471M04V □□
2.5	470	6	7500	6	117.5	V	PCP0DPA471M06V □□
2.5	470	9	6300	6	117.5	V	PCP0DPA471M09V □□
4	68	20	4400	6	27.2	V	PCP0GPA680M20V □□
4	82	16	4900	6	32.8	V	PCP0GPA820M16V □□
4	150	16	4900	6	60.0	V	PCP0GPA151M16V □□
4	220	9	6300	6	88.0	V	PCP0GPA221M09V □□
6.3	10	55	2700	6	6.3	V	PCP0JPA100M55V □□
6.3	22	45	3000	6	13.9	V	PCP0JPA220M45V □□
6.3	33	25	3900	6	20.8	V	PCP0JPA330M25V □□
6.3	47	25	3900	6	29.6	V	PCP0JPA470M25V □□
6.3	68	15	5100	6	42.8	V	PCP0JPA680M15V □□
6.3	100	9	6300	6	63.0	V	PCP0JPA101M09V □□
6.3	100	15	5100	6	63.0	V	PCP0JPA101M15V □□
6.3	150	9	6300	6	94.5	V	PCP0JPA151M09V □□
6.3	150	15	5100	6	94.5	V	PCP0JPA151M15V □□
6.3	220	9	6300	6	138.6	V	PCP0JPA221M09V □□
6.3	220	15	5100	6	138.6	V	PCP0JPA221M15V □□
8	150	10	6000	6	360.0	V	PCP0KPA151M10V □□
8	200	12	5600	6	480.0	V	PCP0KPA201M12V □□
8	220	15	5100	6	480.0	V	PCP0KPA221M15V □□
10	10	55	2700	6	30.0	V	PCP1APA100M55V □□
10	22	28	3700	6	66.0	V	PCP1APA220M28V □□
10	33	25	3900	6	99.0	V	PCP1APA330M25V □□
10	100	15	5100	6	300.0	V	PCP1APA101W15V □□
10	100	15	5100	6	300.0	V	PCP1APA101M15V □□
16	6.8	70	2400	6	32.6	V	PCP1CPA68M70V □□
16	10	60	2600	6	48.0	V	PCP1CPA100M60V □□
16	15	40	3200	6	72.0	V	PCP1CPA150M40V □□
16	22	30	3600	6	105.6	V	PCP1CPA220M30V □□
16	33	15	5100	6	158.4	V	PCP1CPA330M15V □□



Ratings for **HPA** Series

Size:7.3\*4.3\*1.9 (V)

U <sub>r</sub> Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current※2	Dissipation Factor 20°C,120Hz	Leakage Current 20°C,2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
16	33	40	3200	6	158.4	V	PCP1CPA330M40V □□
16	47	55	2700	6	225.6	V	PCP1CPA470M55V □□
16	68	30	3600	6	326.4	V	PCP1CPA680M30V □□
16	100	15	5100	6	480.0	V	PCP1CPA101M15V □□
16	100	25	3900	6	480.0	V	PCP1CPA101M25V □□
16	100	40	3200	6	480.0	V	PCP1CPA101M40V □□
25	10	40	3200	6	112.5	V	PCP1EPA100M40V □□

Ratings for **HPA** Series

Size:7.3\*4.3\*1.1 (E)

U <sub>r</sub> Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current※2	Dissipation Factor 20°C,120Hz	Leakage Current 20°C,2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
2	220	9	6300	6	44.0	E	PCP0DPA221M09E □□
2.5	180	9	6300	6	45.0	E	PCP0EPA181M09E □□
4	120	15	5100	6	48.0	E	PCP0GPA121M15E □□
6.3	68	15	5100	6	42.9	E	PCP0JPA680M15E □□

Ratings for **HPA** Series

Size:7.3\*4.3\*1.4 (B)

U <sub>r</sub> Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current※2	Dissipation Factor 20°C,120Hz	Leakage Current 20°C,2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
2.5	330	9	6300	6	82.5	B	PCP0EPA331M09B □□

※ 2 Rated Ripple current: 100KHz / +45°C, Temp coefficient as below:

Temp	T ≤ 45°C	45 °C < T ≤ 85 °C	85 °C < T ≤ 105 °C
coef	1.0	0.7	0.25



Ratings for HPA Series

Size: 7.3\*4.3\*2.8 (D)

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current×2	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
2	100	16	4900	6	20.0	D	PCP0DPA101M16D □□
2	150	9	6300	6	30.0	D	PCP0DPA151M09D □□
2	220	9	6300	6	44.0	D	PCP0DPA221M09D □□
2	270	9	6300	6	54.0	D	PCP0DPA271M09D □□
2	330	7	7000	6	66.0	D	PCP0DPA331M07D □□
2	330	9	6300	6	66.0	D	PCP0DPA331M09D □□
2	470	4.5	8500	6	94.0	D	PCP0DPA471M04D □□
2	470	6	7500	6	94.0	D	PCP0DPA471M06D □□
2	470	9	6300	6	94.0	D	PCP0DPA471M09D □□
2.5	100	16	4900	6	25.0	D	PCP0EPA101M16D □□
2.5	150	9	6300	6	37.5	D	PCP0EPA151M09D □□
2.5	180	12	5600	6	45.0	D	PCP0EPA181M12D □□
2.5	220	9	6300	6	55.0	D	PCP0EPA221M09D □□
2.5	270	9	6300	6	67.5	D	PCP0EPA271M09D □□
2.5	330	7	7000	6	82.5	D	PCP0EPA331M07D □□
2.5	330	9	6300	6	82.5	D	PCP0EPA331M09D □□
2.5	470	4.5	8500	6	117.5	D	PCP0EPA471M04D □□
2.5	470	6	7500	6	117.5	D	PCP0EPA471M06D □□
2.5	470	9	6300	6	117.5	D	PCP0EPA471M09D □□
4	68	20	4400	6	27.2	D	PCP0GPA680M20D □□
4	82	16	4900	6	32.8	D	PCP0GPA820M16D □□
4	150	18	4600	6	60.0	D	PCP0GPA151M18D □□
6.3	10	55	2700	6	6.3	D	PCP0JPA100M55D □□
6.3	22	45	3000	6	13.9	D	PCP0JPA220M45D □□
6.3	33	25	3900	6	20.8	D	PCP0JPA330M25D □□
6.3	47	25	3900	6	29.6	D	PCP0JPA470M25D □□
6.3	68	15	5100	6	42.8	D	PCP0JPA680M15D □□
6.3	100	15	5100	6	63.0	D	PCP0JPA101M15D □□
6.3	150	10	6000	6	94.5	D	PCP0JPA151M10D □□
6.3	150	15	5100	6	94.5	D	PCP0JPA151M15D □□
6.3	220	10	6000	6	138.6	D	PCP0JPA221M10D □□
6.3	220	15	5100	6	138.6	D	PCP0JPA221M15D □□
8	150	10	6000	6	360.0	D	PCP0KPA151M10D □□
8	200	12	5600	6	480.0	D	PCP0KPA201M12D □□
10	10	55	2700	6	30.0	D	PCP1APA100M55D □□
10	22	28	3700	6	66.0	D	PCP1APA220M28D □□
10	33	25	3900	6	99.0	D	PCP1APA330M25D □□
10	68	15	5100	6	204.0	D	PCP1APA680M15D □□
10	100	15	5100	6	300.0	D	PCP1APA101M15D □□
16	6.8	70	2400	6	32.6	D	PCP1CPA68M70D □□
16	10	60	2600	6	48.0	D	PCP1CPA100M60D □□
16	15	40	3200	6	72.0	D	PCP1CPA150M40D □□
16	22	30	3600	6	105.6	D	PCP1CPA220M30D □□
16	33	30	3600	6	158.4	D	PCP1CPA330M30D □□
16	47	30	3600	6	225.6	D	PCP1CPA470M30D □□
16	68	30	3600	6	326.4	D	PCP1CPA680M30D □□
16	100	40	3200	6	480.0	D	PCP1CPA101M40D □□
25	10	40	3200	6	112.5	D	PCP1EPA100M40D □□



## Scope

Multi-layers conductive polymer aluminum solid capacitor(plastic mold)

## Product Introduction

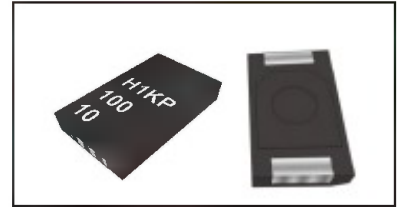
Reliability:105°C, 2000H

Low profile

RoHS Compliant and lead-free

Application: Notebook, DC/DC Converter, Switching

Power Supply, Backup Power Supplies for CPU etc.



## Specifications

Items	Characteristics
Operating Temperature Range (°C)	-55 ~ +105
Voltage Range (V)	2 ~ 10
Capacitance Range (μF) (20°C, 120Hz)	47 ~ 330
Capacitance Tolerance (20°C, 120Hz)	± 20%
Surge Voltage	$U_p \times 1.25$
Leakage Current (μA) $\times 1$	$I \leq 0.1CV [ < 8Vdc ], I \leq 0.3CV [ \geq 8Vdc ]$
Dissipation Factor Tanδ(20°C, 120Hz)	$\leq 6\%$
Equivalent Series Resistance (20°C, 100kHz)	Please see attached rating lists
Endurance	2000h, applied rated voltage at 105°C Capacitance change: within ± 20% of the initial measured value Dissipation Factor (Tanδ): $\leq 200\%$ of the initial specified value LC: $\leq 300\%$ of the initial specified value [ $< 8Vdc$ ] $\leq$ the initial specified value [ $\geq 8Vdc$ ]
Humidity Test	500h, applied rated voltage at 60°C, 90~95% RH $\Delta C/C$ : -20%~+70% of the initial value (2-2.5 Vdc) -20%~+60% of the initial value (4 Vdc) -20%~+50% of the initial value (6.3 Vdc) -20%~+60% of the initial value (10 Vdc) Dissipation Factor (Tanδ): $\leq 200\%$ of initial specified value LC: $\leq$ the initial specified value [ $< 8Vdc$ ] $\leq 300\%$ of the initial specified value [ $\geq 8Vdc$ ]

Ratings for **HPS** Series

Size: 7.3\*4.3\*1.1 (E)

$U_R$ Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current $\times 2$	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size Code	P/N
[V]	[μF]	[mΩ]	[mA]	[%]	[μA]	-	-
2	220	6	7500	6	44.0	E	PCPDPS221M06E □□
2.5	180	6	7500	6	45.0	E	PCPEPS181M06E □□
4	120	15	5100	6	48.0	E	PCPGPS121M15E □□
6.3	68	15	5100	6	42.84	E	PCPJPS680M15E □□
10	47	40	3200	6	141.0	E	PCPIAPS470M40E □□

Ratings for **HPS** Series

Size: 7.3\*4.3\*1.4 (B)

$U_R$ Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current $\times 1$	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size Code	P/N
[V]	[μF]	[mΩ]	[mA]	[%]	[μA]	-	-
2	330	6	7500	6	66.0	B	PCPDPS331M06B □□
2.5	270	6	7500	6	67.5	B	PCPEPS271M06B □□
4	180	15	5100	6	72.0	B	PCPGPS101M15B □□
6.3	100	15	5100	6	63.0	B	PCPJPS101M15B □□
10	68	40	3200	6	204.0	B	PCPIAPS680M40B □□

$\times 1$  Rated Ripple current: 100KHz / +45°C, Temp coefficient as below:

Temp		$T \leq 45^\circ\text{C}$	$45^\circ\text{C} < T \leq 85^\circ\text{C}$	$85^\circ\text{C} < T \leq 105^\circ\text{C}$
2V~6.3V	coef	1.0	0.7	0.25
10V		1.0	0.8	0.5



## Scope

Multi-layers conductive polymer aluminum solid capacitor(plastic mold)

## Product Introduction

Reliability:85°C, 2000H

RoHS Compliant and lead-free

Application: Notebook, DC/DC Converter, Switching

Power Supply, Backup Power Supplies for CPU etc.



## Specifications

Items	Characteristics
Operating Temperature Range (°C)	-55 ~ +85
Voltage Range (V)	4.0,6.3
Capacitance Range (μF) (20°C, 120Hz)	330~470
Capacitance Tolerance (20°C, 120Hz)	± 20%
Surge Voltage	$U_R \times 1.25$
Leakage Current (μA)	$I \leq 0.1 CV(2min)$
Dissipation Factor Tanδ(20°C, 120Hz)	≤ 6%
Equivalent Series Resistance (20°C, 100kHz)	Please see attached rating lists
Endurance	2000h, applied rated voltage at 85°C Capacitance change: within ± 20% of the initial measured value Dissipation Factor (Tanδ): ≤ 200% of the initial specified value LC: ≤ 300% of the initial specified value
Humidity Test	500h, applied rated voltage at 60°C, 90~95% RH $\Delta C/C$ : -20%~+60% of the initial value (4 Vdc) -20%~+50% of the initial value (6.3 Vdc) Dissipation Factor (Tanδ): ≤ 200% of initial specified value LC: ≤ the initial specified value

Ratings for **HPE** Series

Size: 7.3\*4.3\*1.9 (V)

$U_R$ Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current※1	Dissipation Factor 20°C,120Hz	Leakage Current 20°C,2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
6.3	330	9	6300	6	207.9	V	PCP0JPE331M09V □□
6.3	330	15	5100	6	207.9	V	PCP0JPE331M15V □□
6.3	330	25	2400	6	207.9	V	PCP0JPE331M25V □□

Ratings for **HPS** Series

Size:7.3\*4.3\*2.8 (D)

$U_R$ Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current※1	Dissipation Factor 20°C,120Hz	Leakage Current 20°C,2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
4	470	9	6300	6	188.00	D	PCP0GPE471M09D □□
4	470	15	5100	6	188.00	D	PCP0GPE471M15D □□
6.3	330	9	6300	6	207.9	D	PCP0JPE331M09D □□
6.3	300	15	5100	6	207.9	D	PCP0JPE331M15D □□

※ 1 Rated Ripple current: 100KHz / +45°C, Temp coefficient as below:

Temp	$T \leq 45^\circ\text{C}$	$45^\circ\text{C} < T \leq 65^\circ\text{C}$	$65^\circ\text{C} < T \leq 85^\circ\text{C}$
coef	1.0	0.7	0.25



## Scope

Multi-layers conductive polymer aluminum solid capacitor(plastic mold)

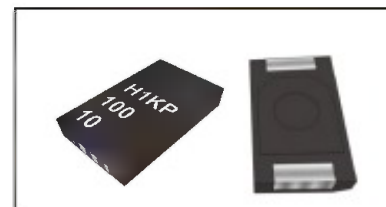
## Product Introduction

Reliability:125°C, 1000H

RoHS Compliant and lead-free

Application: Notebook, DC/DC Converter, Switching

Power Supply, Backup Power Supplies for CPU etc.



## Specifications

Items	Characteristics
Operating Temperature Range (°C)	-55 ~ +125
Voltage Range (V)	2.8~20
Capacitance Range (μF) (20°C, 120Hz)	1.5~470
Capacitance Tolerance (20°C, 120Hz)	± 20%
Surge Voltage	$U_R \times 1.25$
Leakage Current (μA) ※1	$I \leq 0.1 CV [2Vdc, 2min], I \geq 0.3 CV [8 \sim 20Vdc, 2min]$
Dissipation Factor Tanδ(20°C, 120Hz)	≤10%
Equivalent Series Resistance (20°C, 100kHz)	Please see attached rating lists
Endurance	1000h, applied rated voltage at 125°C Capacitance change: within ±20% of the initial measured value Dissipation Factor (Tanδ): ≤ 200% of the initial specified value LC: ≤ the initial specified value
Humidity Test	500h, applied rated voltage at 60°C, 90~95% RH ΔC/C: -20%~+70% of the initial value (2 Vdc) -20%~+60% of the initial value (8~20 Vdc) Dissipation Factor (Tanδ): ≤ 200% of initial specified value LC: ≤ the initial specified value [2 Vdc] ≤ 300% of the initial specified value [8~20 Vdc]

Ratings for HPG Series

Size: 7.3\*4.3\*1.9 (V)

$U_R$ Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current※2	Dissipation Factor 20°C, 120Hz	Leakage Current 20°C, 2min	Size Code	P/N
(V)	(μF)	(mΩ)	(mA)	(%)	(μA)	-	-
2	330	4.5	8500	6	66.0	V	PCP0DPG331M04V □□
2	330	6	7500	6	66.0	V	PCP0DPG331M06V □□
2	330	9	6300	6	66.0	V	PCP0DPG331M09V □□
2	330	15	5100	6	66.0	V	PCP0DPG331M15V □□
2	470	4.5	8500	6	94.0	V	PCP0DPG471M04V □□
2	470	6	7500	6	94.0	V	PCP0DPG471M06V □□
2	470	9	6300	6	94.0	V	PCP0DPG471M09V □□
2	470	15	5100	6	94.0	V	PCP0DPG471M15V □□
2.5	470	4.5	8500	6	94.0	V	PCP0DPG471M04V □□
6.3	150	15	5100	6	94.5	V	PCP0JPG151M15V □□
8	47	40	3200	6	112.8	V	PCP0KPG470M40V □□
8	68	40	3200	6	163.2	V	PCP0KPG680M40V □□
8	100	40	3200	6	240	V	PCP0KPG101M40V □□
16	22	40	3200	6	105.6	V	PCP1CPG220M40V □□
16	33	40	3200	6	158.4	V	PCP1CPG330M40V □□
16	47	40	3200	6	225.6	V	PCP1CPG470M40V □□
16	56	40	3200	6	268.8	V	PCP1CPG560M40V □□
20	10	40	3200	6	90.0	V	PCP1DPG100M40V □□

※ 1 Rated Ripple current: 100KHz / +45°C, Temp coefficient as below:

Temp		T ≤ 45°C	45°C < T ≤ 85°C	85°C < T ≤ 105°C	105°C < T ≤ 125°C
2V	coef	1.0	0.7	0.25	0.25
8~20V		1.0	0.8	0.5	0.25



## I. Prohibited Circuits

Solidconductive polymer multi-layers aluminum electrolytic capacitor have polarity. When used, it cannot be reverse charged, because it will damage the capacitor oxide film and capacitors. In addition, The total voltage and AC voltage peak values cannot exceed the rated voltage. The use of the ripple current cannot exceed the allowable values shown in the Specification sheet. If the R.C is exceeded, the capacitor will heat and be damaged.

II. Please contact Jianghai Group before the product for the following application due to special requirements for circuit design or high reliability to prevent the loss of third party life, body or property directly.

(a) circuit design: Please do not use the capacitors in high impedance circuits, coupling circuits, time constant circuits. And do not use the capacitors if changes in the leakage current affects circuit operations.

(b) special requirements for high reliability :

- 1). Aircraft equipment
- 2). Aerospace equipment
- 3). Undersea equipment
- 4). Power plant control equipment
- 5). Medical equipment
- 6). Transportation equipment (vehicles, trains, ships, etc.)
- 7). Traffic signal equipment
- 8). Disaster prevention crime prevention equipment
- 9). Data-processing equipment
- 10). Application of similar complexity and / or reliability requirements to the applications listed in the above.

## III. Soldering

(a) Reflow soldering is carried out according to the following conditions, The cycles of reflow soldering: At most three times. When the reflow test is carried out, the capacitor cannot be under extreme thermal stress, which will damage the electrode end, causing changes of electrical performance.

(b) The tip temperature of soldering iron is below 350 °C. The exposure time is less than 10 seconds. Electrical performance changes as a result of work in non-specified conditions. When soldering, do not exert excessive external force on the product. Once removed from the printed circuit board for any reason, please do not use the capacitors again.

## IV. Circuit board cleaning

The cleaning temperature of the soldered circuit board is below 60 °C, and the cleaning time is within 5 minutes. Be sure to sufficiently wash and dry. The drying temperature is 100 °C, and the drying time is less than 20 minutes.

Recommended Cleaning Solvents:

Pine Alpha ST-100S, Clean-thru 750H/750L/710M, Aqua Clean 210SEP, Sunelec B-12, DK Beclear CW-5790, Techno Cleaner 219, Cold Cleaner P3-375, Telpene Cleaner EC-7R,

Technocare FRW-17/FRW-1/FRV-1, AXREL32, IPA (Isopropyl alcohol)

- 1). Consult us when performing processes with cleaning solvents other than those listed above or deionized water.
- 2). To protect the earth's environment, please do not use detergents containing ozone depleting substances.
- 3). In the case of using ultrasonic cleaning, the terminals may be broken. Therefore, please test before using in mass production.

## V. Limitation of the use:

- 1). Please avoid in direct sunlight, outdoors, or in dust.
- 2). Please avoid in liquid, such as Water, Oil, or Organic solvent.
- 3). Please avoid in vapor, or air with high harmful gas and corrosive gas;
- 4). Please avoid in an environment where strong static electricity or electromagnetic waves exist.
- 5). Please avoid in acid or alkaline environments.
- 6). Please avoid in excessive vibration and shock environments.
- 7). Please avoid the capacitors near heat-generating components or inflammables.

## VI. Storage Condition

(a) Solid conductive polymer multi-layers aluminum electrolytic capacitor should be stored in the recommended storage environment, avoid sunlight and dew condensation, some problems may occur as follows:

- 1). At the beginning of the use, leakage current will increase and damage the circuit. However, even if the leakage current increases, the capacitors self-repairing function will reduce the leakage current in most cases when a voltage is applied.
- 2). The water vapor absorbed by the resin will evaporate and damage the surface of the resin.

(b) This product meets MSL-3 (Moisture Sensitivity Level). Recommended storage environment: Room temperature range 5-30 °C without direct sunlight, Humidity less than 60% RH. With the package in moisture-proof bag and under the recommended conditions with sealed package, the maximum storage term is 2 years. After opening of the moisture-proof packaging bag, The storage term is 168 hours, please use up all the products within the storage term.

## VII. Disposal Method

Conductive polymer aluminum solid capacitors need to be dealt according to local law and treated as industrial waste.

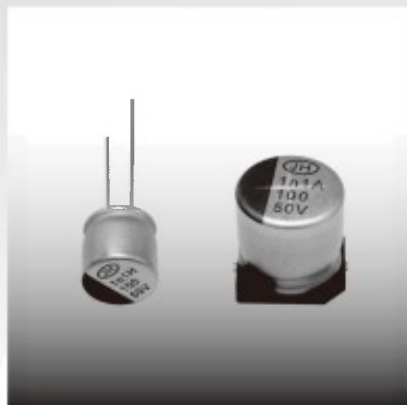
## VIII. Disclaimer

Specification in the datasheet may be subject to change without notice. Please consult us first before use. Jianghai reserves the right of final interpretation of all the content.





## Conductive Polymer Hybrid Aluminum Electrolytic Capacitor





## Part Number System for Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

PH	V	1E		VB		471		M	C10		FV		TS		W		X		
Capacitor Type Code	Terminal Type Code	Rated Voltage Code (V)		Series Code		Capacitance Code (μF)		Capacitance Tolerance Code(%)	Dimension Code		Lead Form		Terminal /Pitch size		Heat-shrinkable sleeve		Rubber/Base shape		
PH= Conductive Polymer Hybrid Aluminum Electrolytic Capacitors	R=Radial	2.5	0E	LA	PHLA	10	100	20	A	F08	6.3x8	FA	Taping forming	20	2	w	Laminated	T	Convex rubber plug
	V=V-chip	4	0G	LB	PHLB	22	220	-8		F10	6.3x10	FB	Lead cul	25	2.5			P	Flat rubber plug
		6.3	0J	LD	PHLD	33	330	20	C	BAB	8x11.5	CC	Long lead	35	3.5				
		10	1A	LE	PHLE	47	470	-3		C10	10x10	LL		50	5				
		16	1C	LF	PHLF	56	560	30	F	CAC	10x12.5	FV	SMD	TS	Special length				SMD
		25	1E	VA	PHVA	68	680	0		C16	10x16								
		35	1V	VB	PHVB	82	820	20	H	SMD								X	Normal seat plate
		40	1G	VD	PHVD	100	101	-5		E60	5x5.7								
		50	1H	VE	PHVE	120	121	10	K	F60	6.3x5.7								
		63	1J	VF	PHVF	150	151	-10		F80	6.3x7.7								
		80	1K			220	221	15	L	B70	8x6.7								
		100	2A			330	331	-15		B10	8x10								
		120	2B			390	391	20	M	B12	8x12.2								
		160	2C			470	471	-20		C10	10x10								
		180	2K			560	561	30	Q	C12	10x12.2								
		200	2D					-10		C16	10x16								
								20	R										
								0											
								50	S										
								-20											
								50	T										
								-10											
								75	U										
								-10											
								20	V										
								-10											
								100	P										
								0											



## ■ TECHNICAL NOTES

### 1. Device circuits design considerations

1-1 Confirm installation and operating requirements for the capacitors, then use them within the performance limits prescribed in this catalog or product specifications.

#### 1-2 Polarity

Capacitors are polarized.

Never apply a reverse voltage or AC voltage. Connecting with wrong polarity will short-circuit or damage the capacitor with the pressure relief vent opening early on. To identify the polarity of a capacitor, see the relevant diagram in the catalogs or product specifications, or the polarity marking on the body of the capacitors.

#### 1-3 Operating voltage

Do not apply an over-voltage that exceeds a rated voltage specified for the capacitors.

The total peak value of the ripple voltage plus the DC voltage must not exceed the rated voltage of the capacitors. Capacitors do not require voltage derating within the category temperature. Although capacitors specify a surge voltage that exceeds the full rated voltage, it does not assure long-term use but limited use under specific conditions.

#### 1-4 Ripple current

Do not apply an over current that exceeds the rated ripple current specified for the capacitors. Excessive ripple current will increase heat production within the capacitors, causing the capacitors to be damaged as follows:

- Shorten lifetime
- Open pressure relief vent
- Short circuit

At the time of low DC bias voltage, reverse voltage may be applied if uses with less than rated ripple current. Please use it as far as the reverse voltage is not applied. The rated ripple current is specified along with a specific ripple frequency. Where using the capacitors at any ripple frequency other than the specified frequency, calculate the allowable ripple current by multiplying the rated ripple current by a frequency compensation factor (Frequency Multiplier) specified for each product series.

#### 1-5 Operating temperature

Do not apply high temperatures that exceed the upper limit of the category temperature range specified for the capacitors. Using the capacitors at temperatures higher than the upper limit will considerably shorten the lifetime of the capacitors and make the pressure relief vent open. The temperature, please confirm the temperature of the capacitors which included the ambient temperature of the device, not only the temperature in the device but also radiant heat of the heating element (power transistor, resistance) in the apparatus, self heating caused by the ripple current. Additionally, please do not place heating element on the back side of the capacitors. In addition, please use the capacitors within category temperature range because the life of the capacitors are affected by the operating temperature. In other words, lowering ambient temperatures will extend the expected lifetime of the capacitors.

#### 1-6 Lifetime

Select the capacitors to meet the service life requirements of device.

### 1. 设计方面的注意事项

1-1 请在确认使用环境及装配环境的基础上，在产品目录及规格书中规定的电容器额定参数范围内使用。

#### 1-2 极性

固液混合电容器具有极性。

请勿加载反向电压或交流电压。如果安装时极性弄反，有可能导致电路在初始状态短路，防爆阀释放等失效。关于极性请确认产品目录或规格书及产品本体的标识。

#### 1-3 电压加载

请勿加载超过额定电压的实际电压。

施加在电容器上的直流电压+交流电压要小于电容器额定电压。在额定温度以内，电容器不需要将额使用。虽然电容器规定了浪涌电压，但浪涌电压只能短时间承受，不能长时间工作。

#### 1-4 纹波电流

请勿加载超过额定纹波的纹波电流。施加过大的纹波电流会引起电容器内部严重发热，引起以下问题：

- 寿命缩短
- 防爆阀打开
- 短路

要关注电容器在低直流偏置电压下使用，这种状况下，即使纹波电流在额定范围内，由于直流电压很低，施加纹波电压后也有可能造成反向电压的产生。要确保电容器不在反向电压下使用。

纹波电流是有频率相对应的，在额定频率外使用时，要将纹波电流换算到对应的频率下。

#### 1-5 使用温度

请勿在超出额定温度的环境下使用。

如果在超出额定温度下使用，可能会导致寿命缩短、甚至防爆阀打开等失效。电容器所处环境温度，不能简单的认为是整机所处的大环境温度，还需考虑电路板上距离电容器较近的发热器件，如晶体管、电阻、电感等的热辐射，以及电容器自身发热等。另外，还需注意不要在电容器的背面正对位置安装发热器件。

此外，电容器寿命受使用温度影响，所以需要在额定温度范围内使用。较低的环境温度，可以延长电容器使用寿命。

#### 1-6 寿命

电容选型时，要根据设备的寿命预期选择合适的电容。



## 1-7 Charging and discharging

Do not use capacitors in circuits intended for rapid charge and discharge cycle operations.

If capacitors are used in the circuits that repeat a charge and discharge with a large voltage drop or a rapid charge and discharge at short interval cycle, capacitance will decrease and/or the capacitors will be damaged by internal heat generation.

Please consult us the capacitors to use for the circuit where rapid charge and discharge is repeated.

Please be careful about rush currents. Recommend to install protective circuit.

## 1-8 Leakage current

The leakage current may increase due to thermal stress such as reflow soldering. After that, however, the leakage current will gradually decrease by self-healing action of the dielectric oxide layer when the capacitors are applied with a voltage less than the rated voltage within the Category Temperature range. As the voltage is closer to the rated voltage and the temperature is closer to the upper limit of Category Temperature range, the leakage current decreases faster. The leakage current will increase by the following factors,

- (1) Soldering
- (2) Testing of high temperature exposure with no voltage applied, high temperature/humidity storage, temperature cycles, etc.

## 1-9 Failure mode of capacitors

Non-solid aluminum electrolytic capacitors have a limited lifetime which ends in an open circuit failure mode, in general. Depending on the product type and operating conditions, the failure mode may involve in opening of the pressure relief vent. But it may lead to short circuit mode failure when capacitor is used in the overload more than the guarantee ranges including over voltage and the over current. Failure modes depend on the application conditions that lead to fail.

## 1-10 Capacitor insulation

The can case of capacitor does not assure electrical insulation. The outer coating on can case is aimed for indication and does not assure function of the electrical insulation. Electrically isolate the outer can case of a capacitor from the negative terminal, the positive terminal and circuit patterns.

## 1-11 Operating conditions

Do not use/expose capacitors to the following conditions:

- ① Direct contact with water, salt water or oil, or high condensation environment.
- ② Direct sunlight
- ③ Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine and its compounds, bromine and its compounds and ammonium
- ④ Ozone, ultraviolet rays or radiation
- ⑤ Extreme vibration or mechanical shock that exceeds limits in the catalogs or product specifications. The standard vibration condition is applicable to JIS C 5101-4.

## 1-12 Mounting

Capacitors contain paper separators and electric-conductive electrolyte that contains organic solvent as main solvent material, both of which are flammable. If the electrolyte leaks onto a printed circuit board, it can erode the device circuit pattern, may short-circuit the copper traces, smoke and burn. Make sure of designing a PC board as follows:

- ① Provide clearance space (2mm minimum) over the pressure relief vent of a capacitor to avoid blocking the correct opening of the pressure relief vent for 10mm case diameter of capacitor.
- ② Do not locate any wire or circuit pattern over the pressure relief vent of a capacitor.
- ③ Avoid locating any heat source components near capacitors or on the opposite side of the PC board under capacitors.

## 1-7 充放电

常规电容器不能用于急速充放电场合。

如果电容器用于电压差大的充放电电路，或者短周期且反复急速充放电电路中，可能会导致容值衰减或内部发热损伤等问题。

如果要应用于急速充放电场合，请先向我司咨询。

使用中需要注意冲击电流，建议设置保护电路。

## 1-8 漏电流

电容器过回流焊后，漏电流可能会由于热应力回升。但在整机正常工作后，如果工作电压及环境温度均在额定值以下，此时，氧化膜可以在通电情况下进行自我修复，漏电流会逐渐下降。所加电压越接近额定电压，环境温度越接近额定温度，漏电流下降越快。

在某些情况下，漏电流会上升，具体如下：

- (1) 焊接
- (2) 高温储存、高温高湿、冷热冲击等试验

## 1-9 电容器失效模式

非固体铝电解电容器是有使用寿命的元件，通常情况下，最终的失效模式为开路。根据实际使用条件的不同，有时会引发防爆阀打开等失效模式。

但是，在超过额定电压或超过额定纹波电流情况下，可能会发生短路失效模式。

## 1-10 电容器的绝缘

电容器外壳镀膜有一定的绝缘性，但不能保证完全绝缘。外部包装层起标识作用，没有电气绝缘功能。电容器铝壳、正极引线端子、负极引线端子和电路板之间需要进行整机端的电气绝缘。

## 1-11 电容器运行环境

电容器不能在以下环境下使用。

- ① 直接溅水、盐水、油或处于结露状态的环境
  - ② 阳光直接照射的环境
  - ③ 充满有毒气体（硫化氢、亚硫酸、亚硝酸、氯及其化合物、溴及其化合物、氨等）的环境
  - ④ 臭氧、紫外线及放射线照射的环境
  - ⑤ 振动或冲击条件超过目录或规格书规定的范围
- 标准振动条件，以JIS C 5101-4为准

## 1-12 安装

电容器使用了以可燃性有机溶剂为主要成分的导电性电解液和可燃性电解纸。如果电解液漏出到电路板上，会腐蚀电路线路，造成电路线路间的短路，进而导致起火、冒烟。因此设计时请参考以下几点：

请在电容器防爆阀上方预留至少2mm的空间

请不要在防爆阀上方设置电路

请避免在电容器周围或电路板背面设置发热元器件

贴片类电容设计安装，请参考目录或规格书中推荐的焊盘及安装尺寸设计



④Design the solder land on the PC board in accordance with the catalog or the product specification.

⑤For radial capacitors, design the terminal holes on the PC board to fit the terminal dimension of the capacitor.

⑥Do not print any copper trace under the seal (terminal) side of a capacitor. When the electrolyte leaks out, it may occur circuit pattern short-circuit, and tracking or migration. Copper traces should be 1 mm (preferably 2mm or more) spaced apart from the side of the capacitor body.

⑦In designing a double-sided PC board, do not locate any through-hole via or unnecessary hole underneath a capacitor.

⑧In designing a double-sided PC board, do not print any circuit pattern underneath a capacitor.

## 1-13 Using capacitors for significantly safety-oriented applications

Consult with us in advance of usage of our products in the following listed applications.

- ①Aerospace equipment
- ②Power generation equipment such as thermal power, nuclear power etc.
- ③Medical equipment
- ④Transport equipment (automobiles, trains, ships, etc.)
- ⑤Transportation control equipment
- ⑥Disaster prevention / crime prevention equipment
- ⑦Highly publicized information processing equipment
- ⑧Submarine equipment
- ⑨Other applications that are not considered general-purpose applications.

## 1-14 Others

Design device circuits taking into consideration the following conditions:

- ①Electrical characteristics of a capacitor depend on the temperature and frequency. In designing the device circuits, consider the change in the characteristics.
- ②If using more than one capacitor connected in parallel, design the device circuits to balance the current flow in individual capacitors.
- ③If using more than one capacitor connected in series, connect shunting resistors in parallel with the individual capacitors to balance the voltage.

## 2 Installation

### 2-1 Assembling

- ①Do not try to reuse the capacitors once assembled and electrified.
- ②Capacitors may have been spontaneously recharged with time by a recovery voltage phenomenon. Capacitors may produce recovery voltage higher than aluminum electrolytic capacitors and conductive polymer aluminum solid capacitors. In this case, discharge electricity through approximately 1kΩ before use.
- ③If capacitors have been stored at any conditions more than 35°C and 75%RH for long storage periods of time more than the limits specified in the catalogs or product specifications, they may have high leakage current. In this case, make pre-conditioning by applying the rated voltage through a resistor of approximately 1kΩ.
- ④Confirm the rated capacitance and voltage of capacitors before installation.
- ⑤Confirm the polarity of capacitors before installation.
- ⑥Do not try to use the capacitors that were dropped to the floor and so forth.
- ⑦Do not deform the can case of a capacitor.
- ⑧Verify that the lead spacing of the capacitor fits the hole spacing in the PC board before installing the capacitors.
- ⑨Do not apply excessive mechanical force to capacitors more than the limits prescribed in the catalogs or product specifications. Avoid excessive mechanical force while the capacitors are in the process of vacuum-picking, placing and positioning by automatic mounting machines or cutting the lead wires by automatic insertion machines.

请保持电容器端子间距和印刷电路板孔距一致

电容器的封口位置下方不要设置电路。电解液漏出时会造成电路短路, 可能会发生漏电或迁移电流。在电容器周围设计线路时, 线路间隔请确保至少1mm (空间允许时2mm以上)

将电容器安装于双面印刷电路板时, 电容器下方请不要设计多余的线路板孔及连接电路板两面的贯穿孔

将电容器安装在双面印刷电路板时, 电容器主体安装位置请不要设置电路。

## 1-13 在涉及安全的产品上的应用

在涉及以下用途时, 请先跟我司业务联系, 双方协商后再行使用。

- ①航空航天设备
- ②核能设备
- ③医疗设备
- ④运输设备 (汽车、列车、船舶等)
- ⑤交通机构控制设备
- ⑥防灾防盗设备
- ⑦公共性较高的信息处理设备
- ⑧海底设备
- ⑨其他特定用途设备

## 1-14 其他

设计电路及选型时要考虑以下几种情况:

随着温度及频率变化, 电容器的电气特性会发生变化, 设计电路时应考虑这种变化量

电容器并联使用时, 电路设计应考虑电流均衡

电容器串联使用时, 电路设计应考虑电压均衡, 注意分压电阻的选取

## 2 安装

### 2-1 组装

- ①已经安装到整机并通过电的电容器, 请勿再次使用。
  - ②电容器可能会产生比非固体铝电解电容器及导电高分子固体铝电解电容器更高的再生电压。使用前, 请用1kΩ左右的电阻进行放电处理。
  - ③在超过温度35°C, 湿度75%RH的条件下, 电容器进行长期储存时, 漏电流会增大。此时, 使用前请用1kΩ左右的电阻进行电压处理。
  - ④安装前请确认电容器的额定电压跟容量。
  - ⑤安装前请确认电容器的极性。
  - ⑥请勿使用跌落到地面上的电容器。
  - ⑦安装时请勿使电容器外壳变形。
  - ⑧请在确认电容器引脚间距跟安装孔间距一致后, 再进行安装。
  - ⑨请勿对电容器施加超过产品目录或规格书规定以上的应力。
- 要注意自动装配机在吸附、装配及位置对准, 或者引线切割时所产生的应力。



## 2-2 Soldering and heat resistance

- ①For soldering using a soldering iron, consider the following conditions: -Soldering conditions (temperature and time) should be  $(380 \pm 10^{\circ}\text{C}, 3 \pm 0.5\text{second})$ .  
-Do not touch the body of a capacitor with the hot tip of the soldering iron.
- ②Verify the following when flow soldering:  
-Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board. -Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.  
-Do not apply flux to any part of capacitors other than their terminals. Make sure the capacitors do not come into contact with any other components while soldering.
- ③For reflow soldering, consider the following conditions: Soldering conditions (preheat, reflow temperature and time) should be within the limits prescribed in the catalogs or product specifications.  
-When using the infrared heater and setting its temperatures, adjust the heating levels taking into consideration that the color and materials of a capacitor vary in their infrared absorbance.  
-The allowable number of reflow passes is specified in the catalogs or product specifications. Please consult us about vapor phase soldering (VPS).
- ④Do not try to reuse the capacitors once assembled.
- ⑤Only use radial lead type capacitors for flow soldering. The other type capacitors are not designed for the flow soldering.
- ⑥Only use chip type capacitors for reflow soldering. The other type capacitors are not designed for the reflow soldering.

## 2-3 Handling after soldering

After soldering the PC board, do not apply the following mechanical stress to the capacitor:

- ①Do not tilt, push down or twist the body of the capacitor.
- ②Do not grab the body of the capacitor to carry the assembly board.
- ③Do not hit anything against the capacitor. When stacking the assembled boards, do not put any of the PC boards or other components against the capacitor.
- ④ Do not drop the assembled board.

## 2-4 Cleaning assembly boards

- ①Do not clean capacitors with the following cleaning agents:
  - Halogenated solvents: cause capacitor failures due to corrosion.
  - Alkali system solvents: corrode (dissolve) the aluminum can case.
  - Terpene and petroleum system solvents: deteriorate the rubber seal materials.
  - Xylene and toluene: deteriorates the rubber seal materials as well.
  - Acetone: erases the markings printed on a capacitor.
 Where cleaning is necessary, use only solvent resistant type capacitors that have been assured for the cleaning within the specific cleaning conditions prescriber in the catalogs or product specifications. In particular, carefully set up the conditions for ultrasonic cleaning system. Consult us regarding alternative CFCs or other cleaners before use.
- ②Where cleaning the capacitors, confirm the following conditions:
  - Control the contamination (the conductivity, pH, specific gravity, water content, etc.) of the cleaning agents.
  - After the cleaning, do not leave the capacitors (assembly boards) in an environment of cleaning agent-rich or in a closed container. Sufficiently evaporate the residual cleaning agent from the assembly boards and the capacitors by forced hot air at temperatures less than the upper limit of category temperature range for more than 10 minutes.
 In general, aluminum electrolytic capacitors are sensitive to contamination of halogen ions (particularly to chlorine ions). Depending on the properties of the electrolyte and rubber seal materials used in a capacitor, the halogen ions lead up to catastrophic failures on the capacitor. Where the inside of a capacitor has been contaminated with more than a certain amount of halogen ions and the capacitor is in use, the corrosion reaction of aluminum occurs. The corrosion causes the capacitor to have a significant increase in leakage current with heat produced, open the pressure relief vent and become open circuit mode failure.  
Due to global environmental issues (greenhouse effects and other environmental destruction by depletion of the ozone layer), the conventional cleaning solvents of CFC 113, Trichloroethylene and 1,1,1-trichloroethylene were replaced by substitutes. The following are some substitute cleaning agents and allowable cleaning conditions:

## 2-2 焊接时耐焊接热

- ①利用烙铁进行焊接时, 请注意以下内容:
  - 焊接条件为, 老铁尖端温度:  $380 \pm 10^{\circ}\text{C}$ , 焊接时间:  $3 \pm 0.5\text{s}$
  - 烙铁高温区不要触碰到电容器本体
- ②进行波峰焊时, 请注意以下内容:
  - 进行焊接时, 请勿将电容器本体浸入到熔融的焊剂中。插入电路板后, 以电路板作为阻隔, 只对电容器背面侧的引线进行焊接。
  - 焊接条件请勿超出目录或规格书规定的范围。
  - 除引线外, 请勿附着助焊剂
  - 进行焊接时, 要注意其他元器件翻到接触到电容器。
- ③进行回流焊接时, 请注意以下内容:
  - 焊接条件 (预热温度、回流温度、焊接时间等) 请勿超出目录或规格书规定的范围。
  - 使用红外线加热器时, 因电容器的颜色和材质不同, 红外线吸收率会有差异, 请注意加热程度。回流炉的加热器种类及位置不同, 电容器承受温度会有差异, 请注意加热程度。
  - 电容器能承受的回流次数在目录及规格书中有规定。
  - 关于气相焊的焊接方法, 请与我们联系。
- ④已经安装过的电容器, 在拆卸下来后, 请勿再次使用。
- ⑤除引线式产品外, 其他类型产品请勿进行波峰焊接。
- ⑥除贴片类产品外, 其他类型产品请勿进行回流焊接。

## 2-3 焊接后处理

电路板完成焊接后, 注意以下几种会造成电容器承受额外机械应力的场景:

- ①请勿使电容器本体倾斜、扭曲或倒地。
- ②请勿抓住电容器本体搬运电路板
- ③请勿让其他物体碰到电容器, 电路板需要重叠堆放的场合, 注意不要让其他电路板的元器件碰到电容器。
- ④请勿让安装好电容器的电路板发生掉落

## 2-4 基板清洗

- 电容器不可用以下清洗剂进行清洗:
- 卤素类溶剂: 电容器腐蚀
  - 碱性类溶剂: 铝壳溶解
  - 萘烯和石油类溶剂: 封口橡胶老化
  - 二甲苯: 封口橡胶老化
  - 丙酮: 标识消失
- 当必须要清洗时, 请在目录或规格书规定的条件范围内清洗。请特别注意超声波清洗条件。
- 清洗电容器时, 请确认以下内容。
- 请注意清洗剂的状态监控 (电导率、PH、成分比、含水量等)。
- 清洗后, 请勿将电容器 (电路板) 留在富含清洁剂的环境或密闭容器中。此外, 请用强热风吹10分钟以上进行充分干燥, 热风温度要低于额定温度。避免电路板及电容器上残留清洁剂。
- 通常情况下, 铝电解电容器很容易跟卤素离子发生反应 (尤其是氯离子), 因所使用的电解质和封装材料等的不同, 反应的程度有所差异, 但当一定量的卤素离子侵入到电容器内部, 会导致使用过程中发生腐蚀, 引起电容器漏电流大幅增加、发热、防爆阀打开、开路等破坏性失效。
- 由于目前的地球环境问题 (臭氧层破坏引起的地球变暖, 环境破坏), 使用以下的新溶剂代替过去使用的氟利昂113 (二氯二氟甲烷等)、氯甲烷、1,1,1三氯乙烷进行清洗时, 请勿超出容许的条件范围。



## a) Fatty-alcohol cleaning agents

### [Cleaning conditions]

Either of immersion or ultrasonic cleaning, for a maximum of 10 minutes and at a maximum liquid temperature of 60°C is acceptable. Make sure that the markings on the capacitor are not rubbed against any other component or the PC board during cleaning. Note that shower cleaning affects the markings on the capacitor.

## b) Alternative CFCs

### [Cleaning conditions]

Either of immersion or ultrasonic cleaning, for a maximum of 5 minutes. However, this type of cleaning agent is not recommended to use, as the cleaning materials may be banned in near future in view of global environmental issues.

## c) IPA (Isopropyl Alcohol)

Immersion cleaning with a maximum flux concentration of 2 wt% is acceptable.

## 2-5 Adhesives and coating materials

① Do not use any adhesive or coating materials containing halogenated solvents.

② Make sure of the following conditions before applying adhesive or coating materials to a capacitor,

- No flux residue nor stain is left between the rubber seal of a capacitor and PC board.

- Dry the capacitor to remove residual cleaning agents before applying adhesive and coating materials. Do not cover up the entire surface of the rubber seal of the capacitor with adhesives or coating materials.

- Consult us Heating and curing conditions for adhesives and coating materials.

- Covering up the entire surface of the rubber seal with resin mold materials will obstruct the normal diffusion of internal hydrogen gas from a capacitor and result in serious failures. Also, where the adhesive and coating materials contain a large amount of halogen ions, the halogen ions will contaminate the inside of the capacitor through the rubber seal materials, causing the capacitor to become a failure.

- Depending on solvent materials that the adhesive or coating materials contains, note that the surface of a capacitor may change in appearance.

## 2-6 Fumigation

In exporting or importing electronic devices, they may be exposed to fumigation with halide such as methyl bromide. Where the capacitors are exposed to halide such as methyl bromide, the capacitors will be damaged with the corrosion reaction with halogen ions in the same way as cleaning agents.

## 3 Precautions during operation of devices

(1) Never touch the terminals of a capacitor directly with bare hands.

(2) Do not short-circuit between the capacitor terminals with anything conductive. Also, do not spill any conductive liquid such as acid or alkaline solution over a capacitor.

(3) Confirm environmental conditions where the device will be placed. Do not use the device in the following environmental conditions:

① Water or oil spatters, or high condensation environment.

② Direct sunlight.

③ Ozone, ultraviolet rays or radiation.

④ Toxic gases such as hydrogen sulfide, sulfuric acid, nitrous acid, chlorine and its compounds, bromine and its compounds and ammonium. ⑤ Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalog or product specification.

## 4 Maintenance inspections

(1) For industrial use capacitors, make periodic inspections of the capacitors. Before the inspections, turn off the power supply of the device and discharge the electricity of the capacitors. Where checking it by a volt-ohm meter, confirm the polarity beforehand. Do not apply mechanical stress to the terminals of the capacitors during inspection.

## a) 脂肪醇类清洁剂

### 清洁条件:

浸没或超声波洗, 最长时间为10分钟, 液体最高温度为60℃。

清洁过程中注意电容器标识不能跟其他元器件或电路板摩擦, 造成标识不清晰。

## b) 换代氟利昂

### 清洁条件:

浸没或超声波洗, 最长时间为5分钟。但是不建议采用此类清洁剂, 因为鉴于全球环境问题, 该类清洁剂在不久的将来会被禁用。

## c) 异丙醇

浸泡方式清洗 (溶剂对清洗剂的浓度为2wt%以下)。

## 2-5 固定剂、涂层剂

请勿使用含有卤素的固定剂和涂层剂

在电容器上使用固定剂和涂层剂时, 请先确认以下内容:

电路板与电容器封口之间不能残留焊剂残渣及污垢

在涂固定剂和涂层剂之前, 请先擦干电容器表面的清洁剂。且电容器胶塞封口处不能被固定剂和涂层剂全部堵住。

有关固定剂和涂层剂的热硬化条件, 请向我们咨询。

电容器的封口如果被完全堵住, 因电容器内部压力无法释放, 将会引发爆炸等风险。此外, 当固定剂和涂层剂中卤素离子过多时, 卤素离子会进入电容器内部, 进而引发腐蚀等异常失效。

固定剂和涂层剂中使用的个别溶剂, 可能会导致电容器外观发生变化, 请务必注意。

## 2-6 熏蒸处理

在电子设备进出口时, 有时需要用溴化甲烷等卤素化合物进行熏蒸处理。此时如果铝电解电容器接触到溴化甲烷等卤素化合物, 会和基板清洗时一样, 有卤素离子进入电容器内部, 进而引发腐蚀的风险。

## 3 使用中的注意事项

(1) 请勿直接接触电容器的端子

(2) 电容器端子直接不能放置短路体, 以免造成短路打火。此外, 请不要把酸性或碱性溶液溅到电容器上。

(3) 请确认安装了电容器的电路板的安装环境。请不要在以下环境中使用。

① 直接溅水或油到电容器上、容易结霜的环境。

② 阳光直射到电容器的环境。

③ 臭氧、紫外线或放射线照射的环境。

④ 充满有毒气体 (硫化氢、亚硫酸、亚硝酸、氯及其化合物、溴及其化合物、氨等) 的环境。

振动或冲击条件超过目录或规格书规定范围的振动条件的环境。

## 4 保养检查事项

(1) 请定期检查使用于工业设备上的电容器。对电容器进行保养检查的时候, 请先切断设备的电源, 放掉电容器的储电。当用万用表检查时, 请先确认万用表的极性再使用, 不要让电容器端子受到应力作用。



## (2) Characteristics to be inspected

- ① Significant damage in appearance: vent opening, electrolyte leakage, etc.
- ② Electrical characteristics: Leakage current, capacitance,  $\tan\delta$  and other characteristics prescribed in the catalogs or product specifications. If finding anything abnormal on the characteristics above, check the specifications of the capacitor and take appropriate actions such as replacement

## 5 Contingencies

- 1) A capacitor with more than a certain case size has the pressure relief vent functioning to escape abnormal gas pressure increase. If gas expels from a venting capacitor, disconnect the power supply of the device or unplug the power supply cord. If not disconnecting the power supply, the device circuit may be damaged due to the short circuit failure of the capacitor or short-circuited with the liquid that the gas was condensed to. It may cause secondary damages such as device burnout in the worst case scenario. The gas that comes out of the open vent is vaporized electrolyte not smoke.
- 2) The gas expelled from a venting capacitor is more than 100°C. Never expose your face to the capacitor. If your eyes are exposed to the gas or you inhale it, immediately flush your eyes and/or gargle with water. If the electrolyte comes in contact with the skin, wash with soap and water.

## 6 Storage

- 1) Do not store capacitors at high temperature or high humidity. Store the capacitors indoors at temperatures of 5 to 35°C and humidities of less than 75%RH. In principle, aluminum electrolytic capacitors should be used within 2 years after production.
- 2) Keep capacitors packed in the original packaging material wherever possible.
- 3) Avoid the following storage environmental conditions:
  - ① Water spattering, high temperatures, high humidity or condensation environment.
  - ② Oil spattering or oil mist filled.
  - ③ Salt water spattering or salt filled.
  - ④ Acidic toxic gases such as hydrogen sulfide, sulfuric acid, nitrous acid, chlorine, bromine and methyl bromide filled.
  - ⑤ Alkaline toxic gases such as ammonium filled.
  - ⑥ Acid or alkaline solutions spattering.
  - ⑦ Direct sunlight, ozone, ultraviolet rays or radiation.
  - ⑧ Extreme vibration or shock loading.

## 7 Capacitor disposal

Please consult with a local organization for the proper disposal of industrial waste. For incinerating capacitors, apply a high temperature incineration (over 800°C). Incinerating them at temperatures lower than that may produce toxic gases such as chlorine. To prevent capacitors from explosion, punch holes in or sufficiently crush the can cases of the capacitors, then incinerate.

## 8 About AEC-Q200

The Automotive Electronics Council (AEC) was originally established by major American automotive related manufactures. Today, the committees are composed of representatives from the sustaining Members of manufacturing companies in automotive electrical components. It has standardized the criteria for "stress test qualification" and "reliability tests" for electronic components. AEC-Q200 is the reliability test standard for approval of passive components in Automotive applications. It specifies the test type, parameters and quantity, etc. for each component. The criteria of the reliability tests such as for our main products, "Aluminum Electrolytic Capacitors" are described in this standard. Pursuant to the customer's specific testing requirements, JIANGHAI submits the test results according to AEC-Q200 for Aluminum Electrolytic Capacitors used in automotive applications on request. An electronic component manufacturer cannot simply claim that their product is "AEC-Q200 Qualified". It can be claimed "Compliant", "Capable", "Available", etc., however each component must be tested per each users "Qualification Test Plan" in order to claim AEC-Q200 status. Please contact us for more information.

## (2)请定期检查以下内容。

- ①外观（防爆阀打开、漏液等）有无明显异常。
- ②电气性能（容量、损耗、漏电流等是否符合目录或规格书中的规定值）。

当以上检查项发生异常时，请确认电容器的规格，并进行替换等处理。

## 5 紧急情况

1)一定尺寸以上的电容器，为了防止异常情况下内部压力过大，都配备有用于泄放压力的防爆阀。如发现设备中的电容器在使用中有气体溢出时，请切断设备的电源或从插座上拔下电源的插头，如果不切断电源任由其发展，电路会因电容器的短路而损坏，进一步的，如果喷射的气体遇冷液化，会造成电路板的线路短路，可能引起设备烧毁等二次伤害。

2)当电容器的防爆阀动作时，会喷出超过100 °C 的气体，请不要将脸部靠近。万一喷出的气体不慎进入眼睛或被吸入，请马上用清水冲洗眼睛、漱口，当黏附在皮肤上时，请用肥皂冲洗。

## 6 储存

- 1)请勿将电容器放置于高温高湿的环境，请储存在室温5-35°C，湿度75%以下的环境。铝电解电容器的储存期限通常为2年。
- 2)请尽量按完整包装的方式储存。
- 3)请避免在以下环境下储存
  - ①溅水、高温高湿及结露水的环境
  - ②溅油、或者充满气体油成分的环境
  - ③溅盐水、或充满盐分的环境
  - ④充满酸性有毒气体（硫化氢、亚硫酸、亚硝酸、氯、溴、溴化甲烷等）的环境
  - ⑤充满氨气等碱性有毒气体的环境
  - ⑥酸性或碱性溶剂的环境
  - ⑦直射阳光、臭氧、紫外线及放射线照射的环境
  - ⑧使电容器受到振动或冲击的环境

## 7 电容器废弃处理

废弃电容器时，请交给专业的工业废弃物处理厂进行焚烧或填埋处理。

焚烧的时候，请使用超过800°C的高温焚烧。低温焚烧会产生卤素气体等有害气体。此外，为了防止电容器爆炸，请预先在电容器上开孔或充分碾碎后焚烧。

## 8 关于AEC-Q200

AEC是Automotive Electronics Council（车载电子零部件评议会）的简称，是由美国主要汽车制造商和零部件供应商设立。现在由电装、零部件制造商构成的行业团体。负责电子零部件的可靠性试验及认定标准的标准化工作。

AEC-Q200是被动元器件认定用的可靠性试验标准，规定了各类元器件的试验项目及试验数量等。其中也规定了铝电解电容器的试验标准。

应对车载客户的试验要求，我司可以提供基于AEC-Q200的铝电解电容器的试验报告。

除了有资质的第三方外，单独的零部件制造商无法给出AEC-Q200标准的认定与否，我司针对有车载需要的客户的产品，会做出基于、符合、可使用等说法的判断。但是特殊客户，特殊规格，需要按照双方约定的项目进行可靠性试验。具体情况可以另行咨询我司。



## 9 Response to the Substances of Concern

1) JIANGHAI aims for developing products that meet laws and regulations concerning substances of concern. (Some products may contain regulated substances for exempted application) Please contact us for more information about law-compliance status.

2) According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).

## 10 Catalogs

Specifications in the catalogs are subject to change without notice. Test data shown in the catalogs are not assured as the whole performance values, but typical values.

## 9 环境有害物质对应

1) 本公司旨在开发符合有关环保和法律法规的产品（部分产品可能含有可豁免应用的管理物质），需要了解更多的产品关于法律法规的情况，请联系我们。

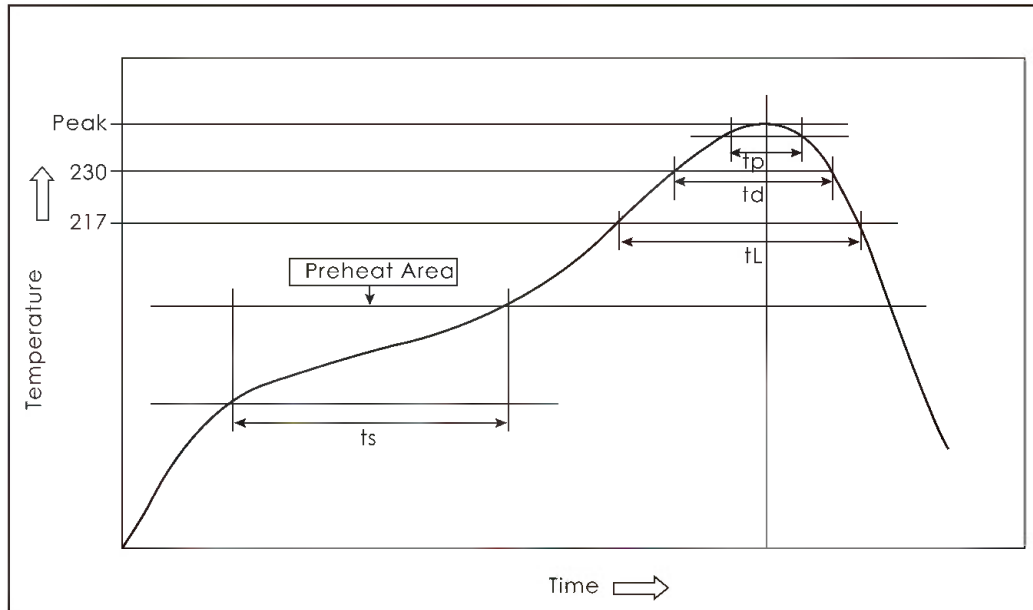
2) 根据REACH指南（条款中物质规定）的内容，我司生产的产品属于“非有意释放成型品”类产品，不适用于EU REACH规则第7条1项“注册”。

## 10 产品目录

产品目录中的内容有可能未经提示而变更，请事先跟我司了解。此外，产品目录上的数据只表示该规格产品的典型值，不保证整体性能值。



## RECOMMENDED SOLDERING CONDITIONS SURFACE MOUNT TYPE

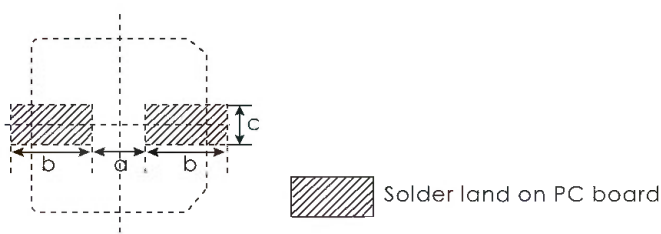


Product diameter	Preheat	Time maintained above 217°C	Time maintained above 230°C	Peak temperature	Reflow Number
$\Phi \leq 6.3$	150~180°C 60~120 seconds	50 seconds max.	40 seconds max.	260°C max.	Only 1 time
$\Phi \geq 8$	150~180°C 60~120 seconds	50 seconds max.	40 seconds max.	260°C max.	Only 1 time
				245°C max.	Twice or less

\* All temperatures are measured on the topside of the Al-can and terminal surface.

\* Please ensure that the capacitor became cold enough to the room temperature (5 to 35°C) before the second reflow.

## Recommended Solder Land on PC Board



(Unit:mm)

Size $\Phi D$ (code)	a	b	c
$\Phi 6.3$ (F)	1.9	3.5	1.6
$\Phi 8$ (B)	3.1	4.2	2.2
$\Phi 10$ (C)	4.5	4.4	2.2

## RADIAL LEAD TYPE

Preheat: 150°C 120 seconds max.

Flow soldering: 260±5°C max. 10±1 seconds max. (Or 380±10°C max. 3±0.5 seconds max.: hand soldering)

## Lead Cut Dimensions For Radial Lead Type

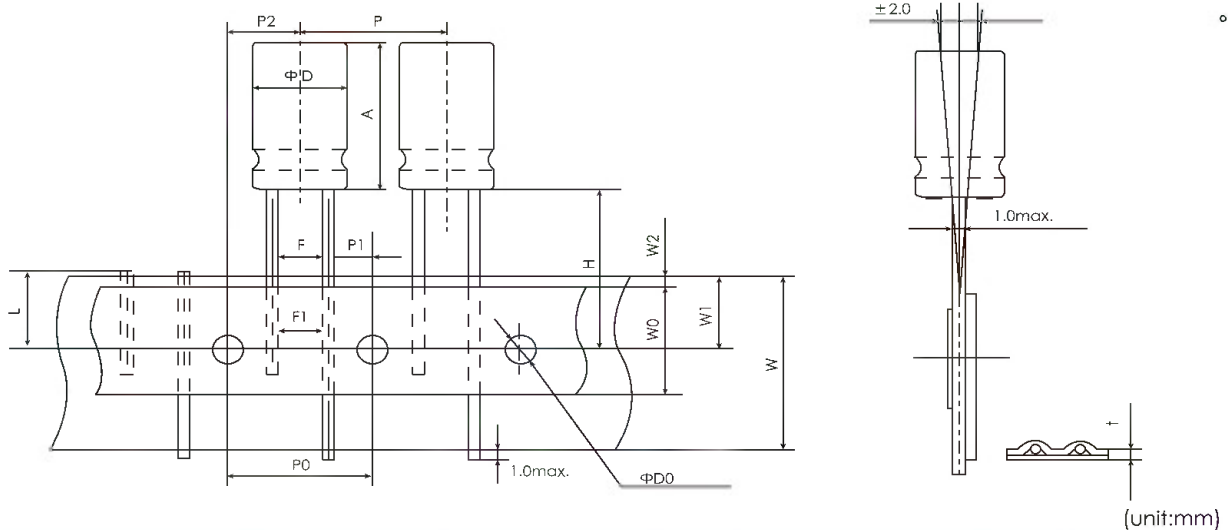
Lead Cut		Code:CC	
		D	P
		5	2.0
		5.5	2.5
		6.3	2.5
		8	2.5/3.5
		10	5.0



## PACKAGING

### Taping Dimensions (FA)

Fig 1

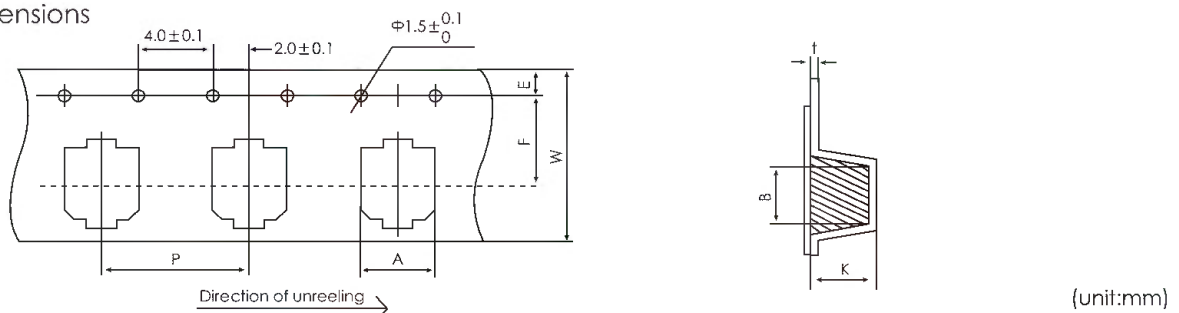


ΦD	A	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	L	ΦD0	t
±0.5		±1.0	±0.2	±0.5	±1.0	+0.8/-0.2	±1.0	±0.5	min	±0.5	max	+0.75/-0.5	max	±0.5	±0.3
5	5~11	12.7	12.7	5.35	6.35	2.0	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
6.3	5~12	12.7	12.7	5.1	6.35	2.5	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
8	6~11.5	12.7	12.7	4.6	6.35	3.5	3.5	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7
10	8~12.5	12.7	12.7	3.85	6.35	5.0	5.0	18.0	12.0	9.0	1.5	18.5	11.0	4.0	0.7

(unit:mm)

### Taping Dimensions For SMD type (Vertical)

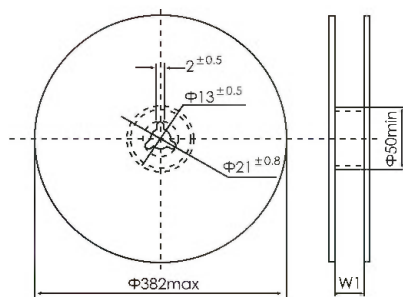
#### Taping Dimensions



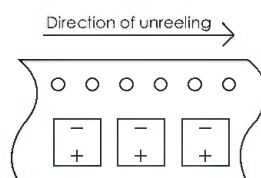
Dimension	A	B	W	E	F	P	K	t
Size Code	±0.2	±0.2	±0.3	±0.1	±0.1	±0.1	±0.2	±0.2
F60	7.0	7.0	16.0	1.75	7.5	12.0	6.3	0.4
F80	7.0	7.0	16.0	1.75	7.5	12.0	8.3	0.4
F10	7.0	7.0	24.0	1.75	11.5	16.0	10.5	0.4
B70	8.7	8.7	24.0	1.75	11.5	12.0	7.2	0.4
B10	8.7	8.7	24.0	1.75	11.5	16.0	11.0	0.4
B12	8.7	8.7	24.0	1.75	11.5	16.0	13.0	0.4
C10	10.7	10.7	24.0	1.75	11.5	16.0	11.0	0.4
C12	10.7	10.7	24.0	1.75	11.5	16.0	13.0	0.4

(unit:mm)

#### Reel Dimensions



#### Polarity



#### Quantity per reel

Size Code	Quantity (pcs/reel)
F60	1000
F80	900
F10	500
B70	1000
B10	500
B12	400
C10	500
C12	400



## Lifetime Estimation of Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

### 1. Lifetime Estimation

$$L_X = L_0 \times 2^{\frac{T_0 + \Delta T_0 - T_X}{10}}$$

Remark:

$$T_X = T_a + \Delta T, \Delta T = \Delta T_0 \times \left(\frac{I_X}{I_0}\right)^2$$

L<sub>x</sub>: Estimation of actual lifetime (hour)

L<sub>0</sub>: Stated lifetime under the rated ripple current superimposition at the upper limit of the category temperature (hours)

T<sub>0</sub>: Maximum category temperature (°C)

T<sub>x</sub>: Actual core temperature of the capacitor (°C)

T<sub>a</sub>: Actual ambient temperature of the capacitor (°C)

Use 40°C if the actual ambient temperature is below it.

ΔT: Rise of internal temperature due to actual ripple current (°C)

ΔT<sub>0</sub>: Rise of internal temperature due to the rated ripple current (°C)--- (Table-1)

I<sub>x</sub>: Operating ripple current (Arms) actually flowing in the capacitor

I<sub>0</sub>: Rated ripple current (Arms), at the upper limit of the category temperature range

Remark:

I<sub>x</sub> and I<sub>0</sub> ripple frequencies must be the same

Table-1: ΔT<sub>0</sub>

Series	PHLA/LE,PHVA/VE	PHLB,PHVB	PHLD,PHVD	PHLF,PHVF
ΔT <sub>0</sub> (°C)	10	6	10	5

### 2. Rated Ripple Current Frequency Multipliers

Self-heat rise is generated by the ripple current even though the conductive polymer hybrid aluminum electrolytic capacitors have low ESR compared to liquid based electrolyte aluminum electrolytic capacitor. The ESR value differs depending on the frequency, thus the degree of self-heat rise differs depending on the ripple current frequency. Therefore, if the actual ripple current frequency differs from the specifications stated in the standard ratings, use the value obtained by multiplying the rated ripple current multiplier to convert the rated current.

Conductive polymer hybrid aluminum electrolytic capacitors have super low ESR characteristic in high-frequency range. On the whole, ESR in low-frequency range relatively rises. Therefore, they can use only small ripple current in low-frequency range. Please ensure that excessive ripple current is not applied to the capacitors in all frequency range.

### 3. Restriction of estimated lifetime calculation

The result calculated by the estimated lifetime formula, it is not guaranteed lifetime by JIANGHAI Corporation. When designer calculate the lifetime of apparatus, please include an ample margin in consideration to the estimated lifetime of a capacitor. When calculated lifetime result are over 15 years by using the estimated lifetime formula, please consider 15 years to be a maximum in considering that the sealing rubber characteristics vary during the lifetime. If 15 years or more may be required as an expected lifetime, please consult us.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability, 105°C , 5000 hours
- AEC-Q200 Compliant
- RoHS Compliant



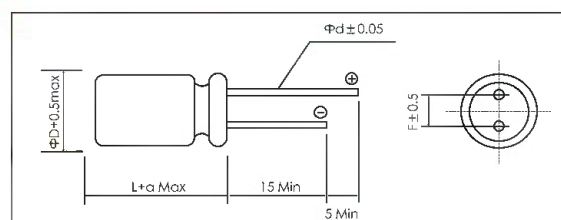
## Specifications

Items	Characteristics							
Category Temperature Range	-55 to +105°C							
Rated Voltage Range	25 to 80Vdc							
Capacitance Range	33 to 390μF							
Capacitance Tolerance	±20% (M) (at 20°C , 120Hz)							
Surge Voltage	Rated Voltage(V)×1.15							
Dissipation Factor (tanδ)	Rated Voltage(V)	16	25	35	50	63	80	
	tanδ(max)	0.16	0.14	0.12	0.10	0.08	0.08	
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$ Rated voltage applied, after 2 minutes.							
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^{\circ}C)/Z(+20^{\circ}C) \leq 2.0$ $Z(-25^{\circ}C)/Z(+20^{\circ}C) \leq 1.5$ (at 100kHz)							
Endurance	105°C, 5,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value					
Shelf Life	105°C, 1,000h	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value(after voltage processing)					
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value(after voltage processing)					
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value					
		DF (tanδ)	≤ The initial specified value					
		ESR	≤ The initial specified value					
		LC	≤ The initial specified value(after voltage processing)					

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
C10	10.0	10.0	1.5	5.0	0.6

## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
1~10	0.03	0.30	0.50	0.60	0.70	0.75	1.00
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~390	0.13	0.45	0.65	0.75	0.85	0.85	1.00



## Ratings for PHLA Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	-
25 1E	150	27	2300	8×11.5	PHR1ELA151MBAB□□35W□
	220	27	2300	8×11.5	PHR1ELA221MBAB□□35W□
	330	20	2500	10×10	PHR1ELA331MC10□□50W□
	390	20	2500	10×10	PHR1ELA391MC10□□50W□
35 1V	100	27	2300	8×11.5	PHR1VLA101MBAB□□35W□
	150	27	2300	8×11.5	PHR1VLA151MBAB□□35W□
	220	20	2500	10×10	PHR1VLA221MC10□□50W□
	270	20	2500	10×10	PHR1VLA271MC10□□50W□
50 1H	33	30	1800	8×11.5	PHR1HLA330MBAB□□35W□
	47	30	1800	8×11.5	PHR1HLA470MBAB□□35W□
	56	30	1800	8×11.5	PHR1HLA560MBAB□□35W□
	68	30	1800	8×11.5	PHR1HLA680MBAB□□35W□
	100	28	2000	10×10	PHR1HLA101MC10□□50W□
	120	28	2000	10×10	PHR1HLA121MC10□□50W□
63 1J	33	40	1700	8×11.5	PHR1JLA330MBAB□□35W□
	47	40	1700	8×11.5	PHR1JLA470MBAB□□35W□
	56	30	1800	10×10	PHR1JLA560MC10□□50W□
	82	30	1800	10×10	PHR1JLA820MC10□□50W□
	100	30	1800	10×10	PHR1JLA101MC10□□50W□
80 1K	56	36	1700	10×10	PHR1KLA560MC10□□50W□

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability, 125°C , 4000 hours.
- AEC-Q200 Compliant
- RoHS Compliant



## Specifications

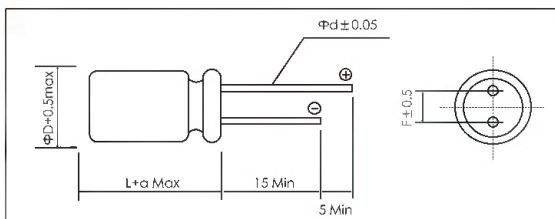
Items	Characteristics					
Category Temperature Range	-55 to +125°C					
Rated Voltage Range	25 to 80Vdc					
Capacitance Range	33 to 470μF					
Capacitance Tolerance	±20% (M) (at 20°C , 120Hz)					
Surge Voltage	Rated Voltage(V)×1.15					
Dissipation Factor (tanδ)	Rated Voltage(V) tanδ(max)	25 0.14	35 0.12	50 0.10	63 0.08	80 0.08
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$ Rated voltage applied, after 2 minutes.					
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^{\circ}C)/Z(+20^{\circ}C) \leq 2.0$ $Z(-25^{\circ}C)/Z(+20^{\circ}C) \leq 1.5$ (at 100kHz)					
Endurance	125°C, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value			
Shelf Life	125°C, 1,000h	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value			
		DF (tanδ)	≤ The initial specified value			
		ESR	≤ The initial specified value			
		LC	≤ The initial specified value(after voltage processing)			

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

HYBRID

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
C10	10.0	10.0	1.5	5.0	0.6

## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~150	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~470	0.13	0.45	0.65	0.75	0.85	0.85	1.00



## Ratings for PHLB Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	-
25 1E	220	27	1600	8×11.5	PHR1ELB221MBAB□□35W□
	330	20	2000	10×10	PHR1ELB331MC10□□50W□
	390	20	2000	10×10	PHR1ELB391MC10□□50W□
	470	20	2100	10×10	PHR1ELB471MC10□□50W□
35 1V	100	27	1600	8×11.5	PHR1VLB101MBAB□□35W□
	150	27	1600	8×11.5	PHR1VLB151MBAB□□35W□
	220	20	2000	10×10	PHR1VLB221MC10□□50W□
	270	20	2000	10×10	PHR1VLB271MC10□□50W□
50 1H	47	30	1250	8×11.5	PHR1HLB470MBAB□□35W□
	68	30	1250	8×11.5	PHR1HLB680MBAB□□35W□
	82	30	1500	10×10	PHR1HLB820MC10□□50W□
	100	28	1600	10×10	PHR1HLB101MC10□□50W□
63 1J	33	40	1100	8×11.5	PHR1JLB330MBAB□□35W□
	47	40	1100	8×11.5	PHR1JLB470MBAB□□35W□
	56	30	1400	10×10	PHR1JLB560MC10□□50W□
	68	30	1400	10×10	PHR1JLB680MC10□□50W□
80 1K	33	36	1360	10×10	PHR1KLB330MC10□□50W□

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, 125°C, 4000 hours
- Extra high ripple current, large capacitance
- AEC-Q200 Compliant
- RoHS Compliant



## Specifications

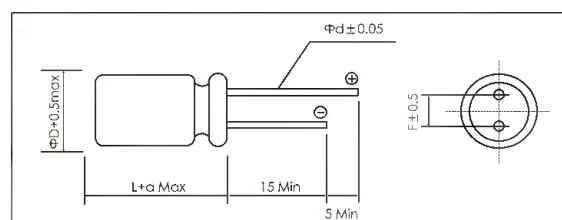
Items	Characteristics					
Category Temperature Range	-55 to +125°C					
Rated Voltage Range	25 to 63Vdc					
Capacitance Range	100 to 820μF					
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)					
Surge Voltage	Rated Voltage(V)×1.15					
Dissipation Factor (tanδ)	Rated Voltage(V) tanδ(max)	25 0.14	35 0.12	50 0.10	63 0.08	
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$ Rated voltage applied, after 2 minutes.					
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^{\circ}C)/Z(+20^{\circ}C) \leq 2.0$ $Z(-25^{\circ}C)/Z(+20^{\circ}C) \leq 1.5$ (at 100kHz)					
Load Life	125°C, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value			
Shelf Life	125°C, 1,000h	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Resistance to soldering heat	Reflow method (260±5°C × 5s)	ΔC/C	≤ ±10% of the initial value			
		DF (tanδ)	≤ The initial specified value			
		ESR	≤ The initial specified value			
		LC	≤ The initial specified value(after voltage processing)			

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

HYBRID

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	a max	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
C10	10.0	10.0	1.5	5.0	0.6
CAC	10.0	12.5	1.5	5.0	0.6
C16	10.0	16.0	1.5	5.0	0.6
C20	10.0	20.0	1.5	5.0	0.6

## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
100~820	0.15	0.45	0.65	0.75	0.85	0.85	1.00



## Ratings for PHLD Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	-
25 1E	270	27	2000	8 × 11.5	PHR1ELD271MBAB □ □ 35W □
	390	20	2800	10 × 10	PHR1ELD391MC10 □ □ 50W □
	470	20	2800	10 × 10	PHR1ELD471MC10 □ □ 50W □
	470	16	3500	10 × 12.5	PHR1ELD471MCAC □ □ 50W □
	560	13	4000	10 × 16	PHR1ELD561MC16 □ □ 50W □
	820	11	4500	10 × 20	PHR1ELD821MC20 □ □ 50W □
35 1V	180	27	2000	8 × 11.5	PHR1VLD181MBAB □ □ 35W □
	330	20	2800	10 × 10	PHR1VLD331MC10 □ □ 50W □
	330	16	3500	10 × 12.5	PHR1VLD331MCAC □ □ 50W □
	470	13	4000	10 × 16	PHR1VLD471MC16 □ □ 50W □
	560	11	4500	10 × 20	PHR1VLD561MC20 □ □ 50W □
50 1H	150	17	3200	10 × 12.5	PHR1HLD151MCAC □ □ 50W □
	220	14	3700	10 × 16	PHR1HLD221MC16 □ □ 50W □
	270	13	4200	10 × 20	PHR1HLD271MC20 □ □ 50W □
63 1J	100	19	3000	10 × 12.5	PHR1JLD101MCAC □ □ 50W □
	150	15	3500	10 × 16	PHR1JLD151MC16 □ □ 50W □
	180	14	4000	10 × 20	PHR1JLD181MC20 □ □ 50W □

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability,  
Large Capacitance, 105°C, 10000 hours.
- AEC-Q200 Compliant
- RoHS Compliant



## Specifications

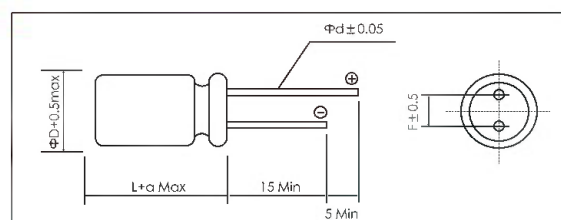
Items	Characteristics					
Category Temperature Range	-55 to +105°C					
Rated Voltage Range	25 to 80Vdc					
Capacitance Range	33 to 390μF					
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)					
Surge Voltage	Rated Voltage(V)×1.15					
Dissipation Factor (tanδ)	Rated Voltage(V) tanδ(max)	25 0.14	35 0.12	50 0.10	63 0.08	80 0.08
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$ Rated voltage applied, after 2 minutes.					
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^{\circ}C)/Z(+20^{\circ}C) \leq 2.0$ $Z(-25^{\circ}C)/Z(+20^{\circ}C) \leq 1.5$ (at 100kHz)					
Load Life	105°C, 10,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value			
Shelf Life	105°C, 1,000h	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value			
		DF (tanδ)	≤ The initial specified value			
		ESR	≤ The initial specified value			
		LC	≤ The initial specified value(after voltage processing)			

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

HYBRID

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	amax	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
C10	10.0	10.0	1.5	5.0	0.6

## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~390	0.13	0.45	0.65	0.75	0.85	0.85	1.00



## Ratings for PHLE Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	-
25 1E	150	27	2300	8×11.5	PHR1ELE151MBAB □□35W□
	220	27	2300	8×11.5	PHR1ELE221MBAB □□35W□
	330	20	2500	10×10	PHR1ELE331MC10 □□50W□
	390	20	2500	10×10	PHR1ELE391MC10 □□50W□
35 1V	100	27	2300	8×11.5	PHR1VLE101MBAB □□35W□
	150	27	2300	8×11.5	PHR1VLE151MBAB □□35W□
	220	20	2500	10×10	PHR1VLE221MC10 □□50W□
	270	20	2500	10×10	PHR1VLE271MC10 □□50W□
50 1H	33	30	1800	8×11.5	PHR1HLE330MBAB □□35W□
	47	30	1800	8×11.5	PHR1HLE470MBAB □□35W□
	56	30	1800	8×11.5	PHR1HLE560MBAB □□35W□
	68	30	1800	8×11.5	PHR1HLE680MBAB □□35W□
	100	28	2000	10×10	PHR1HLE101MC10 □□50W□
63 1J	33	40	1700	8×11.5	PHR1JLE330MBAB □□35W□
	47	40	1700	8×11.5	PHR1JLE470MBAB □□35W□
	56	30	1800	10×10	PHR1JLE560MC10 □□50W□
	82	30	1800	10×10	PHR1JLE820MC10 □□50W□
80 1K	33	36	1700	10×10	PHR1KLE330MC10 □□50W□

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability,  
Large Capacitance, 135°C, 4000 hours.
- AEC-Q200 Compliant
- RoHS Compliant



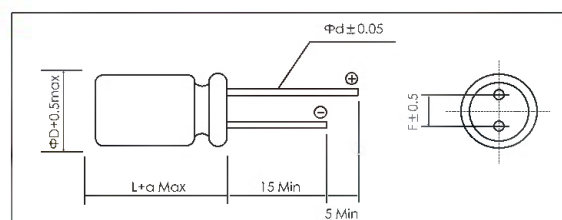
## Specifications

Items	Characteristics					
Category Temperature Range	-55 to +135°C					
Rated Voltage Range	25 to 63Vdc					
Capacitance Range	33 to 560μF					
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)					
Surge Voltage	Rated Voltage(V)×1.15					
Dissipation Factor (tanδ)	Rated Voltage(V)	25	35	50	63	
	tanδ(max)	0.14	0.12	0.10	0.08	
Leakage Current ※1	I ≤ 0.01CV or 3(μA) Rated voltage applied, after 2 minutes.					
Temperature Characteristics (Max. Impedance Ratio)	Z(-55°C)/Z(+20°C) ≤ 2.0 Z(-25°C)/Z(+20°C) ≤ 1.5 (at 100kHz)					
Load Life	135°C, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value			
Shelf Life	135°C, 1,000h	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value			
		DF (tanδ)	≤ The initial specified value			
		ESR	≤ The initial specified value			
		LC	≤ The initial specified value(after voltage processing)			

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L	a max	F±0.5	Φd±0.05
BAB	8.0	11.5	1.5	3.5	0.6
C10	10.0	10.0	1.5	5.0	0.6
CAC	10.0	12.5	1.5	5.0	0.6
C16	10.0	16	1.5	5.0	0.6

## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~560	0.13	0.45	0.65	0.75	0.85	0.85	1.00



## Ratings for PHLF Series

U <sub>R</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size Φ D x L	P/N
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	-
25 1E	220	27	1600	8×11.5	PHR1ELF221MBAB □□35W□
	330	20	2000	10×10	PHR1ELF331MC10 □□50W□
	470	16	2500	10×12.5	PHR1ELF471MCAC□□50W□
	560	14	2600	10×16	PHR1ELF561MC16 □□50W□
35 1V	150	27	1600	8×11.5	PHR1VLF151MBAB □□35W□
	270	20	2000	10×10	PHR1VLF271MC10 □□50W□
	330	17	2400	10×12.5	PHR1VLF331MCAC□□50W□
	470	14	2500	10×16	PHR1VLF471MC16 □□50W□
50 1H	47	30	1250	8×11.5	PHR1HLF470MBAB □□35W□
	100	25	1600	10×10	PHR1HLF101MC10 □□50W□
	120	25	1600	10×10	PHR1HLF121MC10 □□50W□
	150	19	2250	10×12.5	PHR1HLF151MCAC□□50W□
	220	16	2400	10×16	PHR1HLF221MC16 □□50W□
63 1J	33	40	1100	8×11.5	PHR1JLF330MBAB □□35W□
	56	30	1400	10×10	PHR1JLF560MC10 □□50W□
	100	22	2100	10×12.5	PHR1JLF101MCAC□□50W□
	150	16	2400	10×16	PHR1JLF151MC16 □□50W□

Customer products are available on request.

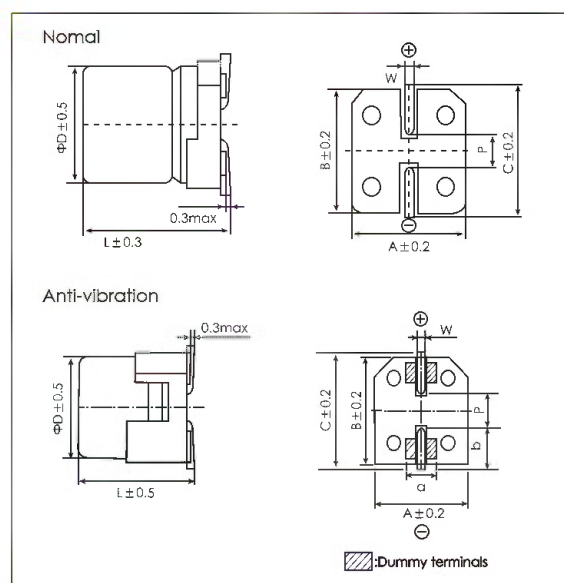


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Items	Characteristics							
Category Temperature Range	-55 to +105℃							
Rated Voltage Range	25 to 80Vdc							
Capacitance Range	33 to 390μF							
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)							
Surge Voltage	Rated Voltage(V)×1.15							
Dissipation Factor (tanδ)	-	Rated Voltage(V)	16	25	35	50	63	80
		tanδ(max)	0.16	0.14	0.12	0.10	0.08	0.08
Leakage Current ※1	I ≤ 0.01CVor3(μA) Rated voltage applied, after 2 minutes.							
Temperature Characteristics (Max. Impedance Ratio)	Z(-55℃)/Z(+20℃) ≤ 2.0 Z(-25℃)/Z(+20℃) ≤ 1.5							
Endurance	105℃, 5,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value					
Shelf Life	105℃, 1,000h	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value(after voltage processing)					
Damp heat(Steady state)	85℃, 85to90%RH 2,000H (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value					
		DF (tanδ)	≤ 200% of the initial specified value					
		ESR	≤ 200% of the initial specified value					
		LC	≤ The initial specified value(after voltage processing)					
Resistance to soldering heat	Reflow method (260±5℃ × 5s)	ΔC/C	≤ ±10% of the initial value					
		DF (tanδ)	≤ The initial specified value					
		ESR	≤ The initial specified value					
		LC	≤ The initial specified value(after voltage processing)					

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## mm



Size Code	ΦD±0.5	L±0.5	A±0.2	B±0.2	C±0.2	W	P±0.2
F80	6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.0
B10	8	10	8.3	8.3	9.0	0.7 to 1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7 to 1.1	4.6

(unit:mm)									
Size Code	$\Phi D \pm 0.5$	$L \pm 1$	$A \pm 0.2$	$B \pm 0.2$	$C \pm 0.2$	W	$P \pm 0.2$	$\alpha$	b
B10	8	10	8.3	8.3	9.2	0.7 to 1.1	3.1	4	3
C10	10	10	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2



## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
1~10	0.03	0.30	0.50	0.60	0.70	0.75	1.00
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~390	0.13	0.45	0.65	0.75	0.85	0.85	1.00

## Ratings for PHVA Series

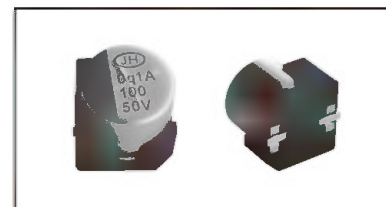
U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ D × L	P/N	
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	Normal	Anti-vibration
25 1E	68	30	2000	6.3×7.7	PHV1EVA680MF80FVTSWX	/
	100	30	2000	6.3×7.7	PHV1EVA101MF80FVTSWX	/
	150	27	2300	8×10	PHV1EVA151MB10FVTSWX	PHV1EVA151MB10FVTSWG
	220	27	2300	8×10	PHV1EVA221MB10FVTSWX	PHV1EVA221MB10FVTSWG
	330	20	2500	10×10	PHV1EVA331MC10FVTSWX	PHV1EVA331MC10FVTSWG
	390	20	2500	10×10	PHV1EVA391MC10FVTSWX	PHV1EVA391MC10FVTSWG
35 1V	68	35	2000	6.3×7.7	PHV1VVA680MF80FVTSWX	/
	100	27	2300	8×10	PHV1VVA101MB10FVTSWX	PHV1VVA101MB10FVTSWG
	150	27	2300	8×10	PHV1VVA151MB10FVTSWX	PHV1VVA151MB10FVTSWG
	220	20	2500	10×10	PHV1VVA221MC10FVTSWX	PHV1VVA221MC10FVTSWG
	270	20	2500	10×10	PHV1VVA271MC10FVTSWX	PHV1VVA271MC10FVTSWG
50 1H	33	40	1600	6.3×7.7	PHV1HVA330MF80FVTSWX	/
	33	30	1800	8×10	PHV1HVA330MB10FVTSWX	PHV1HVA330MB10FVTSWG
	47	30	1800	8×10	PHV1HVA470MB10FVTSWX	PHV1HVA470MB10FVTSWG
	56	30	1800	8×10	PHV1HVA560MB10FVTSWX	PHV1HVA560MB10FVTSWG
	68	30	1800	8×10	PHV1HVA680MB10FVTSWX	PHV1HVA680MB10FVTSWG
	100	28	2000	10×10	PHV1HVA101MC10FVTSWX	PHV1HVA101MC10FVTSWG
	120	28	2000	10×10	PHV1HVA121MC10FVTSWX	PHV1HVA121MC10FVTSWG
63 1J	33	40	1700	8×10	PHV1JVA330MB10FVTSWX	PHV1JVA330MB10FVTSWG
	47	40	1700	8×10	PHV1JVA470MB10FVTSWX	PHV1JVA470MB10FVTSWG
	56	30	1800	10×10	PHV1JVA560MC10FVTSWX	PHV1JVA560MC10FVTSWG
	82	30	1800	10×10	PHV1JVA820MC10FVTSWX	PHV1JVA820MC10FVTSWG
	100	30	1800	10×10	PHV1JVA101MC10FVTSWX	PHV1JVA101MC10FVTSWG
80 1K	56	36	1700	10×10	PHV1KVA560MC10FVTSWX	PHV1KVA560MC10FVTSWG

HYBRID

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability, 125°C, 4000 hours
- AEC-Q200 Compliant
- RoHS Compliant



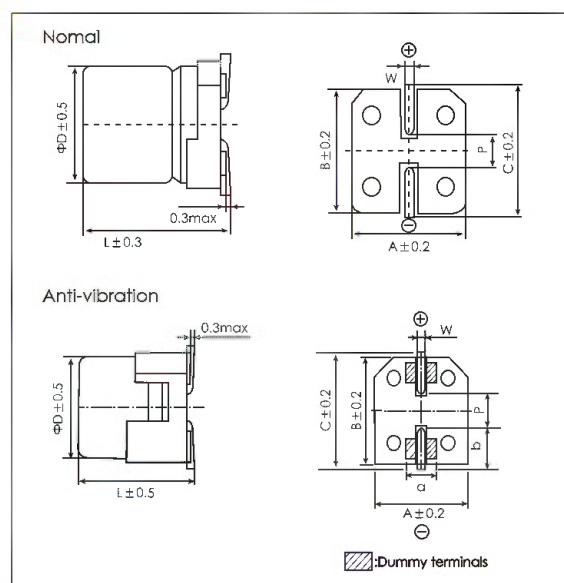
## Specifications

Items	Characteristics						
Category Temperature Range	-55 to +125℃						
Rated Voltage Range	25 to 80Vdc						
Capacitance Range	33 to 470μF						
Capacitance Tolerance	±20% {M} (at 20℃, 120Hz)						
Surge Voltage	Rated Voltage(V)×1.15						
Dissipation Factor (tanδ)	Rated Voltage(V)	25	35	50	63	80	
	tanδ(max)	0.14	0.12	0.10	0.08	0.08	
Leakage Current ※1	I ≤ 0.01C V or 3{μA} Rated voltage applied, after 2 minutes.						
Temperature Characteristics (Max. Impedance Ratio)	Z(-55℃)/Z(+20℃) ≤ 2.0 Z(-25℃)/Z(+20℃) ≤ 1.5						
Endurance	125℃, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value				
Shelf Life	125℃, 1,000h	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value(after voltage processing)				
Damp heat(Steady state)	85℃, 85to90%RH, 2,000H (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value(after voltage processing)				
Resistance to soldering heat	Reflow method (260±5℃ × 5s)	ΔC/C	≤ ±10% of the initial value				
		DF (tanδ)	≤ The initial specified value				
		ESR	≤ The initial specified value				
		LC	≤ The initial specified value(after voltage processing)				

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105℃.

## Dimensions

mm



Size Code	ΦD±0.5	L±0.5	A±0.2	B±0.2	C±0.2	W	P±0.2
F80	6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.0
B10	8	10	8.3	8.3	9.0	0.7 to 1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7 to 1.1	4.6

(unit:mm)									
Size Code	$\Phi D \pm 0.5$	$L \pm 1$	$A \pm 0.2$	$B \pm 0.2$	$C \pm 0.2$	W	$P \pm 0.2$	$\alpha$	b
B10	8	10	8.3	8.3	9.2	0.7 to 1.1	3.1	4	3
C10	10	10	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2



## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~150	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~470	0.13	0.45	0.65	0.75	0.85	0.85	1.00

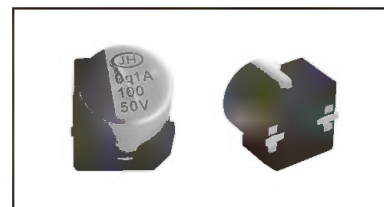
## Ratings for PHVB Series

U <sub>R</sub> Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current 125°C,100kHz	Size Φ D x L	P/N	
[V]	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	Nomal	Anti-vibration
25 1E	68	30	1400	6.3×7.7	PHV1EVB680MF80FVTSWX	/
	100	30	1400	6.3×7.7	PHV1EVB101MF80FVTSWX	/
	220	27	1600	8×10	PHV1EVB221MB10FVTSWX	PHV1EVB221MB10FVTSWG
	330	20	2000	10×10	PHV1EVB331MC10FVTSWX	PHV1EVB331MC10FVTSWG
	390	20	2000	10×10	PHV1EVB391MC10FVTSWX	PHV1EVB391MC10FVTSWG
	470	20	2100	10×10	PHV1EVB471MC10FVTSWX	PHV1EVB471MC10FVTSWG
35 1V	68	35	1400	6.3×7.7	PHV1VVB680MF80FVTSWX	/
	100	27	1600	8×10	PHV1VVB101MB10FVTSWX	PHV1VVB101MB10FVTSWG
	150	27	1600	8×10	PHV1VVB151MB10FVTSWX	PHV1VVB151MB10FVTSWG
	220	20	2000	10×10	PHV1VVB221MC10FVTSWX	PHV1VVB221MC10FVTSWG
	270	20	2000	10×10	PHV1VVB271MC10FVTSWX	PHV1VVB271MC10FVTSWG
50 1H	33	40	1100	6.3×7.7	PHV1HVB330MF80FVTSWX	/
	47	30	1250	8×10	PHV1HVB470MB10FVTSWX	PHV1HVB470MB10FVTSWG
	68	30	1250	8×10	PHV1HVB680MB10FVTSWX	PHV1HVB680MB10FVTSWG
	82	30	1500	10×10	PHV1HVB820MC10FVTSWX	PHV1HVB820MC10FVTSWG
	100	28	1600	10×10	PHV1HVB101MC10FVTSWX	PHV1HVB101MC10FVTSWG
63 1J	33	40	1100	8×10	PHV1JVB330MB10FVTSWX	PHV1JVB330MB10FVTSWG
	47	40	1100	8×10	PHV1JVB470MB10FVTSWX	PHV1JVB470MB10FVTSWG
	56	30	1400	10×10	PHV1JVB560MC10FVTSWX	PHV1JVB560MC10FVTSWG
	68	30	1400	10×10	PHV1JVB680MC10FVTSWX	PHV1JVB680MC10FVTSWG
80 1K	33	36	1360	10×10	PHV1KVB330MC10FVTSWX	PHV1KVB330MC10FVTSWG

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, 125°C, 4000 hours
- Extra high ripple current, large capacitance
- AEC-Q200 Compliant
- RoHS Compliant



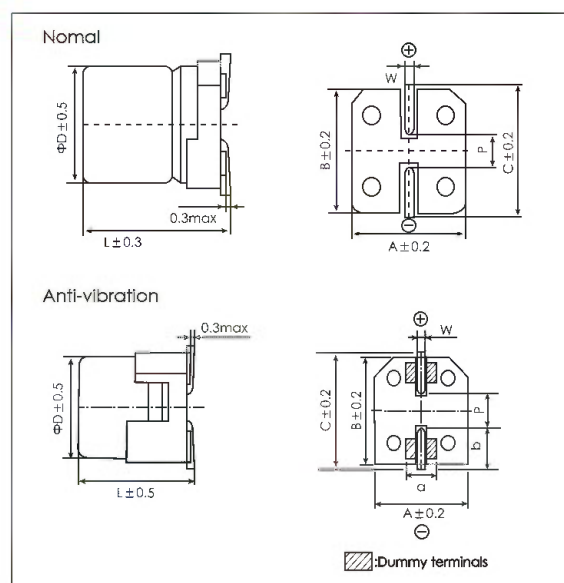
## Specifications

Items	Characteristics				
Category Temperature Range	-55 to +125°C				
Rated Voltage Range	25 to 63Vdc				
Capacitance Range	100 to 560μF				
Capacitance Tolerance	±20% (M)				
Surge Voltage	Rated Voltage(V)×1.15				
Dissipation Factor (tanδ)	Rated Voltage(V)	25	35	50	63
	tanδ(max)	0.14	0.12	0.10	0.08
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$				
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^{\circ}C)/Z(+20^{\circ}C) \leq 2.0$ $Z(-25^{\circ}C)/Z(+20^{\circ}C) \leq 1.5$				
Load Life	125°C, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value		
		DF (tanδ)	≤ 200% of the initial specified value		
		ESR	≤ 200% of the initial specified value		
		LC	≤ The initial specified value		
Shelf Life	125°C, 1,000h	ΔC/C	≤ ±30% of the initial value		
		DF (tanδ)	≤ 200% of the initial specified value		
		ESR	≤ 200% of the initial specified value		
		LC	≤ The initial specified value(after voltage processing)		
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value		
		DF (tanδ)	≤ 200% of the initial specified value		
		ESR	≤ 200% of the initial specified value		
		LC	≤ The initial specified value(after voltage processing)		
Resistance to soldering heat	Reflow method (260±5°C × 5s)	ΔC/C	≤ ±10% of the initial value		
		DF (tanδ)	≤ The initial specified value		
		ESR	≤ The initial specified value		
		LC	≤ The initial specified value(after voltage processing)		

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L±0.5	A±0.2	B±0.2	C±0.2	W	P±0.2
B10	8	10	8.3	8.3	9.0	0.7 to 1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7 to 1.1	4.6
C12	10	12.2	10.3	10.3	11.0	0.7 to 1.1	4.6
C16	10	16	10.3	10.3	11.0	0.7 to 1.1	4.6

(unit:mm)

Size Code	ΦD±0.5	L±1	A±0.2	B±0.2	C±0.2	W	P±0.2	a	b
B10	8	10	8.3	8.3	9.2	0.7 to 1.1	3.1	4	3
C10	10	10	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2
C12	10	12.2	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2
C16	10	16	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2



## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
100~560	0.15	0.45	0.65	0.75	0.85	0.85	1.00

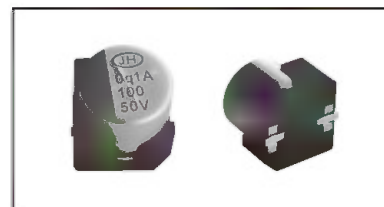
## Ratings for PHVD Series

U <sub>R</sub> Code	Rated Capacitance 20°C,120Hz	Max ESR 20°C,100kHz	Rated Ripple Current 125°C,100kHz	Size Φ D x L	P/N	
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	Nomal	Anti-vibration
25 1E	270	27	2000	8×10	PHV1EVD271MB10FVTSWX	PHV1EVD271MB10FVTSWG
	390	20	2800	10×10	PHV1EVD391MC10FVTSWX	PHV1EVD391MC10FVTSWG
	470	20	2800	10×10	PHV1EVD471MC10FVTSWX	PHV1EVD471MC10FVTSWG
	470	16	3500	10×12.2	PHV1EVD471MC12FVTSWX	PHV1EVD471MC12FVTSWG
	560	13	4000	10×16	PHV1EVD561MC16FVTSWX	PHV1EVD561MC16FVTSWG
35 1V	180	27	2000	8×10	PHV1VVD181MB10FVTSWX	PHV1VVD181MB10FVTSWG
	330	20	2800	10×10	PHV1VVD331MC10FVTSWX	PHV1VVD331MC10FVTSWG
	330	16	3500	10×12.2	PHV1VVD331MC12FVTSWX	PHV1VVD331MC12FVTSWG
	470	13	4000	10×16	PHV1VVD471MC16FVTSWX	PHV1VVD471MC16FVTSWG
50 1H	150	17	3200	10×12.2	PHV1HVD151MC12FVTSWX	PHV1HVD151MC12FVTSWG
	220	14	3700	10×16	PHV1HVD221MC16FVTSWX	PHV1HVD221MC16FVTSWG
63 1J	100	19	3000	10×12.2	PHV1JVD101MC12FVTSWX	PHV1JVD101MC12FVTSWG
	150	15	3500	10×16	PHV1JVD151MC16FVTSWX	PHV1JVD151MC16FVTSWG

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability, Large Capacitance 105°C, 10000 hours.
- AEC-Q200 Compliant
- RoHS Compliant



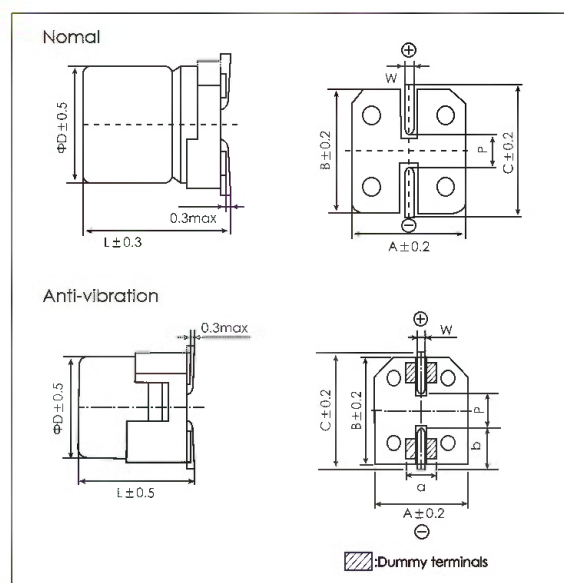
## Specifications

Items	Characteristics						
Category Temperature Range	-55 to +105°C						
Rated Voltage Range	25 to 80Vdc						
Capacitance Range	33 to 390μF						
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)						
Surge Voltage	Rated Voltage(V)×1.15						
Dissipation Factor (tanδ)	Rated Voltage(V)	25	35	50	63	80	
	tanδ(max)	0.14	0.12	0.10	0.08	0.08	
Leakage Current ※1	$I \leq 0.01 CV \text{ or } 3(\mu A)$ Rated voltage applied, after 2 minutes.						
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^\circ C)/Z(+20^\circ C) \leq 2.0$ $Z(-25^\circ C)/Z(+20^\circ C) \leq 1.5$						
Load Life	105°C, 10,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value				
Shelf Life	105°C, 1,000h	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value(after voltage processing)				
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value				
		DF (tanδ)	≤ 200% of the initial specified value				
		ESR	≤ 200% of the initial specified value				
		LC	≤ The initial specified value(after voltage processing)				
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value				
		DF (tanδ)	≤ The initial specified value				
		ESR	≤ The initial specified value				
		LC	≤ The initial specified value(after voltage processing)				

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L±0.5	A±0.2	B±0.2	C±0.2	W	P±0.2
F80	6.3	7.7	6.6	6.6	7.3	0.5 to 0.8	2.0
B10	8	10	8.3	8.3	9.0	0.7 to 1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7 to 1.1	4.6

(unit:mm)

Size Code	ΦD±0.5	L±1	A±0.2	B±0.2	C±0.2	W	P±0.2	a	b
B10	8	10	8.3	8.3	9.2	0.7to1.1	3.1	4	3
C10	10	10	10.3	10.3	11.2	0.7to1.1	4.6	4.4	3.2



## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
1~10	0.03	0.30	0.50	0.60	0.70	0.75	1.00
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~390	0.13	0.45	0.65	0.75	0.85	0.85	1.00

## Ratings for PHVE Series

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size Φ D x L	P/N	
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	Normal	Anti-vibration
25 1E	68	30	2000	6.3×7.7	PHV1EVE680MF80FVTSWX	/
	100	30	2000	6.3×7.7	PHV1EVE101MF80FVTSWX	/
	150	27	2300	8×10	PHV1EVE151MB10FVTSWX	PHV1EVE151MB10FVTSWG
	220	27	2300	8×10	PHV1EVE221MB10FVTSWX	PHV1EVE221MB10FVTSWG
	330	20	2500	10×10	PHV1EVE331MC10FVTSWX	PHV1EVE331MC10FVTSWG
	390	20	2500	10×10	PHV1EVE391MC10FVTSWX	PHV1EVE391MC10FVTSWG
35 1V	68	35	2000	6.3×7.7	PHV1VVE680MF80FVTSWX	/
	100	27	2300	8×10	PHV1VVE101MB10FVTSWX	PHV1VVE101MB10FVTSWG
	150	27	2300	8×10	PHV1VVE151MB10FVTSWX	PHV1VVE151MB10FVTSWG
	220	20	2500	10×10	PHV1VVE221MC10FVTSWX	PHV1VVE221MC10FVTSWG
	270	20	2500	10×10	PHV1VVE271MC10FVTSWX	PHV1VVE271MC10FVTSWG
50 1H	33	40	1600	6.3×7.7	PHV1HVE330MF80FVTSWX	/
	33	30	1800	8×10	PHV1HVE330MB10FVTSWX	PHV1HVE330MB10FVTSWG
	47	30	1800	8×10	PHV1HVE470MB10FVTSWX	PHV1HVE470MB10FVTSWG
	56	30	1800	8×10	PHV1HVE560MB10FVTSWX	PHV1HVE560MB10FVTSWG
	68	30	1800	8×10	PHV1HVE680MB10FVTSWX	PHV1HVE680MB10FVTSWG
	100	28	2000	10×10	PHV1HVE101MC10FVTSWX	PHV1HVE101MC10FVTSWG
63 1J	33	40	1700	8×10	PHV1JVE330MB10FVTSWX	PHV1JVE330MB10FVTSWG
	47	40	1700	8×10	PHV1JVE470MB10FVTSWX	PHV1JVE470MB10FVTSWG
	56	30	1800	10×10	PHV1JVE560MC10FVTSWX	PHV1JVE560MC10FVTSWG
	82	30	1800	10×10	PHV1JVE820MC10FVTSWX	PHV1JVE820MC10FVTSWG
80 1K	33	36	1700	10×10	PHV1KVE330MC10FVTSWX	PHV1KVE330MC10FVTSWG

HYBRID

Customer products are available on request.



- Conductive Polymer Hybrid Aluminum Electrolytic Capacitors
- Low ESR, high ripple current capability, Large Capacitance 135°C, 4000 hours.
- AEC-Q200 Compliant
- RoHS Compliant



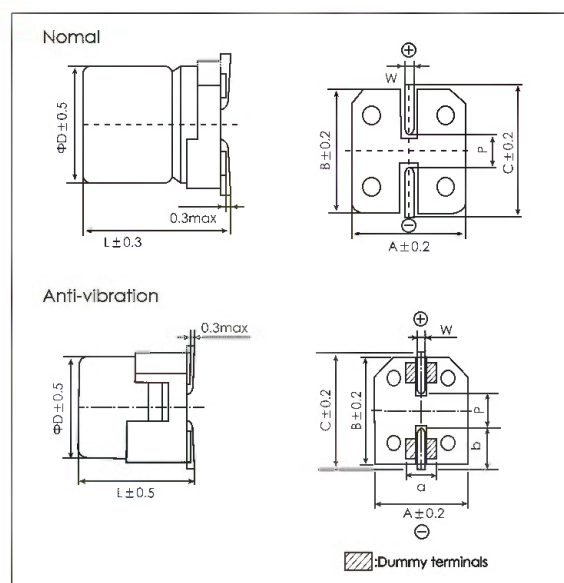
## Specifications

Items	Characteristics					
Category Temperature Range	-55 to +135°C					
Rated Voltage Range	25 to 63Vdc					
Capacitance Range	33 to 560μF					
Capacitance Tolerance	±20% (M)					
Surge Voltage	Rated Voltage(V)×1.15					
Dissipation Factor (tanδ)	Rated Voltage(V)	25	35	50	63	
	tanδ(max)	0.14	0.12	0.10	0.08	
Leakage Current ※1	$I \leq 0.01CV$ or $3(\mu A)$					
Temperature Characteristics (Max. Impedance Ratio)	$Z(-55^\circ C)/Z(+20^\circ C) \leq 2.0$ $Z(-25^\circ C)/Z(+20^\circ C) \leq 1.5$					
Load Life	135°C, 4,000h AC+DC ≤ Rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value			
Shelf Life	135°C, 1,000h	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Damp heat(Steady state)	85°C, 85to90%RH 2,000h (D≤6.3mm, 1,000h) rated voltage applied	ΔC/C	≤ ±30% of the initial value			
		DF (tanδ)	≤ 200% of the initial specified value			
		ESR	≤ 200% of the initial specified value			
		LC	≤ The initial specified value(after voltage processing)			
Resistance to soldering heat	Reflow method (260±5 °C × 5s)	ΔC/C	≤ ±10% of the initial value			
		DF (tanδ)	≤ The initial specified value			
		ESR	≤ The initial specified value			
		LC	≤ The initial specified value(after voltage processing)			

※1 In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C.

## Dimensions

mm



(unit:mm)

Size Code	ΦD±0.5	L±0.5	A±0.2	B±0.2	C±0.2	W	P±0.2
B10	8	10	8.3	8.3	9.0	0.7 to 1.1	3.1
C10	10	10	10.3	10.3	11.0	0.7 to 1.1	4.6
C12	10	12.2	10.3	10.3	11.0	0.7 to 1.1	4.6
C16	10	16	10.3	10.3	11.0	0.7 to 1.1	4.6

(unit:mm)

Size Code	ΦD±0.5	L±1	A±0.2	B±0.2	C±0.2	W	P±0.2	a	b
B10	8	10	8.3	8.3	9.2	0.7 to 1.1	3.1	4	3
C10	10	10	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2
C12	10	12.2	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2
C16	10	16	10.3	10.3	11.2	0.7 to 1.1	4.6	4.4	3.2



## Frequency coefficient for ripple current

Frequency Cap(μF)	120Hz	1kHz	5kHz	10kHz	20kHz	30kHz	100k~500k
1~10	0.03	0.30	0.50	0.60	0.70	0.75	1.00
15~33	0.07	0.30	0.50	0.60	0.70	0.75	1.00
47~180	0.10	0.40	0.60	0.70	0.80	0.80	1.00
220~560	0.13	0.45	0.65	0.75	0.85	0.85	1.00

## Ratings for PHVF Series

U <sub>r</sub> Code	Rated Capacitance 20°C, 120Hz	Max ESR 20°C, 100kHz	Rated Ripple Current 135°C, 100kHz	Size Φ D x L	P/N	
(V)	(μF)	(mΩ)	(mA <sub>rms</sub> )	(mm)	Normal	Anti-vibration
25 1E	220	27	1600	8×10	PHV1EVF221MB10FVTSWX	PHV1EVF221MB10FVTSWG
	330	20	2000	10×10	PHV1EVF331MC10FVTSWX	PHV1EVF331MC10FVTSWG
	470	16	2500	10×12.2	PHV1EVF471MC12FVTSWX	PHV1EVF471MC12FVTSWG
	560	14	2650	10×16	PHV1EVF561MC16FVTSWX	PHV1EVF561MC16FVTSWG
35 1V	150	27	1600	8×10	PHV1VVF151MB10FVTSWX	PHV1VVF151MB10FVTSWG
	270	20	2000	10×10	PHV1VVF271MC10FVTSWX	PHV1VVF271MC10FVTSWG
	330	17	2400	10×12.2	PHV1VVF331MC12FVTSWX	PHV1VVF331MC12FVTSWG
	470	14	2500	10×16	PHV1VVF471MC16FVTSWX	PHV1VVF471MC16FVTSWG
50 1H	47	30	1250	8×10	PHV1HVF470MB10FVTSWX	PHV1HVF470MB10FVTSWG
	100	25	1600	10×10	PHV1HVF101MC10FVTSWX	PHV1HVF101MC10FVTSWG
	120	25	1600	10×10	PHV1HVF121MC10FVTSWX	PHV1HVF121MC10FVTSWG
	150	19	2250	10×12.2	PHV1HVF151MC12FVTSWX	PHV1HVF151MC12FVTSWG
	220	16	2400	10×16	PHV1HVF221MC16FVTSWX	PHV1HVF221MC16FVTSWG
63 1J	33	40	1100	8×10	PHV1JVF330MB10FVTSWX	PHV1JVF330MB10FVTSWG
	56	30	1400	10×10	PHV1JVF560MC10FVTSWX	PHV1JVF560MC10FVTSWG
	100	22	2100	10×12.2	PHV1JVF101MC12FVTSWX	PHV1JVF101MC12FVTSWG
	150	16	2400	10×16	PHV1JVF151MC16FVTSWX	PHV1JVF151MC16FVTSWG

Customer products are available on request.



## A collection of various electrical components including capacitors, inductors, and transformers. The components are arranged on a light surface against a dark background. There are several large rectangular units, some with multiple terminals, and smaller components like a cylindrical inductor and a small rectangular capacitor.



## 1. The standard system of fixed plastic film capacitor for use in electronic equipment

The standard system of fixed plastic film capacitor for use in electronic equipment includes the foundational standard, generic specification, sectional specification, blank detail specification and detail specification, or manufacturer specification.

Generic specification specifies the terminology, inspection procedures and test methods applied in sectional and detail specifications. Sectional specification is classified according to the specific dielectric material and construction of capacitor, it prescribes preferred rating and characteristics and to select from generic specification the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Blank detail specification is a supplementary document to the sectional specification and contains requirements for style, layout and minimum contents of detail specifications.

The corresponding specification lists for plastic film capacitors are as follows.

## 1、电子设备用薄膜电容器的标准体系

电子设备用固定电容器的标准体系是由基础标准、总规范、分规范、空白详细规范以及详细规范（即企业标准）组成。

总规范规定了分规范和详细规范中使用的标准术语、检验程序和试验方法。分规范是按电容器的介质和结构分类的，它是对该类电容器规定优先额定值和特性，并从总规范中选择适当的质量评定程序、试验和测量方法，以及给出一般性能要求。空白详细规范是分规范的一种补充文件，它规定了详细规范的格式、编排和最基本的要求。

薄膜电容器的标准体系，举例如下：

标准号 (No.)	标准 (Standards)
GB/T 2693 (IEC 60384-1)	电子设备用固定电容器 第1部分：总规范 Fixed capacitors for use in electronic equipment Part 1: Generic specification
GB/T 17702 (IEC 61071)	电力电子电容器 Power electronic capacitors
AEC-Q200	被动元件应力测试认证规范 Stress test qualification for passive components
GB/T 25121 (IEC61881)	轨道交通 机车车辆设备 电力电子电容器 Railway applications - Rolling stock equipment - Capacitors for power electronics
GB/T 21563 (IEC61373)	轨道交通 机车车辆设备 冲击和振动试验 Railway applications - Rolling stock equipment Shock and vibration tests
GB/T 4798-1 (IEC 60721-3-1)	电工电子产品应用环境条件 第1部分：贮存 Classification of groups of environmental parameters and their severities Section 1 Storage
GB/T 4798-2 (IEC 60721-3-2)	电工电子产品应用环境条件 第2部分：运输 Classification of groups of environmental parameters and their severities Section 2 Transportation
GB/T 4798-3 (IEC 60721-3-3)	电工电子产品应用环境条件 第3部分：有气候防护场所固定使用 Classification of groups of environmental parameters and their severities Section 3 Stationary use at weather protected locations
GB/T 6346.14 (IEC 60384-14)	电子设备用固定电容器 第14部分：分规范：抑制电源电磁干扰用固定电容器 Fixed capacitors for use in electronic equipment Part 14 : Points specification Fixed capacitors for suppressing electromagnetic interference from power supplies



## 2. General Description of Film Capacitors

### 2-1 Principle of Capacitor Construction

The principle construction of a parallel plate capacitor is shown in Fig.1. When a voltage  $V$  is applied between the conducting electrodes placed opposite to each other, a certain amount  $Q$  of electric charge proportional to the voltage can be stored on the surfaces of the dielectric. The proportional constant is called capacitance  $C$ , designating the ability of a capacitor to store energy in an electric field.

$$Q = C \cdot V$$

$Q$ : Charge [Coulomb]

$V$ : Voltage [Volt]

$C$ : Capacitance [Farad]

The capacitance  $C$  of capacitor can be expressed by the following equation:

$$C = \epsilon_0 \cdot \epsilon \cdot A/d$$

$\epsilon$ : dielectric constant

$\epsilon_0$ : dielectric constant in vacuum ( $= 8.85 \times 10^{-12} \text{ F/m}$ )

$A$ : electrode area [ $\text{m}^2$ ]

$d$ : electrode distance [ $\text{m}$ ]

The dielectric constant of Polypropylene film is 2.2. Larger capacitances can be obtained by enlarging the electrode area  $A$  or by reducing the distance.

Table 1 shows the dielectric constants of typical film dielectrics used in capacitors. In many cases, capacitor naming are related to their dielectric material used.

Table-1

Dielectric	Dielectric Constant
Polypropylene	2.2
Polyester	3.3
Polyimide	3.5
Polyethylene	2.3
Polycarbonate	2.8
Polytetrafluoroethylene	2

The schematic of an film capacitor is shown in Fig.2

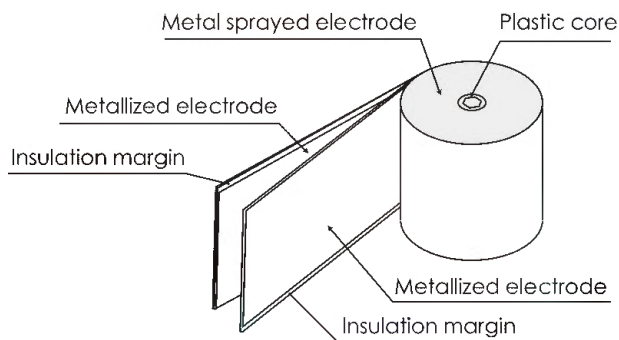


Fig. 2

## 2. 薄膜电容器的基本概要

### 2-1. 电容器的结构原理

平行板电容器的基本结构原理可以用图1来描述。当一个电压 $V$ 施加在彼此正对的两块导电极板两端时，与电压成正比的电荷量 $Q$ 将被储存在电介质的表面。这个用来标称电容器在电场中储能能力的比例常数被称作容量 $C$ 。

$$Q = C \cdot V$$

$Q$ : 电量 [库伦]

$V$ : 电压 [伏特]

$C$ : 电容量 [法拉]

电容器的容量可以用以下公式来表示：

$$C = \epsilon_0 \cdot \epsilon \cdot A/d$$

$\epsilon$ : 电介常数

$\epsilon_0$ : 真空中的电介常数 ( $= 8.85 \times 10^{-12} \text{ F/m}$ )

$A$ : 极板面积 [ $\text{m}^2$ ]

$d$ : 极板距离 [ $\text{m}$ ]

聚丙烯膜的相对介电常数为2.2。要想获得更大的电容，可以通过增加表面积 $A$ 或者减少其厚度 $d$ 来获得。

表1-1列出了电容器中常用的几种典型介质的相对介电常数，在很多情况下，电容器的命名通常是与介质所使用的材料相关的。

表-1

介质	相对介电常数
聚丙烯	2.2
聚酯	3.3
聚酰亚胺	3.5
聚乙烯	2.3
聚碳酸酯	2.8
聚四氟乙烯	2

图2 是薄膜电容器的示意图

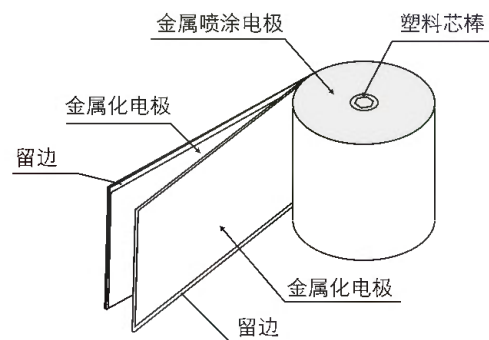


图2



### 3. Basic parameters and terms

#### 3-1. Rated capacitance $C_R$

Nominal capacitance value is measured at 20°C and the measuring frequency range is from 50 to 120 Hz.

#### 3-2. Rated voltage $U_R$

Maximum operating peak voltage of either polarity but of a non-reversing type waveform, for which the capacitor has been designed, for continuous operation. It shall be higher than the sum of operating d.c. voltage and operating ripple peak voltage.

#### 3-3. Rms voltage $U_{rms}$

Root mean square of max. permissible value of sinusoidal a.c. voltage in continuous operation.

#### 3-4. Ripple voltage $U_r$

Peak-to-peak alternating component of the unidirectional voltage.

#### 3-5. Non-recurrent surge voltage $U_s$

Peak voltage induced by a switching or any other disturbance of the system which is allowed for a limited number of times and for durations shorter than the basic period.

- Maximum duration: 50 ms/pulse
- Maximum number of occurrences: 1000 (during load)

#### 3-6. Insulation voltage $U_i$

Rms value of A.C. voltage designed for the insulation between terminals of the capacitor to case or earth. The insulation voltage is equal to the rated voltage of the capacitor, divided by  $\sqrt{2}$ , unless otherwise specified.

#### 3-7. Maximum current $I_{max}$

Maximum rms current for continuous operation.

#### 3-8. Maximum rate of voltage rise $dV/dt$

Maximum permissible repetitive rate of voltage rise of the operational voltage.

#### 3-9. Maximum peak current $\hat{I}$

Maximum permitted repetitive peak current that can occur during continuous operation.

The value is following:  $\hat{I} = C_R \times (dV/dt)$

#### 3-10. Maximum surge current $\hat{I}_s$

Admissible peak current induced by a switching or any other disturbance of the system.

- Maximum duration: 50 ms / pulse
- Maximum number of occurrences: 1000

#### 3-11. Series resistance $R_s$

Effective ohmic resistance of the conductors of a capacitor under specified operating conditions.

#### 3-12. Equivalent series resistance ESR

The equivalent series resistance (ESR) represents all of the ohmic losses of the capacitor.

$$ESR = \frac{tg\delta}{\omega \cdot C} = R_s + \frac{tg\delta_0}{\omega \cdot C}$$

#### 3-13. Dielectric dissipation factor $tg\delta_0$

Constant dissipation factor of the dielectric material for all capacitors at their rated frequency. The typical loss factor of polypropylene film is  $2 \times 10^{-4}$ .

### 3. 基本参数和术语

#### 3-1、额定容量 $C_R$

标称电容值在20°C和50~120Hz 频率下测定。

#### 3-2、额定电压 $U_R$

设计电容器时所采用的非反复型波形的任一极性的可连续运行的最高运行峰值电压。其值应大于直流工作电压与纹波电压峰值之和。

#### 3-3、有效值电压 $U_{rms}$

电容器在连续运行过程中允许出现的最大正弦交流电压的方均根值。

#### 3-4、纹波电压 $U_r$

单向电压的峰到峰的交流分量。

#### 3-5、非周期冲击电压 $U_s$

由切换或系统中任何别的扰动所导致的峰值电压，此电压只允许出现有限的次数，且每次持续时间应比基本周期短。

- 最大持续时间：50毫秒/脉冲
- 最大出现次数：1000（负载）

#### 3-6、绝缘电压 $U_i$

设计电容器时规定的电容器端子对外壳或对地交流电压的均方根值。若未作说明，此绝缘电压等于额定电压除以 $\sqrt{2}$ 。

#### 3-7、最大电流 $I_{max}$

连续运行时的最大电流的均方根值。

#### 3-8、最大电压爬升速率 $dV/dt$

在运行中允许的可重复出现的最大电压爬升速率。

#### 3-9、最大峰值电流 $\hat{I}$

在连续运行中允许的可重复出现的最大峰值电流。

其数值为： $\hat{I} = C_R \times (dV/dt)$

#### 3-10、最大冲击电流 $\hat{I}_s$

由开关切换或其它扰动所导致的、允许出现的峰值电流。

- 最大持续时间：50毫秒/脉冲
- 最大出现次数：1000

#### 3-11、串联电阻 $R_s$

在规定的运行条件下，电容器的导体部分的等效内阻。

#### 3-12、等效串联电阻 ESR

等效串联电阻（ESR）是表征电容器全部欧姆损耗的量值。

$$ESR = \frac{tg\delta}{\omega \cdot C} = R_s + \frac{tg\delta_0}{\omega \cdot C}$$

#### 3-13、介质损耗因素 $tg\delta_0$

电容器的介质材料在额定频率下的损耗常数。聚丙烯薄膜的典型介质损耗因素为  $2 \times 10^{-4}$ 。



## 3-14. Loss factor of the capacitor $\tan\delta$

The dissipation factor is ratio between reactive power of the impedance of the capacitor and effective power when capacitor is submitted to a sinusoidal voltage of specified frequency, it is that ratio between the equivalent series resistance and the capacitive reactance of a capacitor.

## 3-15. Dielectric power loss $P_d$

Loss power induced by dielectric polarization or dielectric conductance.

## 3-16. Joule power loss $P_j$

Loss power induced by series resistance of the capacitor under rms current.

## 3-17. Capacitor losses $P_t$

Active power dissipated in the capacitor.

$$P_t \approx I_{rms}^2 \times ESR$$

## 3-18. Maximum power loss $P_{max}$

Maximum power loss at which the capacitor may be operated at the maximum case temperature.

## 3-19. Self-inductance $L_s$

Represents the sum of all inductive elements which are for mechanical and construction reasons contained in any capacitor.

## 3-20. Resonance frequency $f_r$

Lowest frequency at which the impedance of the capacitor becomes minimum. The value is following:

$$f_r = 1 / (2\pi \times \sqrt{L_s \times C_R})$$

## 3-21. Ambient temperature $\Theta_A$

Temperature of the air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units.

If only one unit is involved, it is the temperature of surrounding air, measured 10cm away and at 2/3 of the case height of the capacitor under steady-state conditions.

## 3-22. Maximum operating temperature $\Theta_{max}$

Highest temperature of the case at which the capacitor may be operated.

## 3-23. Lowest operating temperature $\Theta_{min}$

Lowest temperature of the dielectric at which the capacitor may be energized.

## 3-24. Thermal resistance $R_{th}$

The thermal resistance indicates by how many degrees the capacitor temperature at the hotspot rises above  $\Theta_A$  per watt of the heat dissipation losses.

## 3-25. Hotspot temperature $\Theta_{hotspot}$

Temperature at the hottest spot inside the capacitor. The value is following:

$$\Theta_{hotspot} = \Theta_A + P_t \times R_{th}$$

## 3-14. 电容器的损耗因素 $\tan\delta$

在规定频率的正弦波电压作用下，电容器的有功功率除以电容器的无功功率，其值为等效串联电阻和容抗之比。

## 3-15. 介质损耗功率 $P_d$

电容器的电介质由于极化或电导引起的损耗。

## 3-16. 焦耳损耗功率 $P_j$

当电容器通过有效电流时，由于串联电阻  $R_s$  发热而引起的损耗。

## 3-17. 电容器的损耗功率 $P_t$

电容器所消耗的有功功率。

$$P_t \approx I_{rms}^2 \times ESR$$

## 3-18. 最大损耗功率 $P_{max}$

在最高运行温度下电容器可以承载的最大损耗功率。

## 3-19. 自感 $L_s$

电容器由于自身结构或组成的原因所表现出来的电感。

## 3-20. 谐振频率 $f_r$

电容器的阻抗成为最小时的最低频率。其值为：

$$f_r = 1 / (2\pi \times \sqrt{L_s \times C_R})$$

## 3-21. 环境温度 $\Theta_A$

在稳定状态条件下，在电容器组最热区域的两个单元之间中途所测得的空气温度。

如果仅设计一单元，则指在离电容器外壳10cm且距其底部2/3高度处所测得的空气温度。

## 3-22. 最高运行温度 $\Theta_{max}$

电容器可以运行的最高外壳温度。

## 3-23. 最低运行温度 $\Theta_{min}$

电容器可以运行的最低电介质温度。

## 3-24. 热阻 $R_{th}$

热阻表征的是电容器的发热功率每上升1瓦，电容器内最热点的温度在环境温度  $\Theta_A$  基础上升高的度数。

## 3-25. 热点温度 $\Theta_{hotspot}$

电容器内部最热点处的温度。其值为：

$$\Theta_{hotspot} = \Theta_A + P_t \times R_{th}$$



### 3-26. Temperature coefficient of capacitance $\alpha$

The change rate of capacitance with temperature measured over a specified range of temperature.

### 3-27. Voltage between terminals $U_T$

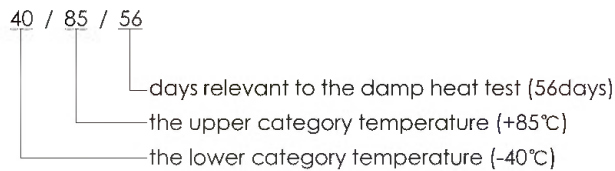
Voltage between terminals

### 3-28. Voltage between terminals and case $U_{TC}$

Voltage between terminals and case

### 3-29. Climatic category

The climatic category which the capacitor belongs to is expressed in three numbers separated by slashes, (IEC 60068-1: example 40/85/56)



### 3-30. Insulation Resistance (IR) / Time Constant ( $t$ )

The insulation resistance is the ratio between an applied D.C. voltage and the resulting leakage current after a minute of charge. It is expressed in  $M\Omega$ . The time constant is expressed in seconds with the following formula:  $t[s] = IR [M\Omega] \times C [\mu F]$

### 3-31. Self-healing (Only for metallized film capacitor)

Process by which the electrical properties of the capacitor, after a local breakdown of the dielectric, are rapidly and essentially restored to the values before the breakdown.

The metal coatings of the metallized film, which are vacuum-deposited directly onto the plastic film, have a thickness of only several tens nm. At weak points or impurities in the dielectric, a dielectric breakdown would occur. The energy released by the arc discharge in the breakdown channel is sufficient to totally evaporate the thin metal coating in the vicinity of the channel. The insulated region thus resulting around the former faulty area will cause the capacitor to regain its full operation ability.

### 3-32. Failure rate $\lambda$

It indicates the failure probability of components in unit time and the value is the number of failure components in unit compared to the total number of components. the unit of  $\lambda$  is FIT, 1 FIT =  $1/10^9$ h

$$\lambda = \frac{r}{n \cdot t}$$

t: test time

n: test number

r: number of failures

### 3-26、容量温度系数 $\alpha$

电容器在规定的温度范围内容量随温度的变化率。

### 3-27. 端子与端子间耐压 $U_T$

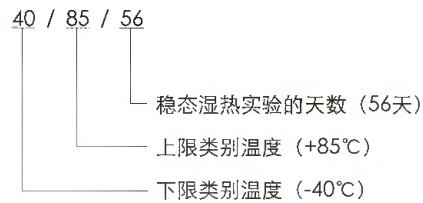
电容器端子与端子间耐压

### 3-28. 端子与外壳间耐压 $U_{TC}$

电容器端子与外壳间耐压

### 3-29、气候类别

电容器所属的气候类别用斜线分隔的三个数来表示 (IEC 60068-1: 如: 40/85/56)



### 3-30、绝缘电阻 (IR) / 时间常数 ( $t$ )

绝缘电阻为电容器充电一分钟后所加的直流电压和流经电容器的漏电流值的比值, 单位为  $M\Omega$ 。时间常数为绝缘电阻和电容量的乘积, 通常以秒表示, 公式如下:  $t[s] = IR[M\Omega] \times C[\mu F]$

### 3-31、自愈性 (仅对金属化膜电容器)

电容器的电特性在发生局部电介质击穿后迅速而基本地恢复到击穿前的值的过程。

金属化膜的金属镀层是通过真空蒸发的方法将金属沉积在薄膜上, 厚度只有几十个纳米, 当介质上存在弱点、杂质时, 局部电击穿就可能发生, 电击穿处的电弧放电所产生的能量足以使电击穿点邻近处的金属镀层蒸发, 使击穿点与周围极板隔开, 电容器电气性能即可恢复正常。

### 3-32、失效率 $\lambda$

失效率表示元件在单位时间内发生失效的概率, 数值上等于单位时间内失效的元件数与元件总数的比值。其单位为 FIT, 1 FIT =  $1/10^9$ h

$$\lambda = \frac{r}{n \cdot t}$$

t: 测试时间

n: 测试产品数

r: 失效产品数



## 4. Expected lifetime of the capacitor

The expected lifetime of the capacitor depends on the applied voltage and the hot spot temperature during operation. For capacitors applied in different situation, the designed average service lives are different. The capacitors used in DC-Link circuits will have a expected lifetime of probable 100000 hrs at rated voltage and 70t hot spot temperature.

### 4-1、The hotspot temperature estimation

During operation, the ripple current flowing through the capacitor will generate heat due to the series resistance of the capacitor. Considering the above factors hotspot temperature estimation formula is as follows:

$$\Theta_{\text{hotspot}} = \Theta_A + I_{\text{rms}}^2 \times \text{ESR} \times R_{\text{th}}$$

$\Theta_{\text{hotspot}}$ : Hotspot Temperature, °C

$\Theta_A$ : Environment Temperature, °C

$I_{\text{rms}}$ : Ripple Current, A

ESR: Equivalent series resistance, Ω

$R_{\text{th}}$ : Thermal Resistance, K/W

### 4-2.Estimation of lifetime calculation

Considering the fever caused by ripple current, internal resistance (hotspot temperature), as well as the applied voltage, life estimation formula:

$$L = L_0 \times (U_R/U)^n \times 2^{(\Theta - \Theta_{\text{hotspot}})/m}$$

L: The calculation of Lifetime, hrs

$L_0$ : Rated Lifetime (100000hrs)

U: Working Voltage,  $V_{\text{DC}}$

$U_R$ : Rated Voltage,  $V_{\text{DC}}$

n: Acceleration Coefficient of Voltage, experienced value:

6~12

$\Theta_{\text{hotspot}}$ : The Actual or Calculated Hotspot Temperature, °C

$\Theta$ : Rated Hotspot Temperature, 70°C

m: Acceleration Coefficient of Temperature, experienced value: 5~10

PS: Typically When the capacity change rate is above ± 3%, the capacitor fails.

Expected lifetime is a statistical value calculated on the basis of experience and on theoretical evaluations. The above formula is only as a theoretical reference. Please consult our technical department in case of working condition different from the rated ones.

## 4、电容器的预期寿命

薄膜电容器的预期寿命与电容器的工作电压及热点温度有关。对于不同的应用场合，电容器的设计寿命不同。应用在直流滤波电路中电容器，在额定电压及热点温度为 70°C 的应用条件下，预期寿命可达到100000小时。

### 4-1、热点温度估算

在工作时，由于电容器内部存在内阻，流过的纹波电流会引起电容器的发热。考虑上述因素热点温度估算公式如下：

$$\Theta_{\text{hotspot}} = \Theta_A + I_{\text{rms}}^2 \times \text{ESR} \times R_{\text{th}}$$

$\Theta_{\text{hotspot}}$ : 热点温度, °C

$\Theta_A$ : 环境温度, °C

$I_{\text{rms}}$ : 纹波电流, A

ESR: 等效串联电阻, Ω

$R_{\text{th}}$ : 热阻, K/W

### 4-2、寿命估算

考虑由纹波电流、内阻引起的发热（热点温度），以及施加的电压，寿命估算公式为：

$$L = L_0 \times (U_R/U)^n \times 2^{(\Theta - \Theta_{\text{hotspot}})/m}$$

L: 计算的寿命, hrs

$L_0$ : 额定电压和额定热点温度下的寿命 (100000hrs)

U: 使用电压,  $V_{\text{DC}}$

$U_R$ : 额定电压,  $V_{\text{DC}}$

n: 电压加速系数, n值一般取: 6~12

$\Theta_{\text{hotspot}}$ : 实际或计算的热点温度, °C

$\Theta$ : 额定热点温度, 70°C

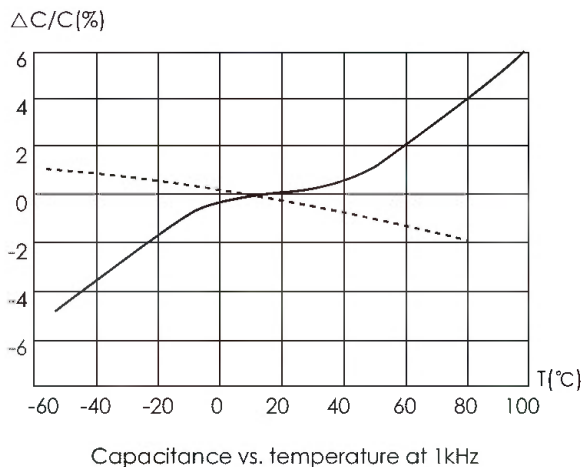
m: 温度加速系数, m值一般取: 5~10

注: 通常容量变化率超出±3%的范围时, 判定产品失效

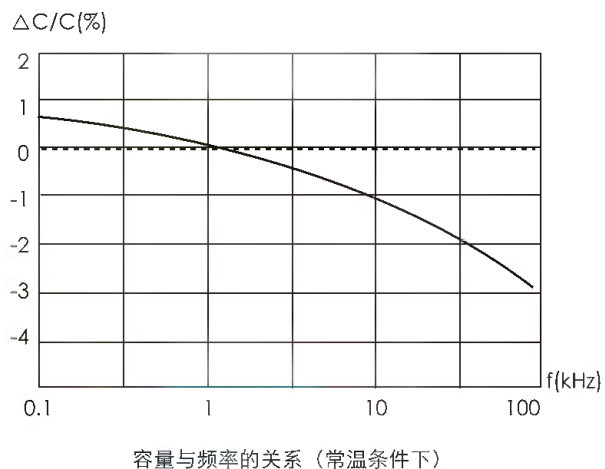
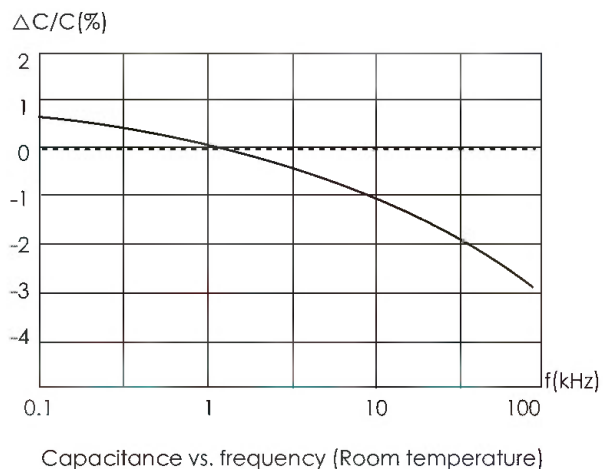
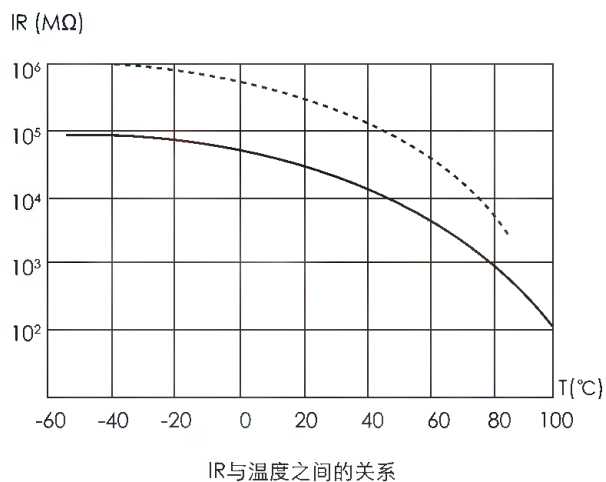
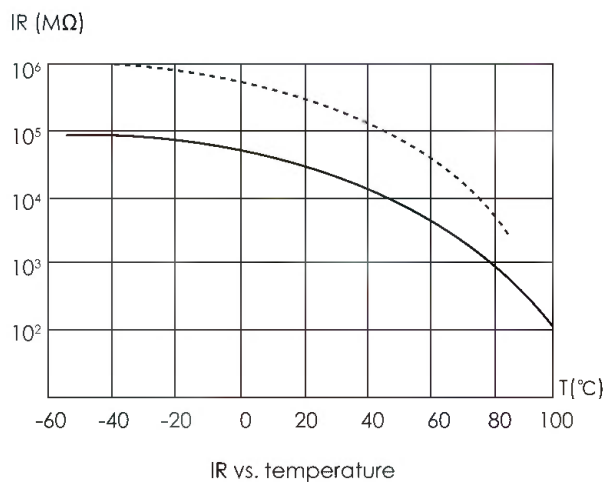
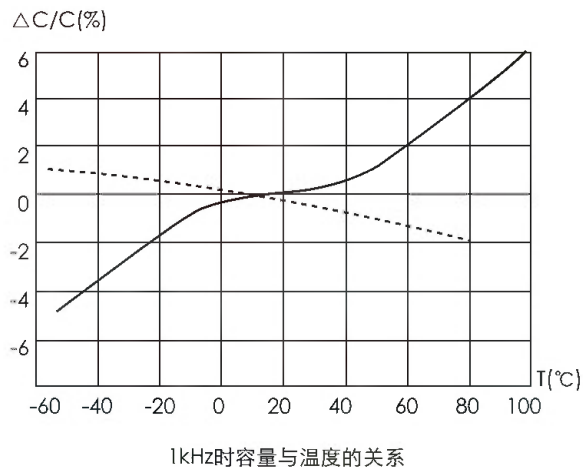
电容器的预期寿命是一个基于实践经验和理论计算的统计学数值。上述公式仅仅作为理论参考。对于工作条件与额定条件有差别的情况, 可以联系我们的技术部门。



## 5. Electrical behaviour



## 5. 电气特性



----- 聚丙烯薄膜 (Polypropylene Film)  
 ———— 聚酯薄膜 (Polyester Film)



## 6. Caution items in using plastic film capacitors

### 6-1. Operation voltage

The plastic film capacitor varies in the maximum applicable voltage depending on the applied voltage waveform, current waveform, frequency, ambient temperature (capacitor surface temperature), capacitance value, etc. Be sure to use capacitors within the specified values by checking the voltage waveform, current waveform, and frequency applied to them (In the application of high frequency, the permissible voltage varies with the type of the capacitor. Refer to the specification for detail).

### 6-2. Operating current

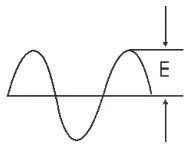
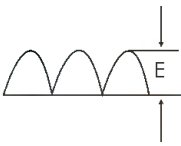
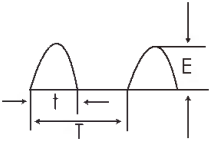
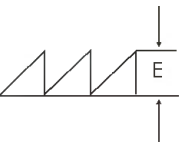
The pulse (or AC) current flowing through the capacitor is expressed as:  $I = C \times dV/dt$ .

Due to the fact that dissipation factor of the capacitor will generate the internal heat under the application of high frequency or high pulse current, This leads to the temperature rising and also causes the danger of breaking down (smoking or firing). Therefore, the safety use of capacitor must be within the rated voltage (or category voltage) and the permissible current.

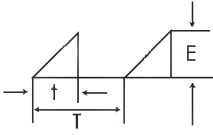
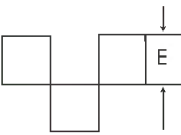
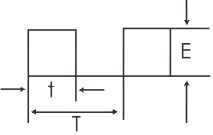
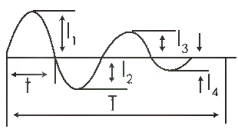
The rated current must be considered by dividing into pulse current (peak current) and continuous current (rms current) depending on the break down mode, and when using, should make sure the both currents are within the permissible values.

### 6-3. Calculation of rms in various waveforms

In each waveform, calculate the rms value in the following formula.

种类(type)	1	2	3	4
波形 (waveform)				
有效值(rms)	$E/\sqrt{2}$	$E/\sqrt{2}$	$E\sqrt{t/(2T)}$	$E/\sqrt{3}$

种类(type)	5	6	7	8
波形 (waveform)				
有效值(rms)	$E\sqrt{t/(3T)}$	$E$	$E\sqrt{t/T}$	$\sqrt{\frac{1}{2T}(I_1^2 + I_2^2 + I_3^2 + I_4^2)}$

### 6-4. Charging and discharging

Because the charging and discharging current of capacitor is obtained by the product of voltage rise rate ( $dV/dt$ ) and capacitance, low voltage charging and discharging may also cause deterioration of capacitor such as shorting and open due to sudden charging and discharging current.

When charging and discharging, pass through a resistance of  $20\Omega/V$  to  $1000\Omega/V$  or more to limit current.

When multiple film capacitors which are connected in parallel are undergoing withstand voltage test or life test, connect a resistor valued at  $20\Omega/V$  to  $1000\Omega/V$  or more in series to each capacitor. (Refer to the specification for more details). In addition, capacitors must be discharged with resistors before handling. If the capacitor doesn't discharge resistor inside, there will be residual heat inside which may cause danger to the operator's life.

## 6. 使用薄膜电容器的注意事项

### 6-1、工作电压

薄膜电容器的选用取决于施加的最高电压，并受施加的电压波形、电流波形、频率、环境温度（电容器表面温度）、电容量等因素的影响。使用前请先检查电容器两端的电压波形、电流波形和频率（在高频场合，允许电压随着电容器类型的不同而改变，详细资料请参阅说明书）是否在额定值内。

### 6-2、工作电流

通过电容器的脉冲（或交流）电流等于电容量C与电压上升速率的乘积，即  $I = C \times dV/dt$ 。

由于电容器存在损耗，在高频或高脉冲条件下使用时，通过电容器的脉冲（或交流）电流会使电容器自身发热而有温升，将会有热击穿（冒烟、起火）的危险。因此，电容器安全使用条件不仅受额定电压（或类别电压）的限制，而且受额定电流的限制。

额定电流被认为是由击穿模式决定的脉冲电流（峰值电流，即由  $dV/dt$  指标所限制的）和连续电流（以峰峰值或有效值表示）组成，当使用时，需确认这两个电流都在允许范围之内。

### 6-3、各种波形的有效值换算关系

不同的波形有效值按下面的公式计算。

### 6-4、电容器充放电

由于电容器充放电电流取决于电容量和电压上升速率的乘积，即使是低电压充放电，也可能产生大的瞬间充放电电流，这可能会导致电容器性能的损害，比如说短路或开路。当进行充放电时，请根据电压串联限流电阻（ $20\sim 1000\Omega/V$ ），将充放电电流限制在规定的范围内。

当多个薄膜电容器并联进行耐压测试或寿命测试时，请为每个电容器串联一个限流电阻（ $20\sim 1000\Omega/V$ ）。详见电容器标准。

另外，在用手操作电容器之前必须对电容器进行充分放电，否则电容器内部残存的能量可能会对操作人员产生致命的伤害。



## 6-5. Buzzing noise

Any buzzing noise produced by capacitor is caused by the vibration of the film due to the coulomb force that is generated between the electrodes with opposite poles. If the wave-form with a high distortion rate or frequency is applied across the capacitor, the buzzing noise will become louder. But the buzzing noise is of no damage to capacitor.

## 6-6. Surface over temperature $\Delta\theta_{case}$

When continuing current flows through the capacitor, the temperature inside the capacitor will rise, induced by accumulated heat. If the temperature exceeds allowed hot-spot temperature, it might cause a short circuit or fire. The limits described in the catalogue are not exceeded and it's necessary to check the temperature on the capacitor surface when it works.

## 6-7. Humid ambient

If used for a long time in a humid ambient, the capacitor might absorb humidity and oxidise the electrodes causing breakage of the capacitor. If case of AC application, high humidity would increase the corona effect. This phenomenon causes a drop of capacitance and a increase of capacitor losses.

## 6-8. Storage conditions

1) Capacitors may not be stored in corrosive atmospheres, particularly not when chlorides, sulfides, acids, lye, salts, organic solvents or similar substances are present.

2) It shouldn't be located in particularly high temperature and high humidity, it must submit to the following conditions (unchanging primal package):

Temperature:  $-40^{\circ}\text{C} \sim +35^{\circ}\text{C}$

Humidity: The annual average value shall not exceed 70%RH, and the average value for any 30 days of one year shall not exceed 80%RH.

Storage time:  $\leq 24$  months (from the date marked on the capacitor's body or the label glued to the package)

## 6-5、因薄膜振动产生的嗡嗡声

电容器的嗡嗡声是由于电容器薄膜受到两电极间库仑力的作用，产生的振动而发出的声音。施加的电压和频率波形失真越严重，所产生的嗡嗡声越大。但这种嗡嗡声对电容器不会产生任何破坏作用。

## 6-6、表面温升 $\Delta\theta_{case}$

当电容器中通过持续电流时，热量累积会使电容器内部温度升高。当温度超出允许的热点温度时，可能会导致电容器短路甚至燃烧。因此，流经电容器的电流不允许超过产品目录所规定的最大数值，而且有必要监测电容器加载时的温升。

## 6-7、高湿环境

如果长时间使用在高湿环境下，电容器可能会吸收潮气、电极被氧化，导致电容器损坏。如果是在AC条件下使用，高湿环境将会加剧电晕的影响，从而引起电容量下降，损耗增加。

## 6-8、储存条件

1) 电容器不能储存在腐蚀性的空气环境中，特别是存在氢化物、硫化物、酸、碱、盐、有机溶剂或类似物质时。

2) 产品不能暴露在高温和高湿状态，必须保存在以下环境中：  
(在不拆开原包装的基础上)

温度:  $-40^{\circ}\text{C} \sim +35^{\circ}\text{C}$

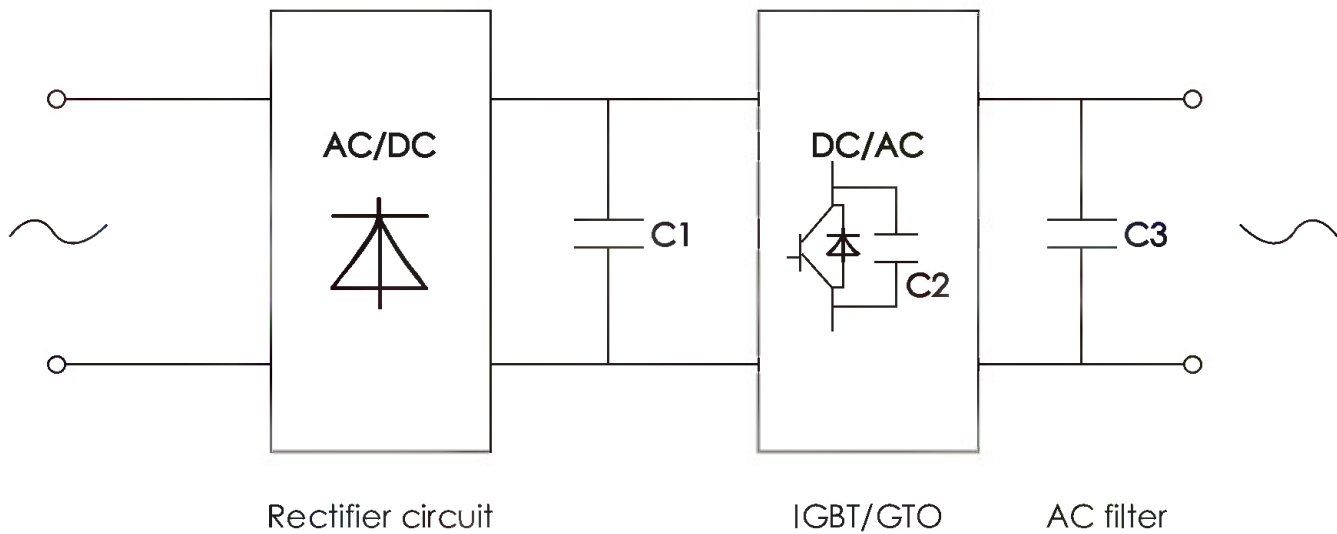
湿度: 年平均值不超过70%RH, 全年任意30天不超过80%RH

储存时间: 不超过24个月 (从产品包装或产品本体上的日期算起)



## 7. 电容器选用指南 Guide for capacitors choosing

### 典型电路 Typical circuit

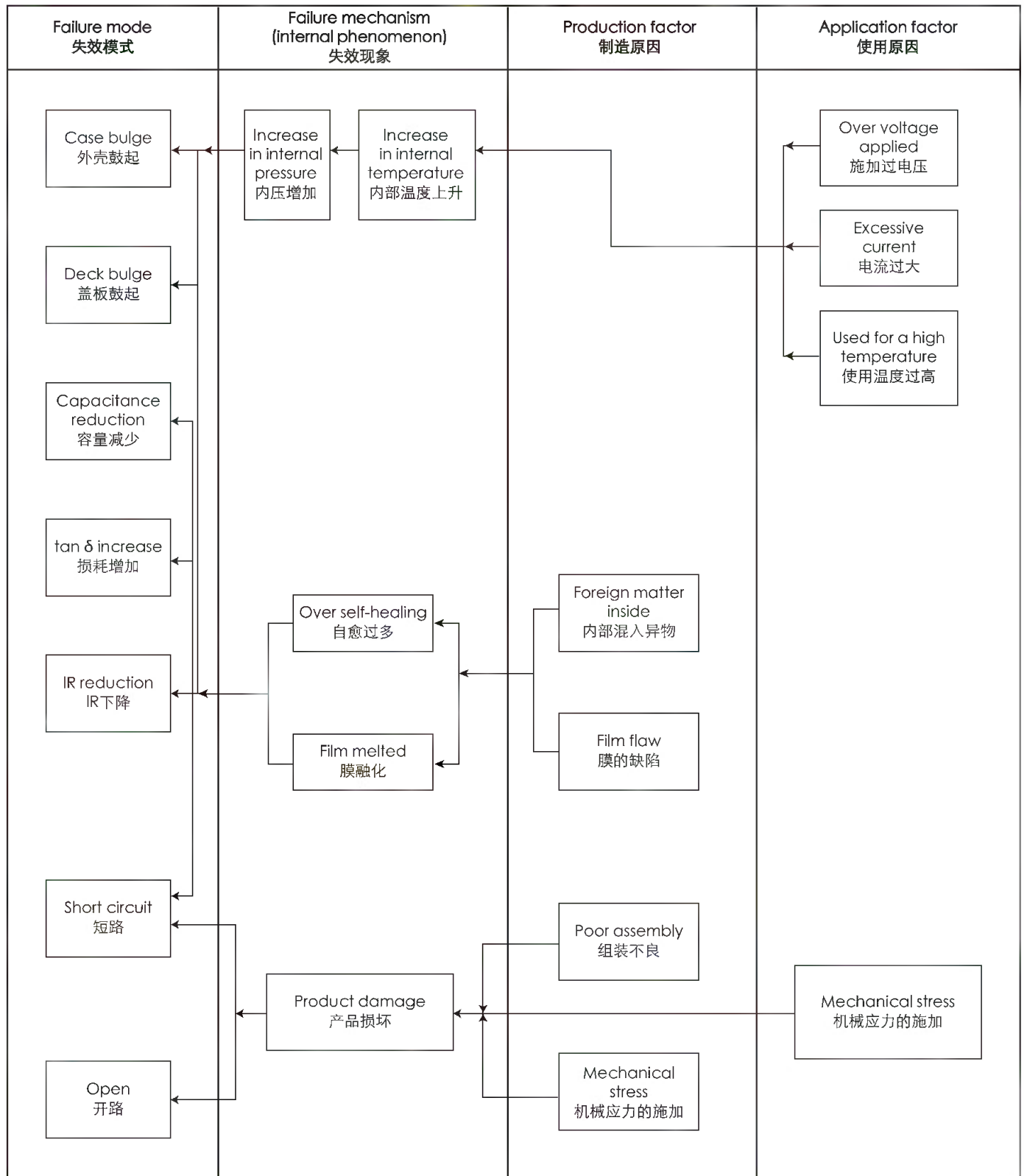


电容 Capacitor	功能 Function	型号 Series
C1	直流滤波 DC Link	CBB131、CBB132、CBB133、CBB135、 CBB136、CBB136G、CBB138
C2	缓冲吸收 Snubber	CBB161、CBB162、CBB165、CBB167
C3	交流滤波 AC filter	CBB235、CBB237、CBB238



## 8. Typical failure modes and factors of film capacitors

### 8、薄膜电容器失效模式及原因分析





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	C	2	S	D	L	6	5	7	K	L	0	9	5	0	3	1	B	1
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		直径 Diameter	高度 Height	引出端子 terminals type	引出端子间距 Terminals Pitch		底部螺栓 Bottom Bolt	图号 Style	内部特征码 Internal use			
Film Capacitor =FC	Column=C	600=2S	CBB131=DL			70=706	±5%=J		76=H	95=095	Female M6*10=0	32=3		Without=0	Style B=B				
		700=2Q				140=147	±10%=K		85=K	120=120	Female M8*10=2	45=4		M12*16=1	Style C=C				
		800=2K				280=287	-15~0%=P		86=L	136=136	Female M10*10=4	50=5		M16*25=2	Style D=D				
		900=R2				500=507	Special=S		89=M	155=155	Female M8*12=6			M12*12=3	Style H=H				
		1000=3A				650=657			96=W	175=175	Female M5*7=8				Style I=I				
		1100=A3				700=707			116=P	225=225	Female M10*12=8								
		1200=3B				750=757			136=T	230=230	Male M6*20=1								
		1300=O3				820=827				252=252	Male M8*20=3								
		1500=C3				920=927				345=345	Male M10*20=5								
		1700=F3				950=957					Male M8*17=7								
		2000=3D				1000=108					Male M8*12=9								
		2200=D2				1100=118					Male M8*15=A								
		2600=3E				1500=158													
		2800=L3				1900=198													
		3000=3F				3000=308													
		3200=3U				5000=508													
		3600=3V				7200=728													



## Features

- Used in DC-Link circuits, can replace electrolytic capacitor
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handling capabilities
- Low Ls
- Self-healing property
- Aluminum case, filled with fire-retardant resin

## 特点

- 直流滤波用，可替代电解电容器
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 自感小
- 有自愈性
- 铝壳，阻燃树脂灌封

## Applications

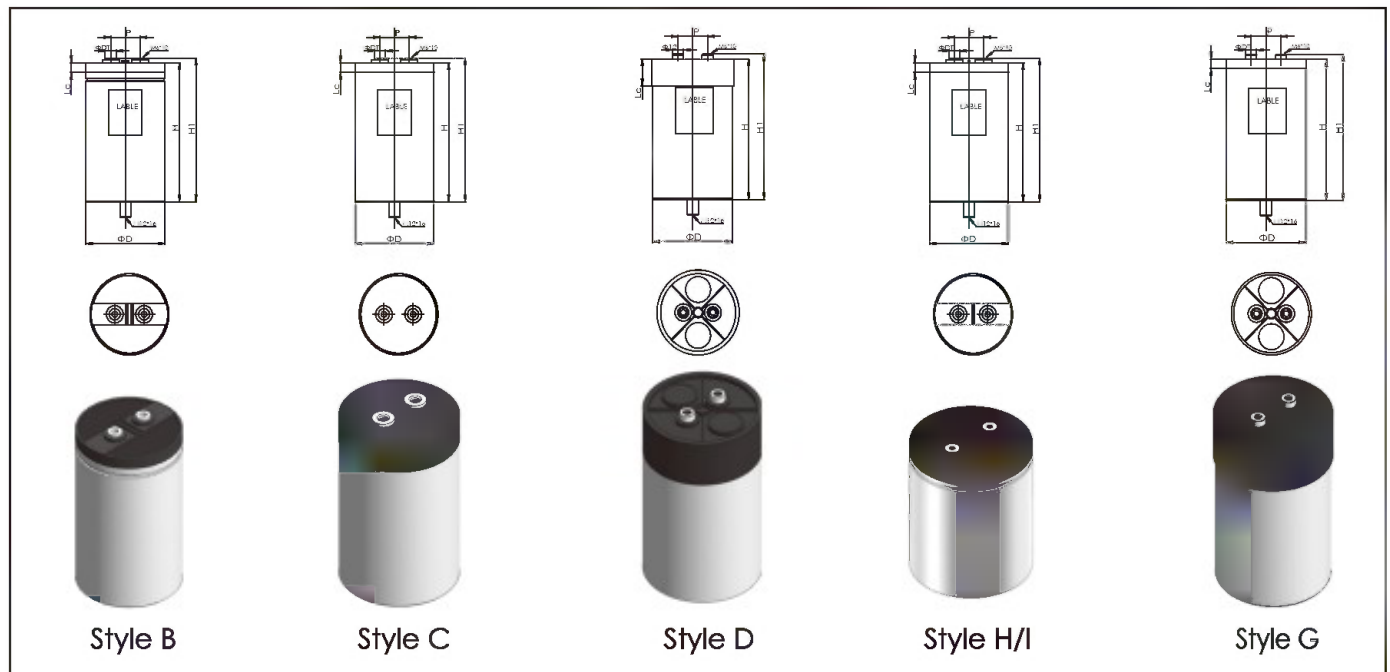
- Wind energy, Solar
- Transportation: HEV or EV
- Welders, Elevators, Motor Driver systems

## 应用场合

- 风能，太阳能
- 交通工具，如：电动车和混合动力车
- 焊接设备，电梯，电机驱动

## 外形图 Dimensions

Unit: mm






类型 Style	D ±1.0mm	D1 ±1.0mm	P ±0.5mm	H ±1.0mm	H1 ±1.0mm H1=H+5	Lc ±1.0mm
B	76	--	32	95~230	100~235	32
C	85	--	45	95~230	100~235	20
B	86	--	32	95~230	100~235	32
D	89	92	45	95~230	100~235	35
C	96	--	45	95~230	100~235	20
H	116	--	50	65~95	70~100	10
I	116	--	50	95~230	100~235	45
G	136	--	50	95~252	100~257	35

## Approvals:

Mark	structure	File no
	UL	E227010



## 标识 Marking

	CBB131	——	1
FCC2KDL438KT345051G3		——	2
4300 $\mu$ F $\pm$ 10% -40/85 $^{\circ}$ C		——	3
$U_R=800V_{DC}$ IEC61071		——	4
$U_{TC}=3000V_{AC}$ 50/60Hz SH		——	5
Torque max.5Nm		——	6
Discharge before handling		——	7
 E227010	N37F26104		8

NO.	项目 Item
1	商标 Brand 产品系列 Products series
2	产品代码 Products code
3	容量和偏差 Capacitance and Tolerance 温度范围 Temperature Range
4	额定电压 Rated voltage 引用标准 Reference Standard
5	端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case 自愈性 Self-healing property
6	电极最大扭矩 Maximum torque of electrode
7	安全警示 Safety Warning
8	<b>UL</b> 年度标记 Year code 二维码 QR Code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/85/56
工作温度范围 Operating Temperature Range	-40~+95 $^{\circ}$ C ( $\theta_{hotspot} \leq 95^{\circ}$ C) $\theta_{hotspot} = 85^{\circ}$ C~95 $^{\circ}$ C: decreasing factor 2.5% per $^{\circ}$ C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+85 $^{\circ}$ C
额定电压 $U_R$ Rated Voltage	600~3600V <sub>DC</sub>
电容量范围 Capacitance Range	44~4300 $\mu$ F
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)
端子与端子电压 $U_{TT}$ Voltage Between Terminals	$1.5 \times U_R V_{DC}$ , 10s (20 $\pm$ 5 $^{\circ}$ C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	>3000V <sub>AC</sub> , 10s (20 $\pm$ 5 $^{\circ}$ C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 10000s$ (20 $\pm$ 5 $^{\circ}$ C, 100V <sub>DC</sub> , 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
最大电极扭矩 Max Torque of terminals	M5:3 Nm    M6:5 Nm    M8:6 Nm    M10:8 Nm
最大安装扭矩 Max Torque of installation	M12: 12 Nm    M16: 15Nm
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot} = 70^{\circ}$ C)
失效率 Failure Rate	50 FIT



## 规格标准 Standard Ratings

U <sub>r</sub> ≤ 85°C (V)	C <sub>r</sub> (μF)	P/N	I <sub>max</sub> (A) @ 1KHz			R <sub>th</sub> [K/W]	I (A)	ESR@ 1KHz, 20°C (mΩ)	L <sub>s</sub> @20°C (nH)	D (mm)	H (mm)
			40°C	50°C	60°C						
600	480	FCC2SDL487*H09503**1	70	61	50	5.1	4800	1.6	≤50	76	95
	650	FCC2SDL657**09503**1	81	70	57	5.6	5200	1.1	≤50	85/86	95
	650	FCC2SDL657*H12003**1	67	58	47	4.7	5200	1.9	≤60	76	120
	880	FCC2SDL887**12003**1	80	69	57	4.8	6248	1.3	≤60	85/86	120
	950	FCC2SDL957*H17503**2	82	71	58	4.2	6650	1.4	≤60	76	175
	1100	FCC2SDL118**15503**2	81	70	57	4.4	6600	1.4	≤50	85/86	155
	1200	FCC2SDL128*P09505**1	96	83	68	5.4	7200	0.8	≤50	116	95
	1300	FCC2SDL138**17503**2	96	84	68	4.3	7800	1.0	≤60	85/86	175
	1600	FCC2SDL168*P12005**1	94	82	67	5.0	9600	0.9	≤60	116	120
	1800	FCC2SDL188**22503**2	95	83	67	4.0	10800	1.1	≤60	85/86	225
	2100	FCC2SDL218*P15505**2	100	100	85	4.6	11550	0.6	≤60	116	155
	2400	FCC2SDL248*P17505**2	100	100	86	4.5	12000	0.6	≤60	116	175
700	3000	FCC2SDL308*P23005**2	100	100	96	2.7	15000	0.8	≤60	116	230
	350	FCC2QDL367*H09503**1	70	61	50	5.1	3600	1.6	≤60	76	95
	480	FCC2QDL487*H12003**1	64	55	45	4.7	3840	2.1	≤60	76	120
	480	FCC2QDL487*H09503**1	71	62	51	5.6	3840	1.4	≤60	85/86	95
	580	FCC2QDL587*H13603**1	60	52	43	4.6	5800	2.4	≤60	76	136
	620	FCC2QDL627*H15503**1	79	68	56	4.3	6200	1.5	≤60	76	155
	700	FCC2QDL707*H17503**1	77	67	55	4.2	7200	1.6	≤60	76	175
	750	FCC2QDL757*H13603**1	66	57	47	4.6	7200	2.0	≤60	86	136
	780	FCC2QDL787*H13603**1	68	59	48	4.6	7800	1.9	≤60	86	136
	920	FCC2QDL927*P09503**1	100	89	73	5.4	9200	0.7	≤60	116	95
	950	FCC2QDL957*H17503**2	79	68	56	4.3	9500	1.5	≤60	86	175
	1200	FCC2QDL128*P12005**2	89	77	63	5.0	7200	1.0	≤60	116	120
800	1500	FCC2QDL158*P13605**1	86	75	61	4.9	9000	1.1	≤60	116	136
	1500	FCC2QDL158*P15505**2	100	90	74	4.6	9000	0.8	≤60	116	155
	1800	FCC2QDL188*P17505**2	94	82	67	4.5	10800	1.0	≤60	116	175
	2300	FCC2QDL238*P23005**2	100	100	96	2.7	13800	0.8	≤60	116	230
	280	FCC2KDL287*H09503**1	68	59	48	5.1	2800	1.7	≤50	76	95
	370	FCC2KDL377**09503**1	69	60	49	5.6	3700	1.5	≤50	85/86	95
	380	FCC2KDL387*H12003**1	58	51	41	4.7	3800	2.2	≤60	76	120
	430	FCC2KDL437*H13603**1	57	49	40	4.6	4300	2.6	≤60	76	136
	470	FCC2KDL477*H15503**2	76	66	54	4.3	4700	1.6	≤60	76	155
	510	FCC2KDL517**12003**1	68	59	48	4.8	5100	1.8	≤60	85/86	120
	560	FCC2KDL567*H17503**2	73	63	51	4.2	5600	1.7	≤60	76	175
	580	FCC2KDL587**13603**1	65	57	47	4.6	5800	2.0	≤60	85/86	136
900	640	FCC2KDL647**15503**2	77	67	55	4.4	6400	1.5	≤50	85/86	155
	710	FCC2KDL717*P09505**1	82	71	58	5.4	7100	1.1	≤50	116	95
	750	FCC2KDL757**17503**2	76	66	54	4.3	7500	1.3	≤60	85/86	175
	970	FCC2KDL977*P12005**1	82	71	58	5.0	7760	1.2	≤60	116	120
	1000	FCC2KDL108**22503**2	85	73	60	4.0	8000	1.4	≤60	85/86	225
	1000	FCC2KDL108*P13605**1	76	66	54	4.9	8000	1.4	≤60	116	136
	1200	FCC2KDL128*P15505**2	100	90	74	4.6	9600	0.8	≤60	116	155
	1400	FCC2KDL148*P17505**2	94	81	66	4.5	11200	0.8	≤60	116	175
	1800	FCC2KDL188*P23005**2	100	100	86	2.7	11700	1.0	≤60	116	230
	2000	FCC2KDL208*P17505**2	100	100	90	3.5	12000	0.7	≤80	136	175
	2700	FCC2KDL278*P23005**2	100	100	93	2.9	16200	0.8	≤80	136	230
	3100	FCC2KDL318*P25205**2	100	100	100	2.0	18600	1.0	≤80	136	252
1000	3300	FCC2KDL338*P34505**3	100	100	100	2.2	19800	0.9	≤80	116	345
	4300	FCC2KDL438*P34505**3	100	100	100	1.8	25800	0.9	≤80	136	345
	280	FCCR2DL287*H09503**1	63	54	44	5.1	2800	2.0	≤50	76	95
	370	FCCR2DL377**09503**1	67	58	47	5.6	3700	1.6	≤50	85/86	95
	380	FCCR2DL387*H12003**1	56	49	40	4.7	3800	2.6	≤60	76	120
	430	FCCR2DL437*H13603**1	55	47	39	4.6	4300	2.9	≤60	76	136
	470	FCCR2DL477*H15503**2	74	64	52	4.3	4700	1.7	≤60	76	155
	510	FCCR2DL517**12003**1	62	54	44	4.8	5100	2.1	≤60	85/86	120
	560	FCCR2DL567*H17503**2	69	60	49	4.2	5600	2.0	≤60	76	175
	580	FCCR2DL587**13603**1	62	54	44	4.6	5800	2.2	≤60	85/86	136
	640	FCCR2DL647**15503**2	77	67	55	4.4	6400	1.5	≤50	85/86	155
	710	FCCR2DL717*P09505**1	79	68	56	5.4	7100	1.2	≤50	116	95
1000	750	FCCR2DL757**17503**2	76	66	53	4.3	7500	1.6	≤60	85/86	175
	970	FCCR2DL977*P12005**1	78	68	55	5.0	7600	1.3	≤60	116	120
	1000	FCCR2DL108**22505**2	82	71	58	4.0	8000	1.5	≤60	85/86	225
	1000	FCCR2DL108*P13605**1	74	64	52	4.9	8000	1.5	≤60	116	136
	1200	FCCR2DL128*P15505**2	93	81	66	4.6	9600	1.0	≤60	116	155
	1400	FCCR2DL148*P17505**2	89	77	63	4.5	11200	0.9	≤60	116	175
	1800	FCCR2DL188*P23005**2	100	100	100	2.7	11700	1.1	≤60	116	230
	2000	FCCR2DL208*P17505**2	100	100	100	2.5	12000	0.8	≤80	136	175
	2700	FCCR2DL278*P23005**2	100	100	88	2.9	16200	0.9	≤80	136	230
	3100	FCCR2DL318*P25205**2	100	100	95	2.0	18600	1.1	≤80	136	252
	3300	FCCR2DL338*P34505**2	100	100	95	2.2	19800	1.0	≤80	116	345
	4300	FCCR2DL438*P34505**3	100	100	100	1.8	25800	1.0	≤80	136	345
1000	220	FCC3ADL227*H09503**1	57	50	40	5.1	2420	2.4	≤50	76	95
	290	FCC3ADL297**09503**1	62	54	44	5.6	3190	1.8	≤50	85/86	95
	300	FCC3ADL307*H12003**1	54	46	38	4.7	3300	2.9	≤60	76	120
	330	FCC3ADL337*H13603**1	51	44	36	4.6	3630	3.3	≤60	76	136
	360	FCC3ADL367*H15503**2	69	60	49	4.3	3960	1.9	≤60	76	155
	400	FCC3ADL407**12003**1	60	52	42	4.8	4400	2.3	≤60	85/86	120
	420	FCC3ADL427*H17503**2	69	60	49	4.2	4620	2.0	≤60	76	175
	450	FCC3ADL457**13603**1	64	56	46	4.6	4950	2.1	≤60	85/86	136
	500	FCC3ADL507**15503**2	75	65	52	4.4	5000	1.6	≤50	85/86	155
	540	FCC3ADL547*P09505**1	79	68	56	5.4	5400	1.2	≤50	116	95
	560	FCC3ADL567**17503**2	73	64	52	4.3	5600	1.7	≤60	85/86	175
	740	FCC3ADL747*P12005**1	79	68	55	5.0	7400	1.3	≤60	116	120
	810	FCC3ADL817**22503**2	81	79	65	3.0	8100	1.6	≤60	85/86	225
1000	860	FCC3ADL867*P13605**1	71	62	51	4.9	8600	1.6	≤60	116	136
	900	FCC3ADL907*P15505**2	98	85	70	4.6	8760	0.9	≤60	116	155
	1100	FCC3ADL118*P17505**2	99	86	70	4.5	8800	0.9	≤60	116	175
	1400	FCC3ADL148*P23005**2	100	100	82	2.7	11200	1.1	≤60	116	230
	1500	FCC3ADL158*P17505**2	100	100	100	2.5	12000	0.8	≤80	136	175
	2100	FCC3ADL218*P23005**2	100	100	88	2.9	12600	0.9	≤80	136	230
	2200	FCC3ADL228*P34505**2	100	100	91	2.2	13200	1.1	≤80	116	345



## 规格标准 Standard Ratings

U <sub>r</sub> ≤ 85°C (V)	C <sub>r</sub> (μF)	P/N	I <sub>max</sub> (A) @ 1KHz			R <sub>th</sub> [K/W]	I (A)	ESR@ 1KHz, 20°C (mΩ)	L <sub>s</sub> @20°C (nH)	D (mm)	H (mm)
			40°C	50°C	60°C						
1000	2400	FCC3ADL248**T25205**2	100	100	95	2.0	14400	1.1	≤80	136	252
	3200	FCC3ADL328**T34505**3	100	100	100	1.8	19200	1.1	≤80	136	345
	170	FCCA3DL17**H09503**1	54	47	38	5.1	2040	2.7	≤50	76	95
1100	240	FCCA3DL247**09503**1	61	53	43	5.6	2880	1.9	≤50	85/86	95
	240	FCCA3DL247**H12003**1	52	45	37	4.7	2880	3.1	≤60	76	120
	270	FCCA3DL277**H13603**1	51	44	36	4.6	3240	3.4	≤60	76	136
	300	FCCA3DL307**H15503**2	68	59	48	4.3	3600	2.0	≤60	76	155
	320	FCCA3DL327**12003**1	58	51	41	4.8	3840	2.4	≤60	85/86	120
	350	FCCA3DL357**H17503**2	64	56	46	4.2	4200	2.3	≤60	76	175
	420	FCCA3DL427**13603**1	60	52	43	4.6	5040	2.4	≤60	85/86	136
	420	FCCA3DL427**15503**2	81	70	57	4.4	5040	1.4	≤50	85/86	155
	450	FCCA3DL457**P09505**1	75	65	53	5.4	5400	1.3	≤50	116	95
	480	FCCA3DL487**17503**2	71	62	50	4.3	5760	1.8	≤60	85/86	175
	620	FCCA3DL627**P12005**1	73	63	52	5.0	6200	1.5	≤60	116	120
	650	FCCA3DL657**22503**2	75	65	53	4.0	6500	1.8	≤60	85/86	225
	690	FCCA3DL697**P13605**1	69	60	49	4.9	6900	1.7	≤60	116	136
	770	FCCA3DL777**P15505**2	93	81	66	4.6	7700	1.0	≤60	116	155
	910	FCCA3DL917**P17505**2	94	82	67	4.5	9100	1.0	≤60	116	175
	1200	FCCA3DL128**P23005**2	100	96	79	2.7	9600	1.2	≤60	116	230
	1200	FCCA3DL128**17505**2	100	100	94	2.5	9600	0.9	≤80	136	175
	1700	FCCA3DL178**T23005**2	100	100	83	2.9	13600	1.0	≤80	136	230
	1900	FCCA3DL198**T25205**2	100	100	95	2.0	15200	1.1	≤80	136	252
	2000	FCCA3DL208**P34505**3	100	100	84	2.2	16000	1.3	≤80	116	345
	2900	FCCA3DL298**T34505**3	100	100	100	1.8	23200	1.0	≤80	136	345
1200	140	FCC3BDL147**H09503**1	51	44	36	5.1	1680	3.0	≤50	76	95
	190	FCC3BDL197**09503**1	58	51	41	5.6	2280	2.1	≤50	85/86	95
	200	FCC3BDL207**H12003**1	50	43	35	4.7	2400	3.4	≤50	76	120
	220	FCC3BDL227**H13603**1	48	42	34	4.6	2640	3.7	≤60	76	136
	240	FCC3BDL247**H15503**2	65	56	46	4.3	2880	2.2	≤60	76	155
	260	FCC3BDL267**12003**1	55	48	39	4.8	3120	2.7	≤60	85/86	120
	280	FCC3BDL287**H17503**2	62	53	44	4.2	3360	2.5	≤60	76	175
	300	FCC3BDL307**13603**1	58	50	41	4.6	3600	2.6	≤60	85/86	136
	330	FCC3BDL337**15503**2	71	61	50	4.4	3960	1.8	≤50	85/86	155
	360	FCC3BDL367**P09505**1	73	63	51	5.4	4320	1.4	≤50	116	95
	380	FCC3BDL387**17503**2	72	62	51	4.3	4560	1.8	≤60	85/86	175
	500	FCC3BDL507**P12005**1	69	59	49	5.0	5500	1.7	≤60	116	120
	540	FCC3BDL547**22503**2	71	61	50	4.0	5940	2.0	≤60	85/86	225
	570	FCC3BDL577**P13605**1	66	57	46	4.9	6270	1.9	≤60	116	136
	620	FCC3BDL627**P15505**2	89	77	63	4.6	6820	1.1	≤60	116	155
	720	FCC3BDL727**P17505**2	86	74	60	4.5	7920	1.2	≤60	116	175
	950	FCC3BDL957**P23005**2	100	92	75	2.7	9500	1.3	≤60	116	230
	1000	FCC3BDL108**T17505**2	100	100	89	2.5	10000	1.0	≤80	136	175
	1400	FCC3BDL148**T23005**2	100	97	79	2.9	14000	1.1	≤80	136	230
	1600	FCC3BDL168**T25205**2	100	100	91	2.0	16000	1.2	≤80	136	252
	1600	FCC3BDL168**P34505**3	100	100	95	2.2	16000	1.0	≤80	116	345
	2200	FCC3BDL228**T34505**3	100	100	100	1.8	23200	1.0	≤80	136	345
1300	120	FCCO3DL127**H09503**1	49	42	34	5.1	1440	3.3	≤50	76	95
	160	FCCO3DL167**09503**1	56	48	39	5.6	1920	2.3	≤50	85/86	95
	160	FCCO3DL167**H12003**1	48	42	34	4.7	1920	3.7	≤60	76	120
	180	FCCO3DL187**H13603**1	46	40	33	4.6	2160	4.1	≤60	76	136
	210	FCCO3DL217**H15503**2	62	54	44	4.3	2520	2.4	≤60	76	155
	220	FCCO3DL227**12003**1	57	49	40	4.8	2640	2.6	≤60	85/86	120
	240	FCCO3DL247**H17503**2	58	51	41	4.2	2880	2.8	≤60	76	175
	250	FCCO3DL257**13603**1	55	47	39	4.6	3000	2.9	≤60	85/86	136
	280	FCCO3DL287**15503**2	73	63	52	4.4	3360	1.7	≤50	85/86	155
	310	FCCO3DL317**P09505**1	68	59	48	5.4	3720	1.6	≤50	116	95
	320	FCCO3DL327**17503**2	70	61	49	4.3	3840	1.9	≤60	85/86	175
	420	FCCO3DL427**P12005**1	67	58	47	5.0	5040	1.8	≤60	116	120
	450	FCCO3DL457**22503**2	67	58	48	4.0	5400	2.2	≤60	85/86	225
	480	FCCO3DL487**P13605**1	62	54	44	4.9	5760	2.1	≤60	116	136
	530	FCCO3DL537**P15505**2	89	77	63	4.6	6360	1.1	≤60	116	155
	630	FCCO3DL637**P17505**2	90	78	64	4.5	7560	1.1	≤60	116	175
	820	FCCO3DL827**P23005**2	99	86	70	2.7	9840	1.5	≤60	116	230
	880	FCCO3DL887**T17505**2	100	100	85	2.5	10560	1.1	≤80	136	175
	1200	FCCO3DL128**T23005**2	100	93	76	2.9	13200	1.2	≤80	136	230
	1300	FCCO3DL138**T25205**2	100	100	88	2.0	14300	1.3	≤80	136	252
	1400	FCCO3DL148**P34505**3	100	100	87	2.2	15400	1.2	≤80	116	345
	1900	FCCO3DL198**T34505**3	100	100	96	1.8	20900	1.2	≤80	136	345
1500	170	FCCC3DL177**12003**1	50	43	35	4.8	2040	3.3	≤60	85/86	120
	210	FCCC3DL217**15503**2	67	58	48	4.4	2520	2.0	≤60	85/86	155
	310	FCCC3DL317**P12005**1	62	53	44	5.0	3720	2.1	≤60	116	120
	330	FCCC3DL337**22503**2	63	55	45	4.0	3960	2.5	≤60	85/86	225
	400	FCCC3DL407**P15505**2	79	68	56	4.6	4800	1.4	≤60	116	155
	600	FCCC3DL607**P23005**2	93	81	66	2.7	7200	1.7	≤60	116	230
	1000	FCCC3DL108**T25205**2	100	100	100	2.0	12000	1.0	≤80	136	252
	1000	FCCC3DL108**P34505**3	100	100	95	2.2	12000	1.0	≤80	116	345
	1400	FCCC3DL148**T34505**3	100	100	100	1.8	16800	1.0	≤80	136	345
	130	FCCF3DL137**12003**1	49	42	35	4.8	1560	3.5	≤60	85/86	120
	160	FCCF3DL167**15503**2	63	54	44	4.4	1920	2.3	≤60	85/86	155
1700	240	FCCF3DL247**P12003**1	50	43	35	5.0	2880	3.2	≤60	116	120
	250	FCCF3DL257**22503**2	59	51	42	4.0	3000	2.9	≤60	85/86	225
	300	FCCF3DL307**P15505**2	53	46	38	4.6	3600	3.0	≤60	116	155
	460	FCCF3DL467**P23005**2	72	62	51	2.7	5520	2.8	≤60	116	230
	760	FCCF3DL767**T25205**2	89	77	63	2.0	9120	2.5	≤80	136	252
	100	FCC3DDL107**12003**1	46	40	32	4.8	1200	4.0	≤60	85/86	120
2000	120	FCC3DDL127**15503**2	48	42	34	4.4	1440	3.8	≤60	85/86	155
	190	FCC3DDL197**P12003**1	54	47	38	5.0	2280	2.7	≤60	116	120
	190	FCC3DDL197**22503**2	55	48	39	4.0	2280	3.3	≤60	85/86	225
	240	FCC3DDL247**P15503**2	70	60	49	4.6	2880	1.8	≤60	116	155
	370	FCC3DDL377**P23005**2	82	71	58	2.7	4440	2.2	≤60	116	230
	600	FCC3DDL607**P34505**2	100	100	87	2.2	6000	1.2	≤80	116	345
	600	FCC3DDL607**T25205**1	100	100	91	2.0	6000	1.2	≤80	136	252
	800	FCC3DDL807**T34505**3	100	100	100	1.8	9600	1.1	≤80	136	345
2200	90	FCCT3DL906**L13603**1	48	42	34	4.6	1080	3.7	≤60	86	136
	140	FCCT3DL147**P12005**2	60	52	43	5.0	1680	2.2	≤60	116	120



## 规格标准 Standard Ratings

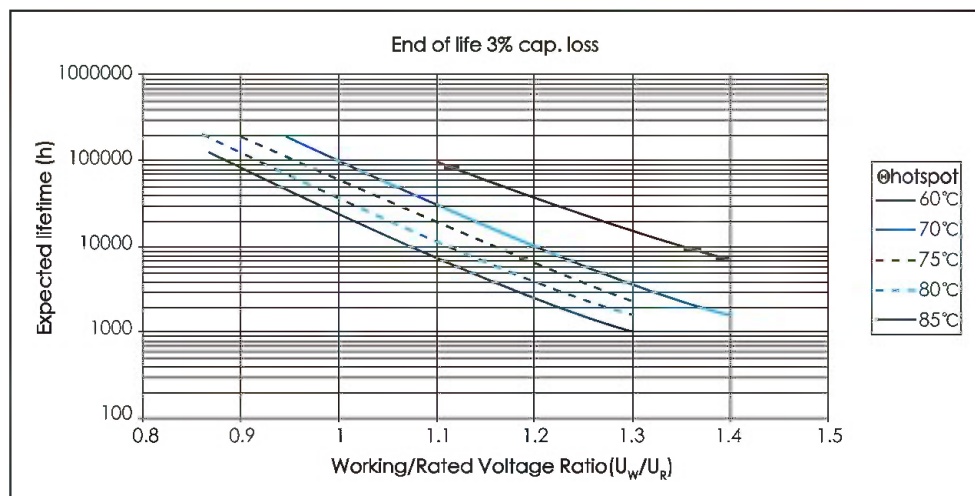
$U_R \leq 85^\circ\text{C}$ (V)	$C_R$ ( $\mu\text{F}$ )	P/N	$I_{\text{max}}(\text{A}) @ 1\text{KHz}$			$R_{\text{th}}$ [K/W]	$\hat{I}$ [A]	ESR@ 1KHz, 20 $^\circ\text{C}$ (m $\Omega$ )	$L_s @ 20^\circ\text{C}$ (nH)	D (mm)	H (mm)
			40 $^\circ\text{C}$	50 $^\circ\text{C}$	60 $^\circ\text{C}$						
2200	150	FCCT3DL157*P122503**2	73	63	51	4.0	1800	1.9	$\leq 60$	86	225
	170	FCCT3DL177*P15505**2	59	51	42	4.6	2040	2.5	$\leq 60$	116	155
	210	FCCT3DL217*P17505**2	90	78	64	4.5	25200	1.1	$\leq 60$	116	175
	290	FCCT3DL297*P23005**2	100	89	73	2.7	3480	1.4	$\leq 60$	116	230
	400	FCCT3DL407*P23005**2	100	93	76	2.9	4800	1.2	$\leq 80$	136	230
	450	FCCT3DL457*P34505**2	100	100	87	2.2	5400	1.2	$\leq 80$	116	345
	500	FCCT3DL507*P25205**2	100	100	87	2.0	6000	1.3	$\leq 80$	136	252
	660	FCCT3DL667*P34505**3	100	100	100	1.8	7920	1.1	$\leq 80$	136	345
2600	63	FCC3FDL636*P15503**1	47	41	33	4.4	756	4.1	$\leq 60$	86	155
	100	FCC3FDL107*P122503**1	65	56	46	4.0	1200	2.4	$\leq 60$	86	225
	100	FCC3FDL107*P12005**2	62	53	44	5.0	1200	2.1	$\leq 60$	116	120
	120	FCC3FDL127*P15505**2	57	49	40	4.6	1440	2.7	$\leq 60$	116	155
	140	FCC3FDL147*P17505**2	86	75	61	4.5	1680	1.2	$\leq 60$	116	175
	200	FCC3FDL207*P23005**1	99	86	70	2.7	2400	1.5	$\leq 60$	116	230
	200	FCC3FDL207*P17505**2	100	100	85	2.5	2400	1.1	$\leq 80$	136	175
	280	FCC3FDL287*P23005**2	100	89	73	2.9	3360	1.3	$\leq 80$	136	230
	320	FCC3FDL327*P34505**2	100	99	81	2.2	3840	1.4	$\leq 80$	116	345
	340	FCC3FDL347*P25205**2	100	100	85	2.0	4080	1.4	$\leq 80$	136	252
2800	450	FCC3FDL457*P34505**3	100	100	92	1.8	5400	1.3	$\leq 80$	136	345
	86	FCCL3DL866*P12005**1	57	49	40	5.0	1032	2.5	$\leq 60$	116	120
	88	FCCL3DL886*P122503**1	67	58	48	4.0	1056	2.2	$\leq 60$	86	225
	100	FCCL3DL107*P13605**1	53	46	38	4.9	1200	2.9	$\leq 60$	116	136
	120	FCCL3DL127*P17505**2	65	56	46	4.5	1440	2.1	$\leq 60$	116	175
	170	FCCL3DL177*P17505**2	100	89	73	2.5	2040	1.5	$\leq 80$	136	175
	240	FCCL3DL247*P23005**2	100	87	72	2.9	2880	1.4	$\leq 80$	136	230
	270	FCCL3DL277*P34505**2	100	99	81	2.2	3240	1.4	$\leq 80$	116	345
	290	FCCL3DL297*P25205**2	100	97	79	2.0	3480	1.6	$\leq 80$	136	252
	390	FCCL3DL397*P34505**3	100	100	92	1.8	4680	1.2	$\leq 80$	136	345
3000	46	FCC3FDL466*P13605**1	43	38	31	4.6	552	4.6	$\leq 60$	86	136
	74	FCC3FDL746*P12005**1	55	48	39	5.0	888	2.6	$\leq 60$	116	120
	75	FCC3FDL756*P122503**1	66	57	47	4.0	900	2.3	$\leq 60$	86	225
	100	FCC3FDL107*P17505**2	83	72	58	4.5	1200	1.3	$\leq 60$	116	175
	140	FCC3FDL147*P17505**2	100	87	71	2.5	1680	1.6	$\leq 80$	136	175
	200	FCC3FDL207*P23005**2	99	86	70	2.9	2400	1.4	$\leq 80$	136	230
	240	FCC3FDL247*P34505**3	100	100	91	2.2	2880	1.1	$\leq 80$	116	345
	250	FCC3FDL257*P25205**2	100	100	91	2.0	3000	1.2	$\leq 80$	136	252
3200	330	FCC3FDL337*P34505**3	100	100	100	1.8	3960	1.0	$\leq 80$	136	345
	64	FCC3UDL646*P12003**1	58	50	41	5.0	768	2.4	$\leq 60$	116	120
	65	FCC3UDL656*P122503**1	45	39	32	4.0	780	4.9	$\leq 60$	86	225
	92	FCC3UDL926*P17503**2	83	72	58	4.5	1104	1.3	$\leq 60$	116	175
	120	FCC3UDL127*P17505**2	97	84	69	2.5	1440	1.7	$\leq 80$	136	175
	180	FCC3UDL187*P23005**2	99	86	70	2.9	2160	1.4	$\leq 80$	136	230
	210	FCC3UDL217*P34505**2	100	100	83	2.2	2520	1.3	$\leq 80$	116	345
	220	FCC3UDL227*P25205**2	100	100	85	2.0	2640	1.4	$\leq 80$	136	252
	300	FCC3UDL307*P34505**3	100	100	96	1.8	3600	1.2	$\leq 80$	136	345
	44	FCC3VDL446*P12005**1	59	51	42	5.0	528	2.3	$\leq 60$	116	120
3600	45	FCC3VDL456*P122503**1	71	61	50	4.0	540	2.0	$\leq 60$	86	225
	88	FCC3VDL886*P23005**2	100	89	73	2.7	1056	1.4	$\leq 60$	116	230
	120	FCC3VDL127*P23005**2	100	89	73	2.9	1440	1.3	$\leq 80$	136	230
	160	FCC3VDL167*P34505**2	100	100	86	2.2	1920	1.2	$\leq 80$	116	345
	170	FCC3VDL177*P25205**2	100	100	88	2.0	2040	1.3	$\leq 80$	136	252
	230	FCC3VDL237*P34505**3	100	100	100	1.8	2760	1.0	$\leq 80$	136	345

\*  $R_{\text{th}}$  为产品热点到环境的热阻（自然冷却）

\* The thermal Resistance from hotspot to ambient environment (Natural cooling)

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	C	2	S	D	L	6	5	7	K	L	0	9	5	0	3	1	B	1
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		直径 Diameter	高度 Height	引出端子 terminals type	引出端子间距 Terminals Pitch		底部螺栓 Bottom Bolt	图号 Style	内部特征码 Internal use			
Film Capacitor =FC	Column=C	600=2S	CBB131=DL			70=706	±5%=J		76=H	95=095	Female M6*10=0	32=3		Without=0	Style B=B				
		700=2Q				180=187	±10%=K		86=L	120=120	Female M8*10=2	50=5		M12*16=1	Style H=H				
		800=2K				220=227	-15~0%=P		116=P	136=136	Female M10*10=4			M16*25=2	Style I=I				
		900=R2				300=357	Special=S			155=155	Female M8*12=6			M12*12=3					
		1000=3A				350=357				175=175	Female M5*7=8								
		1100=A3				500=507					Female M10*12=B								
		1200=3B				700=707					Male M6*20=1								
		1500=C3				1100=108					Male M8*20=3								
						1300=138					Male M10*20=5								
											Male M8*17=7								
											Male M8*12=9								
											Male M8*15=A								



## Features

- Used in DC-Link circuits, can replace electrolytic capacitor
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handing capabilities
- Low Ls
- Self-healing property
- Aluminum case , filled with fire-retardant resin

## Applications

- Wind energy, Solar
- Transportation: HEV or EV
- Welders, Elevators, Motor Driver systems

## 特点

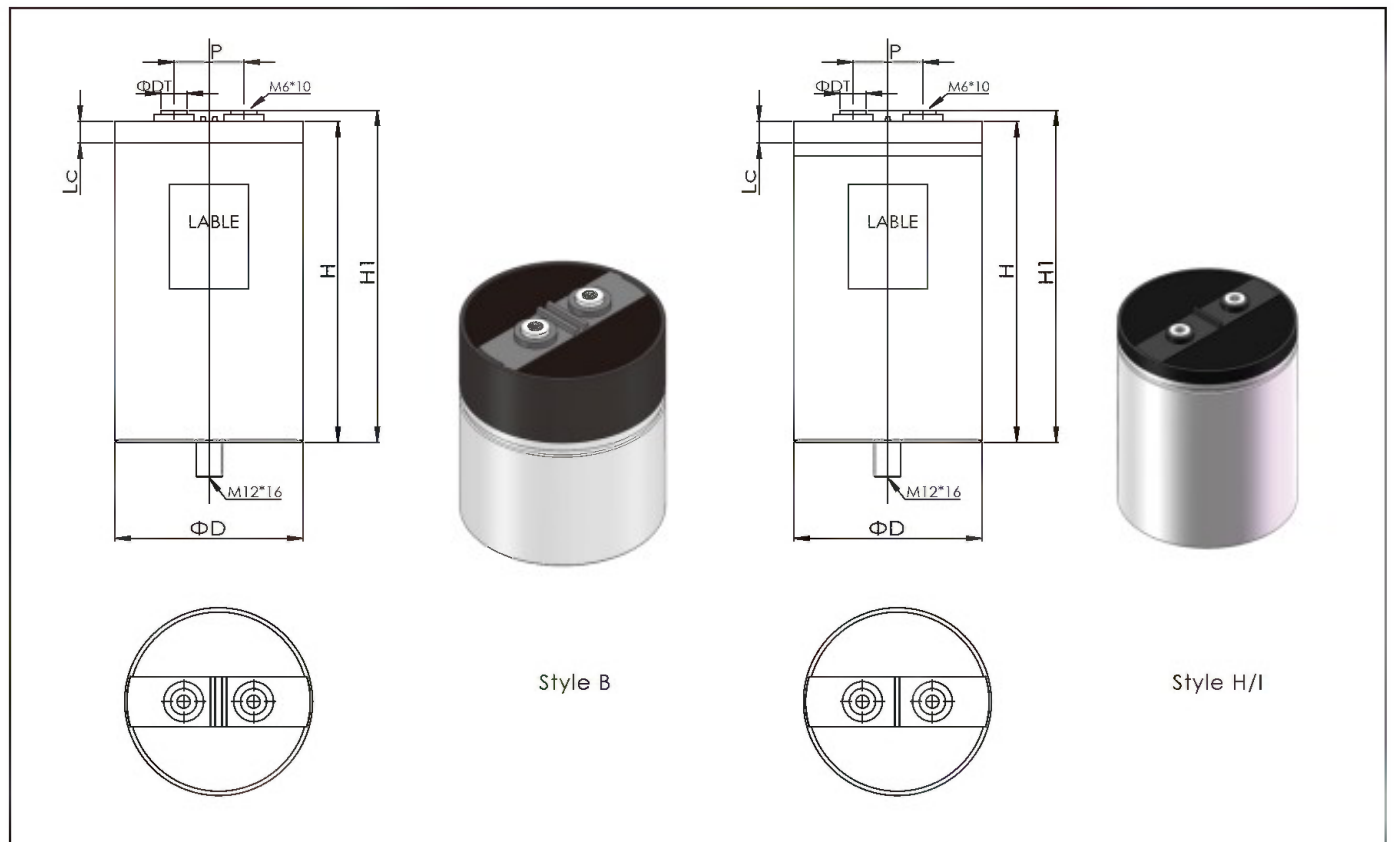
- 直流滤波用，可替代电解电容器
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 自感小
- 有自愈性
- 铝壳，阻燃树脂灌封

## 应用场合

- 风能，太阳能
- 交通工具，如：电动车和混合动力车
- 焊接设备，电梯，电机驱动

## 外形图 Dimensions

Unit: mm






类型 Style	D ±1.0mm	D1 ±1.0mm	P ±0.5mm	H ±1.0mm	H1 ±1.0mm H1=H+5	Lc ±1.0mm
B	76	--	32	95~230	100~235	32
B	86	--	32	95~230	100~235	32
H	116	--	50	65~95	70~100	10
I	116	--	50	95~230	100~235	45

## Approvals:

Mark	structure	File no
	UL	E227010



## 标识 Marking

	CBB131	——	1
FCC2KDL438KT345051G3		——	2
4300 $\mu$ F $\pm$ 10% -40/85 $^{\circ}$ C		——	3
$U_R=800V_{DC}$ IEC61071		——	4
$U_{TC}=3000V_{AC}$ 50/60Hz SH		——	5
Torque max.5Nm		——	6
Discharge before handling		——	7
 E227010	N37F26104		8

NO.	项目 Item
1	商标 Brand 产品系列 Products series
2	产品代码 Products code
3	容量和偏差 Capacitance and Tolerance 温度范围 Temperature Range
4	额定电压 Rated voltage 引用标准 Reference Standard
5	端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case 自愈性 Self-healing property
6	电极最大扭矩 Maximum torque of electrode
7	安全警示 Safety Warning
8	<b>UL</b> 年度标记 Year code 二维码 QR Code

## 性能特性 Specifications

项目 Item	特性 Characteristics			
引用标准 Reference Standard	GB/T 17702 (IEC 61071)			
气候类别 Climatic Category	40/85/56			
工作温度范围 Operating Temperature Range	-40~+85℃ (Θ <sub>hotspot</sub> ≤85℃)			
存储温度范围 Storage Temperature Range	-40~+85℃			
额定电压U <sub>R</sub> Rated Voltage	700~1500V <sub>DC</sub>			
电容量范围 Capacitance Range	100~1500μF			
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)			
端子与端子间耐压U <sub>T</sub> Voltage Between Terminals	1.5×U <sub>R</sub> V <sub>DC</sub> , 10s (20±5℃)			
端子与铝壳间耐压U <sub>TC</sub> Voltage Between Terminals and Case	>3000V <sub>AC</sub> , 10s (20±5℃, 50 Hz)			
介质损耗角正切 Dielectric Dissipation Factor	≤2×10 <sup>-4</sup>			
绝缘电阻 Insulation Resistance	IR•C≥10000s (20±5℃, 100V <sub>DC</sub> , 1min)			
过电压 Over Voltage	1.1U <sub>R</sub> (30% of on-load-duration)			
	1.15U <sub>R</sub> (30 min/day)			
	1.2U <sub>R</sub> (5 min/day)			
	1.3U <sub>R</sub> (1 min/day)			
	1.5U <sub>R</sub> (30 ms every time, 100ms/day)			
最大电极扭矩 Max.Torque of terminals	M5:3 Nm	M6:5 Nm	M8:6 Nm	M10:8 Nm
最大安装扭矩 Max.Torque of installation	M12: 12 Nm		M16: 15Nm	
预期寿命 Life Expectancy	100000 hours (U <sub>R</sub> , Θ <sub>hotspot</sub> =70℃)			
失效率 Failure Rate	100 FIT			



## 规格标准 Standard Ratings

$U_r \leq 85^\circ\text{C}$ (V)	$C_r$ ( $\mu\text{F}$ )	P/N	$I_{\text{max}}(\text{A})@1\text{KHz}$			$R_{\text{th}}$ [K/W]	$\hat{I}$ (A)	ESR@ 1KHz, 20 $^\circ\text{C}$ (m $\Omega$ )	$L_s@20^\circ\text{C}$ (nH)	D (mm)	H (mm)
			40 $^\circ\text{C}$	50 $^\circ\text{C}$	60 $^\circ\text{C}$						
700	500	FCC2GDL507*H09503**1	70	61	50	5.1	1680	1.6	$\leq 50$	76	95
	660	FCC2GDL667*H09503**1	71	62	51	5.6	2200	1.4	$\leq 50$	86	95
	700	FCC2GDL707*H12003**1	65	56	46	4.7	1680	2	$\leq 60$	76	120
	850	FCC2GDL857*H15503**2	64	55	45	4.3	1680	2.3	$\leq 60$	76	155
	900	FCC2GDL907*H12003**1	70	61	50	4.8	3350	1.7	$\leq 60$	86	120
	1000	FCC2GDL108*H17503**2	70	70	63	4.2	3200	1.2	$\leq 60$	76	175
	1200	FCC2GDL128*H15503**2	70	70	67	4.4	2350	1	$\leq 60$	86	155
800	1400	FCC2GDL148*H17503**2	70	70	68	4.3	4500	1	$\leq 50$	86	175
	350	FCC2KDL357*H09503**1	68	59	48	5.1	1550	1.7	$\leq 50$	76	95
	490	FCC2KDL497*H09503**1	69	60	49	5.6	2000	1.5	$\leq 50$	86	95
	500	FCC2KDL507*H12003**1	64	55	45	4.7	1600	2.1	$\leq 60$	76	120
	650	FCC2KDL657*H15503**2	70	70	65	4.3	3200	1.1	$\leq 60$	76	155
	650	FCC2KDL657*H12003**1	68	59	48	4.8	3200	1.8	$\leq 60$	86	120
	730	FCC2KDL737*H17503**2	70	70	63	4.2	3100	1.2	$\leq 60$	76	175
	770	FCC2KDL777*H13603**1	68	59	48	4.6	2100	1.9	$\leq 60$	86	136
	780	FCC2KDL787*H15503**2	67	58	48	4.4	2150	2	$\leq 60$	86	155
	850	FCC2KDL857*H15503**2	70	70	67	4.4	4100	1	$\leq 60$	86	155
900	950	FCC2KDL957*H17503**2	70	70	65	4.3	4130	1.1	$\leq 60$	86	175
	350	FCCR2DL357*H09503**1	68	59	48	5.1	1500	1.7	$\leq 50$	76	95
	490	FCCR2DL497*H09503**1	69	60	49	5.6	2000	1.5	$\leq 50$	86	95
	500	FCCR2DL507*H12003**1	64	55	45	4.7	1600	2.1	$\leq 60$	76	120
	600	FCCR2DL607*H15503**2	62	54	44	4.3	1580	2.4	$\leq 60$	76	155
	650	FCCR2DL657*H15503**2	70	70	65	4.3	3100	1.1	$\leq 60$	76	155
	650	FCCR2DL657*H12003**1	68	59	48	4.8	3100	1.8	$\leq 60$	86	120
	730	FCCR2DL737*H17503**2	70	70	63	4.2	3200	1.2	$\leq 60$	76	175
	770	FCCR2DL777*H13603**1	68	59	48	4.6	2100	1.9	$\leq 60$	86	136
	780	FCCR2DL787*H15503**2	67	58	48	4.4	2150	2	$\leq 60$	86	155
1000	850	FCCR2DL857*H15503**2	70	70	67	4.4	4000	1	$\leq 60$	86	155
	950	FCCR2DL957*H17503**2	70	70	65	4.3	4150	1.1	$\leq 60$	86	175
	300	FCC3ADL307*H09503**1	64	56	45	5.1	1500	1.9	$\leq 50$	76	95
	400	FCC3ADL407*H12003**1	62	54	44	4.7	1580	2.2	$\leq 60$	76	120
	400	FCC3ADL407*H09503**1	67	58	47	5.6	1580	1.6	$\leq 50$	86	95
	490	FCC3ADL497*H15503**2	60	52	42	4.3	1600	2.6	$\leq 60$	76	155
	520	FCC3ADL527*H15503**2	70	70	62	4.3	1600	1.2	$\leq 60$	76	155
	540	FCC3ADL547*H12003**1	66	57	47	4.8	2000	1.9	$\leq 60$	86	120
	590	FCC3ADL597*H17503**2	70	70	61	4.2	3000	1.3	$\leq 60$	76	175
	600	FCC3ADL607*H13603**1	66	57	47	4.6	3120	2	$\leq 60$	86	136
1100	640	FCC3ADL647*H15503**2	66	57	47	4.4	3250	2.1	$\leq 60$	86	155
	680	FCC3ADL687*H15503**2	70	70	64	4.4	3280	1.1	$\leq 60$	86	155
	780	FCC3ADL787*H17503**2	70	70	65	4.3	4000	1.1	$\leq 60$	86	175
	220	FCCA3DL227*H09503**1	63	54	44	5.1	1550	2	$\leq 50$	76	95
	300	FCCA3DL307*H12003**1	58	51	41	4.7	1600	2.5	$\leq 60$	76	120
	300	FCCA3DL307*H09503**1	65	56	46	5.6	1600	1.7	$\leq 50$	86	95
	350	FCCA3DL357*H15503**2	56	48	39	4.3	1650	3	$\leq 60$	76	155
	400	FCCA3DL407*H15503**2	70	70	60	4.3	3100	1.3	$\leq 60$	76	155
	400	FCCA3DL407*H12003**1	63	55	45	4.8	3100	2.1	$\leq 60$	86	120
	430	FCCA3DL437*H13603**1	60	52	43	4.6	3250	2.4	$\leq 60$	86	136
1200	440	FCCA3DL447*H17503**2	70	70	58	4.2	3280	1.4	$\leq 60$	76	175
	500	FCCA3DL507*H15503**2	70	70	62	4.4	3940	1.2	$\leq 60$	86	155
	580	FCCA3DL587*H17503**2	70	70	62	4.3	3980	1.2	$\leq 60$	86	175
	180	FCC3BDL187*H09503**1	61	53	43	5.1	1520	2.1	$\leq 60$	76	95
	250	FCC3BDL257*H12003**1	55	48	39	4.7	1980	2.8	$\leq 60$	76	120
	250	FCC3BDL257*H09503**1	63	55	45	5.6	1980	1.8	$\leq 50$	86	95
	330	FCC3BDL337*H15503**2	70	70	59	4.3	2130	1.3	$\leq 60$	76	155
	370	FCC3BDL377*H17503**2	70	70	58	4.2	2590	1.4	$\leq 60$	76	175
	380	FCC3BDL387*H13603**1	59	51	42	4.6	2600	2.5	$\leq 60$	86	136
	400	FCC3BDL407*H15503**2	59	51	42	4.4	2800	2.6	$\leq 60$	86	155
1500	420	FCC3BDL427*H15503**2	70	70	62	4.4	3000	1.2	$\leq 60$	86	155
	480	FCC3BDL487*H17503**2	70	70	60	4.3	3190	1.3	$\leq 60$	86	175
	110	FCCC3DL117*H09503**1	55	48	39	5.1	1340	2.6	$\leq 50$	76	95
	140	FCCC3DL147*H09503**1	57	49	40	5.6	1360	2.2	$\leq 50$	86	95
	150	FCCC3DL157*H12003**1	51	44	36	4.7	1420	3.3	$\leq 60$	76	120
	160	FCCC3DL167*H15503**2	48	42	34	4.3	1450	4	$\leq 60$	76	155
	180	FCCC3DL187*H15503**2	70	66	54	4.3	1560	1.6	$\leq 60$	76	155
	180	FCCC3DL187*H12003**1	56	48	39	4.8	1560	2.7	$\leq 60$	86	120
	200	FCCC3DL207*H17503**2	70	65	53	4.2	2200	1.7	$\leq 60$	76	175
	220	FCCC3DL227*H13603**1	53	46	37	4.6	2460	3.1	$\leq 60$	86	136
1500	240	FCCC3DL247*H15503**2	70	70	57	4.4	2590	1.4	$\leq 60$	86	155
	270	FCCC3DL277*H15503**2	70	68	56	4.3	3100	1.5	$\leq 60$	86	175

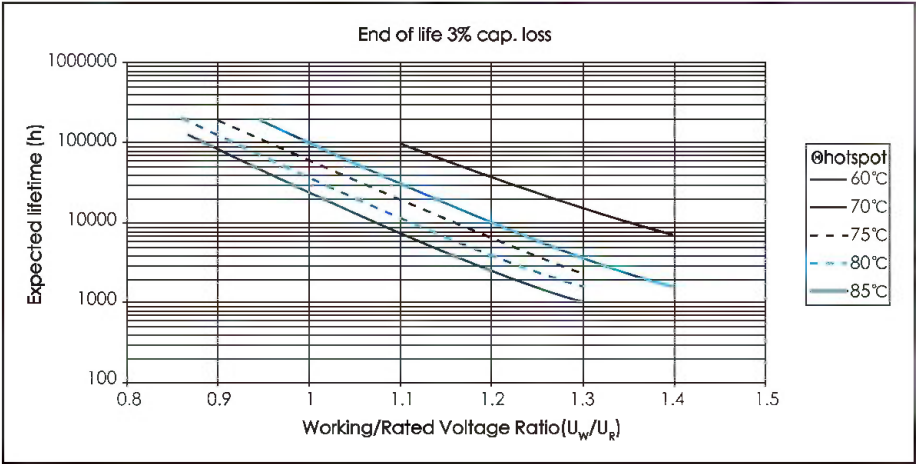
可根据客户要求定制。Customer products are available on request.

\*  $R_{\text{th}}$  为产品热点到环境的热阻（自然冷却）

The thermal Resistance from hotspot to ambient environment (Natural cooling)



预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	C	C	2	K	D	H	6	0	6	J	D	0	7	1	W	0	A
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 D.C.Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		直径 Diameter	总高度 Total height	引出端子 间距 Terminals Pitch	底部螺栓 Bottom-bolt	外壳式样 Shell style				
FC=Film Capacitor	Column=C	600=2S	CBB132=DH		25=356		± 5%=J		50=D	59=059	12.7=W	M8*10=4	A=A				
		800=2K			35=356		± 10%=K		56.3=C	71=071		无=0 Without=0	B=B				
		1000=3A			45=456		Special=S		63.5=E								
		1200=3B			60=606				35.9=X								
					90=906												
					110=117												
					145=157												



## Features

- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handling capabilities
- Self-healing property
- Plastic case, filled with fire-retardant resin

## 特点

- 采用聚丙烯薄膜, 温度特性好
- 容值稳定, 变化率小
- 等效串联电阻小, 能承受较大的纹波电流
- 有自愈性
- 塑壳, 阻燃树脂灌封

## Applications

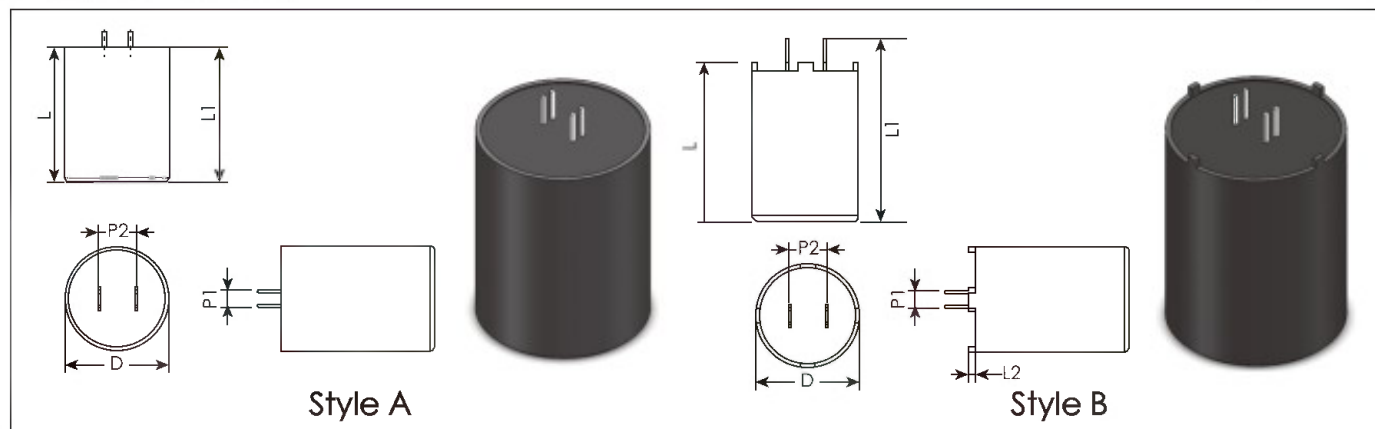
- Used in Inverters of wind power and solar power
- Frequency converters
- Industrial and high-end power supplies

## 应用场合

- 风能发电, 太阳能发电
- 变频器
- 工业和高端电源

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	—	1
CBB132	—	2
65μF ± 10% 900V	—	3
J02F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products Series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	生产批号 Production batch

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105°C ( $\theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R(\text{dc})$
存储温度范围 Storage Temperature Range	-40~+105°C
额定电压 $U_R$ Rated Voltage	600~1200V <sub>DC</sub>
电容量范围 Capacitance Range	25~145μF
电容量偏差 Capacitance Tolerance	± 5%(J), ± 10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	$1.5 \times U_R V_{DC}$ , 10s (20 ± 5 °C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	> 3000 V <sub>AC</sub> , 10s (20 ± 5 °C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 5000s$ (20 ± 5 °C, 100V <sub>DC</sub> , 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	50 FIT



## 规格标准 Standard Ratings

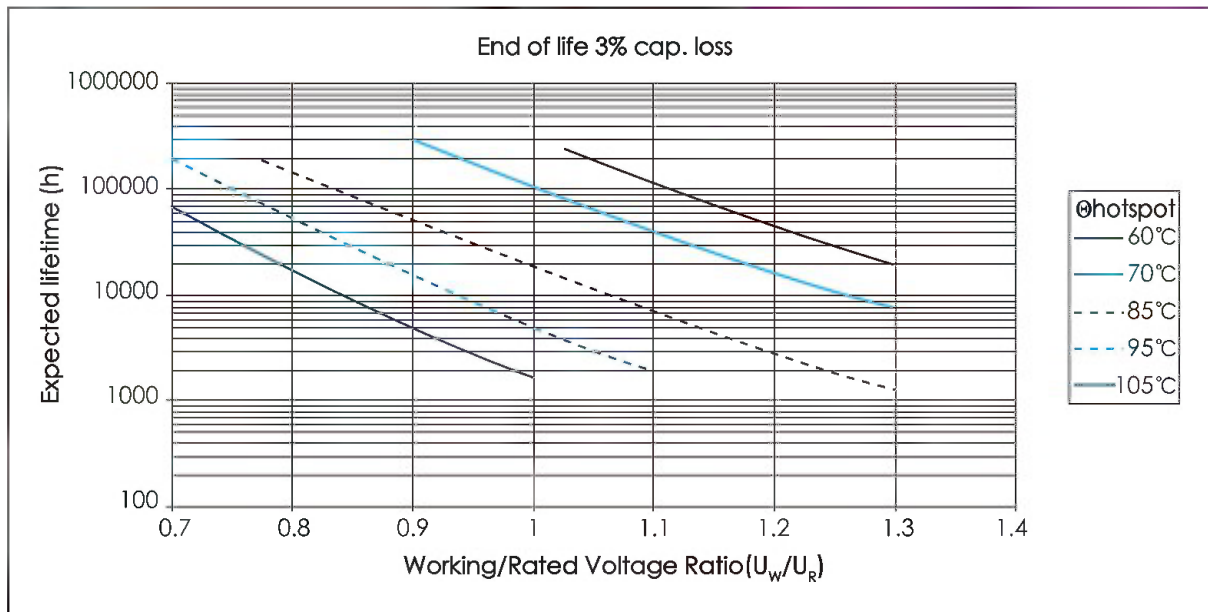
$U_r \leq 85^\circ\text{C}$	$C_r$	P/N	$dV/dt$	$\hat{I}$	ESR@ 10kHz, 20°C	$I_{max}$ @ 10kHz, 70°C	$D \pm 0.5$	$L \pm 0.8$	$L1 \pm 1.3$	$P1 \pm 0.5$	$P2 \pm 0.8$
(V)	( $\mu\text{F}$ )	-	(V/ $\mu\text{s}$ )	(A)	(m $\Omega$ )	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
600	30	FCC2SDH306*X061W0*	28	847	8	12.4	35.9	53.7	61.3	5.4	12.7
	110	FCS2SDH117*D071W0*	15	1650	3.5	25	50	63	70.6	5.1	12.7
	145	FCS2SDH157*C071W0*	15	2175	2.8	35	56.3	63	70.6	5.1	12.7
	145	FCS2SDH157*E059W0*	20	2900	2.5	35	63.5	51.4	59	5.1	12.7
800	60	FCC2KDH606*D071W0*	15	900	5.0	16	50	63	70.6	5.1	12.7
	90	FCC2KDH906*C071W0*	15	1350	4.0	20	56.3	63	70.6	5.1	12.7
	90	FCC2KDH906*E059W0*	20	1800	3.0	20	63.5	51.4	59	5.1	12.7
1000	45	FCS3ADH456*D071W0*	15	675	6.0	15	50	63	70.6	5.1	12.7
	60	FCS3ADH606*C071W0*	15	900	5.0	18	56.3	63	70.6	5.1	12.7
	60	FCS3ADH606*E059W0*	20	1200	4.5	18	63.5	51.4	59	5.1	12.7
1200	25	FCS3BDH256*D071W0*	20	500	8.9	10	50	63	70.6	5.1	12.7
	35	FCS3BDH356*C071W0*	20	700	6.0	15	56.3	63	70.6	5.1	12.7
	35	FCS3BDH356*E059W0*	25	875	5.5	15	63.5	51.4	59	5.1	12.7

可根据客户要求定制。Customer products are available on request.

\*  $R_{th}$  为产品热点到环境的热阻（自然冷却）

The thermal Resistance from hotspot to ambient environment (Natural cooling)

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21										
F	C	S	2	K	D	M	2	5	8	K	0	1	9	0	2	0	0	1	7	X										
电容器类型 Capacitor Type		产品外形 Product Shape	额定电压代码 Rated Voltage Code		系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance	尺寸特征码 Dimension characteristic code										内部特征码 Internal use										
FC=薄膜电容器 FC=Film Capacitor		方型=S Square=S	750=Q2		CBB133=DM		1500=158		± 5%=J	019020017																				
			800=2K				2500=258		± 10%=K																					
			900=R2				2800=288		Special=S																					
			950=K3				3800=388																							
			1020=AA																											
			1200=3B																											
			2250=3T																											
			2500=E3																											
			3000=3F																											



## Features

- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handing capabilities
- Self-healing property
- Metal case , filled with fire-retardant resin

## Applications

- Transportation: Rail transportation
- High voltage, high power converter, converter

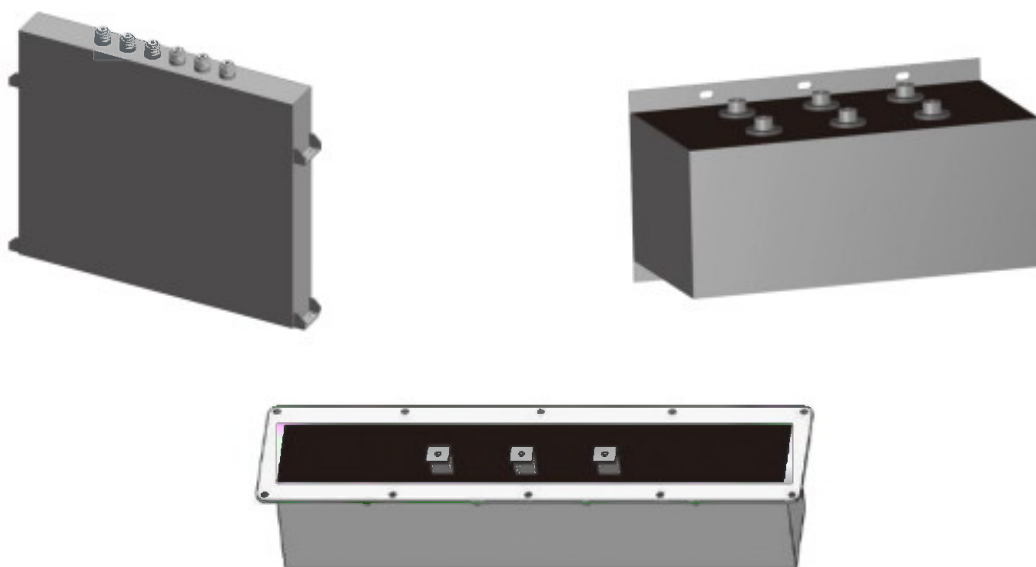
## 特点

- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 有自愈性
- 金属外壳，阻燃树脂灌封



## 应用场合

- 交通工具，如：轨道交通
- 高压大功率变频器，变流器

## 外形图 Dimensions



## 标识 Marking

	1
CBB133	2
FCS2KDM258K019020017F	3
2500μF ± 10%	4
$U_R = 800V_{DC}$ SH	5
$U_{TC} = 3000V_{AC}$ 50/60Hz	6
-40~+85°C IEC61071	7
Discharge before handling	8
N37F26 001 	9

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	产品代码 Products code
4	容量和偏差 Capacitance and Tolerance
5	额定电压和自愈性 Rated voltage and Self-healing property
6	端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case
7	温度范围 Temperature Range 引用标准 Reference Standard
8	安全警示 Safety Warning
9	年度标记 Year Code 二维码 QR Code



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/85/56
工作环境温度范围 Operating environment Temperature Range	-40~+70°C ( $\Theta_{\text{hotspot}} \leq 70^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+85°C
额定电压 $U_R$ Rated Voltage	750~3000V <sub>DC</sub>
电容量范围 Capacitance Range	500~210000 $\mu\text{F}$
电容量偏差 Capacitance Tolerance	$\pm 5\%(\text{J}), \pm 10\%(\text{K})$
端子与端子电压 $U_T$ Voltage Between Terminals	$1.5 \times U_R V_{DC}, 10\text{s} (20 \pm 5^\circ\text{C})$
端子与铝壳电压 $U_C$ Voltage Between Terminals and Case	$> 3000V_{AC}, 10\text{s} (20 \pm 5^\circ\text{C}, 50\text{Hz})$
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 5000\text{s} (20 \pm 5^\circ\text{C}, 100V_{DC}, 1\text{min})$
过电压 Over Voltage	$1.1U_R$ (30% of on-load-duration)
	$1.15U_R$ (30 min/day)
	$1.2U_R$ (5 min/day)
	$1.3U_R$ (1 min/day)
	$1.5U_R$ (30 ms every time, 100ms/day)
预期寿命 Life Expectancy	100000 hours ( $U_R, \Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT

## 规格标准 Standard Ratings

$U_R$ (V)	$C_R$ ( $\mu\text{F}$ )	P/N	$I_{\text{max}}(\text{A})$	(A)	$R_s$ (m $\Omega$ )	$L_s$ (nH)	W (mm)	H (mm)	T (mm)
750	2800	FCSQ2DM288K024010013	80	2200	0.8	80	240	103	125
	3800	FCSQ2DM388K049011009	80	3800	0.6	80	490	110	84
800	2500	FCS2KDM258K019020017	250	3500	0.6	50	190	195	170
	2500	FCS2KDM258K040012011	300	3500	0.4	50	402	116	110
900	18000	FCSR2DM189K050021027	400	3600	0.7	50	500	460	120
950	2500*3	FCSK3DM258J050021027	135*3	8400*3	1.5*3	50	500	205	270
	3750*2	FCSK3DM758J050021027	140*2	6200*2	1.2*2	50	500	205	270
1020	13500	FCS3ADM139K033065017	300	5050	0.5	60	330	650	170
1100	900	FCS3BDM907K016015016	100	9000	1.0	80	163	152	162
1200	8000	FCS3BDM808K062020014	260	6000	0.5	80	620	200	140
	9000	FCS3BDM908J068021023	500	18000	1.2	50	680	210	230
	20000	FCS3BDM209S028070016	250	100000	1	50	280	700	155
	65000	FCS3BDM659S046088019	400	300	1	50	460	880	185
2250	4000	FCS3TDM408J034018067	400	19000	0.5	60	340	175	670
2500	30000	FCSE3DT30MFK040117022	100	90000	0.8	100	395	1170	220
3000	1500	FCS3FDM158J034036023	150	4000	1.0	100	340	360	230

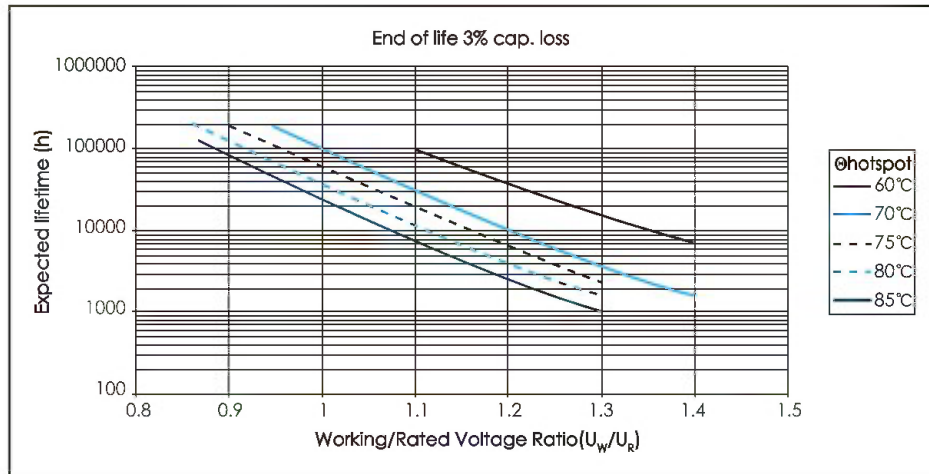
注：详细的产品说明和外形尺寸图，请索取产品规格书

Note: For detail description and outline drawing of product, please see the specifications.

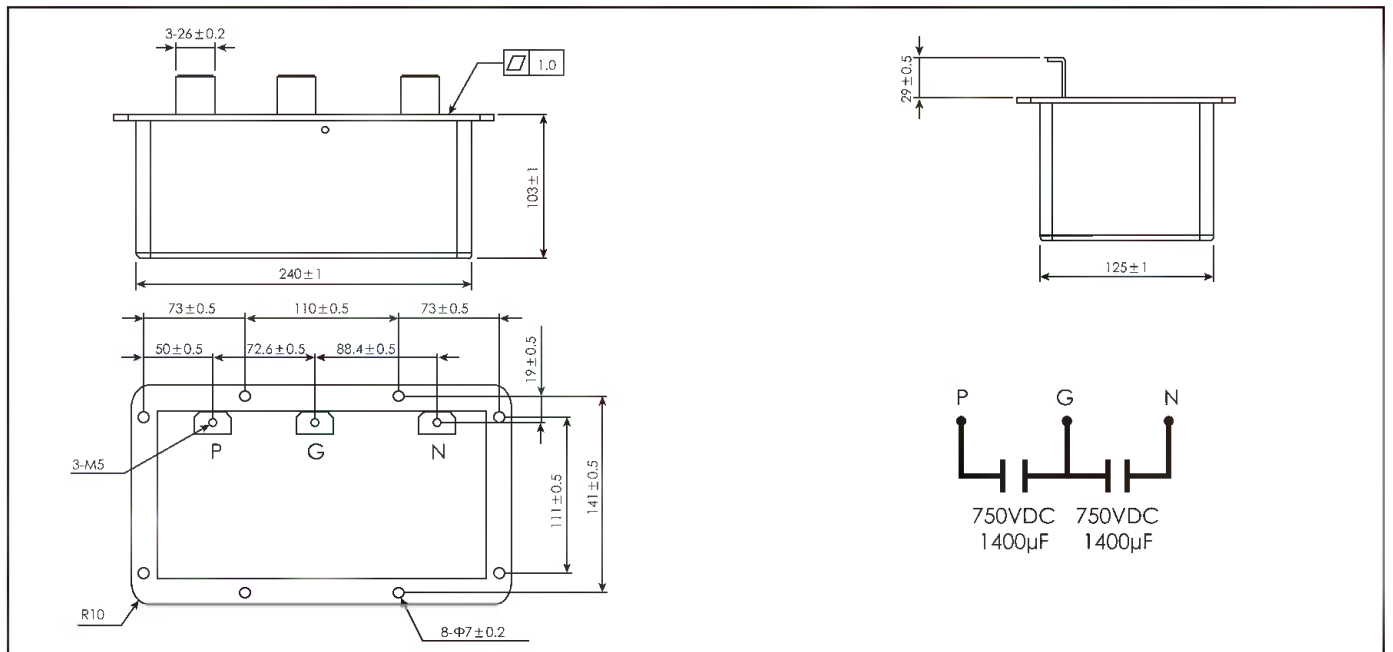
根据客户要求定制。Customer products are available on request.



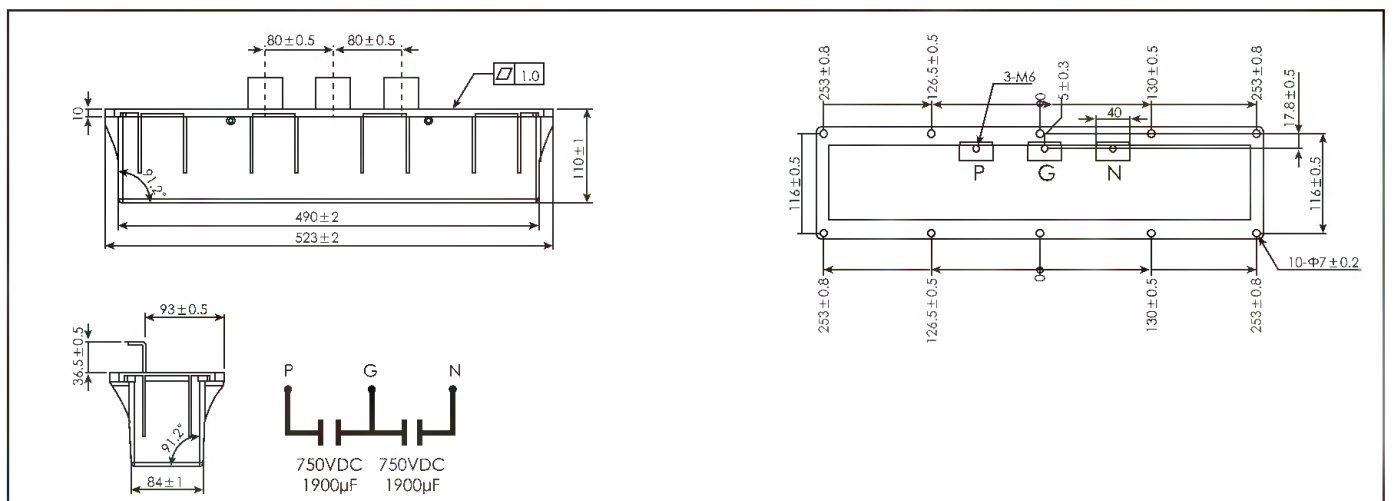
预期寿命曲线 Expected lifetime curve



图一 Style 1



图二 Style 2









## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F	C	S	2	S	D	M	2	2	8	K	B	0	0	1	0	2	1
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		客户代码 Customer code					产品序号 PN			
FC=薄膜电容器 FC=Film Capacitor	方形=S Square =S	450=2W	CBB135=DV		70=706		± 5%=J		B601=客户A					001			
		500=2H			300=307		± 10%=K		B602=客户B					002			
		600=2S			420=427		Special=S							003			
		700=2Q			850=857												
		800=2K			1000=108												
		900=R2															



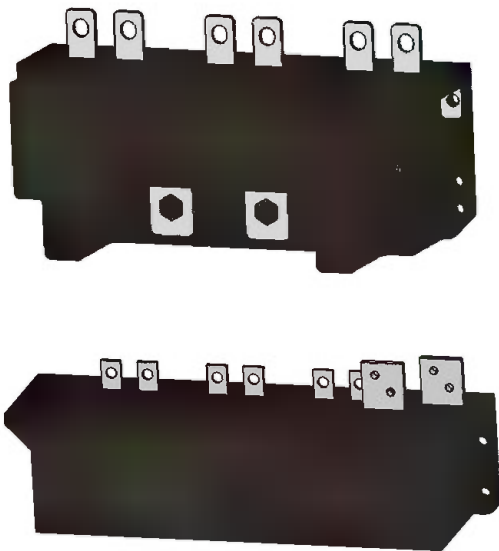
## Features

- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handing capabilities
- Self-healing property
- Plastic case , filled with fire-retardant resin

## Applications

- Transportation: HEV or EV

## 外形图 Dimensions



## 特点



- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 有自愈性
- 塑料外壳，阻燃树脂灌封

## 应用场合

- 交通工具，如：电动车和混合动力车



## 标识 Marking

1	——		CBB135			
2	——		FCS2KDV857KB024011		——	6
3	——		850μF ±10%			
4	——		U <sub>R</sub> =800 VDC SH	N37F26104	——	7
5	——		Discharge before handling			

NO.	项目 Item
1	商标 Brand 产品系列 Products series
2	产品代码 Products code
3	容量和偏差 Capacitance and Tolerance
4	额定电压和自愈性 Rated voltage and Self-healing property
5	安全警示 Safety warning
6	二维码 QR Code
7	年度标记 Year Code



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702(IEC 61071)/AEC-Q200
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105°C (Θmax(hotspot)≤105°C) Θ(hotspot)=85°C~105°C: decreasing factor 1.5% per°C for U <sub>N</sub> (dc)
存储温度范围 Storage Temperature Range	-40~+105°C
额定电压U <sub>R</sub> Rated Voltage	450~1200V <sub>DC</sub>
电容量范围 Capacitance Range	200~2000μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压U <sub>T</sub> Voltage Between Terminals	1.5×U <sub>R</sub> V <sub>DC</sub> , 10s (20±5°C)
端子与铝壳电压U <sub>C</sub> Voltage Between Terminals and Case	> 3000V <sub>AC</sub> , 10s (20±5°C, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	≤2×10 <sup>-4</sup>
绝缘电阻 Insulation Resistance	IR•C≥10000s (20±5°C, 100V <sub>DC</sub> , 1min)
过电压 Over Voltage	1.1U <sub>R</sub> (30% of on-load-duration)
	1.15U <sub>R</sub> (30 min/day)
	1.2U <sub>R</sub> (5 min/day)
	1.3U <sub>R</sub> (1 min/day)
	1.5U <sub>R</sub> (30 ms every time, 100ms/day)
预期寿命 Life Expectancy	10年/300000km
失效率 Failure Rate	100 FIT

## 规格标准 Standard Ratings

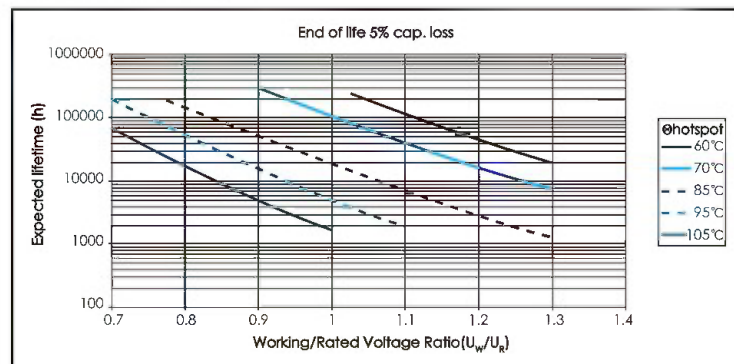
U <sub>R</sub>	C <sub>R</sub>	P/N	I <sub>max</sub>	I	R <sub>s</sub>	W	H	T	L <sub>s</sub>
(V)	(μF)	-	85°C 10KHz(A)	(A)	(mΩ)	(mm)	(mm)	(mm)	(nH)
450	400	FCS2WDV407KB156021Y	100	2000	0.5	249	47	50	15
450	1000	FCS2WDV108KB025011	150	4000	0.6	268	53	101.6	30
500	500	FCS2HDV507KB101021	90	2500	0.8	206	42	72	15
500	500	FCS2HDV507KB191021Y	130	2500	0.45	197	78.5	40	18
500	700	FCS2HDV707KB194811	130	7000	0.5	214	42	82	15
500	850	FCS2HDV857KB010811	180	5500	0.5	275	72	70	15
600	450	FCS2SDV457KB109021	125	3300	0.42	188	57	56	18
800	300	FCS2KDV307KB109021	125	3000	0.5	188	57	56	18
800	400	FCS2KDV407KB059121	110	2000	0.6	193	76	79	20
800	420	FCS2KDV427KB009021	100	4000	0.65	210	81	72	15
800	500	FCS2KDV507KB010021	150	4000	0.6	275	72	70	15
800	500	FCS2KDV507KB051021	160	6000	0.6	194.5	69.5	100	30
800	560	FCS2KDV567KB037021	200	8000	0.4	209.5	84.5	101	24
800	850	FCS2KDV857KB018021	200	8000	0.4	376	97	67	20
800	850	FCS2KDV857KB166021	200	8000	0.4	361	70	65	15
800	900	FCS2KDV907KB114231	180	4500	0.5	291	219	40	20
800	1000	FCS2KDV108KB015021	160	4000	0.8	268	68	101.6	30

注：详细的产品说明和外形尺寸图，请索取产品规格书

Note: For detail description and outline drawing of product, please see the specifications.

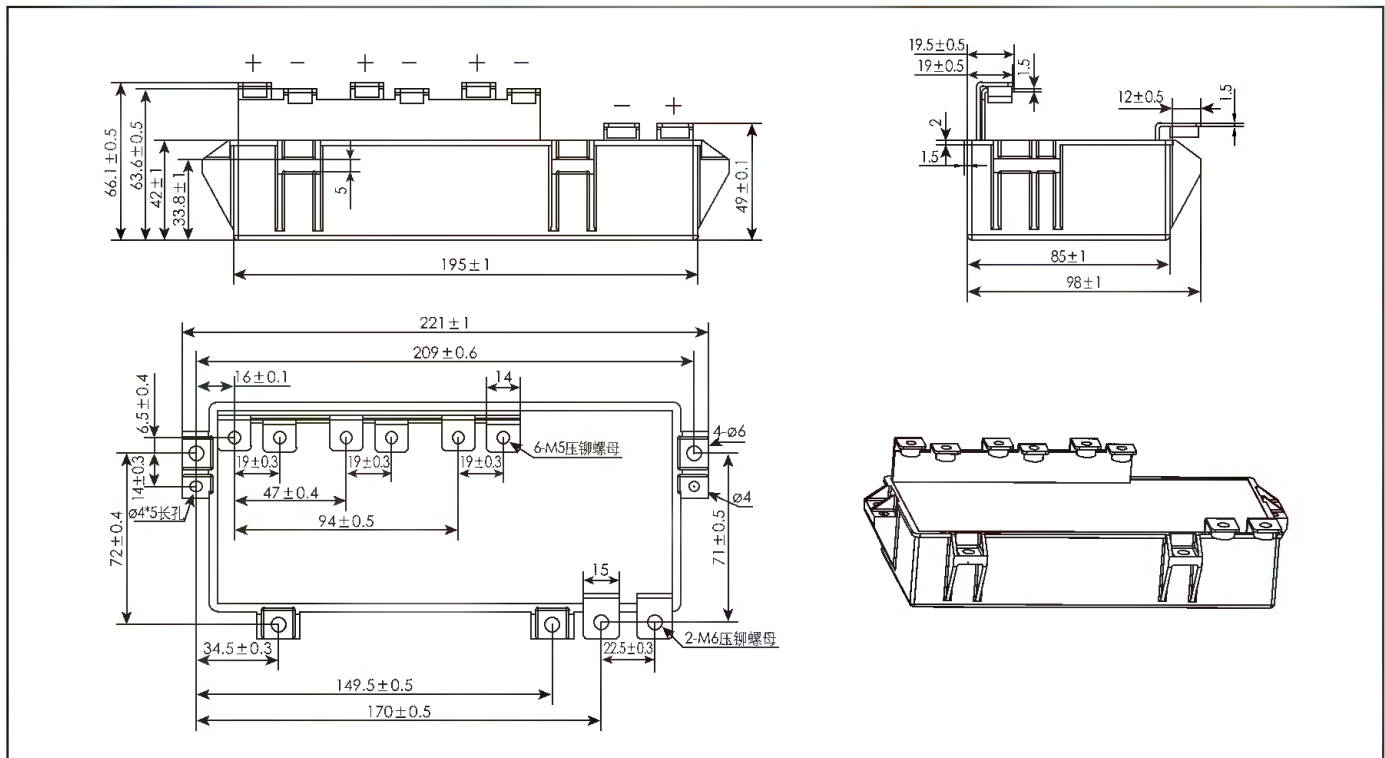
根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve

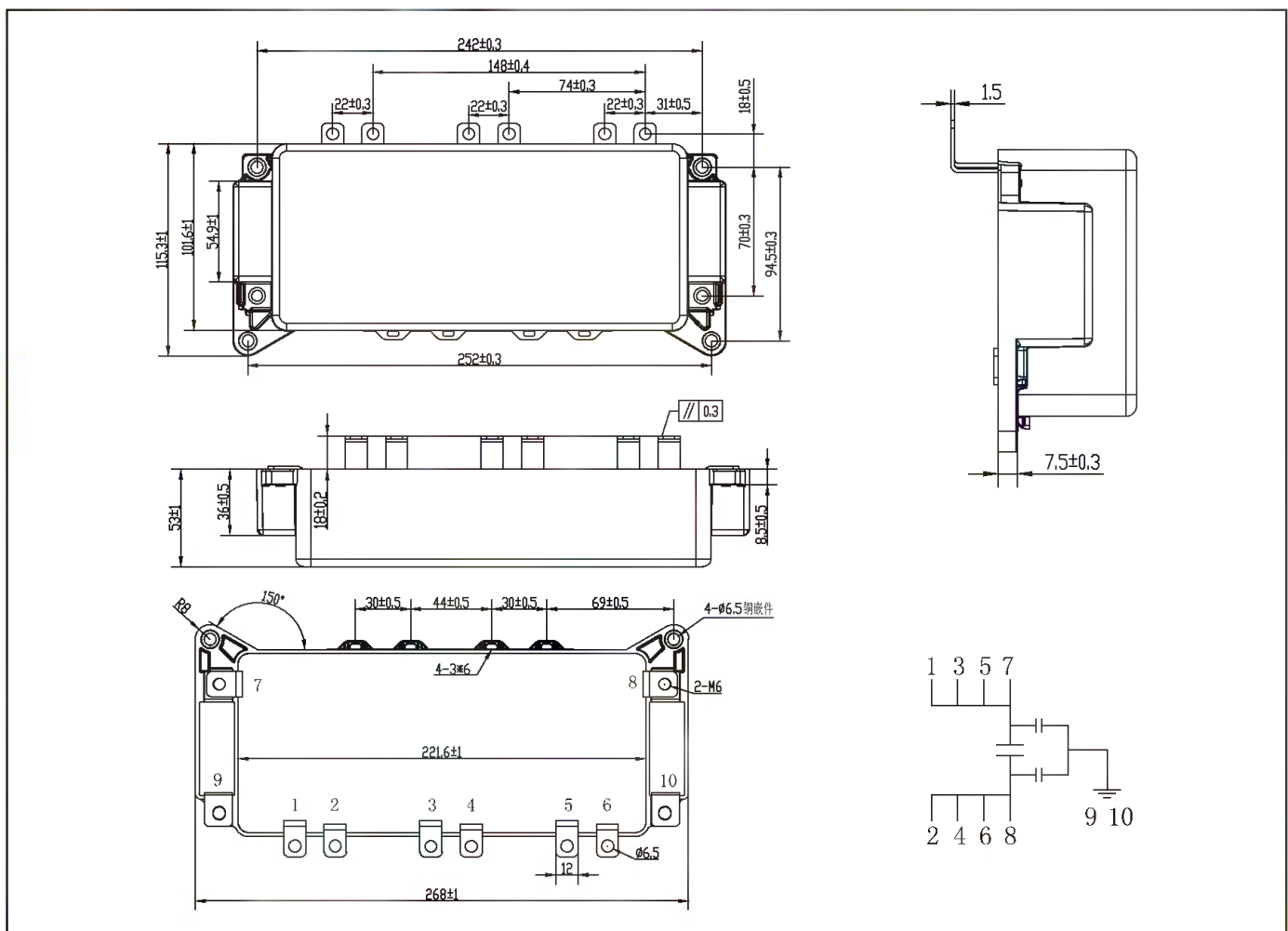




图一 Style 1

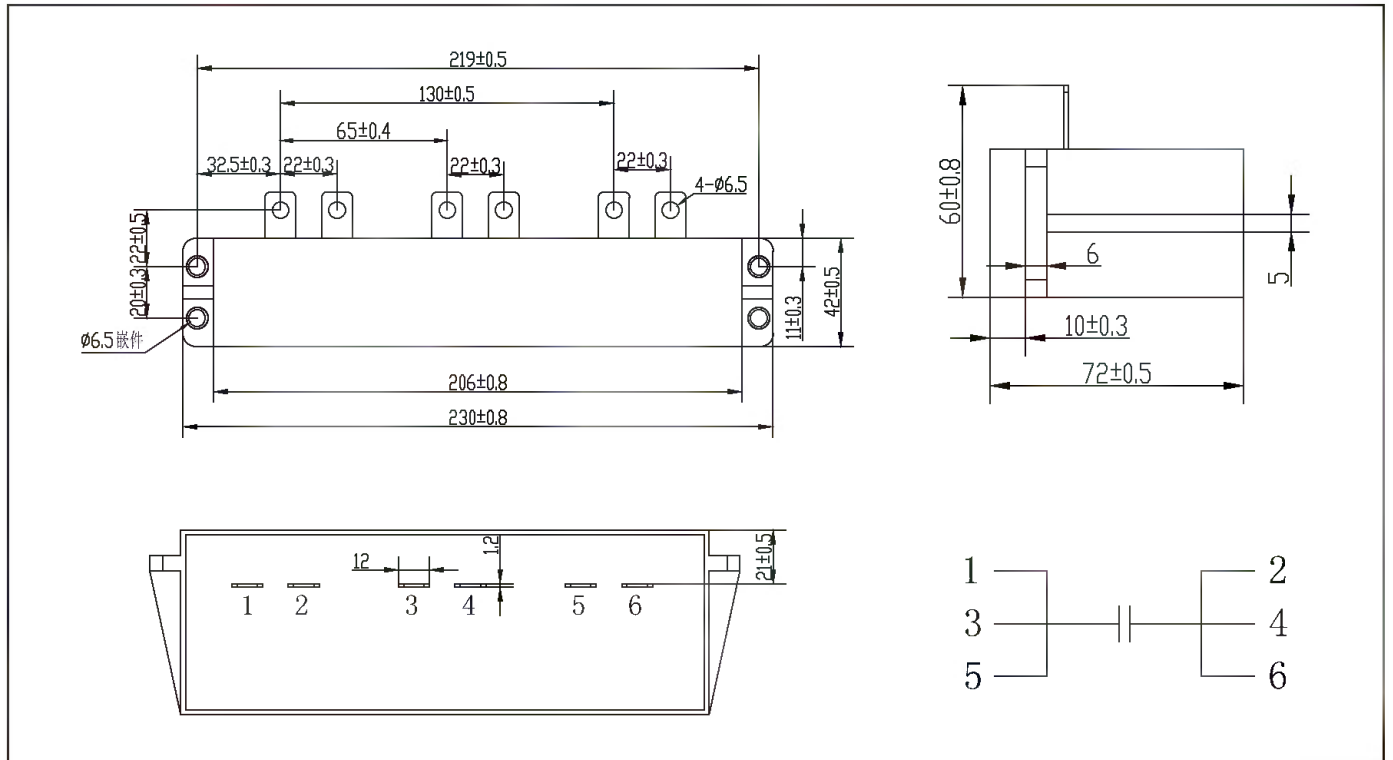


图二 Style 2

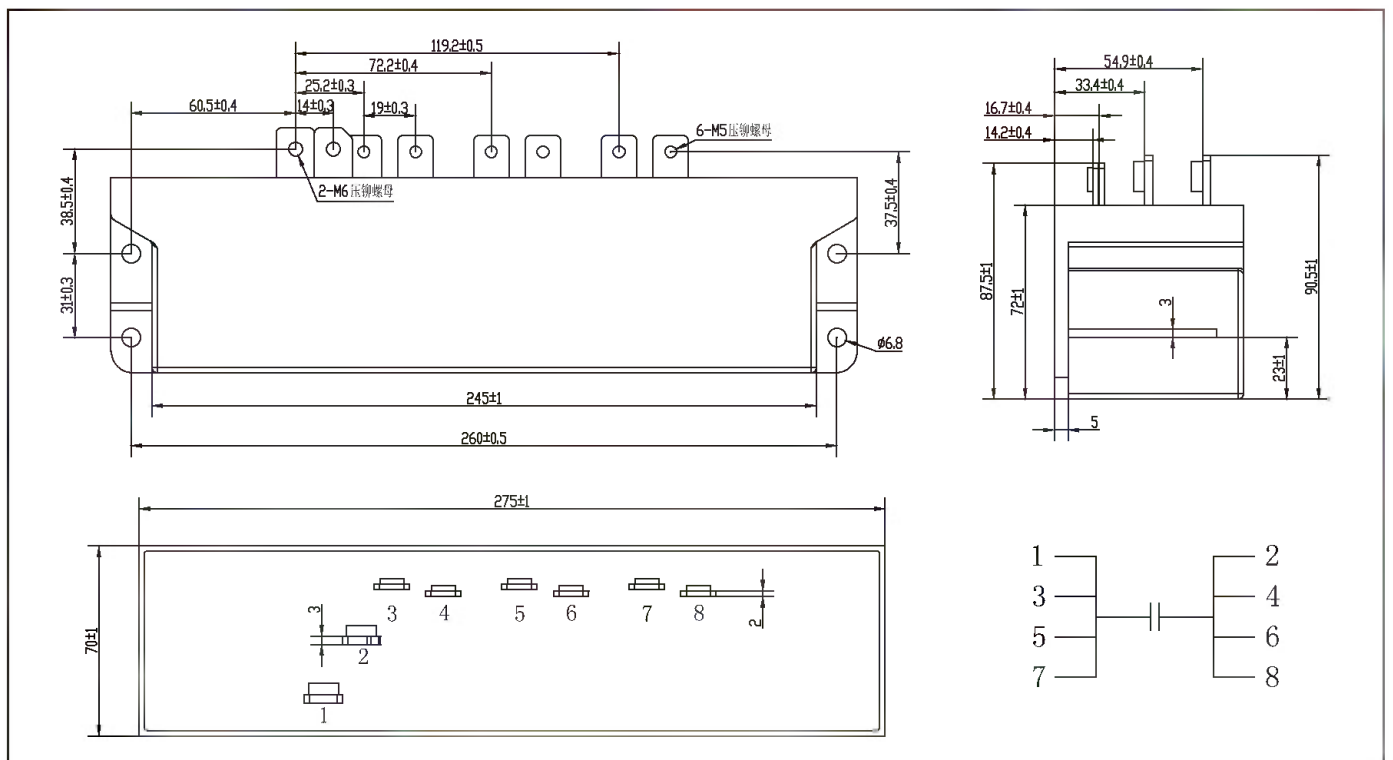




图三 Style 3

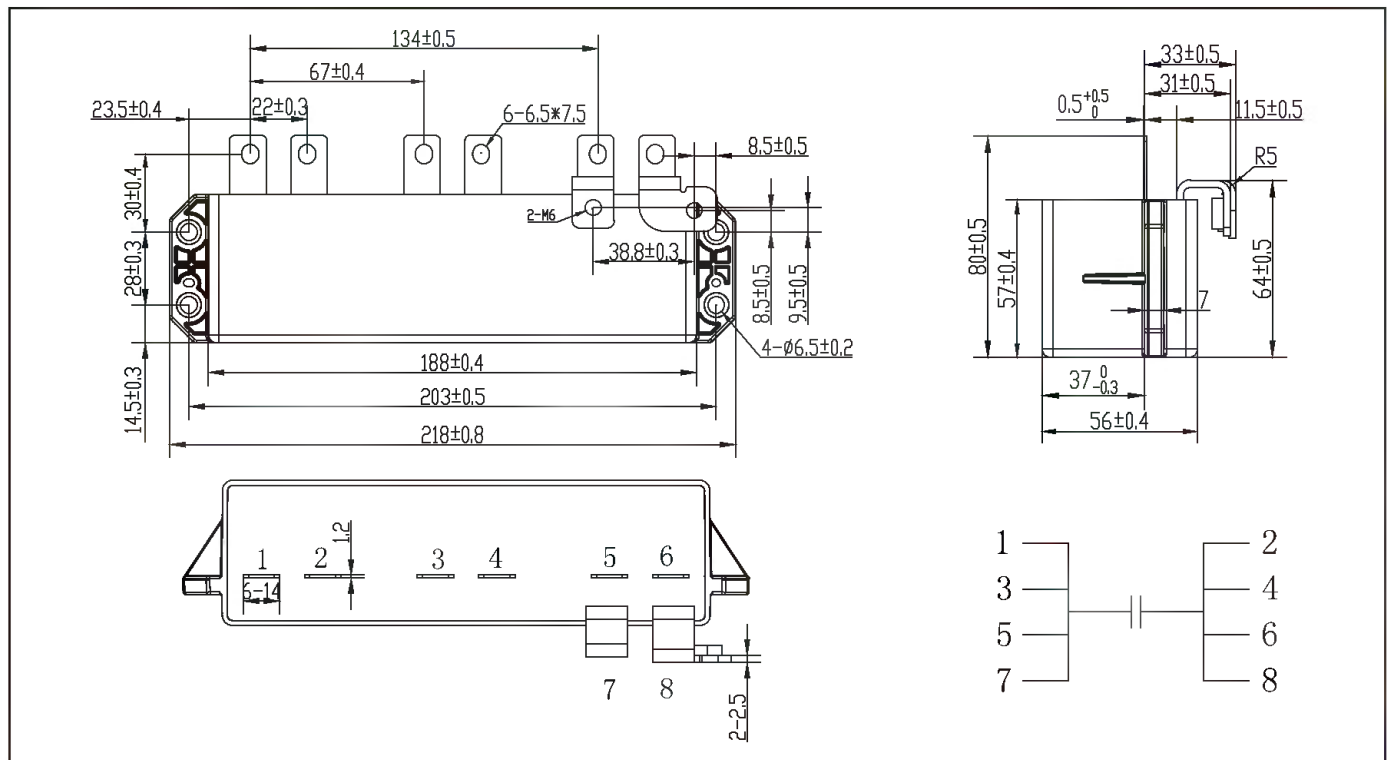


图四 Style 4

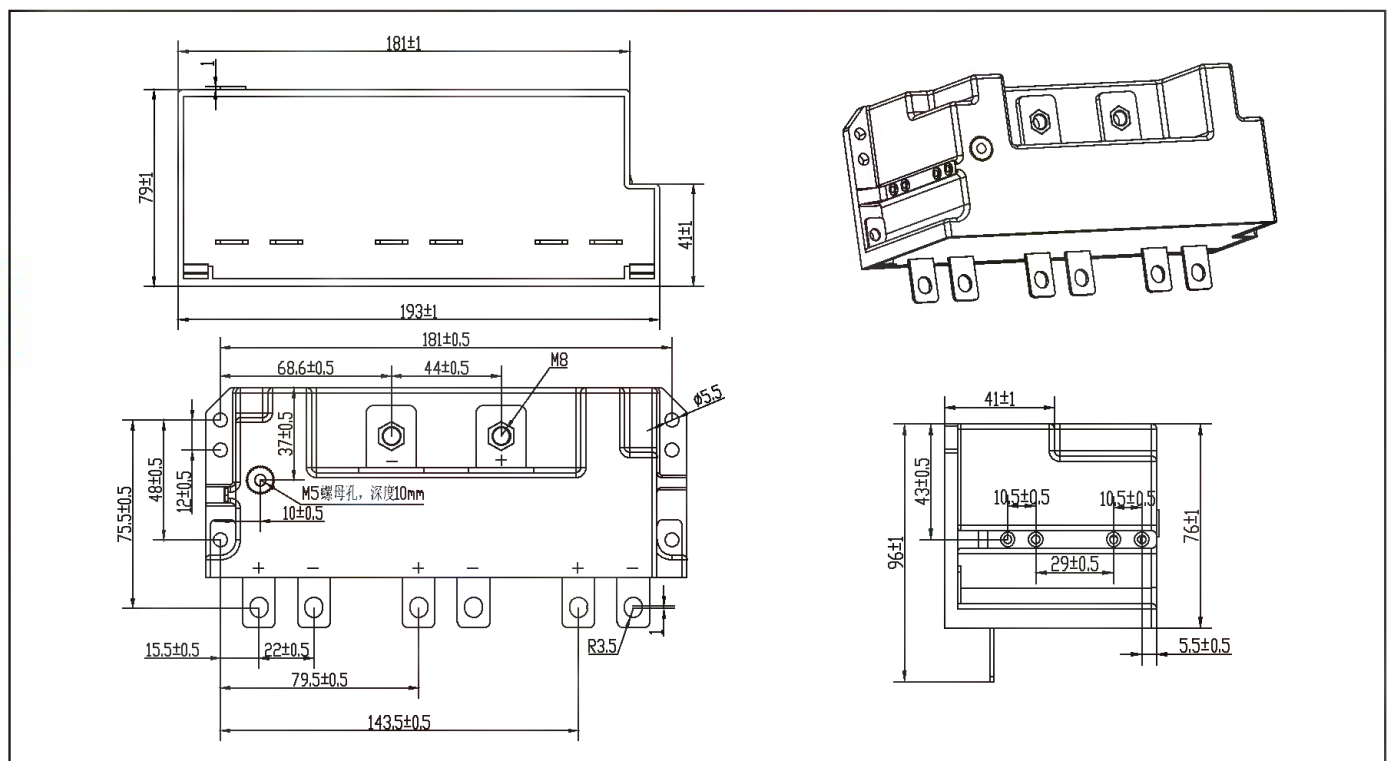




图五 Style 5

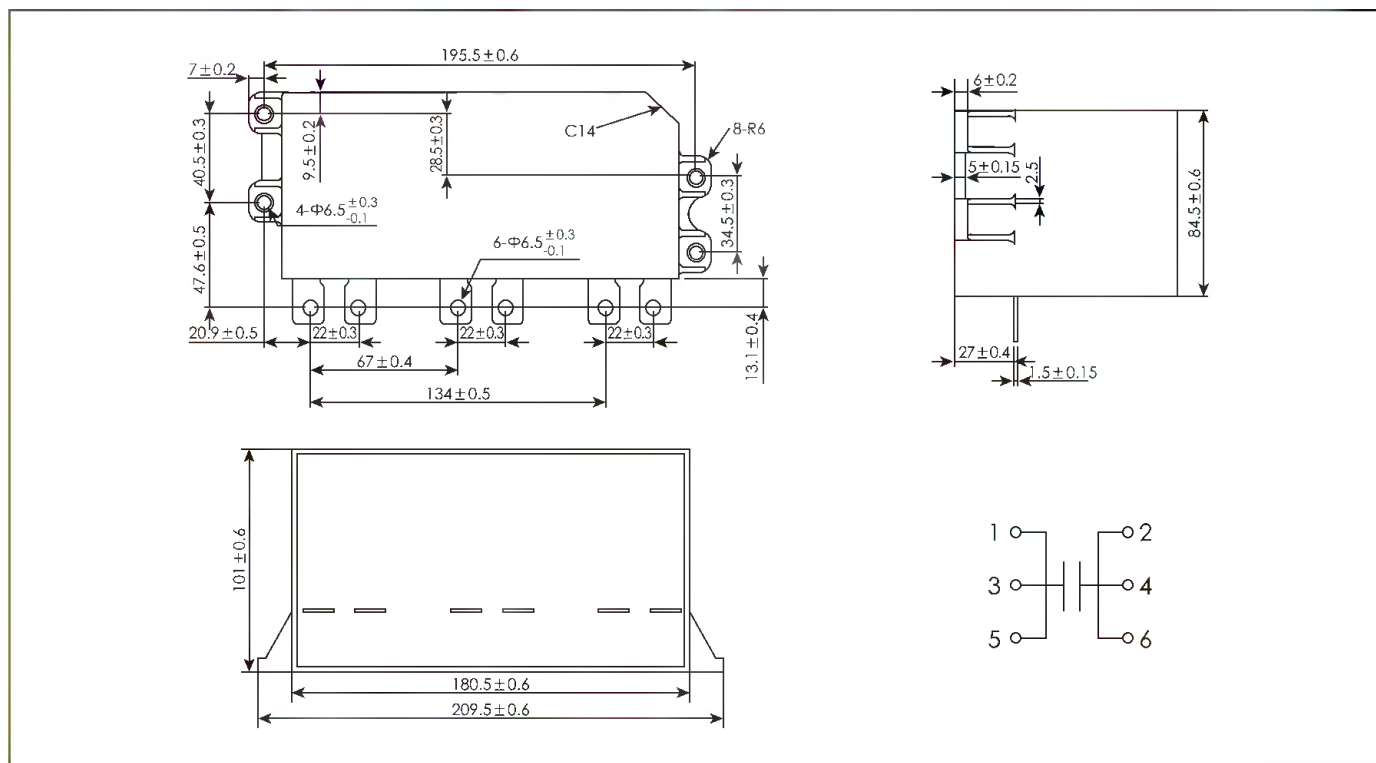


图六 Style 6

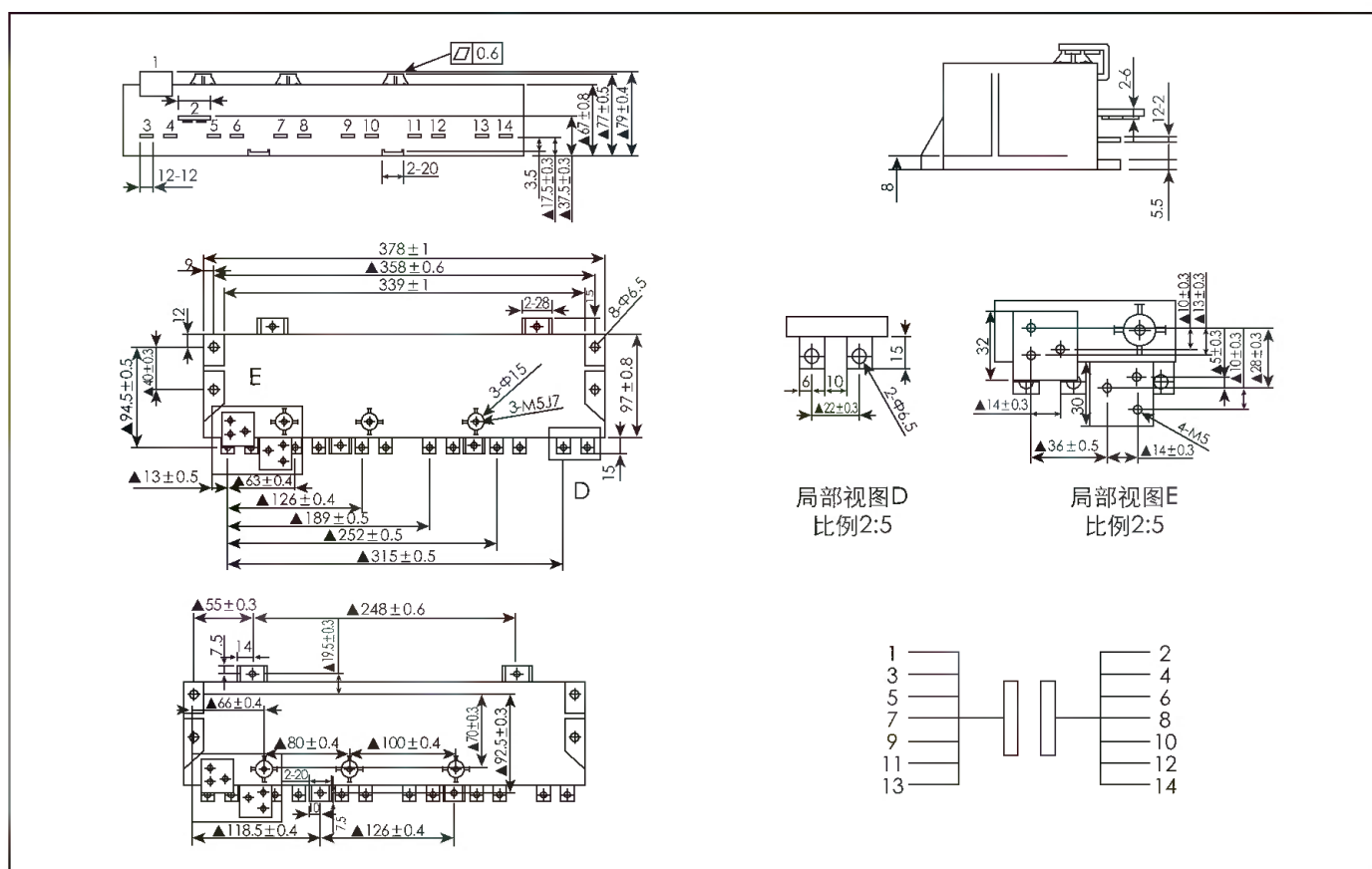




图七 Style 7



图八 Style 8





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	C	2	K	D	P	2	2	7	K	J	0	6	5	0	4	0	A	1
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	直径 Diameter	高度 Height	引出端子 terminals type	引出端子间距 Terminals Pitch	底部结构 Bottom structure	图号 Style	内部特征码 Internal use					
Film Capacitor =FC	Column=C	600=2S	CBB136=DP			75=756	± 5%=J	84.5=J	51=051	Female M6*10=0	38=3	带耳塑壳=0	Style A=A						
		800=2K				110=117	± 10%=K	85=K	65=065	Female M8*10=2	45=4	不带耳塑壳=1	Style B=B						
		1100=A3				120=127	Special=S	95=W	83=083	Female M10*10=4			Style C=C						
		1300=O3				200=207			76=076	Female M8*12=6									
		220=227				Female M5*7=8													
		280=287				Female M8*15=A													
		645=657				Male M6*20=1													
						Male M8*20=3													
						Male M10*20=5													
						Male M8*17=7													
					Male M8*12=9														
					Male M10*12=B														



## Features

- Used in DC-Link circuits, can replace electrolytic capacitor
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handing capabilities
- Self-healing property
- Plastic case, filled with fire-retardant resin

## Applications

- Used in inverters of wind power and solar power
- Welders, Elevators, Motor Driver systems

## 特点

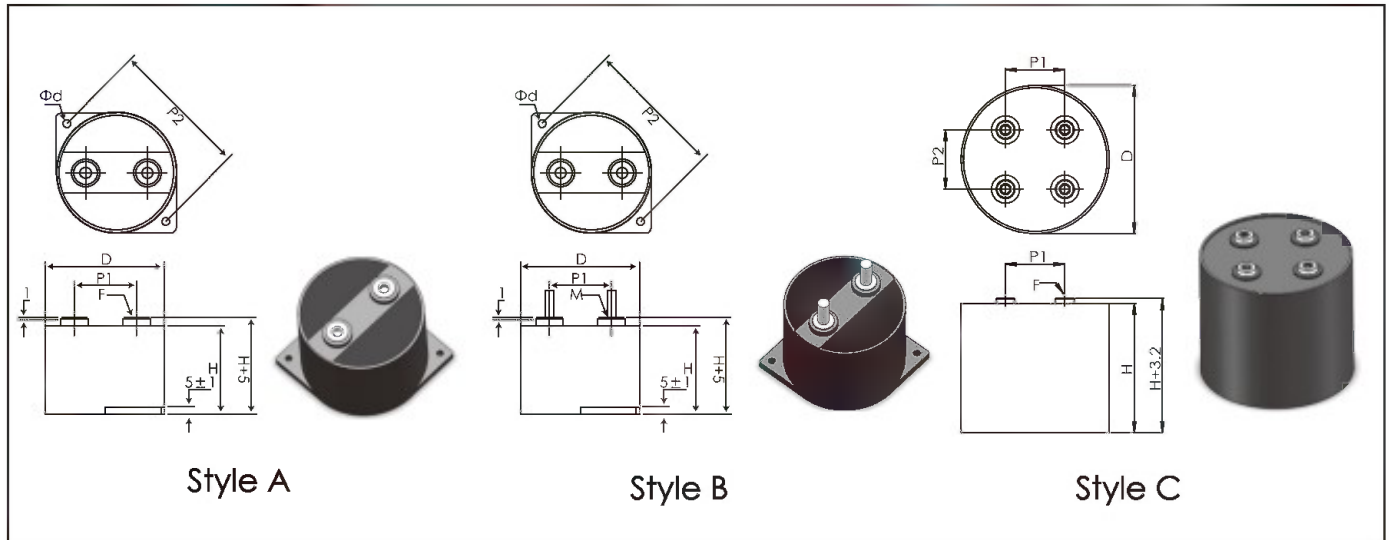
- 直流滤波用，可替代电解电容器
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 有自愈性
- 塑壳，阻燃树脂灌封

## 应用场合

- 风能发电，太阳能发电
- 焊接设备，电梯，电机驱动

## 外形图 Dimensions

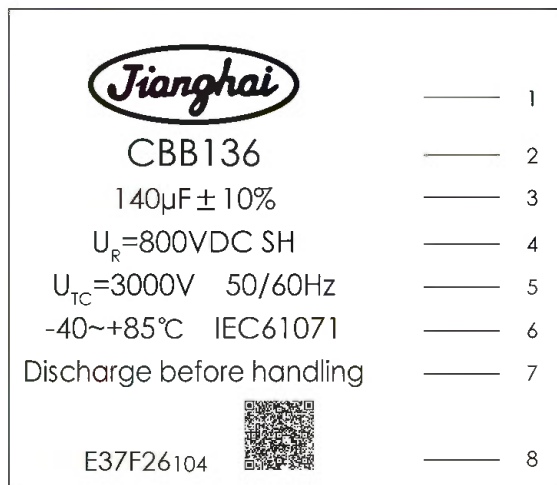
Unit: mm



mm

Style	$\Phi D \pm 1$	$H \pm 1$	$P1 \pm 0.5$	$P2 \pm 0.5$	Output		$\Phi d \pm 0.5$
					F	M	
A	84.5	51/65/76	45	101	M6*10	M8*20	5.5
B	84.5	51/65/76	45	101	M6*10	M8*20	5.5
C	95	83	38	38	M6*10	/	/

## 标识 Marking



NO.	项目 Item
1	商标 Brand
2	产品系列 Products Series
3	容量和偏差 Capacitance and Tolerance
4	额定电压和自愈性 Rated voltage and Self-healing property
5	端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case
6	温度范围 Temperature Range 引用标准 Reference Standard
7	安全警示 Safety Warning
8	日期代码 Date Code 二维码 QR Code



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ ( $\theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R(\text{dc})$
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	600~1300V <sub>DC</sub>
电容量范围 Capacitance Range	70~645μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	$1.5 \times U_R V_{DC}$ , 10s (20±5℃)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	> 3000 V <sub>AC</sub> , 10s (20±5℃, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 5000s$ (20±5℃, 100V <sub>DC</sub> , 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
最大电极扭矩 Max Torque of terminals	M6 (Female): 5 Nm
最大安装扭矩 Max Torque of installation	M8 (Male): 8 Nm
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	50 FIT

## 规格标准 Standard Ratings

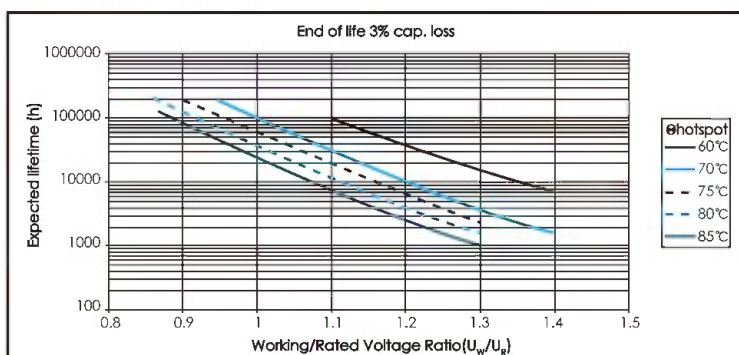
$U_R \leq 85^\circ\text{C}$ (V)	$C_R$ (μF)	P/N	$I_{\text{max}}$ (A) @ 1KHz		$R_{\text{th}}$ [K/W]	$I$ (A)	ESR@ 1KHz, 20℃ (mΩ)	$L_s$ @20℃ (nH)	D (mm)	H (mm)
			55℃	65℃						
600	260	FCC2SDP267**051040A1	79	64	5.3	2193	0.9	32	84.5	51
	380	FCC2SDP387**065040A1	77	63	5.0	2135	1.0	40	84.5	65
	460	FCC2SDP467**076040A1	73	60	4.6	2216	1.2	45	84.5	76
	645	FCC2SDP657**W083040A1	80	65	5.2	4000	0.84	25	95	83
800	150	FCC2KDP127**K051040A1	75	61	5.3	2174	1.0	32	84.5	51
	220	FCC2KDP227**065040A1	73	60	5.0	2123	1.1	40	84.5	65
	280	FCC2KDP287**076040A1	70	57	4.6	2203	1.3	45	84.5	76
1100	100	FCCA3DP756**K051040A1	66	53	5.3	1936	1.3	32	84.5	51
	140	FCCA3DP117**065040A1	63	51	5.0	1805	1.5	40	84.5	65
	190	FCCA3DP197**076040A1	61	50	4.6	2003	1.7	45	84.5	76
1300	70	FCC03DP706**K051040A1	63	51	5.3	1853	1.4	32	84.5	51
	100	FCC03DP107**K065040A1	57	47	5.0	1763	1.8	40	84.5	65
	130	FCC03DP137**K076040A1	58	47	4.6	1874	1.9	45	84.5	76

\*  $R_{\text{th}}$  为产品热点到环境的热阻 (自然冷却)

The thermal Resistance from hotspot to ambient environment (Natural cooling)

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	R	2	D	S	5	0	6	J	0	5	0	H	L	F	9	D	G
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style			引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code			引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions	
Film Capacitor =FC	Square=S	500=2H	CBB138=DS			10=106	±5%=J	2Pin, 直脚=0 2pin, straight=0			5.0=50	57.5*50*35=HL			27.5=9	10.2=3	0.8=B	标准品=无 Standard product=None	
		600=2S				15=156	±10%=K	2Pin, 长引线=1 2pin, long-leaded=1			13=A0				37.5=C	12.7=4	1.0=C	高温高湿=G High temperature and humidity=G	
		700=2Q				20=206	Special=S	4pin, 直角=2 4pin, straight=2			15=A1				52.5=F	20.3=9	1.2=D	车规级=T Automotive grade=T	
		800=2K				25=256					17.5=A2							安全膜=S Security film=S	
		900=R2				30=306												缩体=X Smaller=X	
		1000=3A				35=356												无卤=N Halogen-free=N	
		1100=A3				40=406												低噪音=F Low noise=F	
		1200=3B				50=506													
		1500=C3				60=606													
						80=806													



## Features

- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handling capabilities
- Self-healing property
- Plastic case, filled with fire-retardant resin

## Applications

- Used in Inverters of wind power and solar power
- Frequency converters
- Industrial and high-end power supplies

## 特点

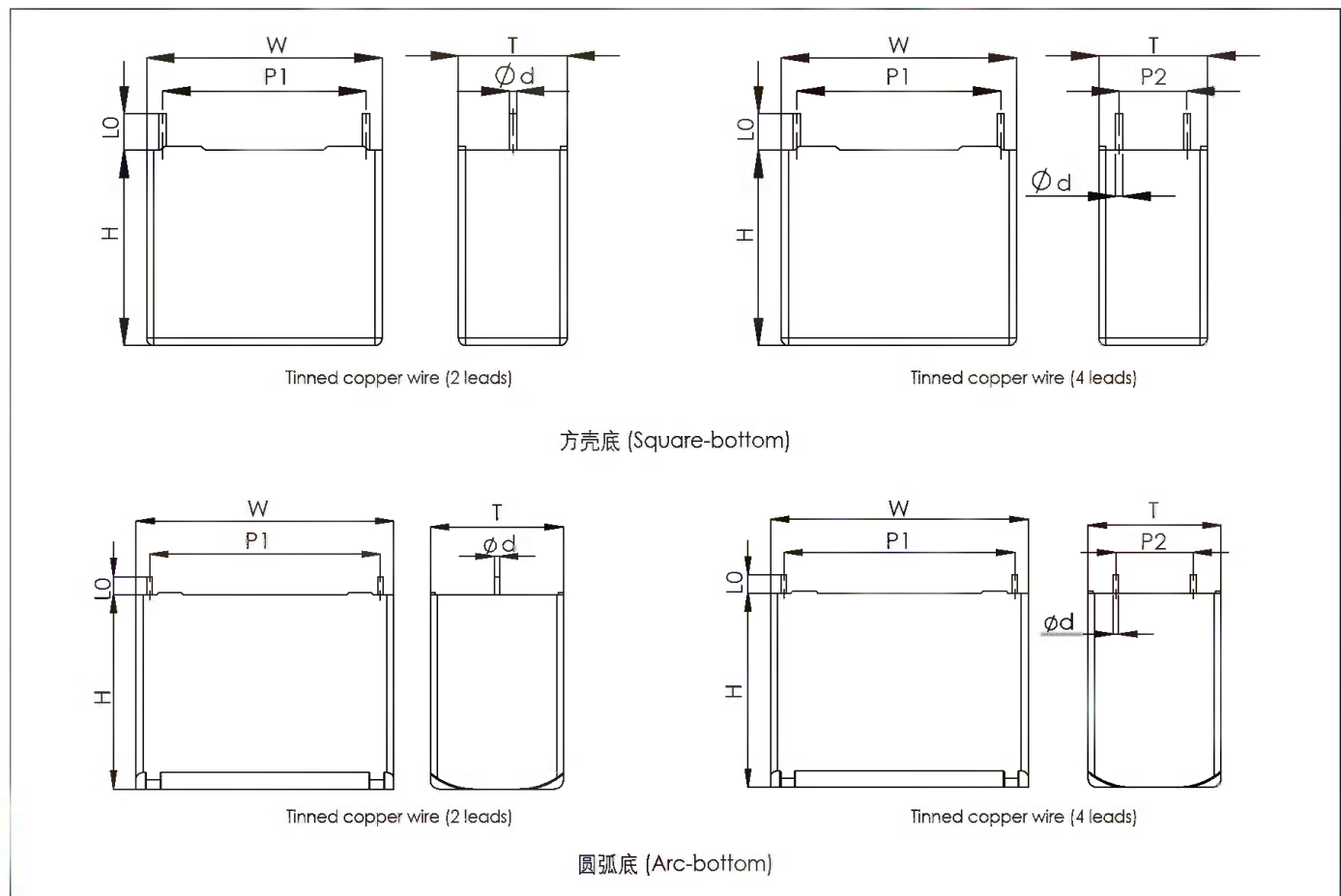
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 有自愈性
- 塑壳，阻燃树脂灌封

## 应用场合

- 风能发电，太阳能发电
- 变频器
- 工业和高端电源

## 外形图 Dimensions

Unit: mm




## 标识 Marking

	—	1
CBB138	—	2
50µF J 800V	—	3
N02F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code



## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)、AEC-Q200
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ ( $\Theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\Theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R(\text{dc})$
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	500~1500Vdc
电容量范围 Capacitance Range	1~150μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子间耐压 $U_{\text{IT}}$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与外壳间耐压 $U_{\text{IC}}$ Voltage Between Terminals and Case	3000 Vac, 10 s (20 °C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $\text{IR} \cdot C_w$ )	≥ 10000s (20°C, 100Vdc, 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	50 FIT

## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dv/dt	I	ESR (mΩ)	$I_{\text{max}}$ (A)	W	H	T	P <sub>1</sub>	P <sub>2</sub>	d
(Vdc) ≤85℃	(μF)	-	(V/μs)	(A)	70°C 10kHz	70°C 10kHz	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
500	3.0	FCS2HDS305*050 I490B	65	195	28.0	4.0	32.0	20.0	11.0	27.5	\	0.8
	5.0	FCS2HDS505*050 I790B	65	325	14.0	6.0	32.0	22.0	13.0	27.5	\	0.8
	8.0	FCS2HDS805*050 I90B	65	520	12.5	8.5	32.0	28.0	14.0	27.5	\	0.8
	10.0	FCS2HDS106*050 I90B	65	650	8.0	10.0	32.0	33.0	18.0	27.5	\	0.8
	15.0	FCS2HDS156*050 I90B	65	975	6.5	12.0	32.0	37.0	22.0	27.5	\	0.8
	15.0	FCS2HDS156*250 I93B	65	975	5.5	13.0	32.0	37.0	22.0	27.5	10.2	0.8
	20.0	FCS2HDS206*250 F2C3C	30	600	6.5	12.5	42.5	40.0	20.0	37.5	10.2	1.0
	22.0	FCS2HDS226*250 F2C3C	30	660	6.5	13.5	42.5	40.0	20.0	37.5	10.2	1.0
	25.0	FCS2HDS256*250 F2C3C	30	750	6.5	14.5	42.5	40.0	20.0	37.5	10.2	1.0
	30.0	FCS2HDS306*250 F9C3C	30	900	6.0	16.0	42.5	44.0	24.0	37.5	10.2	1.0
	35.0	FCS2HDS356*250 FFC9D	30	1050	5.8	18.0	42.5	45.0	30.0	37.5	20.3	1.2
	40.0	FCS2HDS406*250 FFC9D	30	1200	5.5	19.0	42.5	45.0	30.0	37.5	20.3	1.2
	50.0	FCS2HDS506*250 FKC9D	30	1500	5.0	20.0	42.5	50.0	35.0	37.5	20.3	1.2
	60.0	FCS2HDS606*250 HHF9D	15	900	6.8	17.0	57.5	45.0	30.0	52.5	20.3	1.2
	75.0	FCS2HDS756*250 HLF9D	15	1125	5.0	20.0	57.5	50.0	35.0	52.5	20.3	1.2
	100.0	FCS2HDS107*250 HSF9D	15	1500	4.5	24.0	57.5	55.0	45.0	52.5	20.3	1.2
	110.0	FCS2HDS117*250 H2F9D	15	1650	4.0	26.0	57.5	60.0	45.0	52.5	20.3	1.2
	130.0	FCS2HDS137*250 H6F9D	15	1950	3.4	23.0	57.5	60.0	35.0	52.5	20.3	1.2
	140.0	FCS2HDS147*250 KAF9D	15	2100	3.3	25.0	57.5	65.0	35.0	52.5	20.3	1.2
	150.0	FCS2HDS157*250 H8F9D	15	2250	3.1	27.0	57.5	70.0	35.0	52.5	20.3	1.2
600	3.0	FCS2SDS305*050 I490B	65	195	31.8	4.1	32.0	20.0	11.0	27.5	\	0.8
	4.0	FCS2SDS405*050 I490B	65	260	23.9	5.5	32.0	20.0	11.0	27.5	\	0.8
	5.0	FCS2SDS505*050 I90B	65	325	14.5	6.0	32.0	28.0	14.0	27.5	\	0.8
	8.0	FCS2SDS805*050 I90B	65	520	13.9	9.5	32.0	28.0	14.0	27.5	\	0.8
	10.0	FCS2SDS106*050 I90B	65	650	7.5	8.5	32.0	33.0	18.0	27.5	\	0.8
	12.0	FCS2SDS126*050 I90B	65	780	10.8	12.0	32.0	33.0	18.0	27.5	\	0.8
	12.0	FCS2SDS126*050 FLC0C	30	360	11.8	8.0	42.5	18.0	24.0	37.5	\	1.0
	15.0	FCS2SDS156*050 I90B	65	975	9.0	12.0	32.0	37.0	22.0	27.5	\	0.8
	15.0	FCS2SDS156*050 FLC0C	65	975	10.1	9.0	42.5	18.0	24.0	37.5	\	1.0



## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dv/dt	I	ESR (mΩ)	$I_{max}$ (A)	W	H	T	$P_1$	$P_2$	d
[Vdc]	[μF]	-	(V/μs)	(A)	70°C 10kHz	70°C 10kHz	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
600	20.0	FCS2SDS206*250F2C3C	30	600	9.8	11.3	42.5	40.0	20.0	37.5	10.2	1.0
	30.0	FCS2SDS306*250F1C3C	30	900	5.5	13.0	42.5	37.0	28.0	37.5	10.2	1.0
	35.0	FCS2SDS356*250F9C3C	30	1050	5.0	16.5	42.5	44.0	24.0	37.5	10.2	1.0
	40.0	FCS2SDS406*250FFC9D	30	1200	5.2	23.0	42.5	45.0	30.0	37.5	20.3	1.2
	50.0	FCS2SDS506*250HLF9D	15	750	6.5	14.0	57.5	50.0	35.0	52.5	20.3	1.2
	60.0	FCS2SDS606*250HLF9D	15	900	6.0	16.0	57.5	50.0	35.0	52.5	20.3	1.2
	70.0	FCS2SDS706*250HLF9D	15	1050	5.6	21.5	57.5	50.0	35.0	52.5	20.3	1.2
	80.0	FCS2SDS806*250HSF9D	15	1200	5.0	20.0	57.5	55.0	45.0	52.5	20.3	1.2
	90.0	FCS2SDS906*250HSF9D	15	1350	4.6	25.8	57.5	55.0	45.0	52.5	20.3	1.2
	100.0	FCS2SDS107*250H2F9D	15	1500	4.0	26.0	57.5	60.0	45.0	52.5	20.3	1.2
	110.0	FCS2SDS117*250H2F9D	15	1650	3.5	28.0	57.5	60.0	45.0	52.5	20.3	1.2
	120.0	FCS2SDS127*250H6F9D	15	1800	3.4	30.0	57.5	60.0	35.0	52.5	20.3	1.2
	130.0	FCS2SDS137*250KAF9D	15	1950	3.3	32.0	57.5	65.0	35.0	52.5	20.3	1.2
	140.0	FCS2SDS147*250H8F9D	15	2100	3.2	34.0	57.5	70.0	35.0	52.5	20.3	1.2
700	140.0	FCS2SDS147*250H7F9D	15	2100	3.0	35.0	57.5	65.0	45.0	52.5	20.3	1.2
	1.0	FCS2QDS105*050I190B	65	65	54.0	2.5	32.0	18.0	9.0	27.5	\	0.8
	2.0	FCS2QDS205*050I190B	65	130	35.0	3.0	32.0	18.0	9.0	27.5	\	0.8
	3.0	FCS2QDS305*050I490B	65	195	28.0	4.5	32.0	20.0	11.0	27.5	\	0.8
	3.3	FCS2QDS335*050IC90B	65	214.5	26.0	5.5	32.0	28.0	14.0	27.5	\	0.8
	5.0	FCS2QDS505*050IC90B	65	325	16.0	5.7	32.0	28.0	14.0	27.5	\	0.8
	6.0	FCS2QDS605*050ID90B	65	390	14.0	6.0	32.0	28.0	18.0	27.5	\	0.8
	8.0	FCS2QDS805*050IF90B	65	520	10.0	9.0	32.0	33.0	18.0	27.5	\	0.8
	10.0	FCS2QDS106*050IF90B	65	650	7.0	10.0	32.0	33.0	18.0	27.5	\	0.8
	10.0	FCS2QDS106*050IF90B	65	650	6.5	12.0	32.0	37.0	22.0	27.5	\	0.8
	10.0	FCS2QDS106*050FLC0C	30	300	7.5	11.5	42.5	18.0	24.0	37.5	\	1.0
	12.0	FCS2QDS126*050IF90B	65	780	6.0	12.5	32.0	37.0	22.0	27.5	\	0.8
	12.0	FCS2QDS126*050FLC0C	30	360	7.0	12.0	42.5	18.0	24.0	37.5	\	1.0
	15.0	FCS2QDS156*250F2C3C	30	450	8.0	10.0	42.5	40.0	20.0	37.5	10.2	1.0
	20.0	FCS2QDS206*250F1C3C	30	600	7.5	12.0	42.5	37.0	28.0	37.5	10.2	1.0
	22.0	FCS2QDS226*250F9C3C	30	660	6.5	14.0	42.5	44.0	24.0	37.5	10.2	1.0
	25.0	FCS2QDS256*250F9C3C	30	750	6.0	16.0	42.5	44.0	24.0	37.5	10.2	1.0
	30.0	FCS2QDS306*250FFC9D	30	900	5.8	16.0	42.5	45.0	30.0	37.5	20.3	1.2
	35.0	FCS2QDS356*250FKC9D	30	1050	5.5	20.0	42.5	50.0	35.0	37.5	20.3	1.2
	40.0	FCS2QDS406*250HHF9D	15	600	6.2	14.0	57.5	45.0	30.0	52.5	20.3	1.2
	45.0	FCS2QDS456*250HHF9D	15	675	5.0	15.5	57.5	45.0	30.0	52.5	20.3	1.2
	50.0	FCS2QDS506*250HLF9D	15	750	4.8	15.0	57.5	50.0	35.0	52.5	20.3	1.2
	55.0	FCS2QDS556*250HLF9D	15	825	4.5	16.0	57.5	50.0	35.0	52.5	20.3	1.2
	60.0	FCS2QDS606*250HLF9D	15	900	4.2	18.0	57.5	50.0	35.0	52.5	20.3	1.2
	65.0	FCS2QDS656*250HSF9D	15	975	4.0	20.0	57.5	55.0	45.0	52.5	20.3	1.2
	70.0	FCS2QDS706*250HSF9D	15	1050	3.8	20.0	57.5	55.0	45.0	52.5	20.3	1.2
	75.0	FCS2QDS756*250HSF9D	15	1125	3.7	21.0	57.5	55.0	45.0	52.5	20.3	1.2
	80.0	FCS2QDS806*250H2F9D	15	1200	3.5	22.0	57.5	60.0	45.0	52.5	20.3	1.2
	80.0	FCS2QDS806*250H6F9D	15	1200	3.4	23.0	57.5	60.0	35.0	52.5	20.3	1.2
	90.0	FCS2QDS906*250H2F9D	15	1350	3.5	24.0	57.5	60.0	45.0	52.5	20.3	1.2
	90.0	FCS2QDS906*250H6F9D	15	1350	3.5	24.0	57.5	60.0	35.0	52.5	20.3	1.2
	100.0	FCS2QDS107*250H2F9D	15	1500	3.5	26.0	57.5	60.0	45.0	52.5	20.3	1.2
	100.0	FCS2QDS107*250KAF9D	15	1500	3.5	26.0	57.5	65.0	35.0	52.5	20.3	1.2
	110.0	FCS2QDS117*250H8F9D	15	1650	3.4	28.0	57.5	70.0	35.0	52.5	20.3	1.2
	120.0	FCS2QDS127*250H8F9D	15	1800	3.0	30.0	57.5	65.0	45.0	52.5	20.3	1.2
	130.0	FCS2QDS137*250H7F9D	15	1950	2.8	32.0	57.5	65.0	45.0	52.5	20.3	1.2
800	1.0	FCS2KDS105*050I190B	65	65	62.0	2.0	32.0	18.0	9.0	27.5	\	0.8
	2.0	FCS2KDS205*050I490B	65	130	31.0	3.5	32.0	20.0	11.0	27.5	\	0.8
	3.0	FCS2KDS305*050I790B	65	195	25.0	4.0	32.0	22.0	13.0	27.5	\	0.8
	3.3	FCS2KDS335*050IC90B	65	214.5	21.0	4.5	32.0	28.0	14.0	27.5	\	0.8
	5.0	FCS2KDS505*050IC90B	65	325	14.0	7.0	32.0	28.0	14.0	27.5	\	0.8
	6.0	FCS2KDS605*050ID90B	65	390	13.5	8.5	32.0	28.0	18.0	27.5	\	0.8
	8.0	FCS2KDS805*050IF90B	65	520	12.5	10.5	32.0	33.0	18.0	27.5	\	0.8
	9.0	FCS2KDS905*050IF90B	65	585	11.1	11.8	32.0	33.0	18.0	27.5	\	0.8
	10.0	FCS2KDS106*050IF90B	65	650	11.0	12.0	32.0	37.0	22.0	27.5	\	0.8
	10.0	FCS2KDS106*050F5C0C	30	300	12.5	8.0	42.5	32.0	19.0	37.5	\	1.0
	15.0	FCS2KDS156*250F2C3C	30	450	11.9	10.1	42.5	40.0	20.0	37.5	10.2	1.0
	20.0	FCS2KDS206*250F1C3C	30	600	8.0	12.0	42.5	37.0	28.0	37.5	10.2	1.0
	20.0	FCS2KDS206*250F9C3C	30	600	8.9	13.5	42.5	44.0	24.0	37.5	10.2	1.0
	22.0	FCS2KDS226*250F9C3C	30	660	6.0	14.0	42.5	44.0	24.0	37.5	10.2	1.0
	25.0	FCS2KDS256*250FFC9D	30	750	5.5	15.0	42.5	45.0	30.0	37.5	20.3	1.2
	30.0	FCS2KDS306*250FFC9D	30	900	5.9	20.2	42.5	45.0	30.0	37.5	20.3	1.2
	35.0	FCS2KDS356*250HHF9D	15	525	9.5	12.2	57.5	45.0	30.0	52.5	20.3	1.2
	40.0	FCS2KDS406*250HHF9D	15	600	8.9	13.5	57.5	45.0	30.0	52.5	20.3	1.2
	45.0	FCS2KDS456*250HHF9D	15	675	7.9	15.1	57.5	45.0	30.0	52.5	20.3	1.2
	47.0	FCS2KDS476*250HLF9D	15	705	5.0	17.5	57.5	50.0	35.0	52.5	20.3	1.2
	50.0	FCS2KDS506*250HLF9D	15	750	7.1	16.8	57.5	50.0	35.0	52.5	20.3	1.2
	55.0	FCS2KDS556*250HLF9D	15	825	6.5	18.5	57.5	50.0	35.0	52.5	20.3	1.2
	65.0	FCS2KDS656*250H6F9D	15	975	4.0	19.0	57.5	60.0	35.0	52.5	20.3	1.2
	65.0	FCS2KDS656*250HSF9D	15	975	5.5	21.9	57.5	55.0	45.0	52.5	20.3	1.2
	70.0	FCS2KDS706*250HSF9D	15	1050	5.1	23.6	57.5	55.0	45.0	52.5	20.3	1.2
	70.0	FCS2KDS706*250H6F9D	15	1050	3.8	20.0	57.5	60.0	35.0	52.5	20.3	1.2
	75.0	FCS2KDS756*250HSF9D	15	1125	4.8	25.2	57.5	55.0	45.0	52.5	20.3	1.2



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	dv/dt	I	ESR (mΩ)	I <sub>max</sub> (A)	W	H	T	P <sub>1</sub>	P <sub>2</sub>	d
[Vdc]	[μF]	-	(V/μs)	(A)	70°C 10kHz	70°C 10kHz	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
800	75.0	FCS2KDS756*250KAF9D	15	1125	3.8	22.0	57.5	65.0	35.0	52.5	20.3	1.2
	80.0	FCS2KDS806*250H2F9D	15	1200	3.5	23.0	57.5	60.0	45.0	52.5	20.3	1.2
	80.0	FCS2KDS806*250H8F9D	15	1200	3.5	23.0	57.5	70.0	35.0	52.5	20.3	1.2
	90.0	FCS2KDS906*250H2F9D	15	1350	3.3	25.0	57.5	60.0	45.0	52.5	20.3	1.2
	100.0	FCS2KDS107*250H7F9D	15	1500	3.8	31.4	57.5	65.0	45.0	52.5	20.3	1.2
900	1.0	FCSR2DS105*050I190B	70	70	86.0	1.5	32.0	18.0	9.0	27.5	\	0.8
	2.0	FCSR2DS205*050I490B	70	140	43.0	3.1	32.0	20.0	11.0	27.5	\	0.8
	3.0	FCSR2DS305*050I790B	70	210	28.7	4.6	32.0	22.0	13.0	27.5	\	0.8
	3.3	FCSR2DS335*050I190B	70	231	26.5	5.0	32.0	24.5	15.0	27.5	\	0.8
	5.0	FCSR2DS505*050I90B	70	350	22.5	6.0	32.0	28.0	18.0	27.5	\	0.8
	6.0	FCSR2DS605*050I90B	70	420	18.0	6.9	32.0	33.0	18.0	27.5	\	0.8
	8.0	FCSR2DS805*050I90B	70	560	11.5	11.4	32.0	37.0	22.0	27.5	\	0.8
	10.0	FCSR2DS106*050I90B	70	700	12.0	12.2	32.0	37.0	22.0	27.5	\	0.8
	10.0	FCSR2DS106*050F2C0C	35	350	16.7	7.2	42.5	40.0	20.0	37.5	\	1.0
	10.0	FCSR2DS106*050F2C3C	35	350	16.7	7.2	42.5	40.0	20.0	37.5	10.2	1.0
	15.0	FCSR2DS156*050F9C0C	35	525	11.1	10.8	42.5	44.0	24.0	37.5	\	1.0
	18.0	FCSR2DS186*050F9C0C	35	630	9.2	12.9	42.5	44.0	24.0	37.5	\	1.0
	18.0	FCSR2DS186*050F9C3C	35	630	9.3	12.9	42.5	44.0	24.0	37.5	10.2	1.0
	20.0	FCSR2DS206*050FFC0C	35	700	6.0	14.0	42.5	45.0	30.0	37.5	\	1.0
	20.0	FCSR2DS206*050FFC9D	35	700	5.5	15.0	42.5	45.0	30.0	37.5	20.3	1.2
	25.0	FCSR2DS256*050FFC9D	35	875	6.7	17.9	42.5	45.0	30.0	37.5	20.3	1.2
	30.0	FCSR2DS306*050FKC9D	35	1050	5.6	21.5	42.5	50.0	35.0	37.5	20.3	1.2
	30.0	FCSR2DS306*050H9F9D	15	450	11.1	10.8	57.5	45.0	30.0	52.5	20.3	1.2
	35.0	FCSR2DS356*050H9F9D	15	525	9.5	13.5	57.5	50.0	35.0	52.5	20.3	1.2
	40.0	FCSR2DS406*050H9F9D	15	600	8.4	14.4	57.5	50.0	35.0	52.5	20.3	1.2
	50.0	FCSR2DS506*050H9F9D	15	750	6.7	17.9	57.5	50.0	35.0	52.5	20.3	1.2
	55.0	FCSR2DS556*050H6F9D	15	825	5.5	19.0	57.5	60.0	35.0	52.5	20.3	1.2
	55.0	FCSR2DS556*050HSF9D	15	825	6.1	19.7	57.5	55.0	45.0	52.5	20.3	1.2
	60.0	FCSR2DS606*050HSF9D	15	900	5.6	21.5	57.5	55.0	45.0	52.5	20.3	1.2
	60.0	FCSR2DS606*050KAF9D	15	900	4.4	22.0	57.5	65.0	35.0	52.5	20.3	1.2
	65.0	FCSR2DS656*050H8F9D	15	975	3.3	23.0	57.5	70.0	35.0	52.5	20.3	1.2
	70.0	FCSR2DS706*050H2F9D	15	1050	3.2	24.0	57.5	60.0	45.0	52.5	20.3	1.2
	80.0	FCSR2DS806*050H7F9D	15	1200	4.5	26.8	57.5	65.0	45.0	52.5	20.3	1.2
1000	1.0	FCS3ADS105*050I490B	75	75	45.0	2.5	32.0	20.0	11.0	27.5	\	0.8
	2.0	FCS3ADS205*050I790B	75	150	38.2	3.5	32.0	22.0	13.0	27.5	\	0.8
	3.0	FCS3ADS305*050I90B	75	225	25.5	5.2	32.0	24.5	15.0	27.5	\	0.8
	5.0	FCS3ADS505*050I90B	75	375	15.3	8.6	32.0	33.0	18.0	27.5	\	0.8
	8.0	FCS3ADS805*050I90B	75	600	13.0	10.8	32.0	37.0	22.0	27.5	\	0.8
	10.0	FCS3ADS106*050F2C0C	37	370	15.6	6.7	42.5	40.0	20.0	37.5	\	1.0
	10.0	FCS3ADS106*050F2C3C	37	370	15.6	7.7	42.5	40.0	20.0	37.5	10.2	1.0
	12.0	FCS3ADS126*050F9C3C	37	444	11.0	10.5	42.5	44.0	24.0	37.5	10.2	1.0
	15.0	FCS3ADS156*050F9C0C	37	555	10.4	11.5	42.5	44.0	24.0	37.5	\	1.0
	15.0	FCS3ADS156*050F9C3C	37	555	10.4	11.5	42.5	44.0	24.0	37.5	10.2	1.0
	15.0	FCS3ADS156*050FFC9D	37	555	7.5	14.0	42.5	45.0	30.0	37.5	20.3	1.2
	20.0	FCS3ADS206*050FFC9D	37	740	7.8	15.4	42.5	45.0	30.0	37.5	20.3	1.2
	25.0	FCS3ADS256*050FKC9D	37	925	6.2	19.2	42.5	50.0	35.0	37.5	20.3	1.2
	30.0	FCS3ADS306*050H9F9D	17	510	10.4	11.5	57.5	45.0	30.0	52.5	20.3	1.2
	35.0	FCS3ADS356*050H9F9D	17	595	8.9	13.5	57.5	50.0	35.0	52.5	20.3	1.2
	40.0	FCS3ADS406*050H9F9D	17	680	7.8	15.4	57.5	50.0	35.0	52.5	20.3	1.2
	40.0	FCS3ADS406*050H6F9D	17	680	5.0	17.0	57.5	60.0	35.0	52.5	20.3	1.2
	50.0	FCS3ADS506*050HSF9D	17	850	6.2	19.2	57.5	55.0	45.0	52.5	20.3	1.2
	50.0	FCS3ADS506*050KAF9D	17	850	4.5	19.0	57.5	65.0	35.0	52.5	20.3	1.2
	55.0	FCS3ADS556*050H8F9D	17	935	4.4	20.0	57.5	70.0	35.0	52.5	20.3	1.2
	60.0	FCS3ADS606*050H2F9D	17	1020	4.0	22.0	57.5	60.0	45.0	52.5	20.3	1.2
	60.0	FCS3ADS606*050H7F9D	17	1020	5.2	23.1	57.5	65.0	45.0	52.5	20.3	1.2
1100	1.0	FCSA3DS105*050I490B	80	80	80	1.7	32.0	20.0	11.0	27.5	\	0.8
	1.5	FCSA3DS155*050I790B	80	120	55.7	2.4	32.0	22.0	13.0	27.5	\	0.8
	2.0	FCSA3DS205*050I90B	80	160	25.0	4.0	32.0	24.5	15.0	27.5	\	0.8
	2.2	FCSA3DS225*050IC90B	80	176	18.5	5.0	32.0	28.0	14.0	27.5	\	0.8
	3.3	FCSA3DS335*050ID90B	80	304	16.5	6.5	32.0	28.0	18.0	27.5	\	0.8
	4.0	FCSA3DS405*050IF90B	80	320	15.3	8.6	32.0	33.0	18.0	27.5	\	0.8
	5.0	FCSA3DS505*050I90B	80	400	14	9.8	32.0	37.0	22.0	27.5	\	0.8
	6.8	FCSA3DS685*050WYC3C	40	272	20.5	6.0	42.5	34	20.0	37.5	10.2	1.0
	8.0	FCSA3DS805*050F2C0C	40	320	16.5	7.5	42.5	40.0	20.0	37.5	\	1.0
	8.0	FCSA3DS805*050F2C3C	40	320	16.5	7.5	42.5	40.0	20.0	37.5	10.2	1.0
	8.0	FCSA3DS805*050FQC3C	40	320	18.1	6.6	42.5	37.0	22.0	37.5	10.2	1.0
	9.0	FCSA3DS905*050FQC3C	40	360	16.1	7.5	42.5	37.0	22.0	37.5	10.2	1.0
	10.0	FCSA3DS106*050F9C0C	40	400	14.5	8.3	42.5	44.0	24.0	37.5	\	1.0
	10.0	FCSA3DS106*050F9C3C	40	400	14.5	8.3	42.5	44.0	24.0	37.5	10.2	1.0
	12.0	FCSA3DS126*050FFC9D	40	480	10.5	11.5	42.5	45.0	30.0	37.5	20.3	1.2
	15.0	FCSA3DS156*050FFC9D	40	600	9.7	12.4	42.5	45.0	30.0	37.5	20.3	1.2
	18.0	FCSA3DS186*050FKC9D	40	720	8.1	14.9	42.5	50.0	35.0	37.5	20.3	1.2
	20.0	FCSA3DS206*050FKC9D	20	400	7.2	16.6	42.5	50.0	35.0	37.5	20.3	1.2
	20.0	FCSA3DS206*050H9F9D	20	400	14.5	8.3	57.5	45.0	30.0	52.5	20.3	1.2
	25.0	FCSA3DS256*050H9F9D	20	500	11.6	10.4	57.5	50.0	35.0	52.5	20.3	1.2
	30.0	FCSA3DS306*050H9F9D	20	600	9.7	12.4	57.5	50.0	35.0	52.5	20.3	1.2
	35.0	FCSA3DS356*050H6F9D	20	700	5.5	16.0	57.5	60.0	35.0	52.5	20.3	1.2
	40.0	FCSA3DS406*050KAF9D	20	800	4.9	17.0	57.5	65.0	35.0	52.5	20.3	1.2
	40.0	FCSA3DS406*050HSF9D	20	800	7.8	15.5	57.5	55.0	45.0	52.5	20.3	1.2

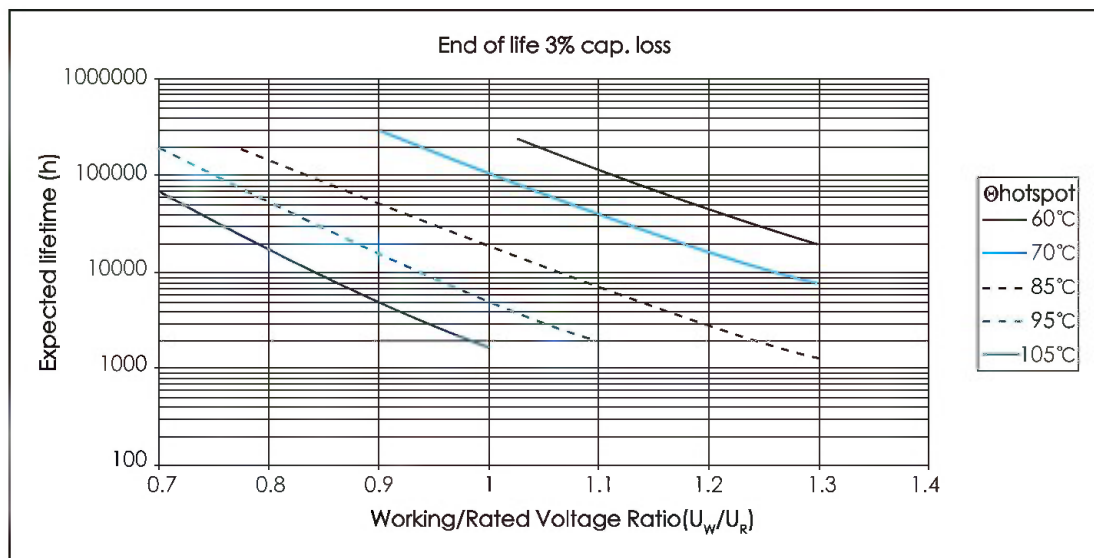


## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	$dv/dt$	$\hat{i}$	ESR (mΩ)	$I_{max}$ (A)	W	H	T	$P_1$	$P_2$	d
(Vdc) ≤85℃	(μF)	-	(V/μs)	(A)	70℃ 10kHz	70℃ 10kHz	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1100	45.0	FCSA3DS456*250H8F9D	20	900	5.4	18.0	57.5	70.0	35.0	52.5	20.3	1.2
	50.0	FCSA3DS506*250H7F9D	20	1000	6.2	19.3	57.5	65.0	45.0	52.5	20.3	1.2
1200	1.0	FCS3BDS105*050I490B	90	90	39.5	3.5	32.0	20.0	11.0	27.5	\	0.8
	2.0	FCS3BDS205*050I90B	90	180	26.3	5.0	32.0	24.5	15.0	27.5	\	0.8
	2.2	FCS3BDS225*050ID90B	90	198	17.0	5.5	32.0	28.0	18.0	27.5	\	0.8
	3.0	FCS3BDS305*050ID90B	90	270	16.0	7.0	32.0	28.0	18.0	27.5	\	0.8
	3.3	FCS3BDS335*050IF90B	90	297	13.5	8.0	32.0	33.0	18.0	27.5	\	0.8
	5.0	FCS3BDS505*050II90B	90	450	12.7	10.4	32.0	37.0	22.0	27.5	\	0.8
	6.0	FCS3BDS605*050F2C0C	45	270	18.6	6.5	42.5	40.0	20.0	37.5	\	1.0
	7.0	FCS3BDS705*250FQC3C	45	315	15.9	7.5	42.5	37.0	22.0	37.5	10.2	1.0
	8.0	FCS3BDS805*250F9C3C	45	360	13.9	8.6	42.5	44.0	24.0	37.5	10.2	1.0
	10.0	FCS3BDS106*250F9C3C	45	450	11.1	10.8	42.5	44.0	24.0	37.5	10.2	1.0
	10.0	FCS3BDS106*250FFC9D	45	450	8.0	12.0	42.5	45.0	30.0	37.5	20.3	1.2
	15.0	FCS3BDS156*250FKC9D	45	675	7.4	16.1	42.5	50.0	35.0	37.5	20.3	1.2
	20.0	FCS3BDS206*250HHF9D	23	460	11.9	10.0	57.5	45.0	30.0	52.5	20.3	1.2
	25.0	FCS3BDS256*250HLF9D	23	575	9.6	12.6	57.5	50.0	35.0	52.5	20.3	1.2
	30.0	FCS3BDS306*250HSF9D	23	690	8.0	15.1	57.5	55.0	45.0	52.5	20.3	1.2
	30.0	FCS3BDS306*250H6F9D	23	690	6.5	16.0	57.5	60.0	35.0	52.5	20.3	1.2
	35.0	FCS3BDS356*250HSF9D	23	805	6.8	17.6	57.5	55.0	45.0	52.5	20.3	1.2
	35.0	FCS3BDS356*250H8F9D	23	805	5.0	18.0	57.5	70.0	35.0	52.5	20.3	1.2
	40.0	FCS3BDS406*250H2F9D	23	920	4.5	20.0	57.5	60.0	45.0	52.5	20.3	1.2
	45.0	FCS3BDS456*250H7F9D	23	1035	5.3	22.6	57.5	65.0	45.0	52.5	20.3	1.2
1500	6.5	FCSC3DS655*250FHC3C	45	292.5	10.5	12	42	42	28	37.5	10.3	1.0
	11	FCSC3DS116*250FKC9D	30	71.5	6.5	20	42	50	35	37.5	20.3	1.2
	12	FCSC3DS126*250HLF9D	25	300	8.2	17.5	57.5	50.0	35.0	52.5	20.3	1.2

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	R	2	D	S	5	0	6	J	0	5	0	H	L	F	9	D	H
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style			引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code			引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions	
Film Capacitor =FC	Square=S	500=2H	CBB138 (125°C)=DS			10=106	±5%=J	2Pin, 直脚=0 2pin, straight=0			5.0=50	57.5*50*35=HL			27.5=9	10.2=3	0.8=B	125°C=H	
		600=2S				15=156	±10%=K	2Pin, 长引线=1 2pin, long-leaded=1			13=A0				37.5=C	12.7=4	1.0=C		
		700=2Q				20=206	Special=S	4pin, 直角=2 4pin, straight=2			15=A1				52.5=F	20.3=9	1.2=D		
		800=2K				25=256					17.5=A2								
		900=R2				30=306													
		1000=3A				35=356													
		1100=A3				40=406													
		1200=3B				50=506													
						60=606													
						80=806													



## Features

- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handling capabilities
- Self-healing property
- Plastic case, filled with fire-retardant resin

## Applications

- Used in Inverters of wind power and solar power
- Frequency converters
- Industrial and high-end power supplies

## 特点

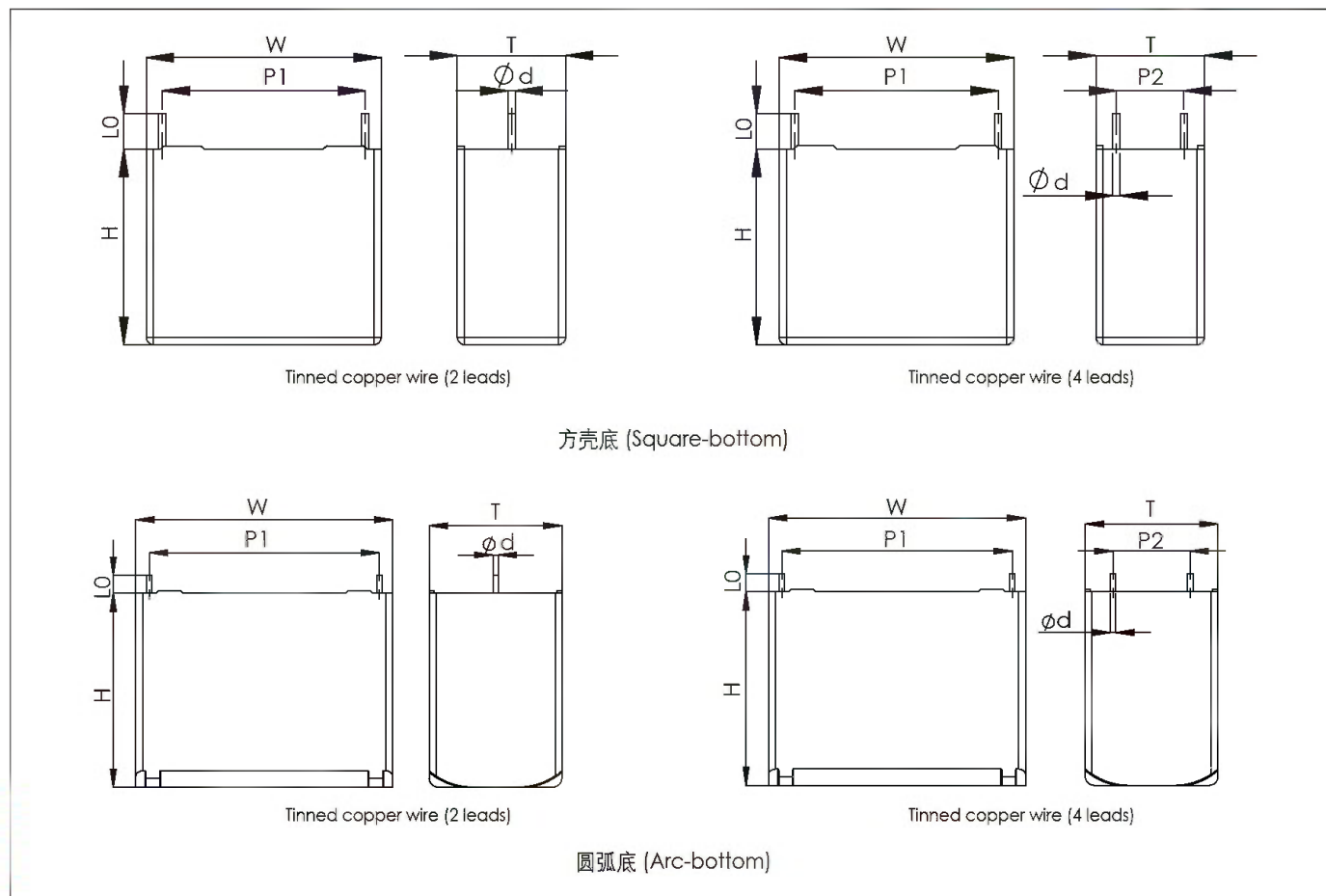
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 有自愈性
- 塑壳，阻燃树脂灌封

## 应用场合

- 风能发电，太阳能发电
- 变频器
- 工业和高端电源

## 外形图 Dimensions

Unit: mm




## 标识 Marking

	—	1
CBB138(125°C)	—	2
50µF J 800V	—	3
N02F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code



## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)、AEC-Q200
气候类别 Climatic Category	40/85/56
工作温度范围 Operating Temperature Range	-40~+125°C $\theta_{\text{hotspot}}=85^{\circ}\text{C}\sim 125^{\circ}\text{C}$ : decreasing factor 0.7% per°C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+125°C
额定电压 $U_R$ Rated Voltage	600~800Vdc
电容量范围 Capacitance Range	4~40μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子间耐压 $U_{TC}$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与外壳间耐压 $U_{IC}$ Voltage Between Terminals and Case	3000 Vac, 10 s (20 °C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_w$ )	≥ 10000s (20 °C, 100Vdc, 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}}=70^{\circ}\text{C}$ )
失效率 Failure Rate	50 FIT

## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dv/dt	I	ESR (mΩ)	$I_{\text{max}}$ (A)	W	H	T	P <sub>1</sub>	P <sub>2</sub>	d
(Vdc) ≤85°C	(μF)	-	(V/μs)	(A)	85°C 10kHz	85°C 10kHz	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
600	4.0	FCS2SDS405*050I490B	65	260	23.9	5.5	32.0	20.0	11.0	27.5	\	0.8
	5.0	FCS2SDS505*050I490B	65	325	14.5	6.0	32.0	28.0	14.0	27.5	\	0.8
	8.0	FCS2SDS805*050I490B	65	520	13.9	9.5	32.0	28.0	14.0	27.5	\	0.8
	10.0	FCS2SDS106*050I490B	65	650	7.5	8.5	32.0	33.0	18.0	27.5	\	0.8
	12.0	FCS2SDS126*050I490B	65	780	10.8	12.0	32.0	33.0	18.0	27.5	\	0.8
	15.0	FCS2SDS156*050I490B	65	975	9.0	12.0	32.0	37.0	22.0	27.5	\	0.8
	20.0	FCS2SDS206*250F2C3C	30	600	9.8	11.3	42.5	40.0	20.0	37.5	10.2	1.0
	30.0	FCS2SDS306*250F1C3C	30	900	5.5	13.0	42.5	37.0	28.0	37.5	10.2	1.0
	35.0	FCS2SDS356*250F9C3C	30	1050	5.0	16.5	42.5	44.0	24.0	37.5	10.2	1.0
	40.0	FCS2SDS406*250FFC9D	30	1200	5.2	23.0	42.5	45.0	30.0	37.5	20.3	1.2
800	4.0	FCS2KDS405*050I890B	65	195	25.0	4.0	32.0	24.5	13.0	27.5	\	0.8
	5.0	FCS2KDS505*050I890B	65	325	14.0	7.0	32.0	24.5	15.0	27.5	\	0.8
	10.0	FCS2KDS106*050I890B	65	650	11.0	12.0	32.0	37.0	22.0	27.5	\	0.8
	15.0	FCS2KDS156*250F2C3C	30	450	11.9	10.1	42.5	40.0	20.0	37.5	10.2	1.0
	20.0	FCS2KDS206*250F9C3C	30	600	8.9	13.5	42.5	44.0	24.0	37.5	10.2	1.0
	25.0	FCS2KDS256*250FFC9D	30	750	5.5	15.0	42.5	45.0	30.0	37.5	20.3	1.2
	30.0	FCS2KDS306*250FFC9D	30	900	5.9	20.2	42.5	45.0	30.0	37.5	20.3	1.2

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
F	C	S	3	B	I	L	1	0	5	K	A	F	C	2	6	1	2	1	4	1		
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		样式 Plate style		外壳尺寸* Dimension Code W×H×T		中心孔距 Nominal pitch P1		焊片间距 Gap between plates P2		焊片宽度Wp Width of plates Wp		孔规格 Holeshape			
Film Capacitor=FC	Square=S	700=2Q	CBB161=IL		0.22=224		± 5%=J		style1=A		42.5×35.5×33.5=FC		24=24		10=10		10=10		ø6.5=0			
		850=K2			0.47=474		± 10%=K		style2=B				26=26		11=11		12=12		ø6.5×8.5=1			
		1000=3A			1.0=105		Special=S		style3=C				40=40		26=26		14=14		ø8.5×10.5=3			
		1200=3B			1.5=155														ø6.5×7.2=R			
		1600=3C			2.0=205														ø6.5×10.5=7			
		2000=3D			3.0=305														ø6.2×7.2=R			
																			ø9×12=5			
																			ø5.5=A			
																			ø7.0=C			
																			ø5.0=E			
																			ø8.5×14.5=D			



## Features

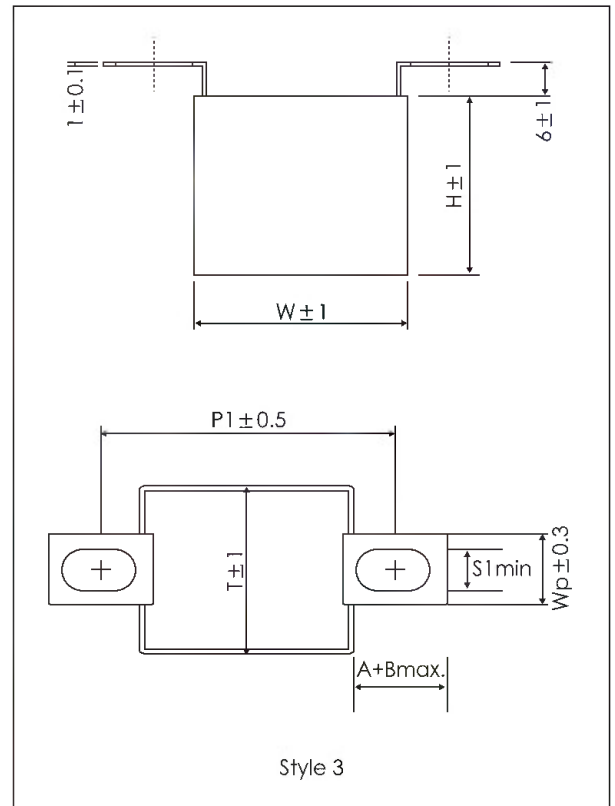
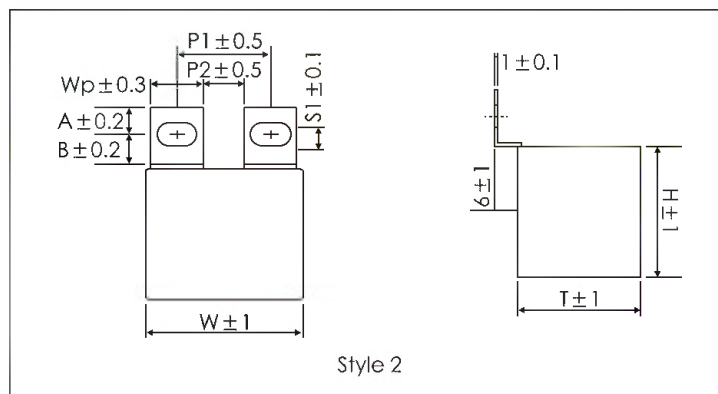
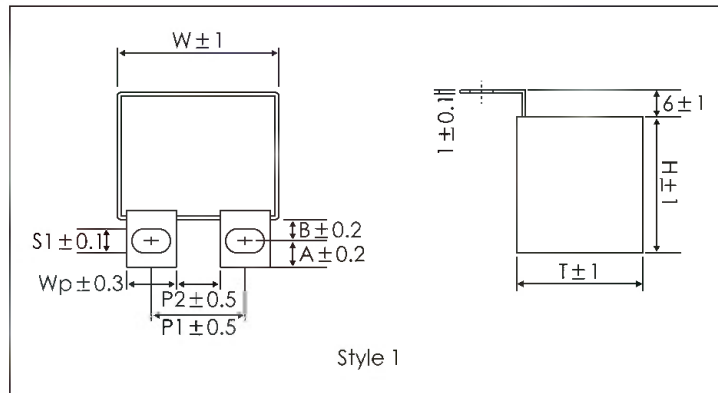
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant circuit
- Double side metallized
- Especially designed as snubber capacitor for IGBT

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小，内部温升小
- 优异的阻燃性能
- 双面金属化
- 适合作为IGBT的吸收电容

## 外形图 Dimensions

Unit: mm



Terminal Style	Length of Case $W \pm 1.0$ (mm)	Mounting Hole Pitch $P_1 \pm 0.5$ (mm)	Gap between Terminals $P_2 \pm 0.3$ (mm)	Width Terminal Plate $W_p \pm 0.3$ (mm)	Thickness Terminal $T_p \pm 0.1$ (mm)	Distance of Terminal $C \pm 0.1$ (mm)	Width of Hole $S_1 \pm 0.1$ (mm)	Length of Hole $N_1 \pm 0.3$ (mm)	Position of Hole $A \pm 0.2$ (mm)	Distance Hole $B \pm 0.2$ (mm)
Style A/B	42.5	24.0	10.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	42.5	26.0	12.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	57.5	24.0	10.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	57.5	37.0	23.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style C	42.5	60.0	38.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	8.5	10.0
Style C	57.5	75.0	53.0	14.0	1.0	6.0	M8:8.2 M8:8.2	M8:14 M8:14	8.5	10.0




## 标识 Marking

	—	1
CBB161	—	2
1 $\mu$ F K 1200V	—	3
J03F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105 °C [ $\Theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ] $\Theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+105 °C
额定电压 $U_R$ Rated Voltage	700~2000Vdc
电容量范围 Capacitance Range	0.2~7.5 $\mu$ F
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	3000Vac, 10s (20 °C, 50Hz)
损耗角正切 Dissipation Factor	$\leq 0.001$ (20 °C, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_R$ )	$IR \geq 100\,000\text{M}\Omega$ , $C_R \leq 0.33\mu\text{F}$ $RC_R \geq 30\,000\text{s}$ , $C_R > 0.33\mu\text{F}$ (20 °C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{\text{hotspot}} = 70^\circ\text{C}$ )



## 规格标准 Standard Ratings

U <sub>R</sub>	C <sub>R</sub>	P/N	dV/dt	I	R <sub>s</sub>	I <sub>max</sub>	W	H	T
(V)	(μF)	-	(V/μs)	(A)	100KHz (mΩ)	100KHz @70°C(A)	(mm)	(mm)	(mm)
700Vdc (420Vac)	1.20	FCS2QIL125**FA*****	325	390	10	12.4	42.5	28	24
	1.80	FCS2QIL185**FD*****	325	585	8	16.8	42.5	36	24
	2.20	FCS2QIL225**FC*****	325	715	7	18.8	42.5	35.5	33.5
	2.50	FCS2QIL255**FC*****	325	813	6	20.3	42.5	35.5	33.5
	3.00	FCS2QIL305**FF*****	325	975	5	22.4	42.5	45	30
	4.00	FCS2QIL405**FE*****	325	1300	4	25	42.5	43	42
	4.20	FCS2QIL425**HG*****	260	1092	3	26	57.5	43.5	29.5
	4.50	FCS2QIL455**HH*****	260	1170	3	26	57.5	45	30
	5.00	FCS2QIL505**HJ*****	260	1300	3	27	57.5	45	35
	5.50	FCS2QIL555**HL*****	260	1430	2	27	57.5	50	35
850Vdc (450Vac)	6.00	FCS2QIL605**HK*****	260	1560	2	28	57.5	45	45
	7.50	FCS2QIL755**HM*****	260	1950	2	30	57.5	55	40
	0.47	FCSK2IL474**FA*****	650	306	10	11.5	42.5	28	24
	0.70	FCSK2IL704**FD*****	650	455	10	15.3	42.5	36	24
	0.80	FCSK2IL804**FC*****	650	520	9	17.2	42.5	35.5	33.5
	0.80	FCSK2IL804**FA*****	650	520	10	11.8	42.5	28	24
	1.00	FCSK2IL105**FC*****	650	650	8	18.6	42.5	35.5	33.5
	1.20	FCSK2IL125**FF*****	650	780	7	20.6	42.5	45	30
	1.20	FCSK2IL125**FD*****	650	780	9	15.6	42.5	36	24
	1.50	FCSK2IL155**FE*****	650	975	6	22	42.5	43	42
	1.50	FCSK2IL155**HG*****	455	683	6	22	57.5	43.5	29.5
	1.50	FCSK2IL155**FC*****	650	975	8	17.6	42.5	35.5	33.5
	1.80	FCSK2IL185**HH*****	455	819	6	23	57.5	45	30
	1.80	FCSK2IL185**FC*****	650	1170	7	19.8	42.5	35.5	33.5
	2.00	FCSK2IL205**HJ*****	455	910	5	24	57.5	45	35
	2.20	FCSK2IL225**HL*****	455	1001	5	24	57.5	50	35
	2.20	FCSK2IL225**FF*****	650	1430	6	21.5	42.5	45	30
	2.50	FCSK2IL255**HK*****	455	1138	4	25	57.5	45	45
	2.80	FCSK2IL285**FE*****	650	1820	5	24	42.5	43	42
	3.00	FCSK2IL305**HM*****	455	1365	4	26	57.5	55	40
1000Vdc (500Vac)	3.00	FCSK2IL305**HG*****	455	1365	4	24	57.5	43.5	29.5
	3.00	FCSK2IL305**HH*****	455	1365	4	25	57.5	45	30
	3.50	FCSK2IL355**HJ*****	455	1592	4	25	57.5	45	35
	4.50	FCSK2IL455**HL*****	455	2047	3	27	57.5	50	35
	5.00	FCSK2IL505**HK*****	455	2275	3	27	57.5	45	45
	5.00	FCSK2IL505**HM*****	455	2275	2	29	57.5	55	40
	0.65	FCS3AIL654**FA*****	500	325	10	11.6	42.5	28	24
	1.00	FCS3AIL105**FD*****	500	500	9	15.5	42.5	36	24
	1.20	FCS3AIL125**FC*****	500	600	8	17.5	42.5	35.5	33.5
	1.40	FCS3AIL145**FC*****	500	700	7	18.8	42.5	35.5	33.5
1200Vdc (600Vac)	1.80	FCS3AIL185**FF*****	500	900	6	21	42.5	45	30
	2.20	FCS3AIL225**FE*****	500	1100	5	23	42.5	43	42
	2.20	FCS3AIL225**HG*****	350	770	6	23	57.5	43.5	29.5
	2.50	FCS3AIL255**HH*****	350	875	5	24	57.5	45	30
	3.00	FCS3AIL305**HJ*****	350	1050	5	24	57.5	45	35
	3.30	FCS3AIL335**HL*****	350	1155	4	25	57.5	50	35
	3.50	FCS3AIL355**HK*****	350	1225	4	25	57.5	45	45
	4.50	FCS3AIL455**HM*****	350	1575	4	28	57.5	55	40
	0.33	FCS3BIL334**FA*****	800	264	11	11.4	42.5	28	24
	0.47	FCS3BIL474**FA*****	800	376	10	11.5	42.5	28	24
	0.50	FCS3BIL504**FD*****	800	400	10	15	42.5	36	24
	0.60	FCS3BIL604**FC*****	800	480	9	16.8	42.5	35.5	33.5
	0.70	FCS3BIL704**FD*****	800	560	10	15.3	42.5	36	24
	0.70	FCS3BIL704**FC*****	800	560	9	18.4	42.5	35.5	33.5
	0.80	FCS3BIL804**FF*****	800	640	8	20.5	42.5	45	30
	0.80	FCS3BIL804**FC*****	800	640	9	17.2	42.5	35.5	33.5
	1.00	FCS3BIL105**FE*****	800	800	7	21	42.5	43	42
	1.00	FCS3BIL105**HG*****	560	560	6	22	57.5	43.5	29.5
	1.00	FCS3BIL105**FC*****	800	800	8	18.6	42.5	35.5	33.5
	1.20	FCS3BIL125**HH*****	560	672	6	22	57.5	45	30
	1.20	FCS3BIL125**FF*****	800	960	7	20.6	42.5	45	30
	1.40	FCS3BIL145**HJ*****	560	784	5	23	57.5	45	35
	1.50	FCS3BIL155**FE*****	800	1200	6	22	42.5	43	42
	1.50	FCS3BIL155**HG*****	560	840	6	22	57.5	43.5	29.5
	1.60	FCS3BIL165**HL*****	560	896	5	23	57.5	50	35
	1.70	FCS3BIL175**HK*****	560	952	4	24	57.5	45	45
	1.80	FCS3BIL185**HH*****	560	1008	6	23	57.5	45	30
	2.00	FCS3BIL205**HJ*****	560	1120	5	24	57.5	45	35
	2.00	FCS3BIL205**HM*****	560	1120	4	25	57.5	55	40
	2.20	FCS3BIL225**HL*****	560	1232	5	24	57.5	50	35
	2.50	FCS3BIL255**HK*****	560	1400	4	25	57.5	45	45
	3.00	FCS3BIL305**HM*****	560	1680	4	26	57.5	55	40

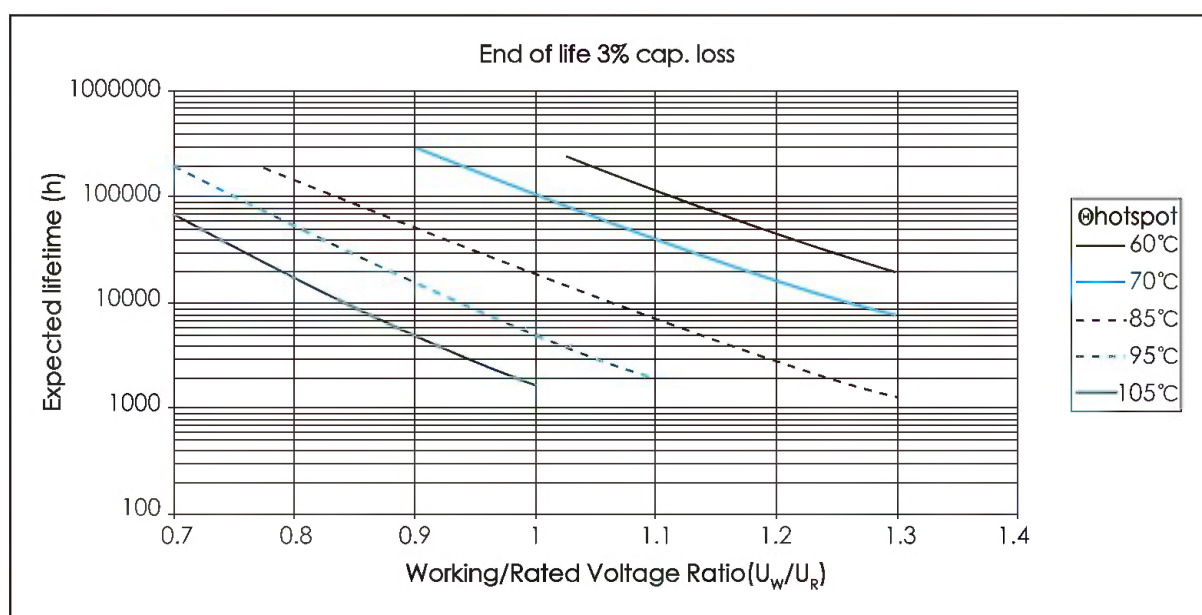


## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dV/dt	$\hat{I}$	$R_s$	$I_{max}$	W	H	T
(V)	( $\mu F$ )	-	(V/ $\mu s$ )	(A)	100KHz (m $\Omega$ )	100KHz @70°C(A)	(mm)	(mm)	(mm)
1600Vdc (650Vac)	0.33	FCS3CIL334**FA*****	800	264	11	11.4	42.5	28	24
	0.50	FCS3CIL504**FD*****	800	400	10	15	42.5	36	24
	0.60	FCS3CIL604**FC*****	800	480	9	16.8	42.5	35.5	33.5
	0.70	FCS3CIL704**FC*****	800	560	9	18.4	42.5	35.5	33.5
	0.80	FCS3CIL804**FE*****	800	640	8	20.5	42.5	45	30
	1.00	FCS3CIL105**FE*****	800	800	7	21	42.5	43	42
	1.00	FCS3CIL105**HG*****	560	560	6	22	57.5	43.5	29.5
	1.20	FCS3CIL125**HH*****	560	672	6	22	57.5	45	30
	1.40	FCS3CIL145**HJ*****	560	784	5	23	57.5	45	35
	1.60	FCS3CIL165**HL*****	560	896	5	23	57.5	50	35
2000Vdc (700Vac)	1.70	FCS3CIL175**HK*****	560	952	4	24	57.5	45	45
	2.00	FCS3CIL205**HM*****	560	1120	4	25	57.5	55	40
	0.20	FCS3DIL204**FA*****	1000	200	11	11.3	42.5	28	24
	0.30	FCS3DIL304**FD*****	1000	300	11	14.9	42.5	36	24
	0.39	FCS3DIL394**FC*****	1000	390	10	16.6	42.5	35.5	33.5
	0.42	FCS3DIL424**FC*****	1000	420	9	18.2	42.5	35.5	33.5
	0.56	FCS3DIL564**FF*****	1000	560	9	20.1	42.5	45	30
	0.70	FCS3DIL704**FG*****	1000	700	8	20	42.5	43	42
	0.75	FCS3DIL754**HG*****	720	540	8	21	57.5	43.5	29.5
	0.82	FCS3DIL824**HH*****	720	590	7	21	57.5	45	30
	0.90	FCS3DIL904**HJ*****	720	648	6	22	57.5	45	35
	1.00	FCS3DIL105**HL*****	720	720	6	22	57.5	50	35
	1.20	FCS3DIL125**HK*****	720	864	5	22	57.5	45	45
	1.40	FCS3DIL145**HM*****	720	1008	4	24	57.5	55	40

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20						
F	C	S	3	A	I	P	1	0	4	K	0	3	5	E	G	5	0	B	T						
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		引线类型 Pin Style		引线长度 Lead Length		外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1		引线 间距 Pitch P2		引线 直径 Lead diameter		高性能 附加条件 subsidiary conditions				
Film Capacitor =FC	Square=S	1000=3A	CBB162=IP		0.1=104		±5%=J		2pin, straight =0		long-lead 20min=00		18*19*11 =EG		5=1		0=0		0.5=E		Standard product=None				
							±10%=K		2pin, long-leaded =1		3.5=35				7.5=2		5.1=1		0.6=A		High temperature high humidity loading=G				
										±20%=M		4in, straight =2		13=A0				10=3		10=2		0.8=B		Automotive grade=I	
												2pin, Straight Taping 12.7=3		15=A1				12.5=4		10.2=3		1.0=C		Security film=S	
												2pin, Straight Taping 15=4		17.5=A2				15=5		12.7=4		1.2=D		Smaller=X	
												2pin, Taping 5&5=5		25=B0				20=6		15=5				Halogen-free =N	
												2pin, Taping 7.5&5=6		30=C0				22.5=7		15.2=6				Low noise=F	
												2pin, Taping 7.5&7.5=7		35=C1				25=8		16.1=7					
												2pin, Taping 10&7.5=8		55=E0				27.5=9		20=8					
												2pin, Taping 10&10=9		100=J0				30=A		20.3=9					
												2pin, Taping 15&7.5=A						32.5=B							
												2pin, Taping 15&10=B						37.5=C							
												2pin, Taping 15&15=C						42.5=D							
												2pin, Kinked 5&5=D						45=E							
												2pin, Kinked 7.5&5=E						52.5=F							
												2pin, Kinked 7.5&7.5=F													
												2pin, Kinked 10&7.5=G													
												2pin, Kinked 10&10=H													
												2pin, Kinked 15&7.5=I													
												2pin, Kinked 15&10=J													
												2pin, Kinked 15&15=K													
												2pin, Y Kinked =L													
												2pin, Z Kinked =M													

\*外壳尺寸表



## Features

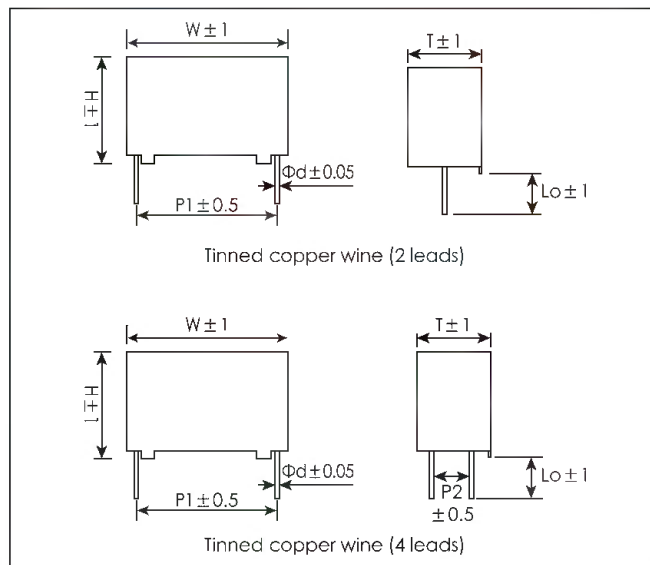
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant circuit
- Double side metallized
- Especially designed as snubber capacitor for IGBT

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小, 内部温升小
- 优异的阻燃性能
- 双面金属化
- 适合作为IGBT的吸收电容适

## 外形图 Dimensions

Unit:mm



## 标识 Marking

	1
CBB162	2
1μF J 1200V	3
N08F15	4


NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702(IEC 61071), AEC-Q200
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105 °C [ $\Theta_{\text{hotspot}} \leq 105 \text{ °C}$ ] $\Theta_{\text{hotspot}} = 85 \text{ °C} \sim 105 \text{ °C}$ : decreasing factor 1.35% per °C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+105 °C
额定电压 $U_R$ Rated Voltage	630~2000Vdc
电容量范围 Capacitance Range	0.0039 ~ 1.8 μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20 °C, 50Hz)
损耗角正切 Dissipation Factor	≤0.001 (20 °C, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance	$R \geq 100000 \text{ M}\Omega, C_N \leq 0.33 \text{ }\mu\text{F}$ $RC_N \geq 30000 \text{ s}, C_N > 0.33 \text{ }\mu\text{F}$ (20 °C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{\text{hotspot}} = 70 \text{ °C}$ )
失效率 Failure Rate	100 FIT



Approvals:

Mark	structure	File no
	UL	E227010

## 规格标准 Standard Ratings

$U_r$	$C_R$	P/N	dV/dt	$I$	W	H	T	$P_1$	d
(V)	( $\mu$ F)	-	(V/ $\mu$ S)	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
630Vdc (420Vac)	0.01	FCSJ2IP103*100C430A	3000	30.0	13	11	5	10	0.6
	0.01	FCSJ2IP103*100E250B	2500	25.0	18	11	5	15	0.8
	0.012	FCSJ2IP123*100E250B	2500	30.0	18	11	5	15	0.8
	0.012	FCSJ2IP123*100C430A	3000	36.0	13	11	5	10	0.6
	0.015	FCSJ2IP153*100E250B	2500	37.5	18	11	5	15	0.8
	0.015	FCSJ2IP153*100C530A	3000	45.0	13	12	6	10	0.6
	0.018	FCSJ2IP183*100E250B	2500	45.0	18	11	5	15	0.8
	0.018	FCSJ2IP183*100C530A	3000	54.0	13	12	6	10	0.6
	0.02	FCSJ2IP203*100E250B	2500	50.0	18	11	5	15	0.8
	0.02	FCSJ2IP203*100C830A	3000	60.0	13	13	7	10	0.6
	0.022	FCSJ2IP223*100C830A	3000	66.0	13	13	7	10	0.6
	0.022	FCSJ2IP223*100E250B	2500	55.0	18	11	5	15	0.8
	0.027	FCSJ2IP273*100E550B	2500	67.5	18	12	6	15	0.8
	0.033	FCSJ2IP333*100E550B	2500	82.5	18	12	6	15	0.8
	0.039	FCSJ2IP393*100E550B	2500	97.5	18	12	6	15	0.8
	0.047	FCSJ2IP473*100E750B	2500	117	18	13.5	7.5	15	0.8
	0.056	FCSJ2IP563*100E750B	2500	140	18	13.5	7.5	15	0.8
	0.068	FCSJ2IP683*100E850B	2500	170	18	14.5	8.5	15	0.8
	0.082	FCSJ2IP823*100EC50B	2500	205	18	16	10	15	0.8
	0.1	FCSJ2IP104*100EC50B	2500	250	18	16	10	15	0.8
	0.12	FCSJ2IP124*100EG50B	2500	300	18	19	11	15	0.8
	0.12	FCSJ2IP124*100B270B	1500	180	26	16.5	7	22.5	0.8
	0.15	FCSJ2IP154*100B370B	1500	225	26	17	8.5	22.5	0.8
	0.18	FCSJ2IP184*100B370B	1500	270	26	17	8.5	22.5	0.8
	0.22	FCSJ2IP224*100B470B	1500	330	26	19	10	22.5	0.8
	0.27	FCSJ2IP274*100B570B	1500	405	26	20	11	22.5	0.8
	0.33	FCSJ2IP334*100B570B	1500	495	26	20	11	22.5	0.8
	0.39	FCSJ2IP394*100B670B	1500	585	26	23	13	22.5	0.8
	0.47	FCSJ2IP474*050I790B	900	423	32	22	13	27.5	0.8
	0.56	FCSJ2IP564*050I790B	900	504	32	22	13	27.5	0.8
	0.68	FCSJ2IP684*050I890B	900	612	32	24.5	13	27.5	0.8
	0.82	FCSJ2IP824*050IC90B	900	738	32	28	14	27.5	0.8
	1	FCSJ2IP105*050IF90B	900	900	32	33	18	27.5	0.8
	1.2	FCSJ2IP125*050IF90B	900	1080	32	33	18	27.5	0.8
	1.5	FCSJ2IP155*050IF90B	900	1350	32	37	22	27.5	0.8
	1.8	FCSJ2IP185*050IF90B	900	1620	32	37	22	27.5	0.8
1000Vdc (500Vac)	0.01	FCS3AIP103*100E250B	2500	25.0	18	11	5	15	0.8
	0.01	FCS3AIP103*100C430A	3000	30.0	13	11	5	10	0.6
	0.012	FCS3AIP123*100E250B	2500	30.0	18	11	5	15	0.8
	0.012	FCS3AIP123*100C430A	3000	36.0	13	11	5	10	0.6
	0.015	FCS3AIP153*100E250B	2500	37.5	18	11	5	15	0.8
	0.015	FCS3AIP153*100C530A	3000	45.0	13	12	6	10	0.6
	0.018	FCS3AIP183*100E250B	2500	45.0	18	11	5	15	0.8
	0.018	FCS3AIP183*100C530A	3000	54.0	13	12	6	10	0.6
	0.02	FCS3AIP203*100E250B	2500	50.0	18	11	5	15	0.8
	0.02	FCS3AIP203*100C830A	3000	60.0	13	13	7	10	0.6
	0.022	FCS3AIP223*100C830A	3000	66.0	13	13	7	10	0.6
	0.022	FCS3AIP223*100E250B	2500	55.0	18	11	5	15	0.8
	0.027	FCS3AIP273*100E550B	2500	67.5	18	12	6	15	0.8
	0.033	FCS3AIP333*100E550B	2500	82.5	18	12	6	15	0.8
	0.039	FCS3AIP393*100E550B	2500	97.5	18	12	6	15	0.8
	0.047	FCS3AIP473*100E750B	2500	117	18	13.5	7.5	15	0.8
	0.056	FCS3AIP563*100E750B	2500	140	18	13.5	7.5	15	0.8
	0.068	FCS3AIP683*100E850B	2500	170	18	14.5	8.5	15	0.8
	0.082	FCS3AIP823*100EC50B	2500	205	18	16	10	15	0.8
	0.1	FCS3AIP104*100EC50B	2500	250	18	16	10	15	0.8
	0.12	FCS3AIP124*100EG50B	2500	300	18	19	11	15	0.8
	0.12	FCS3AIP124*100B270B	1500	180	26	16.5	7	22.5	0.8
	0.15	FCS3AIP154*100B370B	1500	225	26	17	8.5	22.5	0.8
	0.18	FCS3AIP184*100B370B	1500	270	26	17	8.5	22.5	0.8
	0.22	FCS3AIP224*100B470B	1500	330	26	19	10	22.5	0.8
	0.27	FCS3AIP274*100B570B	1500	405	26	20	11	22.5	0.8
	0.33	FCS3AIP334*100B570B	1500	495	26	20	11	22.5	0.8
	0.39	FCS3AIP394*100B670B	1500	585	26	23	13	22.5	0.8
	0.47	FCS3AIP474*050I790B	900	423	32	22	13	27.5	0.8
	0.56	FCS3AIP564*050I790B	900	504	32	22	13	27.5	0.8
	0.68	FCS3AIP684*050I890B	900	612	32	24.5	13	27.5	0.8
	0.82	FCS3AIP824*050IC90B	900	738	32	28	14	27.5	0.8
	1	FCS3AIP105*050IF90B	900	900	32	33	18	27.5	0.8
	1.2	FCS3AIP125*050IF90B	900	1080	32	33	18	27.5	0.8
	1.5	FCS3AIP155*050IF90B	900	1350	32	37	22	27.5	0.8
	1.8	FCS3AIP185*050IF90B	900	1620	32	37	22	27.5	0.8



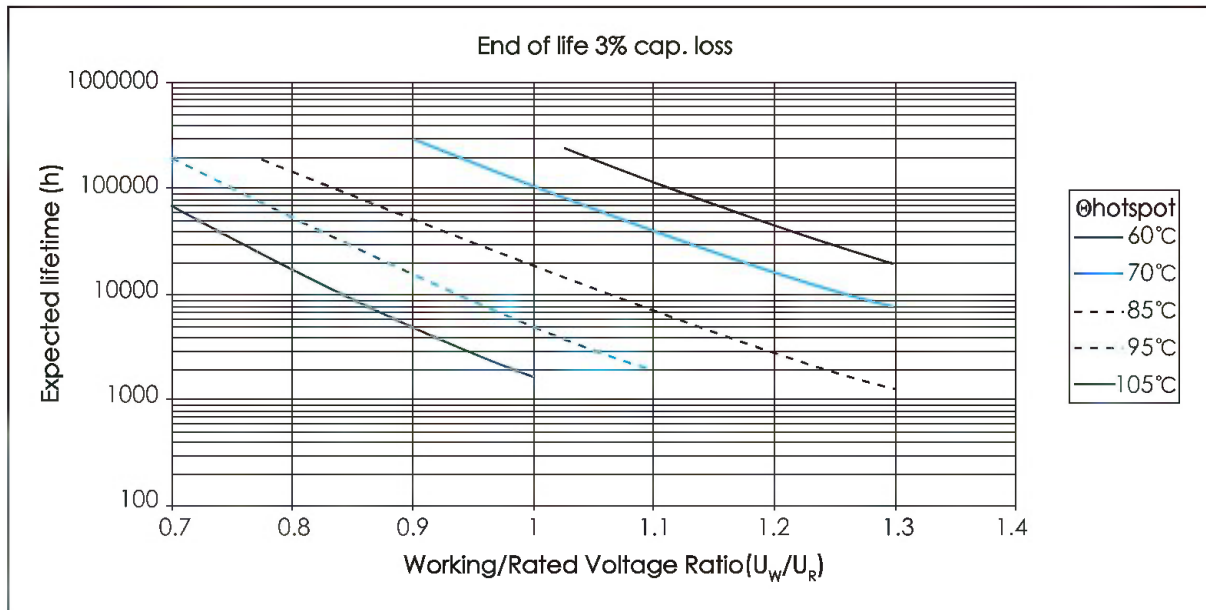
## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dV/dt	$\hat{I}$	W	H	T	$P_1$	d
(V)	( $\mu$ F)	-	(V/ $\mu$ S)	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
1200Vdc (600Vac)	0.0039	FCS3BIP392*100C430A	4800	18.7	13	11	5	10	0.6
	0.0047	FCS3BIP472*100C430A	4800	22.6	13	11	5	10	0.6
	0.0056	FCS3BIP562*100C430A	4800	26.9	13	11	5	10	0.6
	0.0068	FCS3BIP682*100C430A	4800	32.6	13	11	5	10	0.6
	0.0082	FCS3BIP822*100C430A	4800	39.4	13	11	5	10	0.6
	0.01	FCS3BIP103*100E250B	3300	33.0	18	11	5	15	0.8
	0.012	FCS3BIP123*100E250B	3300	39.6	18	11	5	15	0.8
	0.015	FCS3BIP153*100E250B	3300	49.5	18	11	5	15	0.8
	0.018	FCS3BIP183*100E250B	3300	59.4	18	11	5	15	0.8
	0.02	FCS3BIP203*100E250B	3300	66.0	18	11	5	15	0.8
	0.022	FCS3BIP223*100E550B	3300	72.6	18	12	6	15	0.8
	0.027	FCS3BIP273*100E750B	3300	89.1	18	13.5	7.5	15	0.8
	0.033	FCS3BIP333*100E750B	3300	108.9	18	13.5	7.5	15	0.8
	0.039	FCS3BIP393*100E850B	3300	128.7	18	14.5	8.5	15	0.8
	0.047	FCS3BIP473*100B270B	2200	103.4	26	16.5	7	22.5	0.8
	0.056	FCS3BIP563*100B270B	2200	123.2	26	16.5	7	22.5	0.8
	0.068	FCS3BIP683*100B370B	2200	149.6	26	17	8.5	22.5	0.8
	0.082	FCS3BIP823*100B470B	2200	180.4	26	19	10	22.5	0.8
	0.1	FCS3BIP104*100B470B	2200	220.0	26	19	10	22.5	0.8
	0.12	FCS3BIP124*100B570B	2200	264.0	26	20	11	22.5	0.8
	0.15	FCS3BIP154*100B670B	2200	330.0	26	23	13	22.5	0.8
	0.18	FCS3BIP184*050I490B	1000	180.0	32	20	11	27.5	0.8
	0.22	FCS3BIP224*050I790B	1000	220.0	32	22	13	27.5	0.8
	0.27	FCS3BIP274*050I890B	1000	270.0	32	24.5	13	27.5	0.8
	0.33	FCS3BIP334*050IC90B	1000	330.0	32	28	14	27.5	0.8
	0.39	FCS3BIP394*050IF90B	1000	390.0	32	33	18	27.5	0.8
	0.56	FCS3BIP564*050II90B	1000	560.0	32	37	22	27.5	0.8
	0.68	FCS3BIP684*050III90B	1000	680.0	32	37	22	27.5	0.8
1600Vdc (650Vac)	0.0056	FCS3CIP562*100E250B	6000	33.6	18	11	5	15	0.8
	0.0068	FCS3CIP682*100E250B	6000	40.8	18	11	5	15	0.8
	0.0082	FCS3CIP822*100E250B	6000	49.2	18	11	5	15	0.8
	0.01	FCS3CIP103*100E250B	6000	60.0	18	11	5	15	0.8
	0.012	FCS3CIP123*100E550B	6000	72.0	18	12	6	15	0.8
	0.015	FCS3CIP153*100E550B	6000	90.0	18	12	6	15	0.8
	0.018	FCS3CIP183*100E750B	6000	108.0	18	13.5	7.5	15	0.8
	0.022	FCS3CIP223*100E750B	6000	132.0	18	13.5	7.5	15	0.8
	0.027	FCS3CIP273*100E850B	6000	162.0	18	14.5	8.5	15	0.8
	0.033	FCS3CIP333*100E850B	6000	198.0	18	14.5	8.5	15	0.8
	0.039	FCS3CIP393*100B270B	3000	117.0	26	16.5	7	22.5	0.8
	0.047	FCS3CIP473*100B270B	3000	141.0	26	16.5	7	22.5	0.8
	0.056	FCS3CIP563*100B370B	3000	168.0	26	17	8.5	22.5	0.8
	0.068	FCS3CIP683*100B470B	3000	204.0	26	19	10	22.5	0.8
	0.082	FCS3CIP823*100B470B	3000	246.0	26	19	10	22.5	0.8
	0.1	FCS3CIP104*100B570B	3000	300.0	26	20	11	22.5	0.8
	0.12	FCS3CIP124*050I790B	2000	240.0	32	22	13	27.5	0.8
	0.15	FCS3CIP154*050I890B	2000	300.0	32	24.5	13	27.5	0.8
	0.18	FCS3CIP184*050IC90B	2000	360.0	32	28	14	27.5	0.8
	0.22	FCS3CIP224*050IF90B	2000	440.0	32	33	18	27.5	0.8
2000Vdc (700Vac)	0.001	FCS3DIP102*100E250B	9500	2.5	18	11	5	15	0.8
	0.0012	FCS3DIP122*100E250B	9500	11.4	18	11	5	15	0.8
	0.0015	FCS3DIP152*100E250B	9500	14.3	18	11	5	15	0.8
	0.0018	FCS3DIP182*100E250B	9500	17.1	18	11	5	15	0.8
	0.0022	FCS3DIP222*100E250B	9500	20.9	18	11	5	15	0.8
	0.0027	FCS3DIP272*100E250B	9500	25.7	18	11	5	15	0.8
	0.0033	FCS3DIP332*100E250B	9500	31.4	18	11	5	15	0.8
	0.0039	FCS3DIP392*100E250B	9500	37.1	18	11	5	15	0.8
	0.0047	FCS3DIP472*100E250B	9500	44.7	18	11	5	15	0.8
	0.0056	FCS3DIP562*100E550B	9500	53.2	18	12	6	15	0.8
	0.0068	FCS3DIP682*100E550B	9500	64.6	18	12	6	15	0.8
	0.0082	FCS3DIP822*100E550B	9500	77.9	18	12	6	15	0.8
	0.01	FCS3DIP103*100E750B	9500	95.0	18	13.5	7.5	15	0.8
	0.012	FCS3DIP123*100E850B	9500	114.0	18	14.5	8.5	15	0.8
	0.015	FCS3DIP153*100E850B	9500	142.5	18	14.5	8.5	15	0.8
	0.018	FCS3DIP183*100EC50B	9500	171.0	18	16	10	15	0.8
	0.022	FCS3DIP223*100B270B	3500	77.0	26	16.5	7	22.5	0.8
	0.027	FCS3DIP273*100B270B	3500	94.5	26	16.5	7	22.5	0.8
	0.033	FCS3DIP333*100B370B	3500	115.5	26	17	8.5	22.5	0.8
	0.039	FCS3DIP393*100B470B	3500	136.5	26	19	10	22.5	0.8
	0.047	FCS3DIP473*100B470B	3500	164.5	26	19	10	22.5	0.8
	0.056	FCS3DIP563*100B570B	3500	196.0	26	20	11	22.5	0.8
	0.068	FCS3DIP683*050I790B	2500	170.0	32	22	13	27.5	0.8
	0.082	FCS3DIP823*050I890B	2500	205.0	32	24.5	13	27.5	0.8
	0.1	FCS3DIP104*050IC90B	2500	250.0	32	28	14	27.5	0.8
	0.12	FCS3DIP124*050IF90B	2500	300.0	32	33	18	27.5	0.8
	0.15	FCS3DIP154*050IF90B	2500	375.0	32	33	18	27.5	0.8
	0.18	FCS3DIP184*050II90B	2500	450.0	32	37	22	27.5	0.8
	0.22	FCS3DIP224*050III90B	2500	550.0	32	37	22	27.5	0.8

可根据客户要求定制。Customer products are available on request.



## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	3	A	P	H	1	0	4	K	0	3	5	E	G	5	0	B	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code	容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style	引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code	引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions							
Film Capacitor =FC	Square=S	1000=3A	CBB162 125℃ 高温膜=PH	0.1=104	±5%=J	2pin, straight =0	long-lead 20min=00	18*19*11 =EG	5=1	0=0	0.5=E	125℃=H							
						±10%=K	2pin, long-leaded =1		3.5=35										
						±20%=M	4in, straight =2		13=A0										
							2pin, Straight Taping 12.7=3		15=A1										
							2pin, Straight Taping 15=4		17.5=A2										
							2pin, Taping 5&5=5		25=B0										
							2pin, Taping 7.5&5=6		30=C0										
							2pin, Taping 7.5&7.5=7		35=C1										
							2pin, Taping 10&7.5=8		55=E0										
							2pin, Taping 10&10=9		100=J0										
							2pin, Taping 15&7.5=A												
							2pin, Taping 15&10=B												
							2pin, Taping 15&15=C												
							2pin, Kinked 5&5=D												
							2pin, Kinked 7.5&5=E												
							2pin, Kinked 7.5&7.5=F												
							2pin, Kinked 10&7.5=G												
							2pin, Kinked 10&10=H												
							2pin, Kinked 15&7.5=I												
							2pin, Kinked 15&10=J												
							2pin, Kinked 15&15=K												
							2pin, Y Kinked =L												
							2pin, Z Kinked =M												

\*外壳尺寸表



## Features

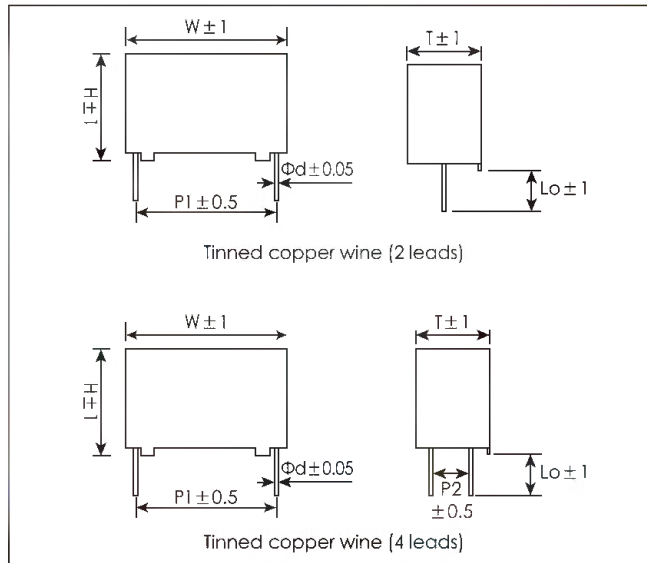
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant circuit
- Double side metallized
- Especially designed as snubber capacitor for IGBT

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小，内部温升小
- 优异的阻燃性能
- 双面金属化
- 适合作为IGBT的吸收电容

## 外形图 Dimensions

Unit:mm



## 标识 Marking

	1
CBB162	2
1 $\mu$ F J 1200V	3
N08F15	4


NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702(IEC 61071), AEC-Q200
气候类别 Climatic Category	40/125/56
工作温度范围 Operating Temperature Range	-40~+125℃ $\Theta_{hotspot}=85^{\circ}\text{C}\sim 125^{\circ}\text{C}$ : decreasing factor 0.7% per℃ for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+125℃
额定电压 $U_R$ Rated Voltage	630~1000Vdc
电容量范围 Capacitance Range	0.1 ~1.2 $\mu$ F
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)
端子与端子电压 $U_{IT}$ Voltage Between Terminals	$1.5U_R$ , 10s (20℃)
端子与铝壳电压 $U_{IC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	$\leq 0.001$ (20℃, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance	$R \geq 100000\text{M}\Omega$ , $C_N \leq 0.33\mu\text{F}$ $RC_N \geq 30000\text{s}$ , $C_N > 0.33\mu\text{F}$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{hotspot}=70^{\circ}\text{C}$ )
失效率 Failure Rate	100 FIT



## Approvals:

Mark	structure	File no
	UL	E227010

## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dV/dt	$I$	W	H	T	$P_1$	d
(V)	( $\mu$ F)	-	(V/ $\mu$ S)	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
630Vdc (420Vac)	0.1	FCSJ2PH104*100EC50B	2500	250	18	16	10	15	0.8
	0.12	FCSJ2PH124*100EG50B	2500	300	18	19	11	15	0.8
	0.12	FCSJ2PH124*100B270B	1500	180	26	16.5	7	22.5	0.8
	0.15	FCSJ2PH184*100B370B	1500	270	26	17	8.5	22.5	0.8
	0.22	FCSJ2PH224*100B470B	1500	330	26	19	10	22.5	0.8
	0.27	FCSJ2PH274*100B570B	1500	405	26	20	11	22.5	0.8
	0.33	FCSJ2PH334*100B570B	1500	495	26	20	11	22.5	0.8
	0.39	FCSJ2PH394*100B670B	1500	585	26	23	13	22.5	0.8
	0.47	FCSJ2PH474*050I790B	900	423	32	22	13	27.5	0.8
	0.56	FCSJ2PH564*050I790B	900	504	32	22	13	27.5	0.8
	0.68	FCSJ2PH684*050I890B	900	612	32	24.5	13	27.5	0.8
	0.82	FCSJ2PH824*050IC90B	900	738	32	28	14	27.5	0.8
	1	FCSJ2PH105*050IF90B	900	900	32	33	18	27.5	0.8
	1.2	FCSJ2PH125*050IF90B	900	1080	32	33	18	27.5	0.8
1000Vdc (500Vac)	0.1	FCS3APH104*100B470B	2100	210	26	19	10	22.5	0.8
	0.12	FCS3APH124*100B570B	2100	252	26	20	11	22.5	0.8
	0.15	FCS3APH154*100B570B	2100	315	26	20	11	22.5	0.8
	0.18	FCS3APH184*050I790B	1000	180	32	22	13	27.5	0.8
	0.22	FCS3APH224*050I790B	1000	220	32	22	13	27.5	0.8
	0.33	FCS3APH334*050IC90B	1000	330	32	28	14	27.5	0.8
	0.47	FCS3APH474*050IF90B	1000	470	32	33	18	27.5	0.8

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F	C	C	3	D	I	T	1	0	5	K	D	1	0	1	0	2	4	A
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		直径 diameter	高度 Height	引出端子 Terminals type	引出端子 间距 Terminals pitch	底部螺栓 Bottom- bolt	图号 Style				
Film Capacitor=FC	Column=C	1400=3O	CBB163=IT		0.1=104		±5%=J		30=A	101=101	Female M6*12.5=0	20=1	M8*10=4	Style A=A				
		2000=3D			1.0=105		±10%=K		40=B	136=136	焊片 lug 6.3*0.8=1	22=2	Without=0	Style B=B				
		2400=3T					-15~0%=P		50=C									
		2500=E3					Special=S											



## Features

- Bolt type high voltage absorption metallized film capacitor
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high ripple current handing capabilities
- Low Ls
- Self-healing property
- Aluminum case, filled with fire-retardant resin

## Applications

- High ripple current D.C filtering
- For high pulse and high frequency application

## 特点

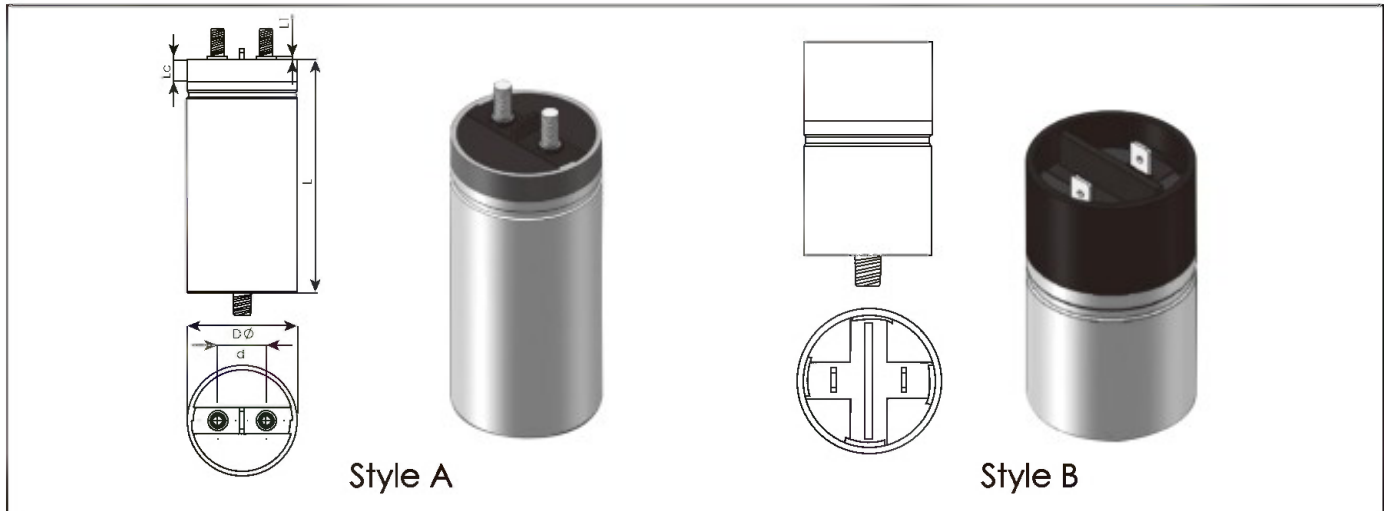
- 螺栓式高压吸收金属化薄膜电容器
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，能承受较大的纹波电流
- 自感小
- 有自愈性
- 铝壳，阻燃树脂灌封

## 应用场合

- 高纹波电流直流滤波应用
- 高压脉冲，高频应用

## 外形图 Dimensions


Unit: mm



mm

类型 Style	D ±1.0mm	P ±0.5mm	L ±1.0mm	H1 ±1.0mm H1=H+5	Lc ±1.0mm
A	50	22	95~150	100~155	10
B	40	20	67	/	24.8

## 标识 Marking

	1
CBB163	2
0.1μF ± 10%	3
U <sub>R</sub> = 2000VDC SH	4
U <sub>IC</sub> = 4000Vac 50/60Hz	5
-40~+85°C IEC61071	6
Discharge before handling	7
N37F26 104	8

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量和偏差 Capacitance and Tolerance
4	额定电压和自愈性 Rated voltage and Self-healing property
5	端子与铝壳电压U <sub>IC</sub> Voltage Between Terminals and Case
6	温度范围 Temperature Range 引用标准 Reference Standard
7	安全警示 Safety Warning
8	年度标记 Year code 二维码 QR Code



## 性能特性 Specifications

项目 Item	特性 Characteristics		
引用标准 Reference Standard	GB/T 17702 (IEC 61071)		
气候类别 Climatic Category	40/85/56		
工作温度范围 Operating Temperature Range	$-40\sim+85^{\circ}\text{C}$ ( $\Theta_{\text{hotspot}} \leq 85^{\circ}\text{C}$ )		
存储温度范围 Storage Temperature Range	$-40\sim+85^{\circ}\text{C}$		
额定电压 $U_R$ Rated Voltage	1400~2500V <sub>DC</sub>		
电容量范围 Capacitance Range	0.05~2 $\mu\text{F}$		
电容量偏差 Capacitance Tolerance	$\pm 5\%(J), \pm 10\%(K)$		
端子与端子间耐压 $U_T$ Voltage Between Terminals	$1.5 \times U_R V_{DC}, 10s (20 \pm 5^{\circ}\text{C})$		
端子与铝壳间耐压 $U_{TC}$ Voltage Between Terminals and Case	$>3000V_{AC}, 10s (20 \pm 5^{\circ}\text{C}, 50\text{ Hz})$		
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$		
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 10000s (20 \pm 5^{\circ}\text{C}, 100V_{DC}, 1\text{ min})$		
过电压 Over Voltage	$1.1U_R$ (30% of on-load-duration)		
	$1.15U_R$ (30 min/day)		
	$1.2U_R$ (5 min/day)		
	$1.3U_R$ (1 min/day)		
	$1.5U_R$ (30 ms every time, 100ms/day)		
最大电极扭矩 Max.Torque of terminals	M6:5 Nm	M8:6 Nm	M12:8 Nm
最大安装扭矩 Max.Torque of installation	M8:5 Nm	M10:7 Nm	M12:10 Nm
预期寿命 Life Expectancy	100000 hours ( $U_R, \Theta_{\text{hotspot}} = 70^{\circ}\text{C}$ )		
失效率 Failure Rate	50 FIT		

## 规格标准 Standard Ratings

$U_R \leq 85^{\circ}\text{C}$ (V)	$C_R$ ( $\mu\text{F}$ )	P/N	$I_{\text{max}}$ (A) 100KHz@70°C	ESR@100KHz, 20°C (m $\Omega$ )	dv/dt (V/ $\mu\text{s}$ )	$\bar{I}$ (A)	$L_s @ 20^{\circ}\text{C}$ (nH)	D (mm)	H (mm)
1400	0.1	FCC30IT104*A063****	10	12.0	900	90	63	30	63
	0.22	FCC30IT224*B063****	13	10.0	900	198	80	40	63
	0.33	FCC30IT334*B063****	13	10.0	900	297	80	40	63
	0.47	FCC30IT474*C063****	13	10.0	900	423	80	50	63
	0.68	FCC30IT684*C063****	18	8.0	900	612	80	50	63
	1.0	FCC30IT105*C063****	18	8.0	900	900	80	50	63
2000	0.05	FCC3DIT054*C067****	2.8	94	2000	100	60	40	67
	0.1	FCC3DIT104*C067****	5.5	17.2	2000	200	50	40	67
2400	1.0	FCC3IIT105*C101****	15	7.5	750	750	70	50	101
	1.5	FCC3IIT155*C136****	18	10.0	500	750	90	50	136
2500	0.47	FCCE3IT474*B095****	13	15.0	1200	564	150	40	95

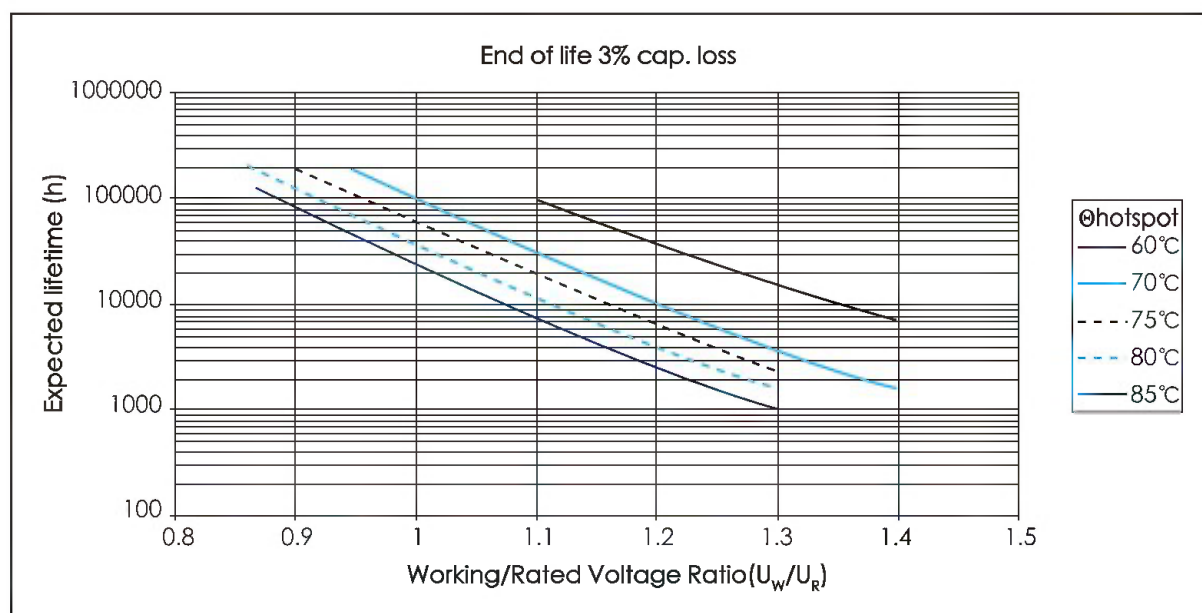
可根据客户要求定制。Customer products are available on request.

\*  $R_{th}$  为产品热点到环境的热阻（自然冷却）

The thermal Resistance from hotspot to ambient environment (Natural cooling)



## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	3	A	I	A	2	2	3	K	0	3	5	E	C	5	0	B	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code		容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style		引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code	引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions					
Film Capacitor =FC	Square=S	1000=3A	C88164=1A		0.022=223	±5%=J	2pin, straight =0		long-lead 20min=00	18*16*10=EC	5=1	0=0	0.5=E	Standard product=None					
						±10%=K	2pin, long-leaded =1		3.5=35		7.5=2	5.1=1	0.6=A	High temperature high humidity loading=G					
						±20%=M	4in, straight =2		13=A0		10=3	10=2	0.8=B	Automotive grade=I					
							2pin, Straight Taping 12.7=3		15=A1		12.5=4	10.2=3	1.0=C	Security film=S					
							2pin, Straight Taping 15=4		17.5=A2		15=5	12.7=4	1.2=D	Smaller=X					
							2pin, Taping 5&5=5		25=B0		20=6	15=5		Halogen-free =N					
							2pin, Taping 7.5&5=6		30=C0		22.5=7	15.2=6		Low noise=F					
							2pin, Taping 7.5&7.5=7		35=C1		25=8	16.1=7							
							2pin, Taping 10&7.5=8		55=E0		27.5=9	20=8							
							2pin, Taping 10&10=9		100=J0		30=A	20.3=9							
							2pin, Taping 15&7.5=A				32.5=B								
							2pin, Taping 15&10=B				37.5=C								
							2pin, Taping 15&15=C				42.5=D								
							2pin, Kinked 5&5=D				45=E								
							2pin, Kinked 7.5&5=E				52.5=F								
							2pin, Kinked 7.5&7.5=F												
							2pin, Kinked 10&7.5=G												
							2pin, Kinked 10&10=H												
							2pin, Kinked 15&7.5=I												
							2pin, Kinked 15&10=J												
							2pin, Kinked 15&15=K												
							2pin, Y Kinked =L												
							2pin, Z Kinked =M												



## Features

- High ripple current
- Self-healing property
- Low losses.
- High dv/dt
- High contact reliability
- Suitable for high frequency applications
- Film/foil, non-inductive wound type, dipped

## Applications

- Monitors(S-correction and flyback tuning)
- ballasts and compact lamps
- snubber and silicon-controlled rectifier
- High frequency, DC and pulse circuits

## 特点

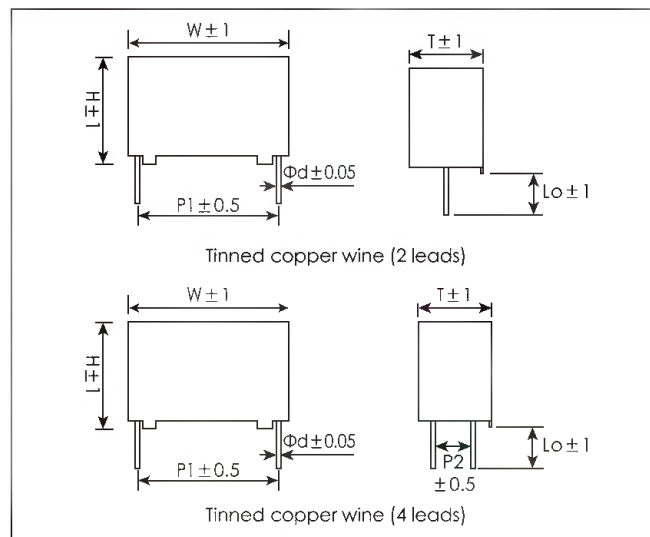
- 高电流
- 自愈性好
- 低功耗
- 高dv/dt
- 高可靠性
- 适用于高频应用
- 膜箔式电容器, 无感卷绕结构, 浸渍型

## 应用场合

- 显示器(S校正和行逆程波形)
- 镇流器和紧凑型灯具
- 吸收和整流电路
- 电源供应

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	1
CBB164	2
0.022μF J 1000V	3
N11	4


NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance, Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC 60384-17
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ ( $\Theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\Theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R(\text{dc})$
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	1000~2000Vdc
电容量范围 Capacitance Range	0.0033~0.082μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	2000 Vac, 10s (20 °C, 50 Hz)
损耗角正切 Dissipation Factor	≤0.0005 (20 °C, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $R^*C_v$ )	≥100 000MΩ (20°C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT



Approvals:

Mark	structure	File no
	UL / CUL	E483921

## 规格标准 Standard Ratings

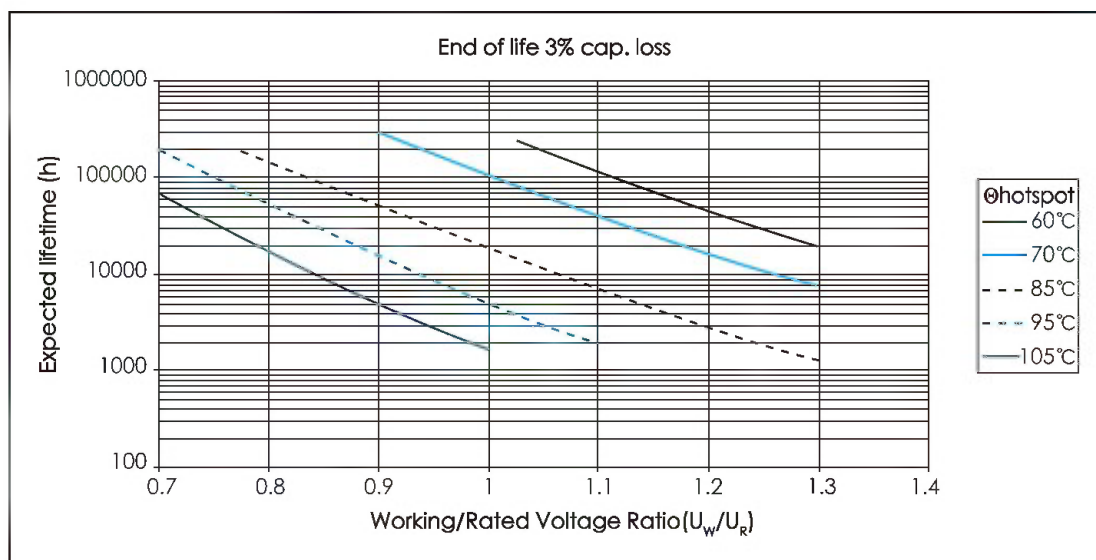
U <sub>r</sub>	C <sub>r</sub>	P/N	dV/dt	I	W	H	T	P <sub>1</sub>	D
(Vdc)	(μF)	-	(V/μs)	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
1000	0.0033	FCS3AIA332*100E250B	28000	92.4	18	11	5	15.0	0.8
	0.0039	FCS3AIA392*100E250B	28000	109.2	18	11	5	15.0	0.8
	0.0047	FCS3AIA472*100E250B	28000	131.6	18	11	5	15.0	0.8
	0.0056	FCS3AIA562*100E250B	28000	156.8	18	11	5	15.0	0.8
	0.0068	FCS3AIA682*100E250B	28000	190.4	18	11	5	15.0	0.8
	0.0082	FCS3AIA822*100E250B	28000	229.6	18	11	5	15.0	0.8
	0.01	FCS3AIA103*100E550B	28000	280.0	18	12	6	15.0	0.8
	0.012	FCS3AIA123*100E550B	28000	336.0	18	12	6	15.0	0.8
	0.015	FCS3AIA153*100E750B	28000	420.0	18	13.5	7.5	15.0	0.8
	0.018	FCS3AIA183*100E850B	28000	504.0	18	14.5	8.5	15.0	0.8
	0.022	FCS3AIA223*100E850B	28000	616.0	18	14.5	8.5	15.0	0.8
	0.027	FCS3AIA273*100EC50B	28000	756.0	18	16	10	15.0	0.8
	0.033	FCS3AIA333*100B270B	11000	363.0	26	16.5	7	22.5	0.8
	0.039	FCS3AIA393*100B370B	11000	429.0	26	17	8.5	22.5	0.8
	0.047	FCS3AIA473*100B470B	11000	517.0	26	19	10	22.5	0.8
	0.056	FCS3AIA563*100B470B	11000	616.0	26	19	10	22.5	0.8
	0.068	FCS3AIA683*100B570B	11000	748.0	26	20	11	22.5	0.8
1250	0.0022	FCSE3IA222*100E250B	30000	66.0	18	11	5	15.0	0.8
	0.0027	FCSE3IA272*100E250B	30000	81.0	18	11	5	15.0	0.8
	0.0033	FCSE3IA332*100E550B	30000	99.0	18	12	6	15.0	0.8
	0.0039	FCSE3IA392*100E550B	30000	117.0	18	12	6	15.0	0.8
	0.0047	FCSE3IA472*100E750B	30000	141.0	18	13.5	7.5	15.0	0.8
	0.0056	FCSE3IA562*100E750B	30000	168.0	18	13.5	7.5	15.0	0.8
	0.0068	FCSE3IA682*100E850B	30000	204.0	18	14.5	8.5	15.0	0.8
	0.0082	FCSE3IA822*100EC50B	30000	246.0	18	16	10	15.0	0.8
	0.01	FCSE3IA103*100B270B	11000	110.0	26	16.5	7	22.5	0.8
	0.012	FCSE3IA123*100B270B	11000	132.0	26	16.5	7	22.5	0.8
	0.015	FCSE3IA153*100B270B	11000	165.0	26	16.5	7	22.5	0.8
	0.018	FCSE3IA183*100B270B	11000	198.0	26	16.5	7	22.5	0.8
	0.022	FCSE3IA223*100B370B	11000	242.0	26	17	8.5	22.5	0.8
	0.027	FCSE3IA273*100B470B	11000	297.0	26	19	10	22.5	0.8
	0.033	FCSE3IA333*100B470B	11000	363.0	26	19	10	22.5	0.8
	0.039	FCSE3IA393*050I190B	11000	429.0	32	18	9	27.5	0.8
	0.047	FCSE3IA473*050I490B	11000	517.0	32	20	11	27.5	0.8
1600	0.056	FCSE3IA563*050I490B	11000	616.0	32	20	11	27.5	0.8
	0.068	FCSE3IA683*050I790B	11000	748.0	32	22	13	27.5	0.8
	0.082	FCSE3IA823*050I890B	11000	902.0	32	24.5	13	27.5	0.8
	0.001	FCS3CIA102*100E250B	34000	34.0	18	11	5	15.0	0.8
	0.0012	FCS3CIA122*100E250B	34000	40.8	18	11	5	15.0	0.8
	0.0015	FCS3CIA152*100E250B	34000	51.0	18	11	5	15.0	0.8
	0.0018	FCS3CIA182*100E250B	34000	61.2	18	11	5	15.0	0.8
	0.0022	FCS3CIA222*100E550B	34000	74.8	18	12	6	15.0	0.8
	0.0027	FCS3CIA272*100E550B	34000	91.8	18	12	6	15.0	0.8
	0.0033	FCS3CIA332*100E750B	34000	112.2	18	13.5	7.5	15.0	0.8
	0.0039	FCS3CIA392*100E750B	34000	132.6	18	13.5	7.5	15.0	0.8
	0.0047	FCS3CIA472*100E850B	34000	159.8	18	14.5	8.5	15.0	0.8
	0.0056	FCS3CIA562*100EC50B	34000	190.4	18	16	10	15.0	0.8
	0.0068	FCS3CIA682*100EC50B	34000	231.2	18	16	10	15.0	0.8
	0.0082	FCS3CIA822*100B270B	11000	90.2	26	16.5	7	22.5	0.8
	0.01	FCS3CIA822*100B270B	11000	110.0	26	16.5	7	22.5	0.8
	0.012	FCS3CIA123*100B270B	11000	132.0	26	16.5	7	22.5	0.8
2000	0.015	FCS3CIA153*100B370B	11000	165.0	26	17	8.5	22.5	0.8
	0.018	FCS3CIA183*100B370B	11000	198.0	26	17	8.5	22.5	0.8
	0.022	FCS3CIA223*100B470B	11000	242.0	26	19	10	22.5	0.8
	0.027	FCS3CIA273*050I190B	11000	297.0	32	18	9	27.5	0.8
	0.033	FCS3CIA333*050I490B	11000	363.0	32	20	11	27.5	0.8
	0.039	FCS3CIA393*050I490B	11000	429.0	32	20	11	27.5	0.8
	0.047	FCS3CIA473*050I790B	11000	517.0	32	22	13	27.5	0.8
	0.056	FCS3CIA563*050I790B	11000	616.0	32	22	13	27.5	0.8
	0.001	FCS3DIA102*100E550B	54000	54.0	18	12	6	15.0	0.8
	0.0012	FCS3DIA122*100E550B	54000	64.8	18	12	6	15.0	0.8
	0.0015	FCS3DIA152*100E750B	54000	81.0	18	13.5	7.5	15.0	0.8
	0.0018	FCS3DIA182*100E750B	34000	61.2	18	13.5	7.5	15.0	0.8
	0.0022	FCS3DIA222*100E850B	34000	74.8	18	14.5	8.5	15.0	0.8
	0.0027	FCS3DIA272*100EC50B	34000	91.8	18	16	10	15.0	0.8



## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dV/dt	I	W	H	T	$P_I$	D
(Vdc)	( $\mu$ F)	-	(V/ $\mu$ S)	(A)	(mm)	(mm)	(mm)	(mm)	(mm)
2000	0.0033	FCS3DIA332*100B270B	11000	36.3	26	16.5	7	22.5	0.8
	0.0039	FCS3DIA392*100B270B	11000	42.9	26	16.5	7	22.5	0.8
	0.0047	FCS3DIA472*100B270B	11000	51.7	26	16.5	7	22.5	0.8
	0.0056	FCS3DIA562*100B270B	11000	61.6	26	16.5	7	22.5	0.8
	0.0068	FCS3DIA682*100B370B	11000	74.8	26	17	8.5	22.5	0.8
	0.0082	FCS3DIA822*100B370B	11000	90.2	26	17	8.5	22.5	0.8
	0.01	FCS3DIA103*100B470B	11000	110.0	26	19	10	22.5	0.8
	0.012	FCS3DIA123*100B570B	11000	132.0	26	20	11	22.5	0.8
	0.015	FCS3DIA153*050I490B	11000	165.0	32	20	11	27.5	0.8
	0.018	FCS3DIA183*050I790B	11000	198.0	32	22	13	27.5	0.8
	0.022	FCS3DIA223*050I790B	11000	242.0	32	22	13	27.5	0.8

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
F	C	S	3	B	I	S	1	0	5	K	A	F	D	2	6	1	2	1	4	1		
电容器类型 Capacitor Type		产品外形 Product Shape	额定电压代码 Rated Voltage Code		系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		样式 Plate style		外壳尺寸* Dimension Code W×H×T		中心孔距 Nominal pitch P1		焊片间距 Gap between plates P2		焊片宽度Wp Width of plates Wp		孔规格 Hole shape	
FC=薄膜电容器 FC=Film Capacitor		方型=S Square=S	850=K2		CBB165=IS		0.40=404		±5%=J		style1=A		42.5×36×24=FD		24=24		10=10		10=10		ø6.5=0	
			1000=3A				0.68=684		±10%=K		style2=B				26=26		12=12		12=12		6.5×8.5=1	
			1200=3B				0.9=904		special=S		style3=C				40=40		26=26		14=14		8.5×10.5=3	
			1600=3C				1.3=135												6.5×10.5=7			
			2000=3D				2.2=225												9×12=5			
			2500=3E				3.3=335												ø5.5=A			
			3000=3F				4.2=425															
							5.0=505															
							6.5=655															
		8.0=805																				

\*外壳尺寸表



## Features

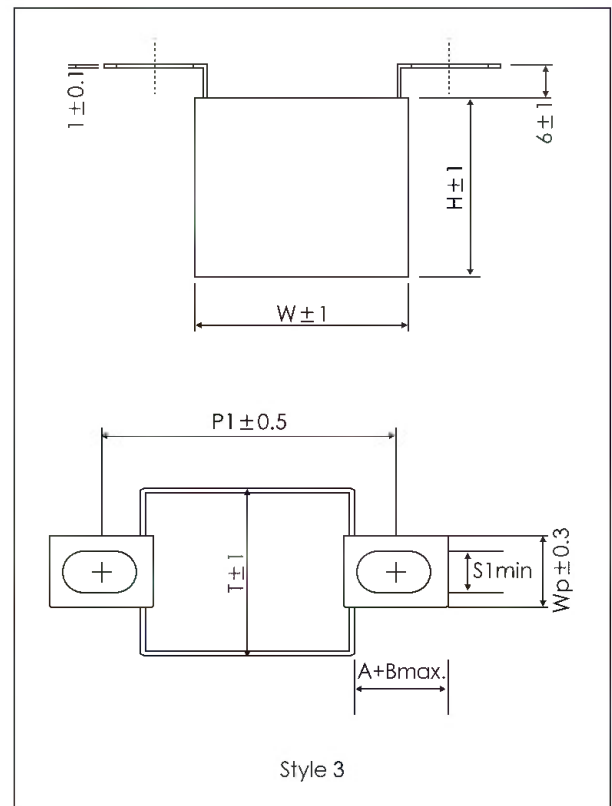
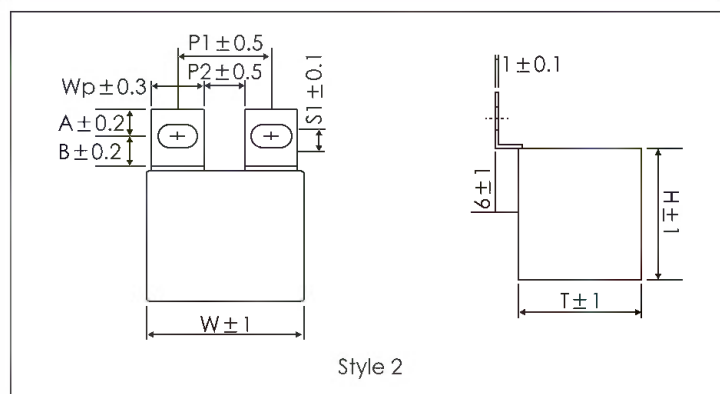
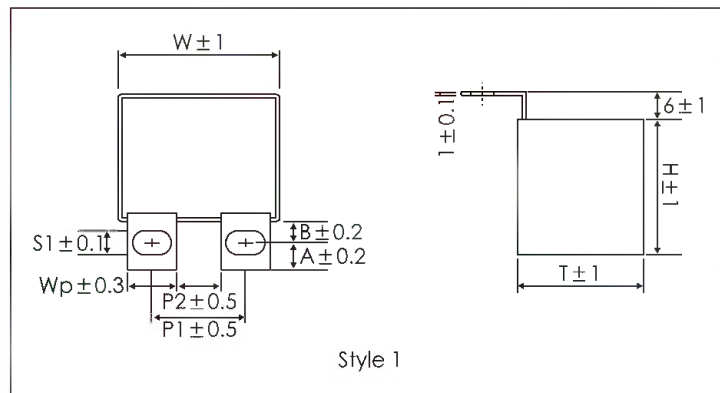
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant circuit
- Especially designed as snubber capacitor for IGBT

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小，内部温升小
- 优异的阻燃性能
- 适合作为IGBT的吸收电容

## 外形图 Dimensions

Unit: mm



DTerminal Style	Length of Case $W \pm 1.0$ (mm)	Mounting Hole Pitch $P_1 \pm 0.5$ (mm)	Gap between Terminals $P_2 \pm 0.5$ (mm)	Width Terminal Plate $W_p \pm 0.3$ (mm)	Thickness Terminal $T_p \pm 0.1$ (mm)	Distance of Terminal $C \pm 1$ (mm)	Width of Hole $S_1 \pm 0.1$ (mm)	Length of Hole $N_1 \pm 0.3$ (mm)	Position of Hole $A \pm 0.2$ (mm)	Distance Hole $B \pm 0.2$ (mm)
Style A/B	42.5	24.0	10.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	42.5	26.0	12.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	57.5	24.0	10.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style A/B	57.5	37.0	23.0	14.0	1.0	6.0	M6:6.5 M8:8.5	M6:8.5 M8:10.5	7.0	7.0
Style C	42.5	60.0	38.0	14.0	1.0	6.0	M8:6.2	M8:14	8.5	10.0
Style C	57.5	75.0	53.0	14.0	1.0	6.0	M8:8.2	M8:14	8.5	10.0



## 标识 Marking

	—	1
CBB165	—	2
1μF K 1200V	—	3
J 05F45	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance, Tolerance and Rated voltage
4	日期代码 Date code

## Approvals:

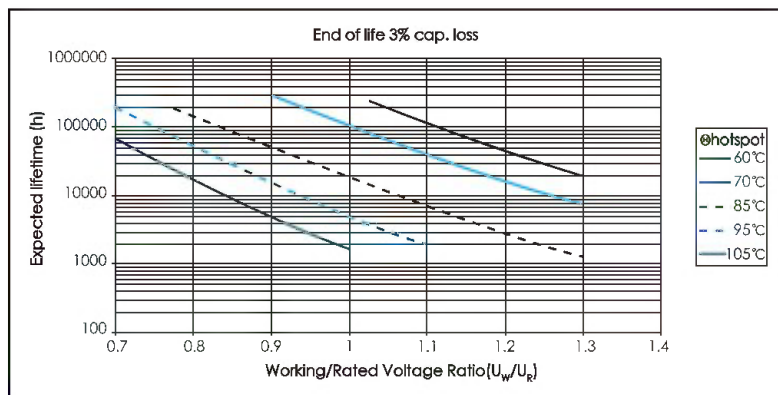
Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ ( $\theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per℃ for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	850~3000Vdc
电容量范围 Capacitance Range	0.4~8.0μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 × $U_R$ , 10s (20℃)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	≤0.0005 (20℃, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_N$ )	$IR \geq 100\,000\text{M}\Omega$ , $C_R \leq 0.33\mu\text{F}$ $RC_R \geq 30\,000\text{s}$ , $C_R > 0.33\mu\text{F}$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT

FILM

## 预期寿命曲线 Expected lifetime curve





## 规格标准 Standard Ratings

U <sub>R</sub>	C <sub>R</sub>	P/N	dV/dt	I	R <sub>S</sub>	I <sub>max</sub>	L <sub>S</sub>	W	H	T
(V)	(μF)	-	(V/μs)	(A)	100KHz (mΩ)	100KHz @70°C(A)	(nH)	(mm)	(mm)	(mm)
850Vdc (450Vac)	1.20	FCSK2IS125**FA*****	375	450	10	11.8	20	42.5	28	24
	2.00	FCSK2IS205**FD*****	375	750	9	15.6	20	42.5	36	24
	2.50	FCSK2IS255**FC*****	375	937	8	17.6	20	42.5	35.5	33.5
	2.80	FCSK2IS285**FC*****	375	1050	7	19.8	20	42.5	35.5	33.5
	3.30	FCSK2IS335**FE*****	375	1237	6	21.5	20	42.5	45	30
	4.00	FCSK2IS405**FE*****	375	1500	5	24	20	42.5	43	42
	4.50	FCSK2IS455**HG*****	225	1012	5	24	20	57.5	43.5	29.5
	4.80	FCSK2IS485**HH*****	225	1080	4	25	20	57.5	45	30
	5.50	FCSK2IS555**HJ*****	225	1237	4	25	20	57.5	45	35
	6.50	FCSK2IS655**HL*****	225	1462	3	26	20	57.5	50	35
1000Vdc (500Vac)	7.00	FCSK2IS705**HK*****	225	1575	3	26	20	57.5	45	45
	8.00	FCSK2IS805**HM*****	225	1800	3	29	20	57.5	55	40
	1.00	FCS3AIS105**FA*****	425	425	10	11.6	20	42.5	28	24
	1.50	FCS3AIS155**FD*****	425	637	9	15.5	20	42.5	36	24
	1.80	FCS3AIS185**FC*****	425	765	8	17.5	20	42.5	35.5	33.5
	2.00	FCS3AIS205**FC*****	425	850	7	18.8	20	42.5	35.5	33.5
	2.50	FCS3AIS255**FE*****	425	1062	6	21	20	42.5	45	30
	3.00	FCS3AIS305**FE*****	425	1275	5	23	20	42.5	43	42
	3.30	FCS3AIS335**HG*****	250	825	6	23	20	57.5	43.5	29.5
	3.50	FCS3AIS355**HH*****	250	875	5	24	20	57.5	45	30
1200Vdc (600Vac)	4.20	FCS3AIS425**HJ*****	250	1050	5	24	20	57.5	45	35
	4.80	FCS3AIS485**HL*****	250	1200	4	25	20	57.5	50	35
	5.00	FCS3AIS505**HK*****	250	1250	4	25	20	57.5	45	45
	6.00	FCS3AIS605**HM*****	250	1500	4	28	20	57.5	55	40
	0.68	FCS3BIS684**FA*****	475	323	10	11.5	20	42.5	28	24
	1.00	FCS3BIS105**FD*****	475	475	10	15.4	20	42.5	36	24
	1.10	FCS3BIS115**FB*****	475	522	9	17.2	20	42.5	33	33
	1.30	FCS3BIS135**FC*****	475	617	8	18.6	20	42.5	35.5	33.5
	1.60	FCS3BIS165**FE*****	475	760	7	20.6	20	42.5	45	30
	2.00	FCS3BIS205**FE*****	475	950	7	22	20	42.5	43	42
1600Vdc (650Vac)	2.20	FCS3BIS225**HG*****	300	660	6	22	20	57.5	43.5	29.5
	2.50	FCS3BIS255**HH*****	300	750	6	23	20	57.5	45	30
	2.80	FCS3BIS285**HJ*****	300	840	6	24	20	57.5	45	35
	3.30	FCS3BIS335**HL*****	300	990	5	24	20	57.5	50	35
	3.50	FCS3BIS355**HK*****	300	1050	5	25	20	57.5	45	45
	4.00	FCS3BIS405**HM*****	300	1200	5	26	20	57.5	55	40
	0.45	FCS3CIS454**FA*****	625	281	11	11.4	20	42.5	28	24
	0.60	FCS3CIS604**FD*****	625	375	10	15.2	20	42.5	36	24
	0.70	FCS3CIS704**FC*****	625	437	10	17	20	43	35.5	33.5
	0.85	FCS3CIS854**FC*****	625	531	9	18.4	20	43	35.5	33.5
2000Vdc (700Vac)	1.00	FCS3CIS105**FE*****	625	625	8	20.5	20	42.5	45	30
	1.30	FCS3CIS135**FE*****	625	812	7	21	20	42.5	43	42
	1.50	FCS3CIS155**HG*****	375	562	6	22	20	57.5	43.5	29.5
	1.60	FCS3CIS165**HH*****	375	600	6	22	20	57.5	45	30
	1.80	FCS3CIS185**HJ*****	375	675	5	23	20	57.5	45	35
	2.00	FCS3CIS205**HL*****	375	750	5	24	20	57.5	50	35
	2.20	FCS3CIS225**HK*****	375	825	4	24	20	57.5	45	45
	2.50	FCS3CIS255**HM*****	375	937	4	25	20	57.5	55	40
	1.00	FCS3DIS105**HG*****	425	425	5	22	20	57.5	43.5	29.5
	1.10	FCS3DIS115**HH*****	425	467	5	23	20	57.5	45	30
2000Vdc (700Vac)	1.30	FCS3DIS135**HJ*****	425	552	4	23	20	57.5	45	35
	1.50	FCS3DIS155**HL*****	425	637	4	24	20	57.5	50	35
	1.70	FCS3DIS175**HK*****	425	722	4	25	20	57.5	45	45
	1.90	FCS3DIS195**HM*****	425	807	3	25	20	57.5	55	40

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
F	C	S	3	C	I	G	1	5	4	K	0	3	5	I	F	9	0	B	T					
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance			引线类型 Pin Style			引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions					
Film Capacitor =FC	Square=S	1600=3C	C88166=IG			0.15=154	±5%=J			2pin, straight =0			long-lead 20min=00	32×33×18=IF		5=1	0=0	0.5=E	Standard product=None					
						±10%=K			2pin, long-leaded =1			3.5=35	7.5=2			5.1=1	0.6=A	High temperature high humidity loading=G						
						±20%=M			4in, straight =2			13=A0	10=3			10=2	0.8=B	Automotive grade=I						
									2pin, Straight Taping 12.7=3			15=A1	12.5=4			10.2=3	1.0=C	Security film=S						
									2pin, Straight Taping 15=4			17.5=A2	15=5			12.7=4	1.2=D	Smaller=X						
									2pin, Taping 5&5=5			25=B0	20=6			15=5		Halogen-free =N						
									2pin, Taping 7.5&5=6			30=C0	22.5=7			15.2=6		Low noise=F						
									2pin, Taping 7.5&7.5=7			35=C1	25=8			16.1=7								
									2pin, Taping 10&7.5=8			55=E0	27.5=9			20=8								
									2pin, Taping 10&10=9			100=J0	30=A			20.3=9								
									2pin, Taping 15&7.5=A							32.5=B								
									2pin, Taping 15&10=B							37.5=C								
									2pin, Taping 15&15=C							42.5=D								
									2pin, Kinked 5&5=D							45=E								
									2pin, Kinked 7.5&5=E							52.5=F								
									2pin, Kinked 7.5&7.5=F															
									2pin, Kinked 10&7.5=G															
									2pin, Kinked 10&10=H															
									2pin, Kinked 15&7.5=I															
									2pin, Kinked 15&10=J															
									2pin, Kinked 15&15=K															
									2pin, Y Kinked =L															
									2pin, Z Kinked =M															



## Features

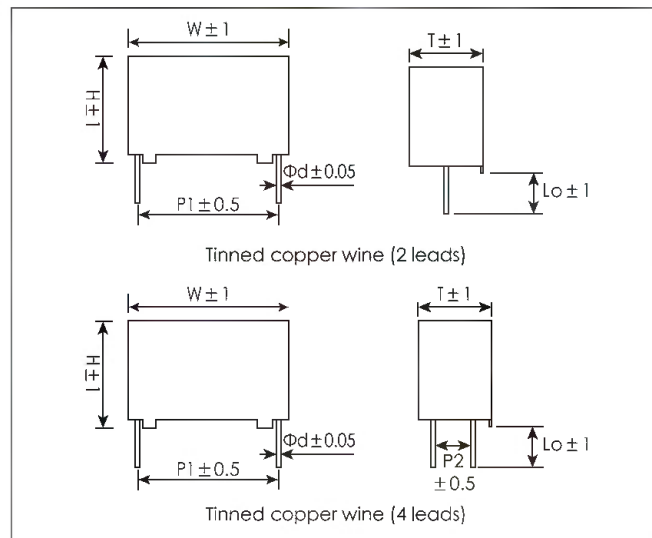
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent active and passive flame resistant circuit
- Double side metallized
- Especially designed as snubber capacitor for IGBT

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小、内部温升小
- 优异的阻燃性能
- 双面金属化
- 适合作为IGBT的吸收电容

## 外形图 Dimensions

Unit: mm




## 标识 Marking

	1
CBB166	2
1μF J 1200V	3
N08F15	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702(IEC 61071)、AEC-Q200
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ ( $\theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per °C for $U_R(\text{dc})$
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	850~2000Vdc
电容量范围 Capacitance Range	0.033~5.0μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20 °C)
端子与铝壳电压 $U_{TC}$ Voltage Between Terminals and Case	3000Vac, 10 s (20 °C, 50 Hz)
损耗角正切 Dissipation Factor	≤ 0.001 (20 °C, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 $(IR \cdot C_N)$	$R \geq 100\,000\text{M}\Omega$ , $C_N \leq 0.33\mu\text{F}$ $RC_N \geq 30\,000\text{s}$ , $C_N > 0.33\mu\text{F}$ (20 °C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT



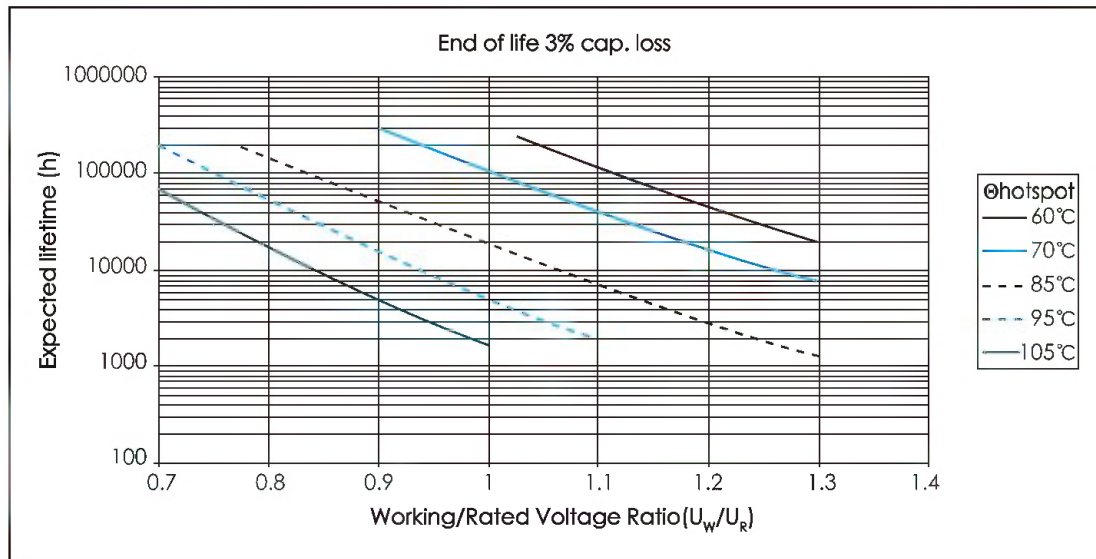
## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	I <sub>max</sub>	I	Rs	Ls	dV/dt	W	H	T	P <sub>1</sub>	P <sub>2</sub>	d
(V <sub>dc</sub> )	(μF)		70°C (A)	(A)	(mΩ)	(nH)	(V/μs)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
850Vdc (450Vac)	0.15	FCSK2IG154*050I490B	8	195	14.5	24	1300	32.0	20.0	11.0	27.5	\	0.8
	0.22	FCS K2IG224*050I790B	10	286	10.5	24	1300	32.0	22.0	13.0	27.5	\	0.8
	0.33	FCS K2IG334*050IC90B	13	429	7.6	26	1300	32.0	28.0	14.0	27.5	\	0.8
	0.47	FCS K2IG474*050IF90B	14	611	5.8	26	1300	32.0	33.0	18.0	27.5	\	0.8
	0.68	FCS K2IG684*050II90B	16	884	4.6	28	1300	32.0	37.0	22.0	27.5	\	0.8
	1.00	FCS K2IG105*250F2C3C	22	800	5.9	30	800	42.5	40.0	20.0	37.5	10.2	1.0
	2.00	FCS K2IG205*250F9C3C	29	1600	3.9	30	800	42.5	44.0	24.0	37.5	10.2	1.0
	3.00	FCSK2IG305*250HFF9D	29	1500	5.0	35	500	57.5	45.0	30.0	52.5	20.3	1.2
	4.00	FCSK2IG405*250HFF9D	29	2000	4.2	35	500	57.5	45.0	30.0	52.5	20.3	1.2
	5.00	FCS K2IG505*250HLF9D	29	2500	3.9	35	500	57.5	50.0	35.0	52.5	20.3	1.2
1000Vdc (500Vac)	0.15	FCS3AIG154*050I490B	8	210	14.0	24	1400	32.0	20.0	11.0	27.5	\	0.8
	0.22	FCS3AIG224*050I790B	9	308	9.9	24	1400	32.0	22.0	13.0	27.5	\	0.8
	0.33	FCS3AIG334*050IC90B	10	462	7.2	26	1400	32.0	28.0	14.0	27.5	\	0.8
	0.47	FCS3AIG474*050IF90B	12	658	5.6	26	1400	32.0	33.0	18.0	27.5	\	0.8
	0.68	FCS3AIG684*050II90B	14	612	4.4	28	900	32.0	37.0	22.0	27.5	\	0.8
	1.00	FCS3AIG105*250F2C3C	16	900	5.5	30	900	42.5	40.0	20.0	37.5	10.2	1.0
	1.50	FCS3AIG155*250F1C3C	16	1350	4.2	30	900	42.5	37.0	28.0	37.5	10.2	1.0
	2.00	FCS3AIG205*250FFC9D	18	1800	3.7	30	900	42.5	45.0	30.0	37.5	20.3	1.2
	2.20	FCS3AIG225*250FF9D	18	1980	3.6	30	900	42.5	45.0	30.0	37.5	20.3	1.2
	3.00	FCS3AIG305*250HFF9D	20	1650	4.7	35	550	57.5	45.0	30.0	52.5	20.3	1.2
1200Vdc (600Vac)	0.10	FCS3BIG104*050I490B	7	160	18.5	24	1600	32.0	20.0	11.0	27.5	\	0.8
	0.15	FCS3BIG154*050I790B	10	240	12.8	24	1600	32.0	22.0	13.0	27.5	\	0.8
	0.22	FCS3BIG224*050IC90B	12	352	9.2	26	1600	32.0	28.0	14.0	27.5	\	0.8
	0.33	FCS3BIG334*050IF90B	14	528	6.7	26	1600	32.0	33.0	18.0	27.5	\	0.8
	0.47	FCS3BIG474*050II90B	14	752	5.3	28	1600	32.0	37.0	22.0	27.5	\	0.8
	0.68	FCS3BIG684*250F2C3C	16	680	6.6	30	1000	42.5	40.0	20.0	37.5	10.2	1.0
	1.00	FCS3BIG105*250F2C3C	18	1000	5.1	30	1000	42.5	40.0	20.0	37.5	10.2	1.0
	1.20	FCS3BIG125*250F1C3C	18	1200	4.4	30	1000	42.5	37.0	28.0	37.5	10.2	1.0
	2.00	FCS3BIG205*250HFF9D	20	1200	5.5	35	600	57.5	45.0	30.0	52.5	20.3	1.2
	2.20	FCS3BIG225*250HFF9D	20	1320	5.2	35	600	57.5	45.0	30.0	52.5	20.3	1.2
1600Vdc (650Vac)	0.10	FCS3BIG255*250HFF9D	22	1500	4.8	35	600	57.5	45.0	30.0	52.5	20.3	1.2
	0.30	FCS3BIG305*250HFF9D	22	1800	4.5	35	600	57.5	50.0	35.0	52.5	20.3	1.2
	3.30	FCS3BIG335*250HLF9D	24	1980	4.1	35	600	57.5	50.0	35.0	52.5	20.3	1.2
	0.10	FCS3CIG104*050I790B	8	190	13.5	24	1900	32.0	22.0	13.0	27.5	\	0.8
	0.15	FCS3CIG154*050I890B	9	285	10.5	24	1900	32.0	24.5	13.0	27.5	\	0.8
	0.18	FCS3CIG184*050IC90B	10	342	9.5	26	1900	32.0	28.0	14.0	27.5	\	0.8
	0.22	FCS3CIG224*050IF90B	12	418	8.0	26	1900	32.0	33.0	18.0	27.5	\	0.8
	0.27	FCS3CIG274*050IF90B	14	513	7.0	26	1900	32.0	33.0	18.0	27.5	\	0.8
	0.33	FCS3CIG334*050II90B	15	627	6.8	28	1900	32.0	37.0	22.0	27.5	\	0.8
	0.39	FCS3CIG394*050II90B	15	741	6.5	28	1900	32.0	37.0	22.0	27.5	\	0.8
2000Vdc (700Vac)	0.47	FCS3CIG474*050F5C0C	16	588	6.0	30	1250	42.5	32.0	19.0	37.5	\	1.0
	0.68	FCS3CIG684*250F2C3C	18	850	5.0	30	1250	42.5	40.0	20.0	37.5	10.2	1.0
	0.82	FCS3CIG824*250F9C3C	18	1025	5.0	30	1250	42.5	44.0	24.0	37.5	10.2	1.0
	1.00	FCS3CIG105*250FFC9D	19	1250	4.8	30	1250	42.5	45.0	30.0	37.5	20.3	1.2
	1.20	FCS3CIG125*250FFC9D	19	1500	4.8	30	1250	42.5	45.0	30.0	37.5	20.3	1.2
	1.50	FCS3CIG155*250HFF9D	20	1125	4.5	35	750	57.5	45.0	30.0	52.5	20.3	1.2
	2.00	FCS3CIG155*250HLF9D	22	1500	4.2	35	750	57.5	50.0	35.0	52.5	20.3	1.2
	0.033	FCS3DIG333*050I490B	5	76	42.5	24	2300	32.0	20.0	11.0	27.5	\	0.8
	0.047	FCS3DIG473*050I490B	6	108	30.5	24	2300	32.0	20.0	11.0	27.5	\	0.8
	0.068	FCS3DIG683*050I790B	8	156	20.8	24	2300	32.0	22.0	13.0	27.5	\	0.8
2000Vdc (700Vac)	0.10	FCS3DIG104*050IC90B	10	230	15.2	26	2300	32.0	28.0	14.0	27.5	\	0.8
	0.15	FCS3DIG154*050IF90B	15	345	10.8	26	2300	32.0	33.0	18.0	27.5	\	0.8
	0.22	FCS3DIG224*050IF90B	17	506	7.8	26	2300	32.0	33.0	18.0	27.5	\	0.8
	0.33	FCS3DIG334*250F2C3C	16	462	9.4	30	1400	42.5	40.0	20.0	37.5	10.2	1.0
	0.47	FCS3DIG474*250F9C3C	18	658	8.3	30	1400	42.5	44.0	24.0	37.5	10.2	1.0
	0.68	FCS3DIG684*250FFC9D	20	952	5.5	30	1400	42.5	45.0	30.0	37.5	20.3	1.2
	1.00	FCS3DIG105*250HFF9D	22	850	7.3	35	850	57.5	45.0	30.0	52.5	20.3	1.2
	1.50	FCS3DIG155*250HLF9D	24	1275	5.6	35	850	57.5	50.0	35.0	52.5	20.3	1.2

可根据客户要求定制。Customer products are available on request.



## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F	C	R	3	B	I	X	1	0	5	K	A	F	D	C
电容器类型 Capacitor type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		外形 Shape	长度 Length	引线直径 Lead Diameter	引线长度 Lead Diameter		
FC=Film Capacitor	Axial=R	850=2T	CBB167=IX		0.22=224		± 5%=J		Circular=O	44/46=F	0.6=A	45=C		
		1000=3A	CBB167L=IV (Lug, 焊片)		0.56=564		± 10%=K		Flat type=A	58/59=H	0.8=B	55=D		
		1200=3B			0.72=724		special=S			34/36=I	1.0=C	41=B		
		1600=3C	CBB167T=IZ (Terminal, 端子)		1.4=145					92=T	1.2=D	35=A		
					1.6=165					140=X	0.5=E	90=F		
					2.4=245					54/56=S	M8*10=F	80=E		
					3.0=305					28/29=A				
					3.6=365					25=B				
					4.2=425					39=C				
										32=J				
										31=D				
										42=E				



## Features

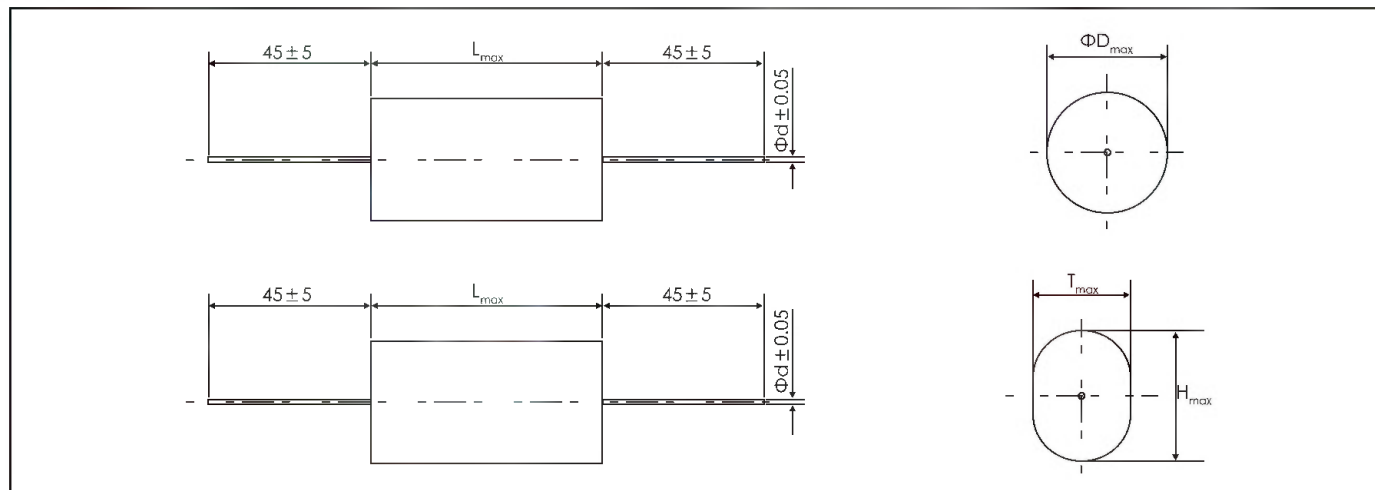
- Widely used in high voltage, high frequency circuit
- Low loss and small inherent temperature rise
- Excellent self-healing property
- Wrapped with polyester adhesive tape and ends filled with flame retardant epoxy resin

## 特点

- 广泛应用于高压高频脉冲电路中
- 损耗小, 内部温升小
- 自愈性能优异
- 外包聚氨酯胶带纸, 两端灌注阻燃性环氧

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	1
CBB167	2
1μF K 1000V <sub>dc</sub>	3
N05	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance, Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/85/21
工作温度范围 Operating Temperature Range	-40~+105°C ( $\Theta_{\text{hotspot}} \leq 105^\circ\text{C}$ ) $\Theta_{\text{hotspot}} = 85^\circ\text{C} \sim 105^\circ\text{C}$ : decreasing factor 1.35% per°C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+85°C
额定电压 $U_R$ Rated Voltage	850~2000Vdc
电容量范围 Capacitance Range	0.047~4.7μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 × $U_R$ , 10s (20°C)
端子与铝壳电压 $U_C$ Voltage Between Terminals and Case	3000 Vac, 10s (20°C, 50Hz)
损耗角正切 Dissipation Factor	0.0005 (20°C, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_N$ )	$IR \geq 100\,000\text{M}\Omega, C_N \leq 0.33\mu\text{F}$ $RC_R \geq 30\,000\text{s}, C_R > 0.33\mu\text{F}$ (20°C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R, \Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT



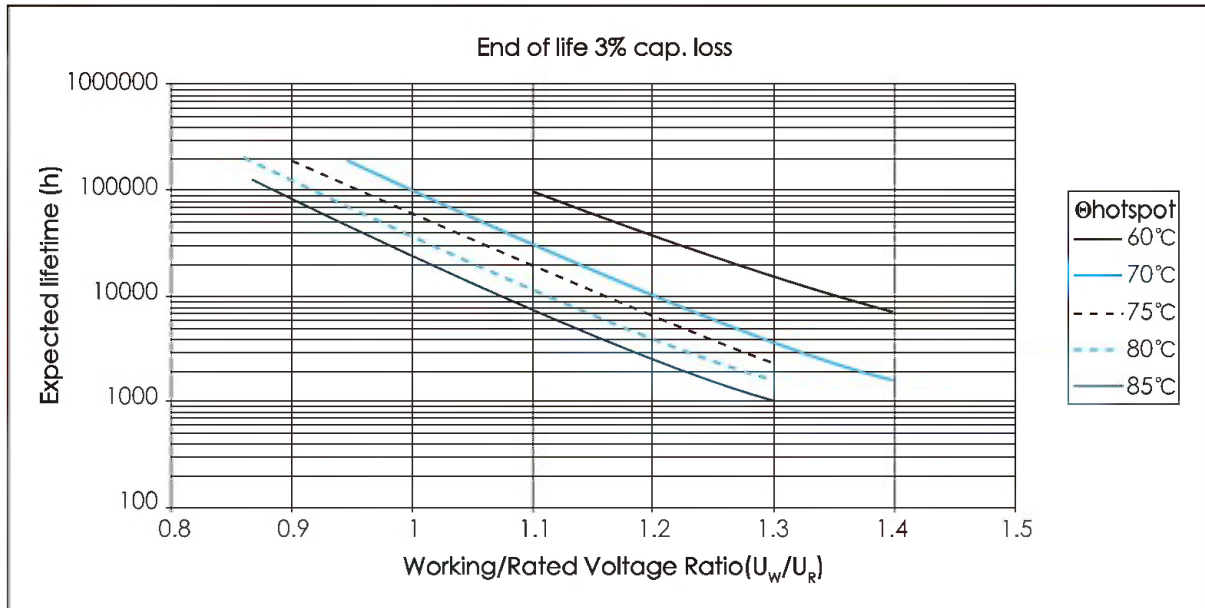
## 规格标准 Standard Ratings

U <sub>R</sub>	C <sub>R</sub>	P/N	dV/dt	i	R <sub>s</sub>	I <sub>max</sub>	L <sub>max</sub>	T <sub>max</sub>	H <sub>max</sub>	D <sub>max</sub>	d
(V)	(μF)	-	(V/μs)	(A)	100KHz (mΩ)	100KHz 70°C(A)	(mm)	(mm)	(mm)	(mm)	(mm)
850Vdc (450Vac)	0.22	FCRK2IX224**IC*	1200	264	9.4	8	34.0	18.0	11.5	14.5	1.0
	0.22	FCR K2IX224**FB*	700	154	11.3	7	44.0	14.5	10	12.0	0.8
	0.33	FCR K2IX334**IC*	1200	396	8.8	9	34.0	20.5	14.5	17.5	1.0
	0.33	FCR K2IX334**FC*	700	231	8.7	10	44.0	16.0	11.5	14.0	1.0
	0.47	FCR K2IX474**IC*	1200	564	5.7	11	34.0	23.5	17.0	20.5	1.0
	0.47	FCR K2IX474**FC*	700	329	7.2	9	44.0	19.5	13.0	16.5	1.0
	0.68	FCR K2IX684**FC*	700	476	4.6	13	44.0	27.0	21.0	19.5	1.0
	0.72	FCR K2IX724**FD*	400	288	10	11.8	46.0	26.0	18.0	25.0	1.2
	1.0	FCR K2IX105**FC*	700	700	4.7	13	44.0	27.0	17.5	23.0	1.0
	1.5	FCR K2IX155**FD*	700	1050	4.0	13	44.0	31.0	21.5	28.5	1.2
	1.5	FCR K2IX155**FD*	400	600	7.0	15.6	46.0	35.0	27.0	35.0	1.2
	2.0	FCR K2IX205**FD*	700	1400	4.3	13	44.0	34.5	25.0	32.0	1.2
	2.2	FCR K2IX225**FD*	700	1540	3.3	14	44.0	36.0	26.5	33.5	1.2
	2.2	FCR K2IX225**HD*	450	990	4.0	12	58.0	29.0	23.0	28.5	1.2
	2.2	FCR K2IX225**FD*	400	880	6.0	21.5	46.0	40.0	34.0	41.0	1.2
	2.5	FCR K2IX255**FD*	700	1750	3.7	15	44.0	38.0	28.5	35.5	1.2
	2.5	FCR K2IX255**HD*	450	1125	4.0	15	58.0	30.5	24.5	30.0	1.2
	3.0	FCR K2IX305**HD*	450	1350	3.7	15	58.0	33.0	26.5	32.5	1.2
	3.0	FCR K2IX305**HD*	290	580	6.0	23	59.0	40.0	27.0	36.0	1.2
	3.3	FCR K2IX335**HD*	450	1485	3.3	15	58.0	35.0	27.0	34.0	1.2
	3.6	FCR K2IX365**HD*	290	725	5.0	24	59.0	45.0	30.0	41.0	1.2
	4.0	FCR K2IX405**HD*	450	1800	3.3	15	58.0	38.0	30.0	37.5	1.2
	4.2	FCR K2IX425**HD*	290	870	4.0	25	59.0	45.0	35.0	44.0	1.2
	4.7	FCR K2IX475**HD*	450	2115	2.9	15	58.0	41.0	32.0	40.0	1.2
1000Vdc (500Vac)	0.22	FCR3AIX224**IC*	1300	286	8.5	8	34.0	20.0	13.5	16.5	1.0
	0.33	FCR3AIX334**IC*	1300	429	6.5	9	34.0	23.0	17.0	20.0	1.0
	0.33	FCR3AIX334**FC*	800	264	8.3	8	44.0	18.0	13.5	16.0	1.0
	0.47	FCR3AIX474**IC*	1300	611	5.4	10	34.0	26.5	20.0	23.5	1.0
	0.47	FCR3AIX474**FC*	800	376	6.7	9	44.0	21.0	14.0	18.5	1.0
	0.6	FCR3AIX604**FD*	500	360	10.0	11.6	46.0	26.0	18.0	25.0	1.2
	0.68	FCR3AIX684**FC*	800	544	5.7	12	44.0	29.0	23.0	22.0	1.0
	1.0	FCR3AIX105**FD*	800	800	4.6	12	44.0	30.0	20.5	26.5	1.2
	1.4	FCR3AIX145**FD*	500	1000	7.0	18.8	46.0	35.0	27.0	35.0	1.2
	1.5	FCR3AIX155**FD*	800	1200	5.2	13	44.0	35.0	25.5	32.0	1.2
	1.5	FCR3AIX155**HD*	500	750	5.6	12	58.0	30.0	20.0	27.0	1.2
	2.0	FCR3AIX205**HD*	500	1000	4.3	15	58.0	33.0	24.0	31.0	1.2
	2.0	FCR3AIX205**FD*	500	1500	5.0	23	46.0	40.0	34.0	41.0	1.2
	2.2	FCR3AIX225**HD*	350	770	6.0	23	59.0	40.0	27.0	36.0	1.2
	2.2	FCR3AIX155**HD*	500	1100	3.9	15	58.0	32.5	26.0	32.0	1.2
	3.0	FCR3AIX305**HD*	500	1500	3.4	15	58.0	38.0	31.0	37.5	1.2
	3.0	FCR3AIX305**HD*	350	1050	5.0	24	59.0	45.0	30.0	41.0	1.2
	3.3	FCR3AIX335**HD*	500	1650	3.1	15	58.0	40.0	32.0	39.0	1.2
	3.5	FCR3AIX355**HD*	350	1225	4.0	25	59.0	45.0	35.0	44.0	1.2
1200Vdc (600Vac)	0.22	FCR3BIX224**FD*	650	143	10.0	11.5	46.0	26.0	18.0	25.0	1.2
	0.22	FCR3BIX224**IC*	1500	330	7.7	9	34.0	24.0	17.5	18.0	1.0
	0.22	FCR3BIX224**FC*	900	198	11.0	8	44.0	21.0	11.5	14.5	1.0
	0.33	FCR3BIX334**IC*	1500	495	6.6	10	34.0	28.0	21.5	22.0	1.0
	0.33	FCR3BIX334**FC*	900	297	7.7	9	44.0	24.0	14.5	17.5	1.0
	0.47	FCR3BIX474**FD*	900	423	6.8	10	44.0	26.0	18.0	24.0	1.2
	0.68	FCR3BIX684**FD*	900	612	5.8	12	44.0	31.0	22.0	26.0	1.2
	0.72	FCR3BIX724**FD*	650	468	9.0	17.2	46.0	35.0	27.0	35.0	1.2
	1.0	FCR3BIX105**FD*	900	900	5.0	11	44.0	33.0	27.0	29.0	1.2
	1.0	FCR3BIX105**HD*	550	550	5.5	10	58.0	36.0	21.0	24.5	1.2
	1.2	FCR3BIX125**FD*	900	1080	4.4	11	44.0	38.0	29.0	32.0	1.2
	1.2	FCR3BIX125**HD*	550	660	4.8	10	58.0	38.0	23.0	26.5	1.2
	1.2	FCR3BIX125**FD*	650	780	7.0	20.5	46.0	40.0	34.0	41.0	1.2
	1.5	FCR3BIX155**FD*	900	1350	3.9	14	44.0	43.0	32.0	35.5	1.2
	1.5	FCR3BIX155**HD*	550	825	4.4	13	58.0	36.0	26.0	29.5	1.2
	1.6	FCR3BIX165**HD*	455	455	8.0	19	59.0	40.0	27.0	36.0	1.2
	2.0	FCR3BIX205**HD*	550	1100	3.9	15	58.0	39.0	30.0	33.0	1.2
	2.1	FCR3BIX215**HD*	455	546	7.0	20	59.0	45.0	30.0	41.0	1.2
	2.2	FCR3BIX225**HD*	550	1210	3.7	15	58.0	42.0	31.0	35.5	1.2
	2.4	FCR3BIX245**HD*	455	682	6.0	22	59.0	45.0	35.0	44.0	1.2
	3.0	FCR3BIX305**HD*	550	1650	3.1	15	58.0	47.5	35.0	41.0	1.2
1600Vdc (650Vac)	0.22	FCR3CIX224**FD*	800	176	11.0	11.4	46.0	26.0	18.0	25.0	1.2
	0.56	FCR3CIX564**FD*	800	448	9.0	16.8	46.0	35.0	27.0	35.0	1.2
	0.72	FCR3CIX724**FD*	800	576	8.0	20.5	46.0	40.0	34.0	41.0	1.2
	1.0	FCR3CIX105**HD*	560	380	7.0	19	59.0	40.0	27.0	36.0	1.2
	1.3	FCR3CIX135**HD*	560	403	6.0	21	59.0	45.0	30.0	41.0	1.2
	1.6	FCR3CIX165**HD*	560	560	6.0	22	59.0	45.0	35.0	44.0	1.2
2000Vdc (700Vac)	0.047	FCR3DIX473**FB*	1200	56.4	30.0	5	44.0	15.0	9.0	11.0	0.8
	0.068	FCR3DIX683**IC*	2000	136	16.8	7	34.0	20.5	14.0	16.0	1.0
	0.068	FCR3DIX683**FC*	1200	81.6	23.3	6	44.0	17.0	11.0	13.0	1.0
	0.1	FCR3DIX104**IC*	2000	200	12.0	10	34.0	23.5	17.0	19.0	1.0
	0.1	FCR3DIX104**FC*	1200	120	17.7	9	44.0	19.0	13.0	15.5	1.0
	0.15	FCR3DIX154**FC*	1200	180	9.5	12	44.0	23.5	14.0	18.5	1.0
	0.22	FCR3DIX224**FC*	1200	264	8.6	13	44.0	27.0	17.5	21.5	1.0
	0.33	FCR3DIX334**FD*	1200	396	6.7	14	44.0	31.5	22.0	26.5	1.2
	0.47	FCR3DIX474**FD*	1200	564	5.6	14	44.0	36.0	26.5	32.0	1.2
	0.56	FCR3DIX564**FD*	1200	672	5.2	15	44.0	38.5	29.0	34.5	1.2
	0.56	FCR3DIX564**HD*	700	392	6.5	15	58.0	31.5	22.5	29.0	1.2
	0.68	FCR3DIX684**HD*	700	476	5.7	15	58.0	33.5	24.5	31.0	1.2
	1.0	FCR3DIX105**HD*	700	700	4.7	15	58.0	43.0	29.0	37.5	1.2
	1.2	FCR3DIX125**HD*	700	840	4.3	15	58.0	46.0	32.0	40.5	1.2

可根据客户要求定制。Customer products are available on request.



## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
F	C	R	3	S	A	D	1	0	5	K	D			W			D		L			
电容器类型 Capacitor Type	产品外形 Product Shape		额定电压代码 Rated Voltage Code				容量代码 Capacitance Code			容量偏差 Capacitance Tolerance	外形 Shape			长度 Length			引线直径 Lead diameter		引出长度 Lead Length			
Film Capacitor =FC	Axial=R		6000=3S				CBB168=AD			0.22=224	±5%=J			090=90mm			125=125mm			M8		2
							0.56=564			±10%=K												
							0.72=724			Special=S												



## Features

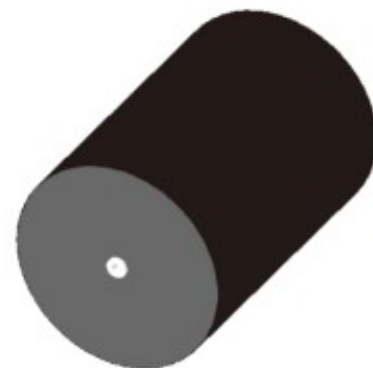
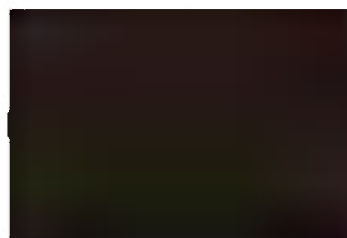
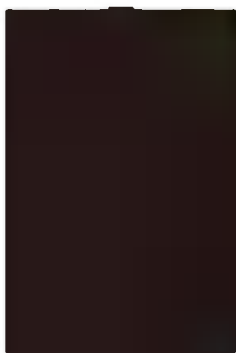
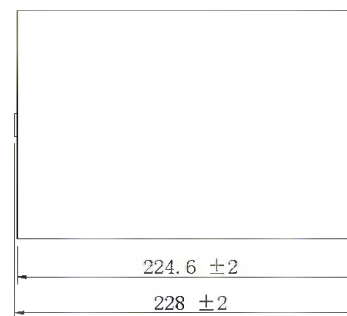
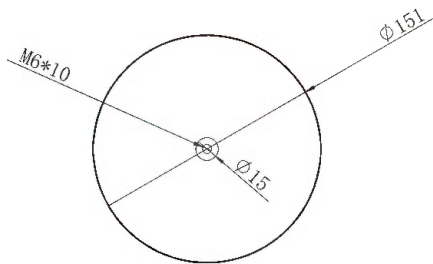
- Widely used in high voltage, high frequency Thristor absorption line
- Medium and small power induction heating power, medium power plasma power supply
- Low loss and small inherent temperature rise
- Excellent self-healing property
- External insulated pvc, pp, AL pressure tube filled with flame retardant epoxy resin

## 特点

- 广泛应用于高压高频脉冲电路及晶闸管吸收线路
- 中小功率感应加热电源, 中功率等离子体电源
- 损耗小, 内部温升小
- 自愈性能优异
- 外部绝缘PVC,PP高压管或铝壳, 两端灌注阻燃性环氧

## 外形图 Dimensions

Unit: mm





## 标识 Marking

	——	1
CBB168	——	2
105K 6000V	——	3
N05	——	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量和偏差 Capacitance and Tolerance
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071), IEC60384-17
气候类别 Climatic Category	40/85/21
工作温度范围 Operating Temperature Range	-40~+85°C ( $\Theta_{\text{hotspot}} \leq 85^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+85°C
额定电压 $U_R$ Rated Voltage	2.5KV <sub>DC</sub> ~50KV <sub>DC</sub> 280V <sub>AC</sub> ~20KV <sub>AC</sub>
电容量范围 Capacitance Range	0.01~100μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子间耐压 $U_T$ Voltage Between Terminals	1.5 $U_N$ , 10s (25°C)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	>5000V <sub>AC</sub> , 60s (25°C, 50/60Hz)
损耗角正切 Dissipation Factor	1.5% <sub>o</sub> (25°C, 100Hz)
介质损耗角正切 Dielectric Dissipation Factor	2X10 <sup>-4</sup>
绝缘电阻 Insulation Resistance	≥ 10000S (25°C, 1000V <sub>DC</sub> , 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

$U_R$	$C_N$	P/N	$dV/dt$	$U_{rms}$	$R_s$	$I_{max}$	$I_p$	$L_s$	$L_{max}$	$D_{max}$	M
(V)	( $\mu F$ )	-	(V/ $\mu s$ )	VAC	(m $\Omega$ )	(A)	KA	KA	(mm)	(mm)	(Kg)
2500	25		140	690	0.95	70	3	9	118	106	1.0
2500	30		110	690	0.9	72	3.3	9.9	118	116	1.1
3000	20		150	800	0.85	55	3	9	155	88	1.0
4200	8		300	850	5	25	2.4	7.2	128	76	0.7
5000	4.5		600	1000	6.3	18	2.7	8.1	128	76	0.7
6000	1		1200	1500	5.5	15	1.2	3.6	118	76	0.7
6000	10		300	1200	0.8	45	3.0	9.0	180	160	1.9
8000	0.5		6000	3500	8.5	15	0.6	1.8	148	76	0.8
8000	1		3000	3500	3.5	35	3	9	148	106	1.1
10000	0.22		6000	4200	11	12	1.3	3.9	148	76	0.9
12000	0.25		6500	4500	10	25			176	76	1.1
12000	1		3500	4500	3.8	45	3.5	10.5	176	140	2.3
15000	1		3500	5500	5.5	25	3.5	10.5	255	76	1.4
15000	2		2000	4500	3.5	35	4	16	255	98	2.6
20000	1.25		3000	5000	5.5	30	3.75	11.5	255	86	2.1
20000	1.5		3000	5000	5.5	35	4.5	13.5	255	100	2.5
30000	0.5		5000	6000	8.5	18	2.5	7.5	298	100	2.8
32000	1		4000	6600	4.1	30	4	12	335	133	3.5
35000	0.22		8000	7200	12.5	10	0.8	2.4	335	80	1.8
40000	1.5		5000	7200	0.5	30	7.5	22.5	580	136	8.5
50000	0.47		8000	10000	0.6	30	3.8	11.4	700	136	11.2

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F	C	C	4	F	A	G	6	0	6	K	D	1	2	5	2	1	0	A
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code(AC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		直径 Diameter	高度 Height	引出端子 Terminals		引出端子间距 Terminals Pitch		底部螺栓 Bottom Bolt	图号 Style		
FC=Film Capacitor	Column=C	450=4F	CBB65=AG			2=205	± 5%=J		40=A	55=055	1pin+1pin=1		16=8		无=0 Without=0	Style A=A		
						3.2=325	± 10%=K		45=B	60=060	2pin+2pin=2		18=1		有=1 With=1	Style B=B		
						4.5=455	Special=S		50=D	65=065	2pin+4pin=3		20=2					
						10=106			55=C	75=075	4pin+4pin=4							
						40=406			60=F	85=085								
						55=556			63.5=E	100=100								
						70=706				110=110								
						100=107				125=125								



## Features

- Used in air-conditioner as motor starting or running
- PP film design, good temperature characteristics
- Stable capacity
- Overpressure disconnector device, 10k AFC
- Fast-on terminals
- Self-healing property
- Aluminum case, filled with plant oil

## 特点

- 用在空调器上, 作马达启动或运转用
- 采用聚丙烯薄膜, 温度特性好
- 容值稳定, 变化率小
- 过压力断开装置, 10KA故障电流
- 快速插拔式接线端子
- 有自愈性
- 铝壳, 浸渍植物油

## Applications

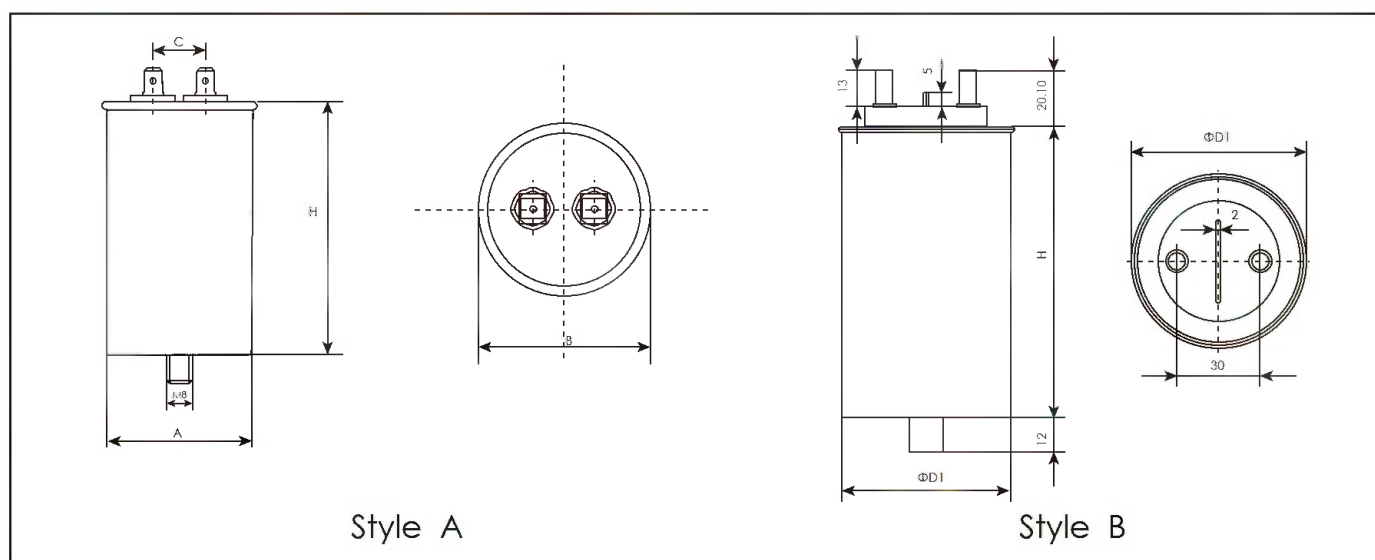
- For general AC applications, mainly as motor starting in air-conditioner

## 应用场合

- 一般交流应用, 主要用在马达启动如空调器

## 外形图 Dimensions

Unit: mm



## 标识 Marking


**Jianghai** CBB65  
FCC4HAG805JA0752B1A  
8 $\mu$ F  $\pm$ 5% -40/+85°C  
U<sub>rms</sub>=450Vac 50/60Hz  
U<sub>N</sub>=636 Vac IEC61071 SH  
Overpressure disconnector  
Torque max.3Nm  
Discharge before handling

**UL** N38T020  
E483921 005

标志 Mark	说明 Description	标志 Mark	说明 Description	标志 Mark	说明 Description
	产品商标 Product trademark	CBB65	产品型号 Product model	FCC4HAG805JA0752B1A	产品代码 Product Code
8 $\mu$ F	电容量 Capacitance	$\pm$ 5%	容量偏差 Capacity deviation	-40/+85°C	工作温度范围 Temperature range
U <sub>rms</sub>	额定均方根电压 Rated RMS voltage	50/60Hz	额定频率 Rated frequency	UN	额定电压 Rated voltage
IEC 61071	引用标准 Reference standard	SH	自愈式电容器标志 Self healing capacitor	Overpressure disconnector	过压力防护 protection
Torque max.3Nm	电极最大扭矩	Discharge before handling	操作建议 Operation suggestions		UL
	生产相关信息 二维码	QR code	生产批号 batch number	N38T020	NO.



## Approvals:

Mark	structure	File no
	UL / CUL	E483921

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 3667 (IEC 60252-1)
气候类别 Climatic Category	40/70/21 or 40/85/21
工作温度范围 Operating Temperature Range	-40~+70℃
存储温度范围 Storage Temperature Range	-40~+70℃
额定电压 $U_r$ Rated Voltage	450 Vac
电容量范围 Capacitance Range	2 ~ 100 $\mu$ F
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)
防护等级 Degree of Protection	IP 00
端子与端子间耐压 $U_T$ Voltage Between Terminals	2 $U_N$ , 2s(20℃)
端子与铝壳间耐压 $U_{TC}$ Voltage Between Terminals and Case	3000 $V_{AC}$ , 60 s(20℃, 50 Hz)
最高运行电压 Maximum permissible voltage	1.1 $U_N$
最高运行电流 Maximum permissible current	1.3 $I_N$
损耗角正切 Dissipation Factor	$\leq 0.0020$ @100Hz, 25℃ $\pm 5^\circ$ C; $C_N \leq 10\mu$ F
	$\leq 0.0060$ @100Hz, 25℃ $\pm 5^\circ$ C; $10\mu$ F < $C_N \leq 33\mu$ F
	$\leq 0.0080$ @100Hz, 25℃ $\pm 5^\circ$ C; $C_N > 33\mu$ F
绝缘电阻 Insulation Resistance( $IR \cdot C_N$ )	$\geq 3000s$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	A 级 30000 hours B 级 10000 hours C 级 3000 hours
失效率 Failure Rate	200 FIT



## 规格标准 Standard Ratings

U <sub>R</sub> (Vac)	C <sub>R</sub> (μF)	P/N -	D (mm)	D1 (mm)	H (mm)	P (mm)
450	2	FCC4FAG205*A055*B*A	40	43	55	16
	2.2	FCC4FAG225*A055*B*A	40	43	55	16
	3	FCC4FAG305*A055*B*A	40	43	55	16
	3.2	FCC4FAG325*A055*B*A	40	43	55	16
	3.5	FCC4FAG355*A055*B*A	40	43	55	16
	4	FCC4FAG405*A055*B*A	40	43	55	16
	4.5	FCC4FAG455*A055*B*A	40	43	55	16
	5	FCC4FAG505*A055*B*A	40	43	55	16
	6	FCC4FAG605*A055*B*A	40	43	55	16
	7	FCC4FAG705*A055*B*A	40	43	55	16
	7	FCC4FAG705*A065*B*A	40	43	65	16
	7.5	FCC4FAG755*A065*B*A	40	43	65	16
	8	FCC4FAG805*A055*B*A	40	43	55	16
	8	FCC4FAG805*A065*B*A	40	43	65	16
	8	FCC4FAG805*A060*B*A	40	43	60	16
	9	FCC4FAG905*A075*B*A	40	43	75	16
	10	FCC4FAG106*A075*B*A	40	43	75	16
	10	FCC4FAG106*A060*B*A	40	43	60	16
	10	FCC4FAG106*C065*2*A	55	58	65	20
	12	FCC4FAG126*A100*B*A	40	43	100	16
	12	FCC4FAG126*A065*B*A	40	43	65	16
	13	FCC4FAG136*A100*B*A	40	43	100	16
	14	FCC4FAG146*A100*B*A	40	43	100	16
	15	FCC4FAG156*A085*B*A	40	43	85	16
	17	FCC4FAG176*A100*B*A	40	43	100	16
	25	FCC4FAG256*D075*2*A	50	53	75	20
	30	FCC4FAG306*D085*2*A	50	53	85	20
	40	FCC4FAG406*D100*2*A	50	53	100	20
	45	FCC4FAG456*D110*2*A	50	53	110	20
	45	FCC4FAG456*D100*2*A	50	53	100	20
	45	FCC4FAG456*B125*2*A	45	48	125	18
	45	FCC4FAG456*F085*2*A	60	63	85	20
	50	FCC4FAG506*D110*2*A	50	53	110	20
	50	FCC4FAG506*B125*2*A	45	48	125	18
	50	FCC4FAG506*F085*2*A	60	63	85	20
	55	FCC4FAG556*C110*2*A	55	58	110	20
	55	FCC4FAG556*D125*2*A	50	53	125	20
	60	FCC4FAG606*D125*2*A	50	53	125	20
	60	FCC4FAG606*C125*2*A	55	58	125	20
	70	FCC4FAG706*C125*2*A	55	58	125	20
	80	FCC4FAG806*F125*2*A	60	63	125	20
	100	FCC4FAG107*F125*2*A	60	63	125	20
	100	FCC4FAG107*E125*2*A	63.5	66.5	125	20

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
F	C	S	2	D	A	F	1	5	7	K	0	1	7	0	2	9	0	1	5	X
电容器类型 Capacitor Type	产品外形 Product Shape	电压代码 voltage code	系列代码 Series Code	容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	尺寸特征码 Dimension characteristic code														内部特征码
FC=薄膜电容器 FC=Film Capacitor	方形=S Square =S	230=2D 267=G2 280=2J 320=2C 400=4A 440=4E 480=4J 530=5D 575=H5 660=6G	CBB233=AF	150=157 8200=828 10000=109 15000=159 20000=209 65000=659	±5%=J ±10%=K Special=S	017029015														X



## Features

- Used in AC filtering or power factor correction
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handing capabilities
- Self-healing property
- Metal/PBT case , filled with resin

## Applications

- Wind energy, Solar
- Power factor correction
- UPS application

## 特点

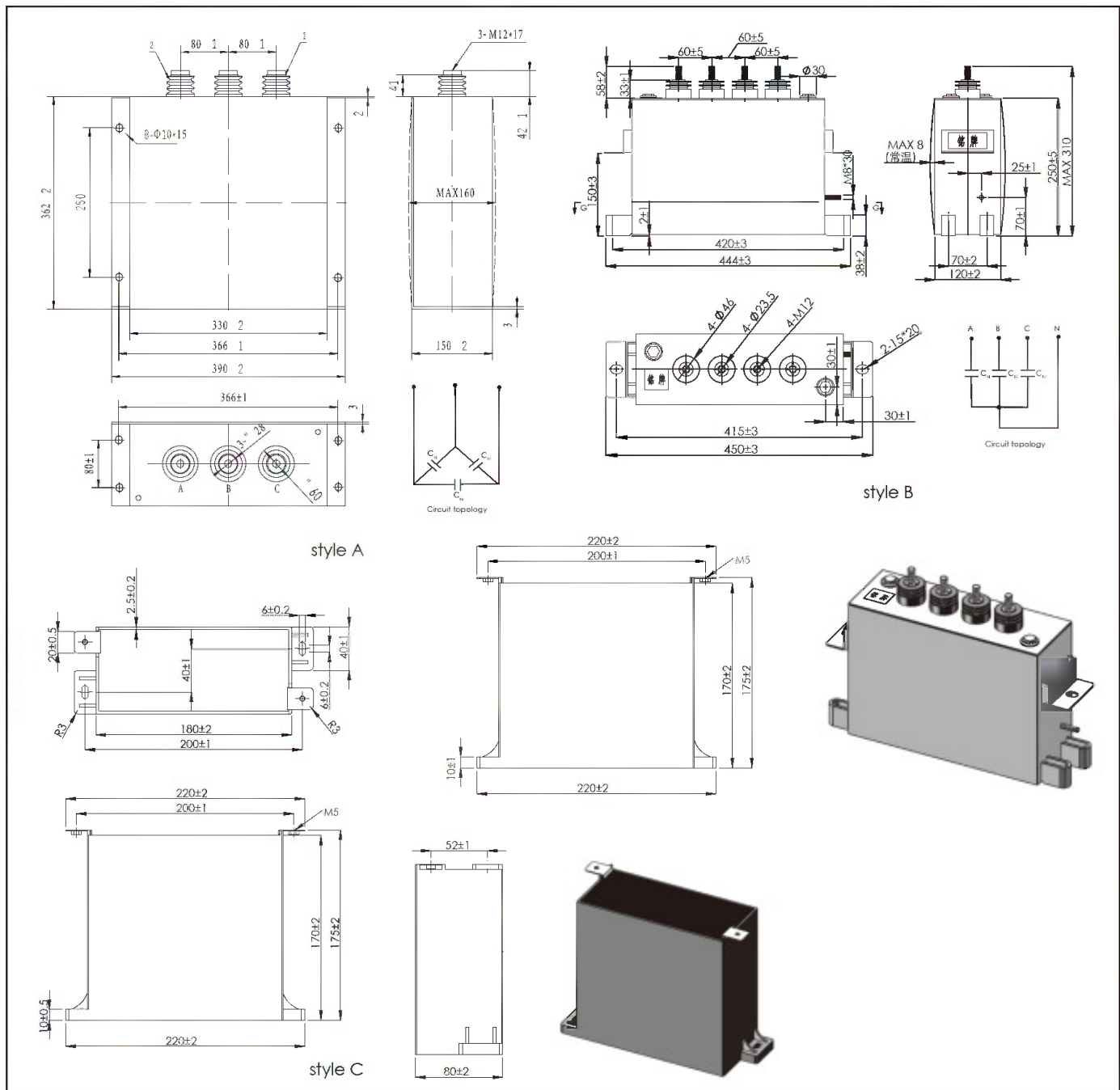
- 交流滤波或功率因数校正
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 有自愈性
- 金属外壳/塑壳，树脂灌封

## 应用场合

- 风能，太阳能
- 功率因数校正
- UPS电源



## 外形图 Dimensions

Unit: mm





## 标识 Marking

	1
CBB233	2
3*365 $\mu$ F $\pm$ 10%	3
$\Delta$ 3Phase	4
$U_n=1000$ VAC SH	5
$U_{TC}=3000$ VAC 50/60Hz	6
-40~+85 $^{\circ}$ C IEC61071	7
Discharge before handling	8
J19G04 001 	9

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量和偏差 Capacitance and Tolerance
4	连接方式及相数 Connection mode and phase number
5	额定电压和自愈性 Rated voltage and Self-healing property
6	端子与外壳电压 UTC Voltage Between Terminals and Case
7	温度范围 Temperature Range 引用标准 Reference Standard
8	安全警示 Safety Warning
9	年度标记 Date Code 二维码 QR Code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071), IEC60831
气候类别 Climatic Category	40/85/56
工作温度范围 Operating Temperature Range	-40~+70 $^{\circ}$ C ( $\theta_{hotspot} \leq 85^{\circ}$ C)
存储温度范围 Storage Temperature Range	-40~+85 $^{\circ}$ C
额定电压 $U_R$ Rated Voltage	160 ~ 5000 V <sub>AC</sub> (三相)/160~10KV <sub>AC</sub>
电容量范围 Capacitance Range	3*10 ~ 3*2000 $\mu$ F (三相)/0.1~10000 $\mu$ F
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K), Special(S)
端子与端子间耐压 $U_T$ Voltage Between Terminals	1.5 $U_N$ (V <sub>AC</sub> )或2.15 $U_N$ (V <sub>DC</sub> ), 10s(25 $\pm$ 5 $^{\circ}$ C, 1atm)
端子与外壳间耐压 $U_{TC}$ Voltage Between Terminals and Case	$\geq 2000$ VAC, 60s(25 $\pm$ 5 $^{\circ}$ C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance	$\geq 1000$ M $\Omega \cdot \mu$ F (20 $^{\circ}$ C, 100V <sub>DC</sub> , 1min)
过电压 Over Voltage	1.1 $U_R$ (30% of on-load-duration)
	1.15 $U_R$ (30 min/day)
	1.2 $U_R$ (5 min/day)
	1.3 $U_R$ (1 min/day)
	1.5 $U_R$ (30 ms every time, 100ms/day)
最大电极扭矩 Max.Torque of terminals	M5: 2 Nm, M6: 3 Nm, M8: 4 Nm, M10: 6 Nm(三相)/M6: 4 Nm, M8: 6Nm
最大安装扭矩 Max.Torque of installation	M12: 10 Nm(三相)/M12: 12Nm
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot}=70^{\circ}$ C)
失效率 Failure Rate	100 FIT

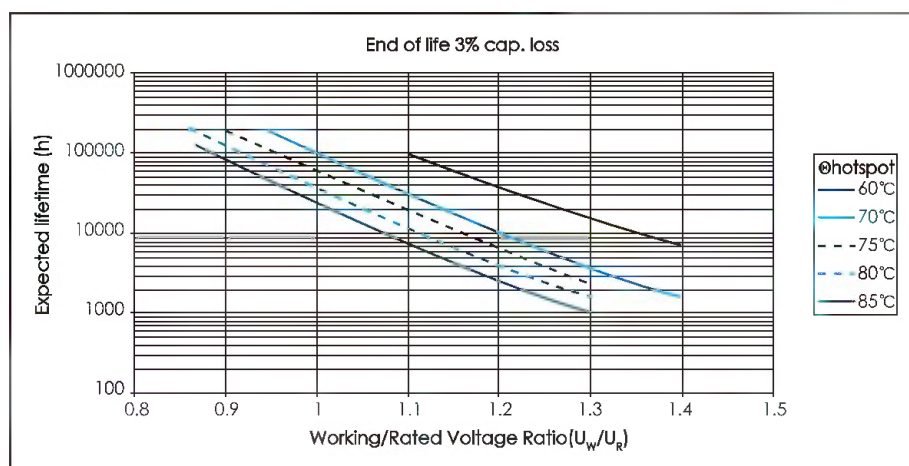


## 规格标准 Standard Ratings

$U_R$ (V <sub>AC</sub> )	$C_R$ ( $\mu$ F)	P/N	$I_{rms}$ (A)	$R_s$ (m $\Omega$ )	$L_s$ (nH)	W (mm)	H (mm)	T (mm)	备注
230	3*166	FCS2DA**	3*100	3*1.2	40	190	160	210	三相
267	3*330	FCSG2A**	3*52	3*1.5	50	350	250	120	三相
280	750	FCS2JA**	120	3	50	180	170	80	
320	320	FCS2CA**	80	3	50	180	170	80	

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve



## 警告 Cautions and warnings

■ In case of dents of more than 1 mm depth or any other mechanical damage, capacitors must not be used at all.

电容器如有深度超过1毫米的凹痕或其他机械损伤不可以使用。

■ To ensure the full functionality of the overpressure disconnector, elastic elements must not be hindered and a minimum space of 12 mm has to be kept above each capacitor.

为了保证过压力断路器的全部功能，每个电容器上方须有至少12毫米的空间，弹性元件不能被阻碍。

■ Do not handle the capacitor before it is discharged.

在电容器放电之前，不能处置电容器。

■ The threaded bottom stud of the capacitor has to be used for grounding. The maximum tightening torque is 12Nm.

电容器的底部螺栓仅用于接地使用，最大扭矩12Nm。

■ Do not use or store capacitor in corrosive atmosphere, in the dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between phase / or phase and ground.

电容器不能用在或存储在腐蚀性环境。在多灰尘的环境里，要求定期维护和清洁，特别是电极端子，以避免相与相间或相与地之间有导电通路。

■ Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

电容器的寿命是有限的，最大工作寿命因使用条件的不同而不同。



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F	C	C	4	A	A	T	3	3	7	K	L	2	7	5	6	A	1	A
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		直径 Diameter	高度 Height	引出端子 Terminals Type	引出端子 间距 Terminals Pitch		底部螺栓 Bottom Bolt	图号 Style			
FC=Film Capacitor	Column=C	230=2D	CBB235=AT			60=606	± 5%=J		76=H	160=160	M5 6pin=6	15/20=A		With=1	Style A			
		400=4A				100=107	± 10%=K		86=L	200=200	M6 6pin=5	16.5=Z		Without=0	Style B			
		440=4E				330=337	Special=S		96=W	230=230	3pinM6 螺杆=1	30=6						
		480=4J				750=757			106=K	265=265	3pinM8 螺杆=2	35=B						
		530=5D				900=907			116=P	275=275	3pinM10*15 螺杆=3							
		660=6G				1000=108			136=T	350=350	3pinM8*15 螺杆=4							



## Features

- Used in AC filtering or power factor correction
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handling capabilities
- Overpressure disconnection device
- Self-healing property
- Aluminum case, filled with soft PU resin
- Three phase in one cylinder aluminum can

## Applications

- Wind energy, Solar
- Power factor correction

## 特点

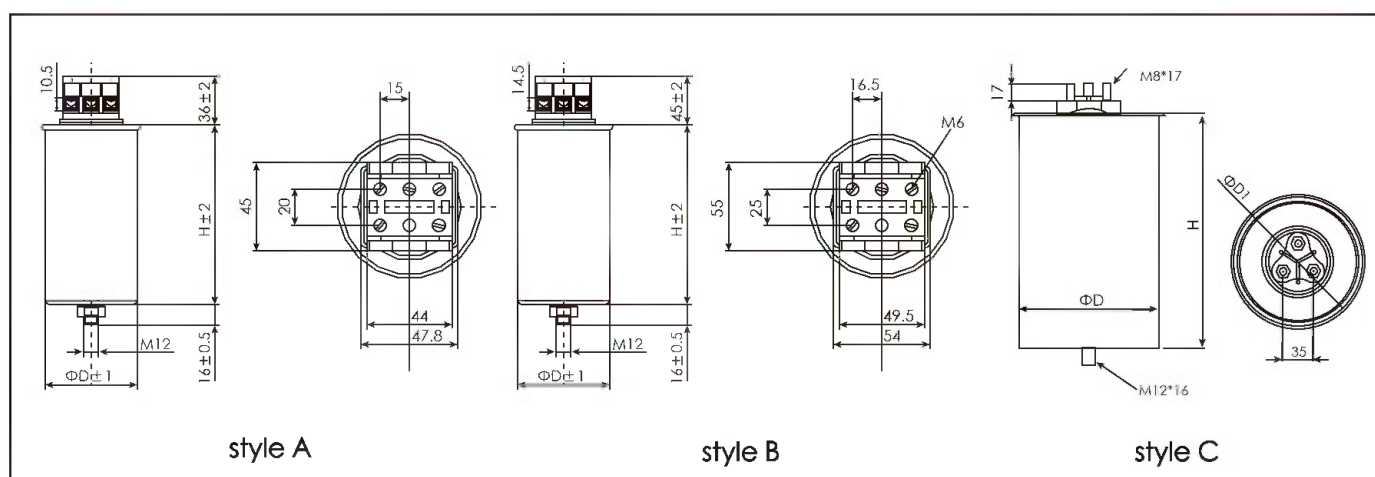
- 交流滤波或功率因数校正
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 过压力断开装置
- 有自愈性
- 铝壳，软树脂灌封
- 三相电容器，封装在一个铝壳内

## 应用场合


- 风能，太阳能
- 功率因数校正

## 外形图 Dimensions

Unit: mm



## Approvals:

Mark	structure	File no
	UL / CUL	E483921

## 标识 Marking

 CBB235  
 FCC8FAT556JT2305A1A  
 3\*55.8μF ±5% △-40/+85°C  
 Urms=850Vac 50/60Hz  
 U<sub>N</sub>=1200Vac IEC61071 SH  
 Overpressure disconnecter  
 Torque max.3Nm  
 Discharge before handling  
 N38T020 005 

标志 Mark	说明 Description	标志 Mark	说明 Description	标志 Mark	说明 Description
	产品商标 Product trademark	CBB235	产品型号 Product model	FCC8FAT556JT2305A1A	产品代码 Product Code
3*55.8μF	电容量 Capacitance	±5%	容量偏差 Capacity deviation	-40/+85°C	工作温度范围 Temperature range
Urms	额定均方根电压 Rated RMS voltage	50/60Hz	额定频率 Rated frequency	UN	额定电压 Rated voltage
IEC 61071	引用标准 Reference standard	SH	自愈式电容器标志 Self healing capacitor	Overpressure disconnecter	过压力防护 protection
Torque max.3Nm	电极最大扭矩 Electrode maximum torque	Discharge before handling	操作建议 Operation suggestions	 E483921	UL
	生产相关信息 二维码 Production information QR code	N38T020	生产批号 batch number	005	NO.



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/70/56
工作温度范围 Operating Temperature Range	-40~+85°C ( $\Theta_{\text{hotspot}} \leq 85^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+70°C
额定电压 $U_r$ Rated Voltage	230~850Vac
电容量范围 Capacitance Range	3*20.3 ~ 3*335 $\mu\text{F}$
电容量偏差 Capacitance Tolerance	$\pm 5\%(\text{J})$ , $\pm 10\%(\text{K})$
防护等级 Degree of Protection	IP 00
端子与端子耐压 $U_T$ Voltage Between Terminals	2.15 $U_{\text{rms}}$ , 10s(20°C)
端子与铝壳耐压 $U_{TC}$ Voltage Between Terminals and Case	4000 $V_{\text{AC}}$ , 10 s(20°C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance ( $\text{IR} \cdot C_N$ )	$\geq 10000\text{s}$ (20°C, 100Vdc, 1min)
最大电极扭矩 Max Torque of terminals	M5: 2 Nm, M6: 3 Nm, M8: 6 Nm, M10: 8 Nm
最大安装扭矩 Max Torque of installation	M12: 10 Nm
预期寿命 Life Expectancy	100000 hours ( $0.8U_{\text{rms}}$ , $\Theta_{\text{hotspot}} = 70^\circ\text{C}$ )
失效率 Failure Rate	300 FIT

## 规格标准 Standard Ratings

$U_{\text{rms}}/U_N$	$C_r$	P/N	$R_m$	$I_{\text{max}}$ 55°C, 1KHz	$R_s$ 20°C, 1KHz	$f$	$L_s$ 20°C	D	H
(Vac)	( $\mu\text{F}$ )	-	(K/W)	(A)	(m $\Omega$ )	(A)	(nH)	(mm)	(mm)
230/325	3×200.6	FCC2DAT207*P170*A1A	3.5	3×45	3×1.5	2400	110	116	170
	3×250.7	FCC2DAT257*P200*A1A	3.1	3×53	3×1.1	3000	110	116	200
	3×300.9	FCC2DAT307*P200*A1A	3.1	3×54	3×1.0	4400	110	116	200
	3×335.0	FCC2DAT337*P230*A1A	3.0	3×55	3×1.0	4800	130	116	230
440/625	3×46	FCC4EAT466*L170*A1A	5.1	3×32	3×1.5	1400	110	86	170
	3×68.5	FCC4EAT686*L200*A1A	4.8	3×35	3×1.4	1800	110	86	200
	3×77.0	FCC4EAT776*P170*A1A	3.5	3×38	3×1.6	2200	110	116	170
	3×82.2	FCC4EAT826*L200*A1A	4.7	3×40	3×1.3	2300	110	86	200
	3×92.6	FCC4EAT926*P200*A1A	3.1	3×41	3×1.3	2600	110	116	200
	3×103.0	FCC4EAT107*L275*A1A	3.5	3×43	3×1.4	2900	140	86	275
	3×109.0	FCC4EAT117*L275*A1A	3.5	3×44	3×1.4	3050	140	86	275
	3×123.3	FCC4EAT127*P200*A1A	3.1	3×45	3×1.1	3600	110	116	200
	3×137.0	FCC4EAT137*L275*A1A	3.5	3×45	3×1.3	3800	140	86	275
	3×154.0	FCC4EAT157*P200*A1A	3.1	3×45	3×1.0	4000	110	116	200
	3×164.4	FCC4EAT167*P200*A1A	3.1	3×45	3×1.0	4200	110	116	200
	3×40	FCC4JAT406*L200*A1A	4.8	3×30	3×1.6	1200	110	86	200
480/680	3×60	FCC4JAT606*L275*A1A	3.5	3×33	3×1.6	1500	140	86	275
	3×80	FCC4JAT806*P200*A1A	3.1	3×35	3×1.3	2000	110	116	200
	3×140	FCC4JAT147*P230*A1A	3.0	3×45	3×1.1	3600	130	116	230
	3×38.5	FCC5DAT386*L200*A1A	4.9	3×39	3×1.7	1300	110	86	200
530/750	3×48.1	FCC5DAT486*L200*A1A	4.8	3×40	3×1.6	1400	110	86	200
	3×53.1	FCC5DAT536*L200*A1A	4.8	3×40	3×1.6	1600	110	86	200
	3×57.7	FCC5DAT576*L230*A1A	3.2	3×45	3×1.6	1650	120	86	230
	3×77.0	FCC5DAT776*P200*A1A	3.1	3×45	3×1.4	2200	110	116	200
	3×96.2	FCC5DAT966*P200*A1A	3.1	3×47	3×1.3	2700	110	116	200
	3×27.9	FCC6KAT276*L230*A1A	3.4	3×40	3×1.8	1400	120	86	230
690/980	3×33.4	FCC6KAT336*W230*A1A	3.2	3×42	3×1.6	1600	120	96	230
	3×44.6	FCC6KAT446*L350*A1A	2.9	3×43	3×1.8	1900	170	86	350
	3×55.7	FCC6KAT556*L350*A1A	2.9	3×45	3×1.8	2200	170	86	350
	3×10	FCC8FAT106*L170*A1A	5.3	3×25	3×1.5	700	110	86	170
850/1200	3×17	FCC8FAT176*K170*A1A	4.5	3×28	3×1.2	1100	110	106	170
	3×23	FCC8FAT236*L230*A1A	3.4	3×32	3×1.1	1300	130	86	230
	3×33	FCC8FAT336*K230*A1A	3.2	3×40	3×1.0	1200	130	106	230
	3×38	FCC8FAT386*P230*A1A	2.9	3×42	3×0.9	1400	130	116	230
	3×55.8	FCC8FAT556*L230*A1A	2.5	3×45	3×0.8	2200	130	136	230

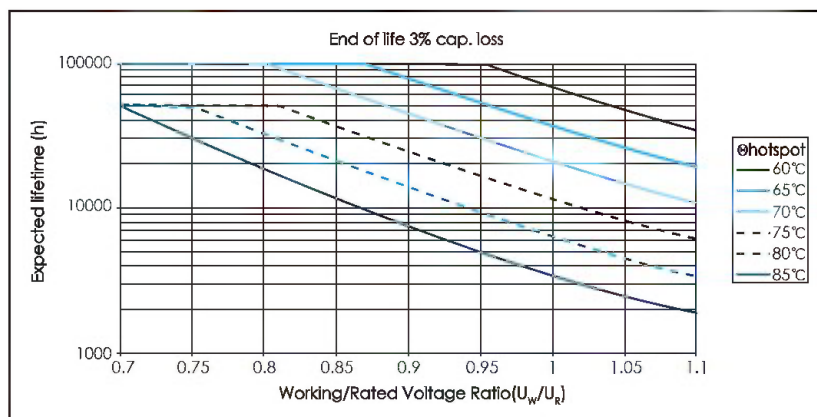
可根据客户要求定制。Customer products are available on request.



## 最高使用海拔 Max. Altitude

2000m: 不降额, 2000m-4000m: 每500m 电流降额5%

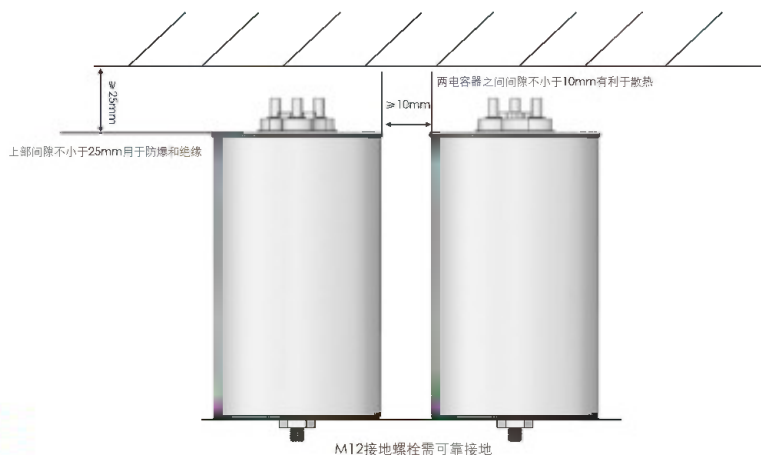
## 预期寿命曲线 Expected lifetime curve



## 安装要求 Installation space requirements

取电容时请勿直接抓取端子, 电容要安装在阴凉、通风良好的位置, 且其周围不能有热辐射的物体, 如滤波电路电抗器、太阳直射。电容必须要垂直安装, 且引出端子朝上。对于多个电容器并联, 每个电容器采用直接连接到母线上方式。

When taking the capacitor, do not grab the terminal directly. Install the capacitor in a cool and well-ventilated place, and do not surround the object with heat radiation, such as the filter circuit reactor and direct sunlight. The capacitor must be installed vertically with the leading terminal facing upwards. For multiple capacitors in parallel, each capacitor is directly connected to the bus



## 连接电缆 Connecting cable

上部必须保持足够的空间, 该空间内不能安装其他组件。连接电缆应使用软性电线并保持松弛, 不要用硬芯电缆。可根据实际电流值来选择合适的电缆。

Sufficient space must be maintained in the upper part, and no other components can be installed in this space. Connecting cables should use soft wires and keep them loose, not hard cores Cable. The appropriate cable can be selected according to the actual current value.

## 警告 Cautions and warnings

■ In case of dents of more than 1 mm depth or any other mechanical damage, capacitors must not be used at all.

电容器如有深度超过1毫米的凹痕或其他机械损伤不可以使用。

■ To ensure the full functionality of the overpressure disconnector, elastic elements must not be hindered and a minimum space of 12 mm has to be kept above each capacitor.

为了保证过压力断路器的全部功能, 每个电容器上方须有至少12毫米的空间, 弹性元件不能被阻碍。

■ Do not handle the capacitor before it is discharged.

在电容器放电之前, 不能处置电容器。

■ The threaded bottom stud of the capacitor has to be used for grounding. The maximum tightening torque is 12Nm

电容器的底部螺栓仅用于接地使用, 最大扭矩12Nm。

■ Do not use or store capacitor in corrosive atmosphere, in the dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between phase / or phase and ground.

电容器不能在或存储在腐蚀性环境。在多灰尘的环境里, 要求定期维护和清洁, 特别是电极端子, 以避免相与相间或相与地之间有导电通路。

■ Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in. 电容器的寿命是有限的, 最大工作寿命因使用条件的不同而不同。



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
F	C	C	2	F	A	Q	2	0	7	K	H	1	2	5	9	6	1	A
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		直径 Diameter	高度 Height	引出端子 Terminals Type	引出端子间距 Terminals Pitch	底部固定孔 Bottom Stud Hole	图号 Style				
FC=Film Capacitor	Column=C	250=2F	CBB237=AQ			10=106	± 5%=J		50=D	75=075	Male M6*13=0	32=3	With=1	Style A=A				
		330=3D				30=306	± 10%=K		55=C	100=100	Male M8*10=2	50=5	Without=0	Style B=B				
		450=4F				80=806	Special=S		60=F	125=125	Male M10*10=4	30=6		Style C=C				
		480=4J				100=107			63.5=E	180=180	Male M6*20=1	13.5=X						
		550=5F				150=157			65=G	200=200	Male M8*20=3	18=Y						
		600=6A				200=207			76=H	247=247	Male M8*17=9	16=Z						
		660=6G				350=357			86=L		Male M10*22=Z	20=W						
		690=6K				450=457			96=W		Male M10*16=7	35=V						
									106=K		M10*24=X							
									116=P									



## Features

- Used as AC filtering
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handling capabilities
- Overpressure disconnection device
- Self-healing property
- Aluminum case, filled with soft PU resin

## Applications

- Wind energy, Solar
- UPS application

## 特点

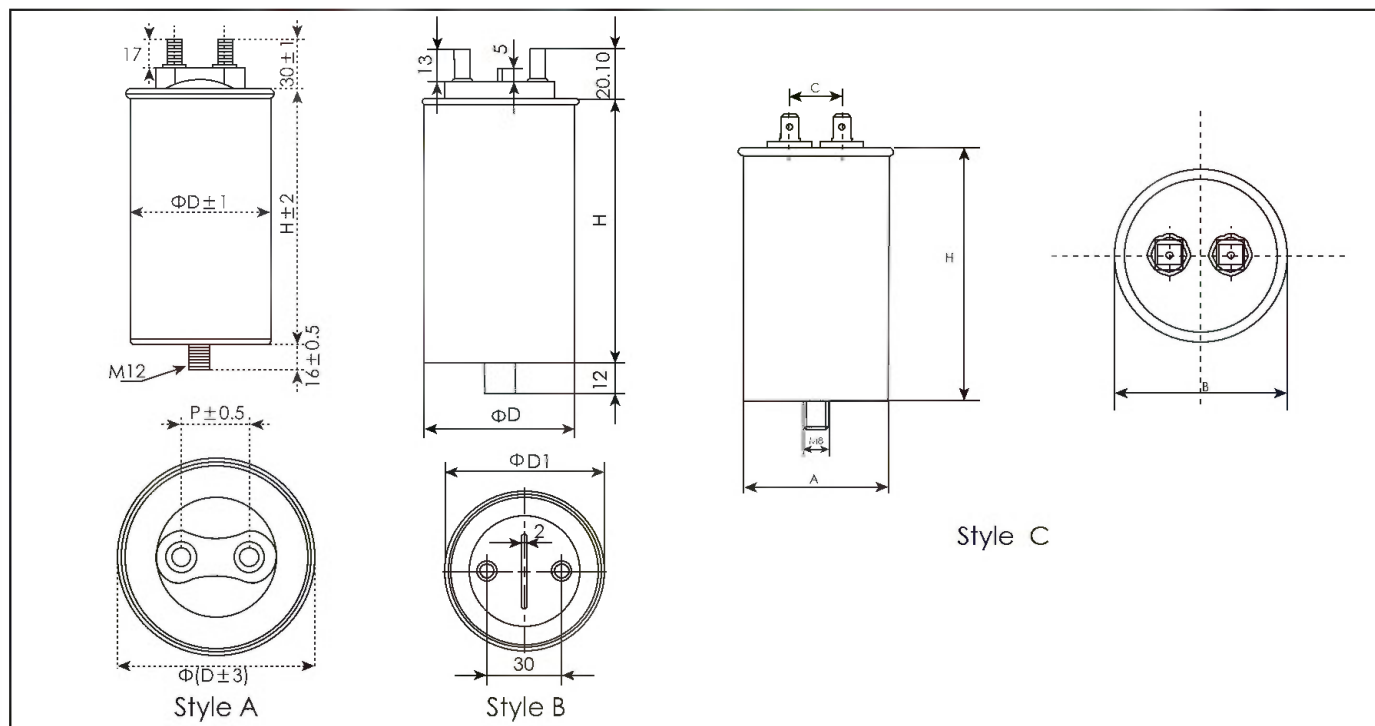
- 交流滤波用
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 过压力断开装置
- 有自愈性
- 铝壳，软树脂灌封

## 应用场合

- 风能，太阳能
- UPS电源

## 外形图 Dimensions

Unit: mm



## Approvals:

Mark	structure	File no
	UL / CUL	E483921

## 标识 Marking

**CBB237**

FCC4FAQ137JL150961A  
 131μF ±5% -40/+85°C  
 U<sub>rms</sub>=850Vac 50/60Hz  
 U<sub>N</sub>=1200Vac IEC61071 SH  
 Overpressure disconnecter  
 Torque max.3Nm  
 Discharge before handling

**N38T020**

005

标志 Mark	说明 Description	标志 Mark	说明 Description	标志 Mark	说明 Description
	产品商标 Product trademark	CBB237	产品型号 Product model	FCC4FAQ137JL150961A	产品代码 Product Code
131μF	电容量 Capacitance	±5%	容量偏差 Capacity deviation	-40/+85°C	工作温度范围 Temperature range
U <sub>rms</sub>	额定均方根电压 Rated RMS voltage	50/60Hz	额定频率 Rated frequency	UN	额定电压 Rated voltage
IEC 61071	引用标准 Reference standard	SH	自愈式电容器标志 Self healing capacitor	Overpressure disconnecter	过压力防护 protection
Torque max.3Nm	电极最大扭矩	Discharge before handling	操作建议 Operation suggestions	E483921	UL
	生产相关信息 二维码	N38T020	生产批号 batch number	005	NO.



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/70/56
工作温度范围 Operating Temperature Range	-40~+85°C ( $\Theta_{hotspot} \leq 85^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+70°C
额定电压 $U_{rms}$ Rated Voltage	250~850V <sub>AC</sub>
电容量范围 Capacitance Range	10~600 $\mu\text{F}$
电容量偏差 Capacitance Tolerance	$\pm 5\%(\text{J}), \pm 10\%(\text{K})$
防护等级 Degree of Protection	IP 00
端子与端子耐压 $U_{Ti}$ Voltage Between Terminals	2.15 $U_{rms}$ , 10s(20 °C)
端子与铝壳耐压 $U_{TC}$ Voltage Between Terminals and Case	4000 V <sub>AC</sub> , 10 s(20 °C, 50 Hz)
介质损耗角正切 Dielectric Dissipation Factor	$\leq 2 \times 10^{-4}$
绝缘电阻 Insulation Resistance ( $IR \cdot C_N$ )	$\geq 10000\text{s}$ (20°C, 100Vdc, 1min)
最大电极扭矩 Max Torque of terminals	M6: 4 Nm
最大安装扭矩 Max Torque of installation	M12: 12 Nm
预期寿命 Life Expectancy	100000 hours(0.8U <sub>rms</sub> , $\Theta_{hotspot}=70^\circ\text{C}$ )
失效率 Failure Rate	300 FIT

## 规格标准 Standard Ratings

$U_{rms}/U_N$	$C_R$	P/N	$R_{th}$	$I_{max}$ 55°C, 1KHz	$R_s$ 20°C, 1KHz	$\hat{I}$	$L_s$ 20°C	P	D	H
(Vac)	( $\mu\text{F}$ )	-	(K/W)	(A)	(m $\Omega$ )	(A)	(nH)	(mm)	(mm)	(mm)
250/350	60	FCC2FAQ606*D100**1B	12.6	16	5.2	1000	100	20	50	100
	80	FCC2FAQ806*D100**1B	11.2	16	4.3	1300	100	20	50	100
	100	FCC2FAQ107*D125**1B	10	16	4.8	1260	110	20	50	125
	120	FCC2FAQ127*D125**1B	9.0	16	5.4	1500	120	20	55	125
	150	FCC2FAQ157*G130**1B	7.7	16	6.8	1900	130	20	60	125
	150	FCC2FAQ157*H122**1A	7.1	22	3.4	1620	140	30	76	125
	175	FCC2FAQ177*G125**1B	10.0	16	4.8	2200	140	20	63.5	125
	200	FCC2FAQ207*H125**1A	6.2	30	3.3	2340	140	30	76	125
	230	FCC2FAQ237*H152**1A	5.7	30	3.8	2000	190	30	76	150
	250	FCC2FAQ257*H152**1A	5.6	30	3.1	2160	190	30	76	150
	300	FCC2FAQ307*H152**1A	4.7	36	2.0	2600	110	30	86	150
	330	FCC2FAQ337*L200**1A	4.6	40	1.8	3600	110	30	86	150
	350	FCC2FAQ357*L152**1A	4.2	35	1.6	3600	160	30	76	200
	400	FCC2FAQ407*L152**1A	4.2	40	1.5	4100	140	30	86	200
	500	FCC2FAQ507*L210**1A	3.7	50	1.5	5400	140	30	86	200
	600	FCC2FAQ607*L210**1A	3.3	50	1.7	4800	190	30	86	250
330/460	50	FCC3DAQ506*D100**1B	11.6	16	5.0	832.5	100	20	50	100
	60	FCC3DAQ606*D125**1B	10.5	16	5.6	756	110	20	50	125
	100	FCC3DAQ107*G130**1B	7.8	16	7.9	1260	110	20	60	125
	100	FCC3DAQ107*H122**1A	7.8	30	4.7	1305	140	30	76	125
	120	FCC3DAQ127*G130**1B	7.3	16	4.2	864	140	20	63.5	125
	150	FCC3DAQ157*H152**1A	6.4	40	5.4	1350	190	30	76	150
	175	FCC3DAQ177*G165**1A	6.1	40	4.7	1496.3	190	30	76	150
	200	FCC3DAQ207*H180**1A	4.7	40	1.9	2610	160	30	76	200
	200	FCC3DAQ207*L152** A	4.6	40	1.8	2610	110	30	86	150
	250	FCC3DAQ257*H180**1A	4.5	40	1.6	2137.5	160	30	76	200
	300	FCC3DAQ307*L180**1A	4.0	50	1.5	3915	140	30	86	200
	350	FCC3DAQ357*L210**1A	4.0	50	1.5	4567.5	140	30	86	200
	400	FCC3DAQ407*L247**1A	3.3	50	1.8	3240	190	30	86	250
	450	FCC3DAQ457*L247**1A	4.0	50	1.5	3645	190	30	86	250



## 规格标准 Standard Ratings

Urms/U <sub>N</sub>	C <sub>R</sub>	P/N	R <sub>m</sub>	I <sub>max</sub> 55°C, 1KHz	R <sub>s</sub> 20°C, 1KHz	I	Ls 20°C	P	D	H
(Vac)	(μF)	-	(K/W)	(A)	(mΩ)	(A)	(nH)	(mm)	(mm)	(mm)
450/630	20	FCC4FAQ206*D075**1B	11.1	16	6.0	700	100	20	50	75
	30	FCC4FAQ306*D100**1B	11.6	16	5.0	700	100	20	50	100
	33	FCC4FAQ336*D100**1B	14.8	16	4.5	700	100	20	50	100
	40	FCC4FAQ406*D100**1B	16.6	16	4.0	540	100	20	50	100
	50	FCC4FAQ506*F125**1B	7.8	16	7.9	540	110	20	60	125
	50	FCC4FAQ506*H100**1A	5.3	25	6.0	855	120	30	76	100
	70	FCC4FAQ706*F125**1B	10.2	16	6.5	907	110	20	60	125
	80	FCC4FAQ806*F125**1B	11.1	16	6.0	907.2	110	20	60	125
	90	FCC4FAQ906*E125**1B	11.6	16	5.0	1020.6	140	20	63.5	125
	100	FCC4FAQ107*H150**1A	5.0	35	4.7	1080	190	30	76	150
	150	FCC4FAQ157*L150**1A	4.3	40	3.9	1957.5	110	30	86	150
	200	FCC4FAQ207*L200**1A	4.3	50	2.5	2700	140	30	86	200
480/675	250	FCC4FAQ257*L200**1A	5.3	50	2.0	2025	140	30	86	200
	300	FCC4FAQ307*L250**1A	5.9	50	1.8	2403	190	30	86	250
	20	FCC4JAQ206*D075**1B	9.1	16	7.3	750	100	20	50	75
	25	FCC4JAQ256*D100**1B	10.7	16	6.2	750	100	20	50	100
	30	FCC4JAQ306*D100**1B	9.4	16	7.1	750	100	20	50	100
	40	FCC4JAQ406*F100**1B	8.3	16	8.0	850	100	20	60	100
	50	FCC4JAQ506*C125**1B	10.2	16	6.5	850	110	20	55	125
	50	FCC4JAQ506*H100**1A	7.7	29	3.2	950	120	30	76	100
	60	FCC4JAQ606*H125**1A	7.2	31	2.8	1053	140	30	76	125
	70	FCC4JAQ706*H125**1A	6.6	29	3.8	1575	140	30	76	125
	80	FCC4JAQ806*H150**1A	6.2	31	3.5	1224	190	30	76	150
	100	FCC4JAQ107*H200**1A	4.8	50	1.5	1710	160	30	76	200
550/770	150	FCC4JAQ157*H200**1A	4.2	59	1.2	2565	160	30	76	200
	200	FCC4JAQ207*H250**1A	3.5	64	1.2	2610	190	30	76	250
	250	FCC4JAQ257*L250**1A	3.1	65	1.3	2925	190	30	86	250
	20	FCC5FAQ206*D100**1B	9.6	16	6.9	600	100	20	50	100
	30	FCC5FAQ306*D125**1B	10.1	16	6.6	750	110	20	50	125
	40	FCC5FAQ406*F125**1B	11.1	16	6.0	750	110	20	60	125
	50	FCC5FAQ506*E125**1B	12.1	16	5.5	850	140	20	63.5	125
	70	FCC5FAQ706*H150**1A	6.0	31	3.5	900	190	30	76	150
	80	FCC5FAQ806*H150**1A	5.1	52	1.3	1800	190	30	76	150
	100	FCC5FAQ107*L150**1A	4.8	56	1.1	2821	110	30	86	150
	125	FCC5FAQ127*L200**1A	5.3	50	2.0	2821	140	30	86	200
	150	FCC5FAQ157*L200**1A	3.7	53	1.7	3217	140	30	86	200
600/850	200	FCC5FAQ207*L250**1A	3.4	58	1.4	3217	190	30	86	250
	250	FCC5FAQ257*W250**1A	3.0	63	1.3	3500	190	30	96	250
	300	FCC5FAQ307*K250**1A	2.8	65	1.2	3500	190	30	106	250
	10	FCC6AAQ106*D075**1B	7.0	16	9.5	350	100	20	50	75
	20	FCC6AAQ206*D125**1B	6.0	16	11.1	500	110	20	50	125
	25	FCC6AAQ256*D125**1B	6.3	16	10.5	500	110	20	50	125
	30	FCC6AAQ306*F125**1B	7.0	16	9.5	600	110	20	60	125
	35	FCC6AAQ356*F125**1B	7.4	16	9.0	700	110	20	60	125
	40	FCC6AAQ406*E125**1B	7.8	16	8.5	700	140	20	63.5	125
	45	FCC6AAQ456*G125**1B	8.3	16	8.0	700	130	20	65	125
	50	FCC6AAQ506*H150**1A	5.4	41	2.0	850	190	30	76	150
660/930	10	FCC6GAQ106*D125**1B	6.3	16	10.5	400	110	20	50	125
	12	FCC6GAQ126*D125**1B	6.6	16	10.0	420	110	20	50	125
	15	FCC6GAQ156*D125**1B	7.0	16	9.5	420	110	20	50	125
	18	FCC6GAQ186*D125**1B	7.4	16	9.0	450	110	20	50	125
	20	FCC6GAQ206*C125**1B	7.8	16	8.5	550	120	20	55	125
	25	FCC6GAQ256*F125**1B	8.3	16	8.0	550	130	20	60	125
	30	FCC6GAQ306*G125**1B	8.9	16	7.5	750	130	20	65	125
	35	FCC6GAQ356*H150**1A	3.0	30	5.6	750	190	30	76	150
	40	FCC6GAQ406*H150**1A	3.2	30	5.2	900	190	30	76	150
	45	FCC6GAQ456*L150**1A	2.2	40	5.0	900	110	30	86	150
	50	FCC6GAQ506*L150**1A	2.5	40	4.7	1000	110	30	86	150
690/980	10	FCC6KAQ106*D125**1B	7.0	16	9.5	750	110	20	50	125
	15	FCC6KAQ156*D125**1B	7.4	16	9.0	750	110	20	50	125
	20	FCC6KAQ206*C125**1B	7.8	16	8.5	900	120	20	55	125
	30	FCC6KAQ306*E125**1B	8.3	16	8.0	900	140	20	63.5	125
	40	FCC6KAQ406*H150**1A	5.0	25	4.8	1150	190	30	76	150
	50	FCC6KAQ506*L150**1A	4.0	30	4.3	1150	110	30	86	150
	70	FCC6KAQ706*H250**1A	4.5	30	3.7	1260	190	30	76	250
	85	FCC6KAQ856*L250**1A	3.0	50	2.0	1530	190	30	86	250
	100	FCC6KAQ107*L250**1A	3.4	53	1.8	1800	190	30	86	250
	125	FCC6KAQ127*K250**1A	3.3	50	1.8	1563	190	30	106	250
	150	FCC6KAQ157*K250**1A	3.0	56	1.4	1875	190	30	106	250
	170	FCC6KAQ177*K250**1A	3.5	59	1.2	2125	190	30	106	250
850/1200	10	FCC8FAQ106*H095**1A	9.2	20	3.5	600	100	30	76	95
	15	FCC8FAQ156*H105**1A	7.8	23	3.4	670	120	30	76	105
	33	FCC8FAQ336*H170**1A	5.2	38	2.1	1500	190	30	76	170
	47	FCC8FAQ476*L200**1A	4.5	40	2.3	1600	140	30	86	200
	68	FCC8FAQ686*L250**1A	3.5	43	2.4	1700	190	30	86	250



## 规格标准 Standard Ratings

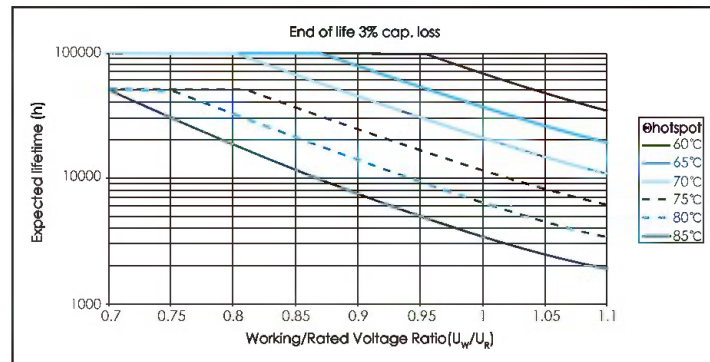
$U_R$	$C_R$	P/N	$R_{th}$	$I_{max}$ 55°C, 1KHz	$R_s$ 20°C, 1KHz	$I$	$L_s$ 20°C	P	D	H
(Vac)	( $\mu F$ )	-	(K/W)	(A)	(m $\Omega$ )	(A)	(nH)	(mm)	(mm)	(mm)
850/1200	82	FCC8FAQ826*W250**1A	3.1	50	2.1	1780	190	30	96	250
	100	FCC8FAQ107*W250**1A	3.0	55	2.0	2100	190	30	96	250
	150	FCC8FAQ157*P250**1A	2.6	62	1.8	2900	190	30	116	250

\*  $R_{th}$  为产品热点到环境的热阻（自然冷却）

The thermal Resistance from hotspot to ambient environment (Natural cooling)

可根据客户要求定制。Customer products are available on request.

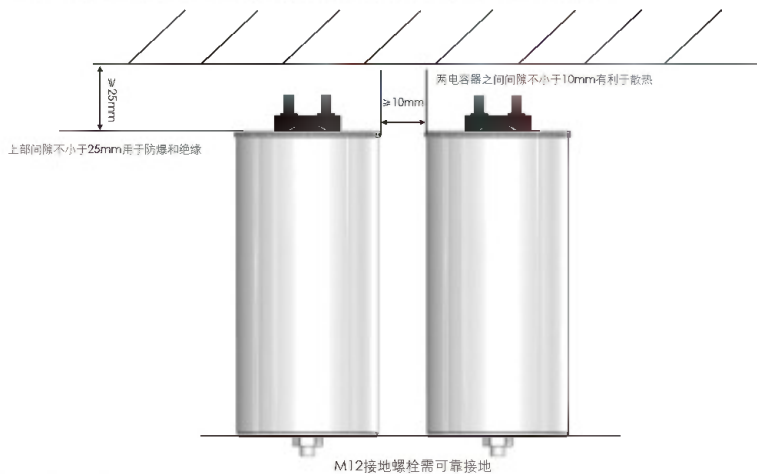
## 预期寿命曲线 Expected lifetime curve



## 安装要求 Installation space requirements

取电容时请勿直接抓取端子，电容要安装在阴凉、通风良好的位置，且其周围不能有热辐射的物体，如滤波电路电抗器、太阳直射。电容必须要垂直安装，且引出端子朝上。对于多个电容器并联，每个电容器采用直接连接到母线上方式。

When taking the capacitor, do not grab the terminal directly. Install the capacitor in a cool and well-ventilated place, and do not surround the object with heat radiation, such as the filter circuit reactor and direct sunlight. The capacitor must be installed vertically with the leading terminal facing upwards. For multiple capacitors in parallel, each capacitor is directly connected to the bus



## 连接电缆 Connecting cable

上部必须保持足够的空间，该空间内不能安装其他组件。连接电缆应使用软性电线并保持松弛，不要用硬芯电缆。可根据实际电流值来选择合适的电缆。

Sufficient space must be maintained in the upper part, and no other components can be installed in this space. Connecting cables should use soft wires and keep them loose, not hard cores Cable. The appropriate cable can be selected according to the actual current value.

## 警告 Cautions and warnings

■ In case of dents of more than 1 mm depth or any other mechanical damage, capacitors must not be used at all.

电容器如有深度超过1毫米的凹痕或其他机械损伤不可以使用。

■ To ensure the full functionality of the overpressure disconnector, elastic elements must not be hindered and a minimum space of 12 mm has to be kept above each capacitor.

为了保证过压力断路器的全部功能，每个电容器上方须有至少12毫米的空间，弹性元件不能被阻碍。

■ Do not handle the capacitor before it is discharged.

在电容器放电之前，不能处置电容器。

■ The threaded bottom stud of the capacitor has to be used for grounding. The maximum tightening torque is 12Nm

电容器的底部螺栓仅用于接地使用，最大扭矩12Nm。

■ Do not use or store capacitor in corrosive atmosphere, in the dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between phase / or phase and ground.

电容器不能用在或存储在腐蚀性环境。在多灰尘的环境里，要求定期维护和清洁，特别是电极端子，以避免相与相间或相与地之间有导电通路。

■ Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

电容器的寿命是有限的，最大工作寿命因使用条件的不同而不同。



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	R	2	A	N	1	0	5	J	0	5	0	I	F	F	9	D	G
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code	容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style	引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code	引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions							
Film Capacitor =FC	Square=S	160=1G	CBB238=AN	1=105	±5%=J	2Pin, 直脚=0 2pin, straight=0	5.0=50	32*33*18=IF	27.5=9	10.2=3	0.8=B	标准品=无 Standard product=None							
		250=2F		2.2=225	±10%=K	2Pin, 长引线=1 2pin, long-leaded=1	13=A0		37.5=C	12.7=4	1.0=C	高温高湿=G High temperature and high humidity=G							
		280=2J		4.7=475		4pin, 直角=2 4pin, straight=2	15=A1		52.5=F	20.3=9	1.2=D	车规级=T Automotive grade=T							
		350=3F					17.5=A2					安全膜=S Security film=S							
		400=4A										缩水=X Smaller=X							
		450=4F										无卤=N Halogen-free=N							
												低噪音=F Low noise=F							



## Features

- Used in AC circuits as input or output filter
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handling capabilities
- Self-healing property
- Plastic box, filled with fire-retardant resin
- 2 or 4 tinned copper wires for PCB mounting
- Meet the requirement of on-board AEC-Q200 standard

## Applications

- Solar inverters,
- UPS power supply
- Motor Driver systems

## 特点

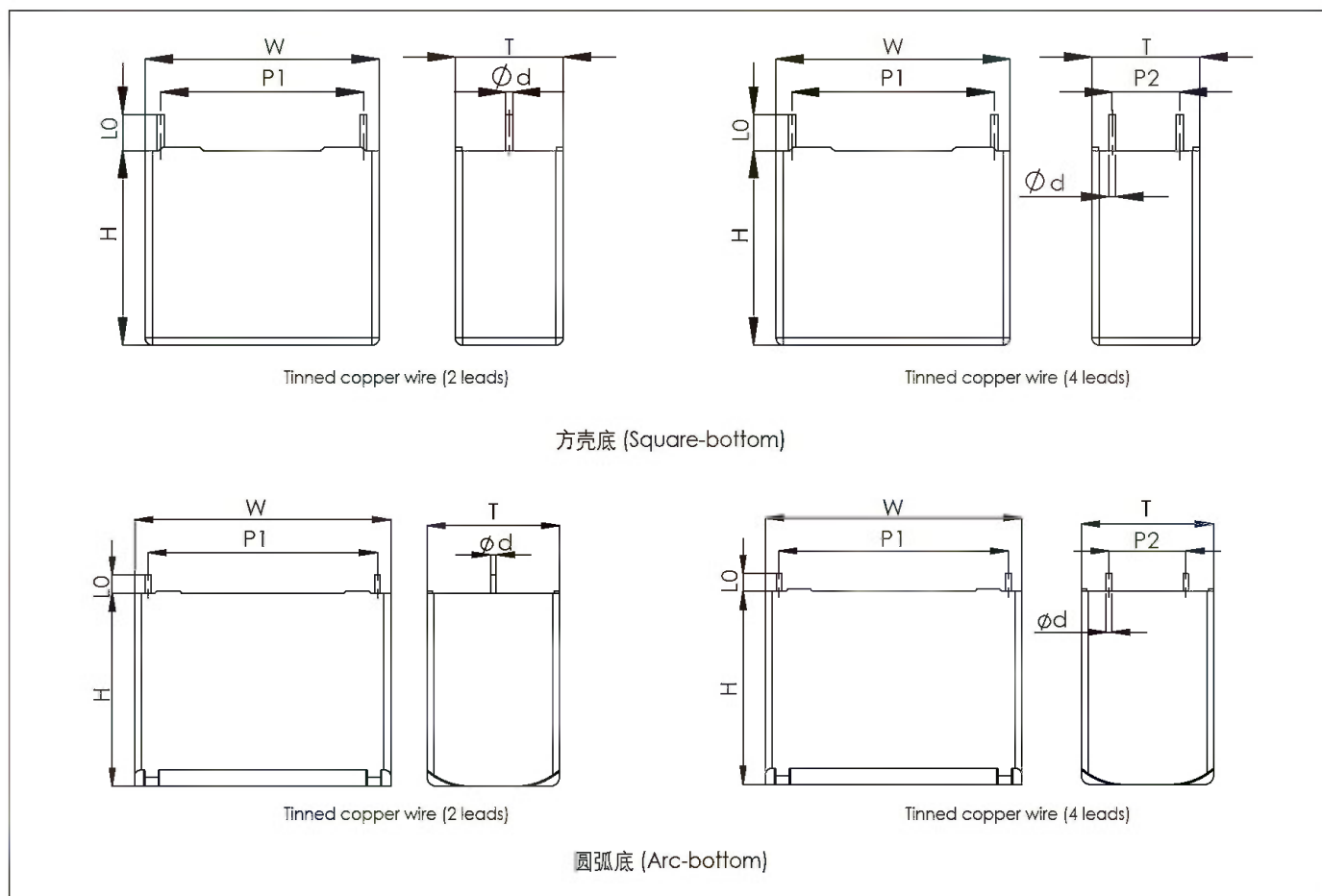
- AC电路输入输出滤波
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 有自愈性
- 塑壳封装，阻燃树脂灌封
- 镀锡铜线引出，适合PCB安装
- 符合车载AEC-Q200标准要求

## 应用场合

- 太阳能逆变器
- UPS电源
- 电机驱动

## 外形图 Dimensions

Unit: mm




## 标识 Marking

	—	1
CBB238	—	2
50µF J 250Vac	—	3
N02F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance, Tolerance and Rated voltage
4	日期代码 Date code



## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)、AEC-Q200
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ +85℃~+105℃: decreasing factor 1.5% per℃ for $U_{rms}$
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	160~450Vac
电容量范围 Capacitance Range	0.47~50μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子耐压 $U_{TT}$ Voltage Between Terminals	2.15 $U_{rms}$ (Vdc), 10s(20℃)
端子与铝壳耐压 $U_{TC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20℃, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \times C_N$ )	≥10000s (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot}=70℃$ )
失效率 Failure Rate	100 FIT

## 规格标准 Standard Ratings

$U_{rms}=160Vac$ , $U_N=225Vac$ , $U_{NDC}=400Vdc$										
$C_R$ (μF)	P/N	$I_{max}$ 70℃(A)	$I_{Peak}$ (A)	dv/dt (V/us)	ESR 70℃ (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1	FCS1GAN105**50I490*	5	32	32	30.3	32	20	11	27.5	\
2.2	FCS1GAN225**50I490*	7	70.4	32	15.3	32	20	11	27.5	\
3.3	FCS1GAN335**50I790*	7	105.6	32	11.3	32	22	13	27.5	\
5	FCS1GAN505**50IC90*	7	160	32	8.8	32	28	14	27.5	\
10	FCS1GAN106**50IF90*	7	320	32	6.8	32	33	18	27.5	\
10	FCS1GAN106**50FIC3*	12	220	22	7.2	42.5	37	28	37.5	10.2
20	FCS1GAN206**50FIC3*	12	440	22	6.9	42.5	37	28	37.5	10.2
30	FCS1GAN306**50FFC9*	12	660	22	7.4	42.5	45	30	37.5	20.3
40	FCS1GAN406**50HHF9*	12	640	16	7.6	57.5	45	30	52.5	20.3
50	FCS1GAN506**50HLF9*	12	800	16	7.5	57.5	50	35	52.5	20.3
$U_{rms}=250Vac$ , $U_N=350Vac$ , $U_{NDC}=475Vdc$										
$C_R$ (μF)	P/N	$I_{max}$ 70℃(A)	$I_{Peak}$ (A)	dv/dt (V/us)	ESR 70℃ (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1	FCS2FAN155**50I490*	8	60	40	10.0	32	20	11	27.5	\
2.2	FCS2FAN205**50I790*	9	80	40	8.2	32	22	13	27.5	\
3.3	FCS2FAN335**50IC90*	9	132	40	6.2	32	28	14	27.5	\



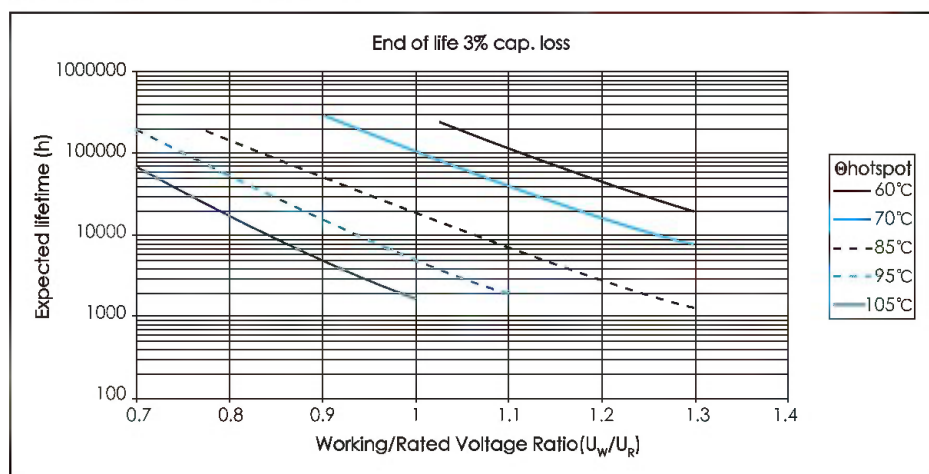
## 规格标准 Standard Ratings

U <sub>rms</sub> =250Vac, U <sub>N</sub> =350Vac, U <sub>NDC</sub> =475Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 70°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/us)	ESR 70°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
5	FCS2FAN505**50IF90*	9	200	40	5.2	32	33	18	27.5	\
6.8	FCS2FAN685**50IF90*	14	272	40	4.9	32	37	22	27.5	\
10	FCS2FAN106**50F2C3*	14	300	30	5.6	42.5	40	20	37.5	10.2
15	FCS2FAN156**50F1C3*	14	450	30	5.2	42.5	37	28	37.5	10.2
20	FCS2FAN206**50FFC9*	14	600	30	4.8	42.5	45	30	37.5	20.3
25	FCS2FAN256**50HIF9*	14	625	25	5.7	57.5	45	30	52.5	20.3
30	FCS2FAN306**50HIF9*	14	750	25	5.3	57.5	45	30	52.5	20.3
35	FCS2FAN356**50HIF9*	14	875	25	5.5	57.5	50	35	52.5	20.3
40	FCS2FAN406**50HLF9*	14	1000	25	5.2	57.5	50	35	52.5	20.3
U <sub>rms</sub> =275Vac, U <sub>N</sub> =385Vac, U <sub>NDC</sub> =520Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 70°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/us)	ESR 70°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
3.3	FCS2HAN335**50IF90*	9	132	40	6.2	32	33	18	27.5	\
6.8	FCS2HAN685**50IF90*	9	272	40	4.7	32	37	22	27.5	\
10	FCS2HAN106**50F2C3*	14	300	30	5.9	42.5	40	20	37.5	10.2
15	FCS2HAN156**50FFC9*	14	450	30	5.1	42.5	45	30	37.5	20.3
20	FCS2HAN206**50HIF9*	14	500	25	6.0	57.5	45	30	52.5	20.3
30	FCS2HAN306**50HLF9*	14	750	25	5.3	57.5	50	35	52.5	20.3
U <sub>rms</sub> =350Vac, U <sub>N</sub> =480Vac, U <sub>NDC</sub> =600Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 70°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/us)	ESR 70°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1	FCS3FAN105**50IF90*	9	45	45	10.9	32	22	13	27.5	\
2	FCS3FAN205**50IF90*	9	90	45	7.3	32	33	18	27.5	\
2.2	FCS3FAN225**50IF90*	9	99	45	6.9	32	33	18	27.5	\
3.3	FCS3FAN335**50IF90*	9	148.5	45	5.7	32	37	22	27.5	\
4.7	FCS3FAN475**50F2C3*	14	159.8	34	6.9	42.5	40	20	37.5	10.2
5	FCS3FAN505**50F2C3*	14	170	34	6.8	42.5	40	20	37.5	10.2
6.8	FCS3FAN685**50F1C3*	14	231.2	34	6.2	42.5	37	28	37.5	10.2
10	FCS3FAN106**50FFC9*	14	340	34	5.3	42.5	45	30	37.5	20.3
12	FCS3FAN126**50HIF9*	14	336	28	6.8	57.5	45	30	52.5	20.3
20	FCS3FAN206**50HLF9*	14	560	28	5.9	57.5	50	35	52.5	20.3
U <sub>rms</sub> =400Vac, U <sub>N</sub> =560Vac, U <sub>NDC</sub> =700Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 70°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/us)	ESR 70°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1	FCS4AAN105**50IC90*	9	50	50	10.3	32	28	14	27.5	\
1.5	FCS4AAN155**50IF90*	9	75	50	8.1	32	33	18	27.5	\
2.2	FCS4AAN225**50IF90*	9	110	50	6.4	32	33	18	27.5	\
3	FCS4AAN305**50IF90*	9	150	50	5.7	32	37	22	27.5	\
5	FCS4AAN505**50F1C3*	14	200	40	6.2	42.5	37	28	37.5	10.2
10	FCS4AAN106**50HIF9*	14	350	35	6.9	57.5	45	30	52.5	20.3
15	FCS4AAN156**50HLF9*	14	525	35	6.1	57.5	50	35	52.5	20.3
U <sub>rms</sub> =450Vac, U <sub>N</sub> =630Vac, U <sub>NDC</sub> =750Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 70°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/us)	ESR 70°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
0.47	FCS4FAN474**50IF90*	8	25.85	55	15.7	32	22	13	27.5	\
1	FCS4FAN105**50IF90*	8	55	55	9.2	32	33	18	27.5	\
1.5	FCS4FAN155**50IF90*	8	82.5	55	7.3	32	37	22	27.5	\
3.3	FCS4FAN335**50F1C3*	14	148.5	45	7.4	42.5	37	28	37.5	10.2
4.7	FCS4FAN475**50FFC9*	14	211.5	45	6.2	42.5	45	30	37.5	20.3
6.8	FCS4FAN685**50HIF9*	14	258.4	38	7.5	57.5	45	30	52.5	20.3
10	FCS4FAN106**50HLF9*	14	380	38	6.6	57.5	50	35	52.5	20.3

可根据客户要求定制。Customer products are available on request.



## 预期寿命曲线 Expected lifetime curve



## 警告 Cautions and warnings

■ Don't exceed the upper category temperature.

电容器的使用不能超过上限温度。

■ For longtime storage, maximum relative humidity 80%, no dew allowed on the capacitor.

电容器的长期存储，其最大相对湿度是80%，且在上面不允许沾有水。

■ Do not use or store capacitor in corrosive atmosphere, in the dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between terminal / or terminal and ground.

电容器不能用在或存储在腐蚀性环境。在多灰尘的环境里，要求定期维护和清洁，特别是电极端子，以避免相与相间或相与地之间有导电通路。

■ Don't apply any mechanical stress to the capacitor terminals, and avoid any compressive, tensile or flexural stress.

不要将任何机械应力施加到电容器的端子上，且要避免任何压缩，拉伸或弯曲应力。

■ Avoid overload of the capacitors.

电容器不能超负荷使用。

■ Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

电容器的寿命是有限的，最大工作寿命因使用条件的不同而不同。



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	R	2	A	N	1	0	5	J	0	5	0	I	F	F	9	D	H
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code	容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style	引线长度 Lead Length	外壳尺寸 W×H×T Dimension code	引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions							
Film Capacitor =FC	Square=S	160=1G	CBB238(125°C)=AN	1=105	±5%=J	2Pin, 直脚=0 2pin, straight=0	5.0=50	32*33*18=IF	27.5=9	10.2=3	0.8=B	125°C=H							
		250=2F		2.2=225	±10%=K	2Pin, 长引线=1 2pin, long-leaded=1	13=A0		37.5=C	12.7=4	1.0=C								
		275=2H		4.7=475		4pin, 直角=2 4pin, straight=2	15=A1		52.5=F	20.3=9	1.2=D								
							17.5=A2												



## Features

- Used in AC circuits as input or output filter
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handling capabilities
- Self-healing property
- Plastic box, filled with fire-retardant resin
- 2 or 4 tinned copper wires for PCB mounting
- Meet the requirement of on-board AEC-Q200 standard

## Applications

- Solar inverters,
- UPS power supply
- Motor Driver systems

## 特点

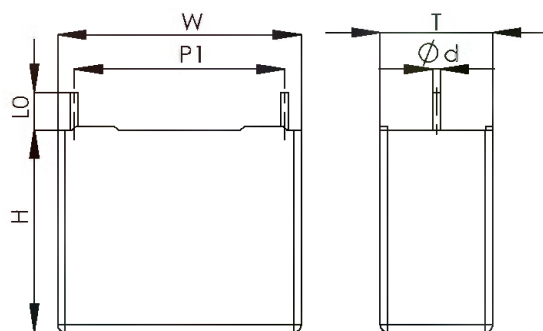
- AC电路输入输出滤波
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 有自愈性
- 塑壳封装，阻燃树脂灌封
- 镀锡铜线引出，适合PCB安装
- 符合车载AEC-Q200标准要求

## 应用场合

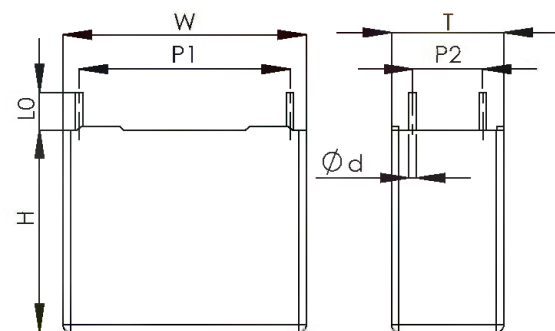
- 太阳能逆变器
- UPS电源
- 电机驱动

## 外形图 Dimensions

Unit: mm

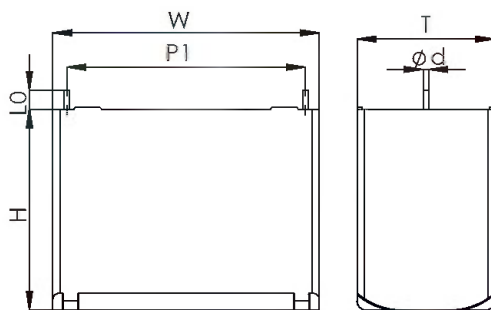


Tinned copper wire (2 leads)

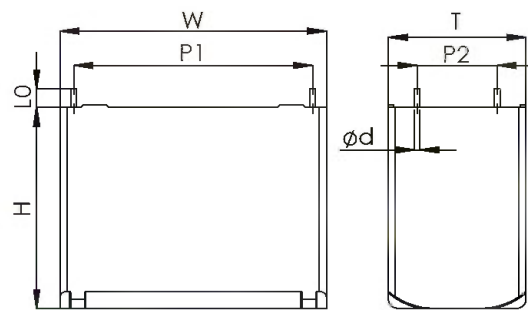


Tinned copper wire (4 leads)

方壳底 (Square-bottom)



Tinned copper wire (2 leads)



Tinned copper wire (4 leads)

圆弧底 (Arc-bottom)


## 标识 Marking

	—	1
CBB238(125°C)	—	2
50µF J 250Vac	—	3
N02F12	—	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code



## Approvals:

Mark	structure	File no
	UL	E227010

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)、AEC-Q200
气候类别 Climatic Category	40/85/56
工作温度范围 Operating Temperature Range	-40~+125°C $\theta_{\text{hotspot}}=85^{\circ}\text{C}\sim 125^{\circ}\text{C}$ : decreasing factor 0.7% per°C for $U_R$ (dc)
存储温度范围 Storage Temperature Range	-40~+125°C
额定电压 $U_R$ Rated Voltage	160~275Vac
电容量范围 Capacitance Range	1~30μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子耐压 $U_{IT}$ Voltage Between Terminals	2.15 $U_{rms}$ (Vdc), 10s (20 °C)
端子与铝壳耐压 $U_{IC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20°C, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $I_R \cdot C_N$ )	≥ 10000s (20°C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{\text{hotspot}}=70^{\circ}\text{C}$ )
失效率 Failure Rate	100 FIT

## 规格标准 Standard Ratings

$U_{rms}=160\text{Vac}$ , $U_N=225\text{Vac}$ , $U_{Ndc}=400\text{Vdc}$										
$C_R$ (μF)	P/N	$I_{max}$ 85°C (A)	$I_{Peak}$ (A)	dv/dt (V/us)	ESR 85°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1	FCS1GAN105**50I490*	5	32	32	30.3	32	20	11	27.5	\
2	FCS1GAN205**50I790*	7	105.6	32	11.3	32	22	13	27.5	\
5	FCS1GAN505**50I990*	7	160	32	8.8	32	28	14	27.5	\
10	FCS1GAN106**50I190*	7	320	32	6.8	32	33	18	27.5	\
20	FCS1GAN206**50F1C3*	12	440	22	6.9	42.5	37	28	37.5	10.2
30	FCS1GAN306**50FFC9*	12	660	22	7.4	42.5	45	30	37.5	20.3
$U_{rms}=250\text{Vac}$ , $U_N=350\text{Vac}$ , $U_{Ndc}=475\text{Vdc}$										
$C_R$ (μF)	P/N	$I_{max}$ 85°C (A)	$I_{Peak}$ (A)	dv/dt (V/us)	ESR 85°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
1.5	FCS2FAN155**50I790*	9	80	40	8.2	32	22	13	27.5	\
5	FCS2FAN505**50I190*	9	200	40	5.2	32	33	18	27.5	\
6.8	FCS2FAN685**50I190*	14	272	40	4.9	32	37	22	27.5	\
10	FCS2FAN106**50F2C3*	14	300	30	5.6	42.5	40	20	37.5	10.2
15	FCS2FAN156**50F1C3*	14	450	30	5.2	42.5	37	28	37.5	10.2
20	FCS2FAN206**50FFC9*	14	600	30	4.8	42.5	45	30	37.5	20.3



## 规格标准 Standard Ratings

U <sub>rms</sub> =275Vac, U <sub>N</sub> =385Vac, U <sub>ndc</sub> =520Vdc										
C <sub>R</sub> (μF)	P/N	I <sub>max</sub> 85°C(A)	I <sub>Peak</sub> (A)	dv/dt (V/μs)	ESR 85°C (mΩ)	W (mm)	H (mm)	T (mm)	P1 (mm)	P2 (mm)
3.3	FCS2HAN335**50IF90*	9	132	40	6.2	32	33	18	27.5	\
6.8	FCS2HAN685**50II90*	9	272	40	4.7	32	37	22	27.5	\
10	FCS2HAN106**50F2C3*	14	300	30	5.9	42.5	40	20	37.5	10.2
15	FCS2HAN156**50FFC9*	14	450	30	5.1	42.5	45	30	37.5	20.3

可根据客户要求定制。Customer products are available on request.

## 警告 Cautions and warnings

■Don't exceed the upper category temperature.

电容器的使用不能超过上限温度。

■For longtime storage, maximum relative humidity 80%, no dew allowed on the capacitor.

电容器的长期存储，其最大相对湿度是80%，且在上面不允许沾有水。

■Do not use or store capacitor in corrosive atmosphere, in the dusty environments regular maintenance and cleaning especially of the terminals is required to avoid conductive path between terminal / or terminal and ground.

电容器不能在或存储在腐蚀性环境。在多灰尘的环境里，要求定期维护和清洁，特别是电极端子，以避免相与相间或相与地之间有导电通路。

■Don't apply any mechanical stress to the capacitor terminals, and avoid any compressive, tensile or flexural stress.

不要将任何机械应力施加到电容器的端子上，且要避免任何压缩，拉伸或弯曲应力。

■Avoid overload of the capacitors.

电容器不能超负荷使用。

■Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

电容器的寿命是有限的，最大工作寿命因使用条件的不同而不同。



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F	C	R	1	G	A	W	1	0	6	K	O	C	C	A
电容器类型 Capacitor type		产品外形 Product Shape	额定电压代码 Rated Voltage Code(AC)		系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		外形 Shape	长度 Length	引线直径 Lead Diameter	引线长度 Lead Diameter
Film Capacitor=FC		Axial=R	160=1G		CBB267=AW		1.0=105		± 5%=J		Circular=O	22=A	0.6=A	35=A
			250=2F				10=106		± 10%=K			28=B	0.8=B	45=C
			330=3D									44/46=F	1.0=C	
			400=4A									58/59=H	1.2=D	
			450=4F									34/36=I		
												54=S		
												48=C		



## Features

- Used in AC circuits as input or output filter
- PP film design, good temperature characteristics
- Stable capacity
- Low ESR, high RMS current handling capabilities
- Self-healing property
- Wrapped with polyester adhesive tape and ends filled with flame retardant epoxy resin

## Applications

- Solar inverters,
- UPS power supply
- Motor Driver systems

## 特点

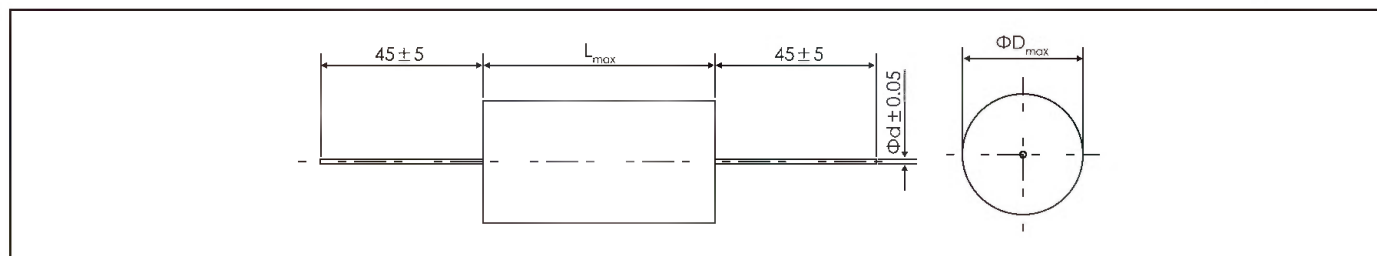
- AC电路输入输出滤波
- 采用聚丙烯薄膜，温度特性好
- 容值稳定，变化率小
- 等效串联电阻小，承受较大的有效值电流
- 有自愈性
- 外包聚氨酯胶带纸，两端灌注阻燃性环氧

## 应用场合

- 太阳能逆变器
- UPS电源
- 电机驱动

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	1
CBB267	2
1μF K 250Vac	3
N05	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 17702 (IEC 61071)
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+85℃
存储温度范围 Storage Temperature Range	-40~+85℃
额定电压 $U_r$ Rated Voltage	160~450Vac
电容量范围 Capacitance Range	0.15~40μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	2.15 $U_r$ , 10s (20℃)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	3000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	0.003 (20℃, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance (IR $\cdot C_N$ )	≥10000s (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_r$ , $\theta_{hotspot}$ = 70℃)
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

U <sub>R</sub>	C <sub>R</sub>	P/N	dV/dt	I	Rs	I <sub>max</sub>	ESL	L <sub>max</sub>	D <sub>max</sub>	d
(Vac)	(μF)	-	(V/μs)	(A)	100KHz (mΩ)	100KHz 70°C(A)	(nH)			(mm)
160	2.20	FCR1GAW225*OIB*	30	66.0	14.2	6.0	20	34.0	11.5	0.8
160	2.50	FCR1GAW255*OIB*	30	75.0	12.7	7.0	20	34.0	12.0	0.8
160	3.00	FCR1GAW305*OIC*	30	90.0	10.7	8.0	20	34.0	13.5	1.0
160	3.30	FCR1GAW335*OIC*	30	99.0	9.8	9.0	20	34.0	14.0	1.0
160	4.00	FCR1GAW405*OIC*	30	120.0	8.3	9.0	20	34.0	15.5	1.0
160	5.00	FCR1GAW505*OIC*	30	150.0	7.0	9.0	20	34.0	17.0	1.0
160	6.80	FCR1GAW685*OIC*	30	204.0	5.7	9.0	20	34.0	19.5	1.0
160	10.00	FCR1GAW106*OFC*	20	200.0	6.9	9.0	25	44.0	20.0	1.0
160	10.00	FCR1GAW106*OCC*	20	200.0	12.4	9.0	25	48.0	20.0	1.0
160	15.00	FCR1GAW156*OFD*	20	300.0	5.1	12.0	25	44.0	24.5	1.2
160	20.00	FCR1GAW206*OFD*	20	400.0	4.4	12.0	25	44.0	28.0	1.2
160	20.00	FCR1GAW206*OCD*	20	400.0	10.7	12.0	25	48.0	28.0	1.2
160	25.00	FCR1GAW256*OFD*	20	500.0	4.0	12.0	25	44.0	31.0	1.2
160	30.00	FCR1GAW306*OHD*	15	450.0	5.2	12.0	30	58.0	29.0	1.2
160	40.00	FCR1GAW406*OHD*	15	600.0	4.6	12.0	30	58.0	33.5	1.2
160	40.00	FCR1GAW406*OHD*	15	600.0	8.8	12.0	30	58.0	36.0	1.2
250	0.47	FCR2FAW474*OBB*	60	28.2	14.4	6.0	15	28.0	9.5	0.8
250	0.68	FCR2FAW684*OIB*	45	30.6	15.2	6.0	20	34.0	10.0	0.8
250	1.00	FCR2FAW105*OIB*	45	45.0	10.8	7.0	20	34.0	12.0	0.8
250	1.50	FCR2FAW155*OIC*	45	67.5	75.0	9.0	20	34.0	14.5	1.0
250	2.00	FCR2FAW205*OIC*	45	90.0	6.1	9.0	20	34.0	16.5	1.0
250	2.20	FCR2FAW225*OIC*	45	99.0	5.7	9.0	20	34.0	17.5	1.0
250	2.50	FCR2FAW255*OIC*	45	112.5	5.2	9.0	20	34.0	18.5	1.0
250	3.00	FCR2FAW305*OIC*	45	135.0	4.7	9.0	20	34.0	20.0	1.0
250	3.30	FCR2FAW335*OFC*	30	99.0	6.8	9.0	25	44.0	18.0	1.0
250	4.00	FCR2FAW405*OFC*	30	120.0	6.0	9.0	25	44.0	19.5	1.0
250	4.70	FCR2FAW475*OFC*	30	141.0	5.3	9.0	25	44.0	21.0	1.0
250	5.00	FCR2FAW505*OFC*	30	150.0	5.2	9.0	25	44.0	21.5	1.0
250	6.80	FCR2FAW685*OFD*	30	204.0	4.2	12.0	25	44.0	25.0	1.2
250	10.00	FCR2FAW106*OFD*	30	300.0	3.5	12.0	25	44.0	30.0	1.2
250	15.00	FCR2FAW156*OHD*	20	300.0	6.2	12.0	30	58.0	31.5	1.2
250	20.00	FCR2FAW206*OHD*	20	400.0	5.2	12.0	30	58.0	35.0	1.2
330	0.47	FCR3DAW474*OIB*	60	28.2	17.0	6.0	20	34.0	11.0	0.8
330	0.68	FCR3DAW684*OIB*	60	40.8	12.2	7.0	20	34.0	13.0	0.8
330	1.00	FCR3DAW105*OIC*	60	60.0	8.6	9.0	20	34.0	15.5	1.0
330	2.00	FCR3DAW205*OFC*	40	80.0	8.2	9.0	25	44.0	18.5	1.0
330	2.20	FCR3DAW225*OFC*	40	88.0	6.8	9.0	25	44.0	19.5	1.0
330	3.00	FCR3DAW305*OFC*	40	120.0	6.2	9.0	25	44.0	22.5	1.0
330	3.30	FCR3DAW335*OFD*	40	132.0	5.6	12.0	25	44.0	23.5	1.2
330	4.00	FCR3DAW405*OFD*	40	160.0	4.9	12.0	25	44.0	25.5	1.2
330	4.70	FCR3DAW475*OFD*	40	188.0	4.6	12.0	25	44.0	27.5	1.2
330	5.00	FCR3DAW505*OFD*	40	200.0	4.4	12.0	25	44.0	28.5	1.2
330	6.80	FCR3DAW685*OHD*	30	204.0	8.8	12.0	30	58.0	28.5	1.2
330	10.00	FCR3DAW106*OHD*	30	300.0	6.9	12.0	30	58.0	34.5	1.2
400	0.47	FCR4AAW474*OIC*	80	37.6	12.4	8.0	20	34.0	14.5	1.0
400	0.68	FCR4AAW684*OIC*	80	54.4	9.1	9.0	20	34.0	17.0	1.0
400	1.00	FCR4AAW105*OIC*	80	80.0	6.8	9.0	20	34.0	20.5	1.0
400	1.50	FCR4AAW155*OFC*	60	90.0	8.3	9.0	25	44.0	20.5	1.0
400	2.00	FCR4AAW205*OFD*	60	120.0	6.5	12.0	25	44.0	23.5	1.2
400	2.20	FCR4AAW225*OFD*	60	132.0	6.1	12.0	25	44.0	24.5	1.2
400	3.00	FCR4AAW305*OFD*	60	180.0	5.1	12.0	25	44.0	28.5	1.2
400	3.30	FCR4AAW335*OFD*	60	198.0	4.8	12.0	25	44.0	30.0	1.2
400	4.00	FCR4AAW405*OFD*	60	240.0	4.6	12.0	25	44.0	33.0	1.2
400	4.70	FCR4AAW475*OHD*	40	188.0	10.3	12.0	30	58.0	29.5	1.2
400	5.00	FCR4AAW505*OHD*	40	200.0	9.8	12.0	30	58.0	30.5	1.2
400	6.80	FCR4AAW685*OHD*	40	272.0	7.9	12.0	30	58.0	35.0	1.2
450	0.15	FCR4FAW154*OIB*	210	31.5	18.9	5.0	20	34.0	10.0	0.8
	0.22	FCR4FAW224*OIB*	210	46.2	13.4	7.0	20	34.0	12.0	0.8
450	0.33	FCR4FAW334*OIC*	210	69.3	9.2	9.0	20	34.0	14.5	1.0
450	0.47	FCR4FAW474*OIC*	210	98.7	7.0	9.0	20	34.0	17.0	1.0
450	0.68	FCR4FAW684*OIC*	210	142.8	5.5	9.0	20	34.0	20.5	1.0
450	1.00	FCR4FAW105*OFC*	140	140.0	6.1	9.0	25	44.0	20.5	1.0

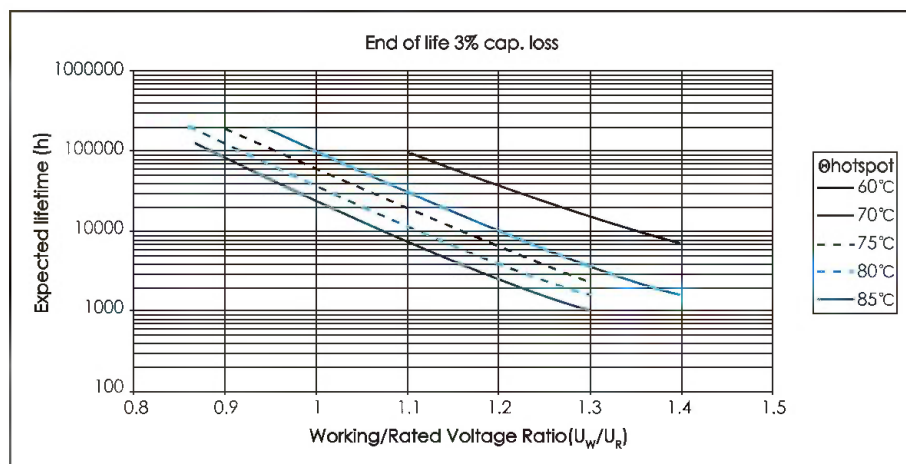


## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	dV/dt	$\hat{i}$	$R_s$	$I_{max}$	ESL	$L_{max}$	$D_{max}$	d
(Vac)	( $\mu F$ )	-	(V/ $\mu s$ )	(A)	100KHz (m $\Omega$ )	100KHz 70°C(A)	(nH)			(mm)
450	1.50	FCR4FAW155*OFD*	140	210.0	4.6	12.0	25	44.0	24.5	1.2
450	2.00	FCR4FAW205*OFD*	140	280.0	4.0	12.0	25	44.0	28.5	1.2
450	2.20	FCR4FAW225*OFD*	140	308.0	3.9	12.0	25	44.0	29.5	1.2
450	2.50	FCR4FAW255*OFD*	140	350.0	3.8	12.0	25	44.0	31.5	1.2
450	3.00	FCR4FAW305*OHD*	90	270.0	4.7	12.0	30	58.0	28.0	1.2
450	3.30	FCR4FAW335*OHD*	90	297.0	4.6	12.0	30	58.0	29.5	1.2
450	4.00	FCR4FAW405*OHD*	90	360.0	4.2	12.0	30	58.0	32.5	1.2

可根据客户要求定制。Customer products are available on request.

## 预期寿命曲线 Expected lifetime curve





## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	3	F	A	U	1	0	5	K	0	3	5	B	9	7	0	B	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		引线类型 Pin Style		引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions		
Film Capacitor =FC	Square=S	350=3F	CBB311=AU		1.0=105		±5%=J	2pin, straight =0		long-lead 20min=00	26*25*15=B9	5=1	0=0	0.5=E	Standard product=None				
							±10%=K	2pin, long-leaded =1		3.5=35						High temperature high humidity loading=G			
							±20%=M	4in, straight =2		13=A0						10=3	10=2	0.8=B	Automotive grade=I
									2pin, Straight Taping 12.7=3	15=A1						12.5=4	10.2=3	1.0=C	Security film=S
									2pin, Straight Taping 15=4	17.5=A2						15=5	12.7=4	1.2=D	Smaller=X
									2pin, Taping 5&5=5	25=B0						20=6	15=5		Halogen-free =N
									2pin, Taping 7.5&5=6	30=C0						22.5=7	15.2=6		Low noise=F
									2pin, Taping 7.5&7.5=7	35=C1						25=8	16.1=7		
									2pin, Taping 10&7.5=8	55=E0						27.5=9	20=8		
									2pin, Taping 10&10=9	100=J0						30=A	20.3=9		
									2pin, Taping 15&7.5=A							32.5=B			
									2pin, Taping 15&10=B							37.5=C			
									2pin, Taping 15&15=C							42.5=D			
									2pin, Kinked 5&5=D							45=E			
									2pin, Kinked 7.5&5=E							52.5=F			
									2pin, Kinked 7.5&7.5=F										
									2pin, Kinked 10&7.5=G										
									2pin, Kinked 10&10=H										
									2pin, Kinked 15&7.5=I										
									2pin, Kinked 15&10=J										
									2pin, Kinked 15&15=K										
									2pin, Y Kinked =L										
									2pin, Z Kinked =M										

\*外壳尺寸表



## Features

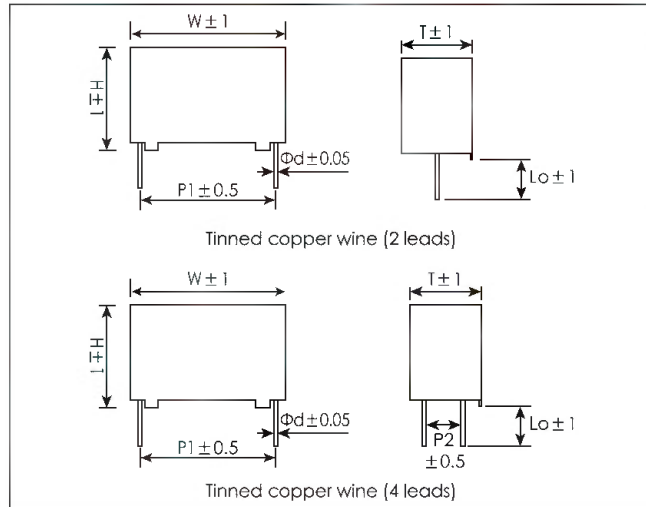
- Self-healing properties
- High temperature (110°C)
- Overvoltage stress withstanding.
- Flame-retardant plastic case and epoxy resin

## 特点

- 自愈特性
- 耐温强度高(110°C)
- 能承受过压冲击
- 阻燃胶壳和环氧树脂

## 外形图 Dimensions

Unit: mm






## 标识 Marking



NO.	项目 Item
1	商标、产品系列以及额定电压 Brand、Products series and Rated voltage
2	容量、偏差以及年度标记 Capacitance、Tolerance and Year code
3	安全认证 Safety Approvals

## Approvals:

Mark	structure	File no
	UL / CUL	E483922
	ENEC	ENEC-03934
	CQC	CQC21001318988

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC 60384-14, EN 60384-14, UL 60384-14, AEC-Q200
气候类别 Climatic Category	40/110/56 IEC60068-1
工作温度范围 Operating Temperature Range	-40°C~+110°C
电容量范围 Capacitance Range	0.001~20μF
电容量偏差 Capacitance Tolerance	±10% (K), ±20% (M)
额定电压 U <sub>R</sub> Rated Voltage	350Vac, 440Vac, 480Vac, 530Vac, 600Vac, 760Vac(50Hz/60Hz)
损耗 Dissipation Factor	0.01μF < C ≤ 1.0μF ≤ 0.20% (1KHz, 25°C)
	1.0μF < C ≤ 10.0μF ≤ 0.25% (1KHz, 25°C)
	10.0μF < C ≤ 20μF ≤ 0.30% (1KHz, 25°C)
绝缘电阻 Insulation Resistance(I <sub>R</sub> *C <sub>N</sub> )	R ≥ 15000MΩ, C <sub>N</sub> ≤ 0.33μF(20°C, 100Vdc, 1min) RC <sub>N</sub> ≥ 5000s, C <sub>N</sub> > 0.33μF
端子与端子耐压U <sub>TT</sub> Voltage Between Terminals	4.3U <sub>R</sub> Vdc for 2s
端子与铝壳耐压U <sub>TC</sub> Voltage Between Terminals and Case	2U <sub>R</sub> + 1500 Vac 50/60Hz for 60 sec at +25°C



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
350	0.01	FCS3FAU103*100C430A	13	11	5	10	0.6
	0.012	FCS3FAU123*100C430A	13	11	5	10	0.6
	0.015	FCS3FAU153*100C430A	13	11	5	10	0.6
	0.018	FCS3FAU183*100C430A	13	11	5	10	0.6
	0.022	FCS3FAU223*100C430A	13	11	5	10	0.6
	0.027	FCS3FAU273*100C430A	13	11	5	10	0.6
	0.033	FCS3FAU333*100C430A	13	11	5	10	0.6
	0.039	FCS3FAU393*100C530A	13	12	6	10	0.6
	0.047	FCS3FAU473*100C530A	13	12	6	10	0.6
	0.056	FCS3FAU563*100C830A	13	13	7	10	0.6
	0.068	FCS3FAU683*100C930A	13	14	8	10	0.6
	0.01	FCS3FAU103*100E250A	18	11	5	15	0.6
	0.012	FCS3FAU123*100E250A	18	11	5	15	0.6
	0.015	FCS3FAU153*100E250A	18	11	5	15	0.6
	0.018	FCS3FAU183*100E250A	18	11	5	15	0.6
	0.022	FCS3FAU223*100E250A	18	11	5	15	0.6
	0.027	FCS3FAU273*100E250A	18	11	5	15	0.6
	0.033	FCS3FAU333*100E250A	18	11	5	15	0.6
	0.039	FCS3FAU393*100E250A	18	11	5	15	0.6
	0.047	FCS3FAU473*100E250A	18	11	5	15	0.6
	0.056	FCS3FAU563*100E250A	18	11	5	15	0.6
	0.068	FCS3FAU683*100E550A	18	12	6	15	0.6
	0.082	FCS3FAU823*100E550A	18	12	6	15	0.6
	0.1	FCS3FAU104*100E950B	18	13	7	15	0.8
	0.1	FCS3FAU104*100EE50B	18	17.5	6	15	0.6
	0.12	FCS3FAU124*100E750B	18	13.5	7.5	15	0.8
	0.12	FCS3FAU124*100EE50B	18	17.5	6	15	0.6
	0.15	FCS3FAU154*100EB50B	18	14	8	15	0.8
	0.18	FCS3FAU184*100EB50B	18	14.5	8.5	15	0.8
	0.22	FCS3FAU224*100EC50B	18	16	10	15	0.8
	0.27	FCS3FAU274*100EG50B	18	19	11	15	0.8
	0.33	FCS3FAU334*100EG50B	18	19	11	15	0.8
	0.039	FCS3FAU393*100BE70B	26.5	15.5	6	22.5	0.8
	0.047	FCS3FAU473*100BE70B	26.5	15.5	6	22.5	0.8
	0.056	FCS3FAU563*100BE70B	26.5	15.5	6	22.5	0.8
	0.068	FCS3FAU683*100BE70B	26.5	15.5	6	22.5	0.8
	0.082	FCS3FAU823*100BE70B	26.5	15.5	6	22.5	0.8
	0.1	FCS3FAU104*100BE70B	26.5	15.5	6	22.5	0.8
	0.12	FCS3FAU124*100BE70B	26.5	15.5	6	22.5	0.8
	0.15	FCS3FAU154*100BE70B	26.5	15.5	6	22.5	0.8
	0.18	FCS3FAU184*100BE70B	26.5	15.5	6	22.5	0.8
	0.22	FCS3FAU224*100B270B	26.5	16.5	7	22.5	0.8
	0.27	FCS3FAU274*100B270B	26.5	16.5	7	22.5	0.8
	0.33	FCS3FAU334*100B370B	26.5	17	8.5	22.5	0.8
	0.47	FCS3FAU474*100B470B	26.5	19	10	22.5	0.8
	0.56	FCS3FAU564*100B570B	26.5	20	11	22.5	0.8
	0.68	FCS3FAU684*100B770B	26.5	22	12	22.5	0.8
	0.82	FCS3FAU824*100B770B	26.5	24.5	13	22.5	0.8
	1.0	FCS3FAU105*100B970B	26.5	25	15	22.5	0.8
	1.2	FCS3FAU125*100BA70B	26.5	29.5	14.5	22.5	0.8
	0.15	FCS3FAU154*050I190B	32	18	9	27.5	0.8
	0.18	FCS3FAU184*050I190B	32	18	9	27.5	0.8
	0.22	FCS3FAU224*050I190B	32	18	9	27.5	0.8
	0.33	FCS3FAU334*050I190B	32	18	9	27.5	0.8
	0.39	FCS3FAU394*050I190B	32	18	9	27.5	0.8
	0.47	FCS3FAU474*050I190B	32	18	9	27.5	0.8
	0.56	FCS3FAU564*050I490B	32	20	11	27.5	0.8
	0.68	FCS3FAU684*050I190B	32	20	11	27.5	0.8
	0.82	FCS3FAU824*050I190B	32	20	11	27.5	0.8
	1.00	FCS3FAU105*050I790B	32	22	13	27.5	0.8
	1.00	FCS3FAU105*050I890B	32	24.5	13	27.5	0.8
	1.20	FCS3FAU125*050IC90B	32	28	14	27.5	0.8
	1.50	FCS3FAU155*050IC90B	32	28	14	27.5	0.8
	1.80	FCS3FAU185*050ID90B	32	28	18	27.5	0.8
	2.2	FCS3FAU225*050ID90B	32	28	18	27.5	0.8
	2.2	FCS3FAU225*050IF90B	32	28	18	27.5	0.8
	2.7	FCS3FAU275*050I90B	32	37	22	27.5	0.8
	3.3	FCS3FAU335*050I90B	32	37	22	27.5	0.8
	1.20	FCS3FAU125*050FZC0C	42.5	24	13	37.5	1.0
	1.50	FCS3FAU155*050FPC0C	42.5	26	15	37.5	1.0
	1.80	FCS3FAU185*050FPC0C	42.5	26	15	37.5	1.0
	2.20	FCS3FAU225*050F4C0C	42.5	28	19	37.5	1.0
	2.70	FCS3FAU275*050F5C0C	42.5	32	19	37.5	1.0
	3.30	FCS3FAU335*050F5C0C	42.5	32	19	37.5	1.0
	4.70	FCS3FAU475*050FQC0C	42.5	37	22	37.5	1.0
	5.60	FCS3FAU565*050F9C0C	42.5	44	24	37.5	1.0
	6.80	FCS3FAU685*050FHC0C	42.5	43	28	37.5	1.0
	8.20	FCS3FAU825*050FFC0C	42.5	45	30	37.5	1.2
	8.20	FCS3FAU825*050HHF0D	57.5	45	30	52.5	1.2
	10.00	FCS3FAU106*050HHF0D	57.5	45	30	52.5	1.2
	12.00	FCS3FAU126*050HHF0D	57.5	45	30	52.5	1.2
	15.00	FCS3FAU156*050HLF0D	57.5	50	35	52.5	1.2
	20.00	FCS3FAU206*050HRF0D	57.5	65	45	52.5	1.2
440/480	0.01	FCS4EAU103*100C430A	13	11	5	10	0.6
	0.012	FCS4EAU123*100C430A	13	11	5	10	0.6
	0.015	FCS4EAU153*100C430A	13	11	5	10	0.6
	0.018	FCS4EAU183*100C430A	13	11	5	10	0.6
	0.022	FCS4EAU223*100C430A	13	11	5	10	0.6
	0.027	FCS4EAU273*100C530A	13	12	6	10	0.6
	0.033	FCS4EAU333*100C530A	13	12	6	10	0.6
	0.039	FCS4EAU393*100C830A	13	13	7	10	0.6
	0.047	FCS4EAU473*100C930A	13	14	8	10	0.6



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
440/480	0.056	FCS4EAU563*100C930A	13	14	8	10	0.6
	0.01	FCS4EAU103*100E250A	18	11	5	15	0.6
	0.012	FCS4EAU123*100E250A	18	11	5	15	0.6
	0.015	FCS4EAU153*100E250A	18	11	5	15	0.6
	0.018	FCS4EAU183*100E250A	18	11	5	15	0.6
	0.022	FCS4EAU223*100E250A	18	11	5	15	0.6
	0.027	FCS4EAU273*100E250A	18	11	5	15	0.6
	0.033	FCS4EAU333*100E250A	18	11	5	15	0.6
	0.039	FCS4EAU393*100E550A	18	12	6	15	0.6
	0.047	FCS4EAU473*100E550A	18	12	6	15	0.6
	0.056	FCS4EAU563*100E950B	18	13	7	15	0.8
	0.068	FCS4EAU683*100E750B	18	13.5	7.5	15	0.8
	0.082	FCS4EAU823*100E850B	18	14	8	15	0.8
	0.1	FCS4EAU104*100E850B	18	14.5	8.5	15	0.8
	0.12	FCS4EAU124*100EC50B	18	16	10	15	0.8
	0.15	FCS4EAU154*100EG50B	18	19	11	15	0.8
	0.18	FCS4EAU184*100EG50B	18	19	11	15	0.8
	0.22	FCS4EAU224*100EI50B	18	22	12.5	15	0.8
	0.039	FCS4EAU393*100BE70B	26.5	15.5	6	22.5	0.8
	0.047	FCS4EAU473*100BE70B	26.5	15.5	6	22.5	0.8
	0.056	FCS4EAU563*100BE70B	26.5	15.5	6	22.5	0.8
	0.068	FCS4EAU683*100BE70B	26.5	15.5	6	22.5	0.8
	0.082	FCS4EAU823*100BE70B	26.5	15.5	6	22.5	0.8
	0.1	FCS4EAU104*100BE70B	26.5	15.5	6	22.5	0.8
	0.12	FCS4EAU124*100BE70B	26.5	15.5	6	22.5	0.8
	0.15	FCS4EAU154*100B270B	26.5	16.5	7	22.5	0.8
	0.18	FCS4EAU184*100B370B	26.5	17	8.5	22.5	0.8
	0.22	FCS4EAU224*100B370B	26.5	17	8.5	22.5	0.8
	0.27	FCS4EAU274*100B470B	26.5	19	10	22.5	0.8
	0.33	FCS4EAU334*100B570B	26.5	20	11	22.5	0.8
	0.39	FCS4EAU394*100B570B	26.5	20	11	22.5	0.8
	0.47	FCS4EAU474*100BD70B	26.5	24.5	13	22.5	0.8
	0.56	FCS4EAU564*100B970B	26.5	25	15	22.5	0.8
	0.68	FCS4EAU684*100BA70B	26.5	29.5	14.5	22.5	0.8
	0.15	FCS4EAU154*050I190B	32	18	9	27.5	0.8
	0.18	FCS4EAU184*050I190B	32	18	9	27.5	0.8
	0.22	FCS4EAU224*050I190B	32	18	9	27.5	0.8
	0.33	FCS4EAU334*050I190B	32	18	9	27.5	0.8
	0.39	FCS4EAU394*050I490B	32	20	11	27.5	0.8
	0.47	FCS4EAU474*050I490B	32	20	11	27.5	0.8
	0.56	FCS4EAU564*050I790B	32	22	13	27.5	0.8
	0.68	FCS4EAU684*050I890B	32	24.5	13	27.5	0.8
	0.82	FCS4EAU824*050IA90B	32	25	16	27.5	0.8
	0.82	FCS4EAU824*050IC90B	32	28	14	27.5	0.8
	1.00	FCS4EAU105*050ID90B	32	28	18	27.5	0.8
	1.20	FCS4EAU125*050IF90B	32	33	18	27.5	0.8
	1.50	FCS4EAU155*050IF90B	32	33	18	27.5	0.8
	1.80	FCS4EAU185*050I190B	32	37	22	27.5	0.8
	0.82	FCS4EAU824*050FZC0C	42.5	24	13	37.5	1.0
	1.00	FCS4EAU105*050FZC0C	42.5	24	13	37.5	1.0
	1.20	FCS4EAU125*050FPC0C	42.5	26	15	37.5	1.0
	1.80	FCS4EAU185*050F4C0C	42.5	28	19	37.5	1.0
	2.20	FCS4EAU225*050F5C0C	42.5	32	19	37.5	1.0
	2.70	FCS4EAU275*050FQC0C	42.5	37	22	37.5	1.0
	3.30	FCS4EAU335*050F9C0C	42.5	44	24	37.5	1.0
	3.90	FCS4EAU395*050FHC0C	42.5	43	28	37.5	1.0
	4.70	FCS4EAU475*050FFC0D	42.5	45	30	37.5	1.2
	5.60	FCS4EAU565*050HHF0D	57.5	45	30	52.5	1.2
	6.80	FCS4EAU685*050HHF0D	57.5	45	30	52.5	1.2
	8.20	FCS4EAU825*050HLF0D	57.5	50	35	52.5	1.2
	10.00	FCS4EAU106*050HLF0D	57.5	50	35	52.5	1.2
	15.00	FCS4EAU156*050HRF0D	57.5	65	45	52.5	1.2
530	0.0010	FCS5DAU102*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0012	FCS5DAU122*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0015	FCS5DAU152*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0018	FCS5DAU182*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0022	FCS5DAU222*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0027	FCS5DAU272*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0033	FCS5DAU332*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0039	FCS5DAU392*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0047	FCS5DAU472*100C230A	13.0	9.0	4.0	10.0	0.6
	0.0056	FCS5DAU562*100C430A	13.0	11.0	5.0	10.0	0.6
	0.0068	FCS5DAU682*100C430A	13.0	11.0	5.0	10.0	0.6
	0.0082	FCS5DAU822*100C430A	13.0	11.0	5.0	10.0	0.6
	0.010	FCS5DAU103*100C530A	13.0	12.0	6.0	10.0	0.6
	0.012	FCS5DAU123*100C530A	13.0	12.0	6.0	10.0	0.6
	0.015	FCS5DAU153*100C830A	13.0	13.0	7.0	10.0	0.6
	0.0068	FCS5DAU682*100E250A	18.0	11.0	5.0	15.0	0.6
	0.0082	FCS5DAU822*100E250A	18.0	11.0	5.0	15.0	0.6
	0.010	FCS5DAU103*100E250A	18.0	11.0	5.0	15.0	0.6
	0.022	FCS5DAU223*100E550A	18.0	12.0	6.0	15.0	0.6
	0.033	FCS5DAU333*100E750B	18.0	13.5	7.5	15.0	0.8
	0.047	FCS5DAU473*100E850B	18.0	14.5	8.5	15.0	0.8
	0.056	FCS5DAU563*100E850B	18.0	14.5	8.5	15.0	0.8
	0.068	FCS5DAU683*100EC50B	18.0	16.0	10.0	15.0	0.8
	0.100	FCS5DAU104*100BE50B	18.0	19.0	11.0	15.0	0.8
	0.033	FCS5DAU333*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.047	FCS5DAU473*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.056	FCS5DAU563*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.068	FCS5DAU683*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.082	FCS5DAU823*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.10	FCS5DAU104*100B270B	26.5	16.5	7.0	22.5	0.8



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
530	0.15	FCS5DAU154*100B370B	26.5	17.0	8.5	22.5	0.8
	0.22	FCS5DAU224*100B470B	26.5	19.0	10.0	22.5	0.8
	0.33	FCS5DAU334*100B770B	26.5	22.0	12.0	22.5	0.8
	0.47	FCS5DAU474*100B470B	26.5	29.5	14.5	22.5	0.8
	0.10	FCS5DAU104*050I190B	32.0	18.0	9.0	27.5	0.8
	0.12	FCS5DAU124*050I190B	32.0	18.0	9.0	27.5	0.8
	0.15	FCS5DAU154*050I490B	32.0	20.0	11.0	27.5	0.8
	0.18	FCS5DAU184*050I490B	32.0	20.0	11.0	27.5	0.8
	0.22	FCS5DAU224*050I490B	32.0	20.0	11.0	27.5	0.8
	0.33	FCS5DAU334*050I490B	32.0	20.0	11.0	27.5	0.8
	0.47	FCS5DAU474*050I890B	32.0	24.5	13.0	27.5	0.8
	0.56	FCS5DAU564*050I890B	32.0	24.5	13.0	27.5	0.8
	0.68	FCS5DAU684*050I90B	32.0	28.0	18.0	27.5	0.8
	0.82	FCS5DAU824*050I90B	32.0	28.0	18.0	27.5	0.8
	1.00	FCS5DAU105*050IF90B	32.0	33.0	18.0	27.5	0.8
	1.50	FCS5DAU155*050I90B	32.0	37.0	22.0	27.5	0.8
	1.80	FCS5DAU185*050I90B	32.0	37.0	22.0	27.5	0.8
	0.56	FCS5DAU564*050FZCOC	42.5	24.0	13.0	37.5	1.0
	0.68	FCS5DAU684*050FZCOC	42.5	24.0	13.0	37.5	1.0
	0.82	FCS5DAU824*050FPCOC	42.5	26.0	15.0	37.5	1.0
	1.0	FCS5DAU105*050FPCOC	42.5	26.0	15.0	37.5	1.0
	1.2	FCS5DAU125*050FSCOC	42.5	30.0	17.0	37.5	1.0
	1.5	FCS5DAU155*050F5COC	42.5	32.0	19.0	37.5	1.0
	2.2	FCS5DAU225*050F2COC	42.5	40.0	20.0	37.5	1.0
	3.3	FCS5DAU335*050FFCOC	42.5	45.0	30.0	37.5	1.0
760	0.001	FCS7GAU102*100E250A	18.0	11.0	5.0	15	0.6
	0.0012	FCS7GAU122*100E250A	18.0	11.0	5.0	15	0.6
	0.0015	FCS7GAU152*100E250A	18.0	11.0	5.0	15	0.6
	0.0018	FCS7GAU182*100E250A	18.0	11.0	5.0	15	0.6
	0.0022	FCS7GAU222*100E250A	18.0	11.0	5.0	15	0.6
	0.0027	FCS7GAU272*100E250A	18.0	11.0	5.0	15	0.6
	0.0033	FCS7GAU332*100E250A	18.0	11.0	5.0	15	0.6
	0.0047	FCS7GAU472*100E250A	18.0	11.0	5.0	15	0.6
	0.0056	FCS7GAU562*100E250A	18.0	11.0	5.0	15	0.6
	0.0068	FCS7GAU682*100E250A	18.0	11.0	5.0	15	0.6
	0.0082	FCS7GAU822*100E250A	18.0	11.0	5.0	15	0.6
	0.01	FCS7GAU103*100E250A	18.0	11.0	5.0	15	0.6
	0.012	FCS7GAU123*100E550A	18.0	12.0	6.0	15	0.6
	0.015	FCS7GAU153*100E550A	18.0	12.0	6.0	15	0.6
	0.018	FCS7GAU183*100E750B	18.0	13.5	7.5	15	0.6
	0.022	FCS7GAU223*100E750B	18.0	13.5	7.5	15	0.8
	0.027	FCS7GAU273*100E850B	18.0	14.0	8.0	15	0.8
	0.033	FCS7GAU333*100E850B	18.0	14.5	8.5	15	0.8
	0.039	FCS7GAU393*100EC50B	18.0	16.0	10.0	15	0.8
	0.047M	FCS7GAU473M100EC50B	18.0	16.0	10.0	15	0.8
	0.047K	FCS7GAU473K100EG50B	18.0	19.0	11.0	15	0.8
	0.056	FCS7GAU563*100EG50B	18.0	19.0	11.0	15	0.8
	0.068M	FCS7GAU683M100EG50B	18.0	19.0	11.0	15	0.8
	0.01	FCS7GAU103*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.012	FCS7GAU123*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.015	FCS7GAU153*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.018	FCS7GAU183*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.022	FCS7GAU223*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.027	FCS7GAU273*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.033	FCS7GAU333*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.039	FCS7GAU393*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.047	FCS7GAU473*100BE70B	26.5	15.5	6.0	22.5	0.8
	0.056	FCS7GAU563*100B270B	26.5	16.5	7.0	22.5	0.8
	0.068	FCS7GAU683*100B270B	26.5	16.5	7.0	22.5	0.8
	0.082	FCS7GAU823*100B370B	26.5	17.0	8.5	22.5	0.8
	0.1M	FCS7GAU104M100B370B	26.5	17.0	8.5	22.5	0.8
	0.1K	FCS7GAU104*100B470B	26.5	19.0	10.0	22.5	0.8
	0.12	FCS7GAU124*100B470B	26.5	19.0	10.0	22.5	0.8
	0.15	FCS7GAU154*100B570B	26.5	20.0	11.0	22.5	0.8
	0.18	FCS7GAU184*100B770B	26.5	22.0	12.0	22.5	0.8
	0.22M	FCS7GAU224M100B770B	26.5	22.0	12.0	22.5	0.8
	0.22K	FCS7GAU224K100B670B	26.5	23.0	13.0	22.5	0.8
	0.27	FCS7GAU274*100B970B	26.5	25.0	15.0	22.5	0.8
	0.33M	FCS7GAU334M100BA70B	26.5	29.5	14.5	22.5	0.8
	0.068	FCS7GAU683*050I190B	32.0	18.0	9.0	27.5	0.8
	0.082	FCS7GAU823*050I190B	32.0	18.0	9.0	27.5	0.8
	0.1	FCS7GAU104*050I190B	32.0	18.0	9.0	27.5	0.8
	0.12	FCS7GAU124*050I190B	32.0	18.0	9.0	27.5	0.8
	0.15	FCS7GAU154*050I490B	32.0	20.0	11.0	27.5	0.8
	0.18	FCS7GAU184*050I490B	32.0	20.0	11.0	27.5	0.8
	0.22	FCS7GAU224*050I790B	32.0	22.0	13.0	27.5	0.8
	0.27	FCS7GAU274*050I890B	32.0	24.5	13.0	27.5	0.8
	0.33	FCS7GAU334*050I90B	32.0	24.5	15.0	27.5	0.8
	0.33	FCS7GAU334*050IC90B	32.0	28.0	14.0	27.5	0.8
	0.39	FCS7GAU395*050IF90B	32.0	33.0	18.0	27.5	0.8
	0.47M	FCS7GAU474M050ID90B	32.0	28.0	18.0	27.5	0.8
	0.47	FCS7GAU474*050IN90B	32.0	30.0	16.0	27.5	0.8
	0.56	FCS7GAU564*050IF90B	32.0	33.0	18.0	27.5	0.8
	0.68	FCS7GAU684*050I90B	32.0	37.0	22.0	27.5	0.8
	0.33	FCS7GAU334*050FZCOC	42.5	24.0	13.0	37.5	1.0
	0.39	FCS7GAU394*050FPCOC	42.5	26.0	15.0	37.5	1.0
	0.39	FCS7GAU394*050FZCOC	42.5	24.0	13.0	37.5	1.0
	0.47	FCS7GAU474*050FPCOC	42.5	26.0	15.0	37.5	1.0
	0.47	FCS7GAU474*050FZCOC	42.5	28.0	17.0	37.5	1.0
	0.56	FCS7GAU564*050FSCOC	42.5	30.0	17.0	37.5	1.0
	0.68M	FCS7GAU684*050FLCOC	42.5	18.0	24.0	37.5	1.0
	0.68K	FCS7GAU684*050FMCOC	42.5	20.0	26.0	37.5	1.0



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
760	0.68	FCS7GAU684*050F5C0C	42.5	32.0	19.0	37.5	1.0
	0.82	FCS7GAU824*050F5C0C	42.5	32.0	19.0	37.5	1.0
	1.0M	FCS7GAU105M050F5C0C	42.5	32.0	19.0	37.5	1.0
	1.0K	FCS7GAU105*050FQC0C	42.5	37.0	22.0	37.5	1.0
	1.2	FCS7GAU125*050FQC0C	42.5	37.0	22.0	37.5	1.0
	1.5	FCS7GAU155*050F8C0C	42.5	42.0	28.0	37.5	1.0
	1.5	FCS7GAU155*050F1C0C	42.5	37.0	28.0	37.5	1.0
	1.8M	FCS7GAU185M050F8C0C	42.5	42.0	28.0	37.5	1.0
	1.8M	FCS7GAU185M050F1C0C	42.5	37.0	28.0	37.5	1.0
	1.8K	FCS7GAU185K050F8C0C	42.5	42.0	28.0	37.5	1.0
	2.2M	FCS7GAU225M050FFC0C	42.5	45.0	30.0	37.5	1.0

以上规格参数为标准品尺寸推荐，如需更高性能的规格，请与我司技术部工程师联系，可根据客户要求定制。

The above specifications and parameters are recommended for standard size. If you need higher performance specifications, please contact our technical engineer., Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	3	B	A	X	2	2	4	K	0	3	5	E	7	5	0	B	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		引线类型 Pin Style		引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions		
Film Capacitor =FC	Square=S	305=3B	CBB312=AX		0.22=224		±5%=J		2pin, straight =0		long-lead 20min=00	18*13.5*7.5=E7		5=1	0=0	0.5=E	Standard product=None		
						±10%=K		2pin, long-leaded =1		3.5=35	7.5=2			5.1=1	0.6=A	High temperature high humidity loading=G			
						±20%=M		4in, straight =2		13=A0	10=3			10=2	0.8=B	Automotive grade=I			
								2pin, Straight Taping 12.7=3		15=A1	12.5=4			10.2=3	1.0=C	Security film=S			
								2pin, Straight Taping 15=4		17.5=A2	15=5			12.7=4	1.2=D	Smaller=X			
								2pin, Taping 5&5=5		25=B0	20=6			15=5		Halogen-free =N			
								2pin, Taping 7.5&5=6		30=C0	22.5=7			15.2=6		Low noise=F			
								2pin, Taping 7.5&7.5=7		35=C1	25=8			16.1=7					
								2pin, Taping 10&7.5=8		55=E0	27.5=9			20=8					
								2pin, Taping 10&10=9		100=J0	30=A			20.3=9					
								2pin, Taping 15&7.5=A			32.5=B								
								2pin, Taping 15&10=B			37.5=C								
								2pin, Taping 15&15=C			42.5=D								
								2pin, Kinked 5&5=D			45=E								
								2pin, Kinked 7.5&5=E			52.5=F								
								2pin, Kinked 7.5&7.5=F											
								2pin, Kinked 10&7.5=G											
								2pin, Kinked 10&10=H											
								2pin, Kinked 15&7.5=I											
								2pin, Kinked 15&10=J											
								2pin, Kinked 15&15=K											
								2pin, Y Kinked =L											
								2pin, Z Kinked =M											

\*外壳尺寸表



Features

- Self-healing properties
- High moisture resistance.
- Overvoltage stress withstanding.
- Flame-retardant plastic case and epoxy rosin.

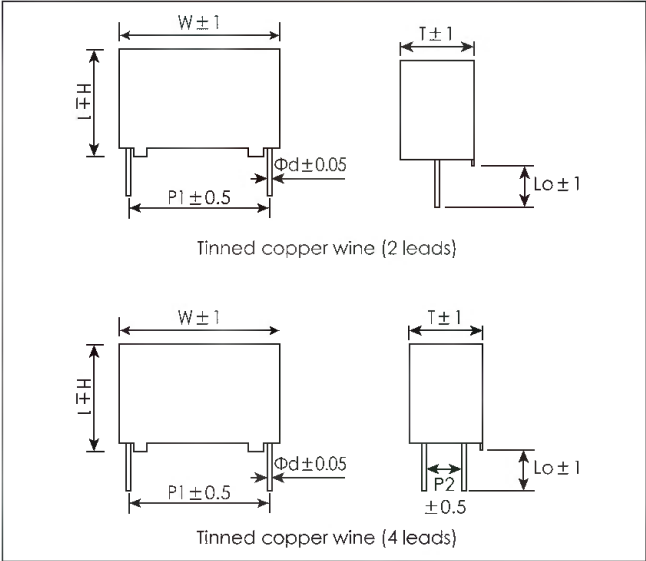
特点

- 自愈特性
- 耐湿强度高
- 能承受过压冲击
- 阻燃胶壳和环氧树脂

外形图 Dimensions

Unit: mm

标识 Marking



Jianghai 0.56μF K

CBB312 40/110/56B X2

250V~ 275V~ 305V~

UL<sup>®</sup> CQC ENEC<sup>10</sup> VDE

XX

NO.	项目 Item
1	商标、产品系列以及额定电压 Brand、Products series and Rated voltage
2	容量、偏差以及年度标记 Capacitance 、Tolerance and Year code
3	安全认证 Safety Approvals

Approvals:

Mark	structure	File no
UL <sup>®</sup>	UL / CUL	E483922
VDE	VDE	40044989
ENEC <sup>10</sup>	ENEC	40044989
CQC	CQC	CQC17001178020



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 14472 (IEC 60384-14), AEC-Q200
工作温度范围 Operating Temperature Range	-40°C~+110°C
电容量范围 Capacitance Range	0.0047~46.0μF
电容量偏差 Capacitance Tolerance	±10% (K), ±20% (M)
额定电压 U <sub>R</sub> Rated Voltage	275Vac, 305Vac (50Hz/60Hz)
损耗 Dissipation Factor	0.0047μF≤C<1.0μF: ≤0.1%(1KHz, 25°C) 1.0μF≤C<10μF: ≤0.2%(1KHz, 25°C) 10μF≤C<45μF: ≤0.3%(1KHz, 25°C)
绝缘电阻 Insulation Resistance (I <sub>R</sub> *C <sub>R</sub> )	R≥15000MΩ, C <sub>R</sub> ≤0.33μF RC <sub>R</sub> ≥5000s, C <sub>R</sub> >0.33μF (20°C, 100Vdc, 1min)
端子与端子间耐压U <sub>TT</sub> Voltage Between Terminals	4.3U <sub>R</sub> (Vdc), 2s
端子与外壳间耐压U <sub>TC</sub> Voltage Between Terminals and Case	2120Vac, 1min

## 规格标准 Standard Ratings

U <sub>R</sub>	C <sub>R</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
275/305	0.010	FCS3BAX103*100C430A	13	11	5.0	10	0.6
	0.012	FCS3BAX123*100C430A	13	11	5.0	10	0.6
	0.015	FCS3BAX153*100C430A	13	11	5.0	10	0.6
	0.018	FCS3BAX183*100C430A	13	11	5.0	10	0.6
	0.022	FCS3BAX223*100C430A	13	11	5.0	10	0.6
	0.027	FCS3BAX273*100C430A	13	11	5.0	10	0.6
	0.033	FCS3BAX333*100C430A	13	11	5.0	10	0.6
	0.039	FCS3BAX393*100C430A	13	11	5.0	10	0.6
	0.047	FCS3BAX473*100C430A	13	11	5.0	10	0.6
	0.047	FCS3BAX473*100C530A	13	12	6.0	10	0.6
	0.056	FCS3BAX563*100C430A	13	11	5.0	10	0.6
	0.056	FCS3BAX563*100C530A	13	12	6.0	10	0.6
	0.068	FCS3BAX683*100C430A	13	11	5.0	10	0.6
	0.068	FCS3BAX683*100C530A	13	12	6.0	10	0.6
	0.082	FCS3BAX823*100C430A	13	11	5.0	10	0.6
	0.082	FCS3BAX823*100C530A	13	12	6.0	10	0.6
	0.1	FCS3BAX104*100C430A	13	11	5.0	10	0.6
	0.1	FCS3BAX104*100C530A	13	12	6.0	10	0.6
	0.12	FCS3BAX124*100C530A	13	12	6.0	10	0.6
	0.12	FCS3BAX124*100C830A	13	13	7.0	10	0.6
	0.15	FCS3BAX154*100C830A	13	13	7.0	10	0.6
	0.15	FCS3BAX154*100C930A	13	14	8.0	10	0.6
	0.18	FCS3BAX184*100C930A	13	14	8.0	10	0.6
	0.18	FCS3BAX184*100C730A	13	16	8.0	10	0.6
	0.22	FCS3BAX224*100C930A	13	14	8.0	10	0.6
	0.22	FCS3BAX224*100C730A	13	16	8.0	10	0.6
	0.22	FCS3BAX224*100D340A	15	12.5	7.0	12.5	0.6
	0.22	FCS3BAX224*100D540A	15	14	8.5	12.5	0.6
	0.27	FCS3BAX274*100D540A	15	14	8.5	12.5	0.6
	0.33	FCS3BAX334*100D540A	15	14	8.5	12.5	0.6
	0.33	FCS3BAX334*100D640A	15	16	10.0	12.5	0.6
	0.39	FCS3BAX394*100D640A	15	16	10.0	12.5	0.6
	0.47	FCS3BAX474*100D640A	15	16	10.0	12.5	0.6
	0.010	FCS3BAX103*100E250A	18	11	5.0	15	0.6
	0.012	FCS3BAX123*100E250A	18	11	5.0	15	0.6
	0.015	FCS3BAX153*100E250A	18	11	5.0	15	0.6
	0.018	FCS3BAX183*100E250A	18	11	5.0	15	0.6
	0.022	FCS3BAX223*100E250A	18	11	5.0	15	0.6
	0.027	FCS3BAX273*100E250A	18	11	5.0	15	0.6
	0.033	FCS3BAX333*100E250A	18	11	5.0	15	0.6
	0.039	FCS3BAX393*100E250A	18	11	5.0	15	0.6
	0.047	FCS3BAX473*100E250A	18	11	5.0	15	0.6
	0.056	FCS3BAX563*100E250A	18	11	5.0	15	0.6
	0.068	FCS3BAX683*100E250A	18	11	5.0	15	0.6
	0.068	FCS3BAX683*100E550A	18	12	6.0	15	0.6
	0.082	FCS3BAX823*100E250A	18	11	5.0	15	0.6
	0.082	FCS3BAX823*100E550A	18	12	6.0	15	0.6
	0.1	FCS3BAX104*100E250A	18	11	5.0	15	0.6



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
275/305	0.1	FCS3BAX104*100E550A	18	12	6.0	15	0.6
	0.1	FCS3BAX104*100E650A	18	13.5	6.0	15	0.6
	0.12	FCS3BAX124*100E250A	18	11	5.0	15	0.6
	0.12	FCS3BAX124*100E550A	18	12	6.0	15	0.6
	0.15	FCS3BAX154*100E250A	18	11	5.0	15	0.6
	0.15	FCS3BAX154*100E550A	18	12	6.0	15	0.6
	0.15	FCS3BAX154*100E750B	18	13.5	7.5	15	0.8
	0.15	FCS3BAX154*100E850B	18	14.5	8.5	15	0.8
	0.18	FCS3BAX184*100E550A	18	12	6.0	15	0.6
	0.18	FCS3BAX184*100E750B	18	13.5	7.5	15	0.8
	0.18	FCS3BAX184*100E850B	18	14.5	8.5	15	0.8
	0.22	FCS3BAX224*100E550A	18	12	6.0	15	0.6
	0.22	FCS3BAX224*100E750B	18	13.5	7.5	15	0.8
	0.22	FCS3BAX224*100E850B	18	14.5	8.5	15	0.8
	0.22	FCS3BAX224*100E950B	18	13	7	15	0.8
	0.22	FCS3BAX224*100EA50B	18	12.5	9	15	0.8
	0.27	FCS3BAX274*100E750B	18	13.5	7.5	15	0.8
	0.27	FCS3BAX274*100E850B	18	14.5	8.5	15	0.8
	0.33	FCS3BAX334*100E950B	18	13	7	15	0.8
	0.33	FCS3BAX334*100E850B	18	14.5	8.5	15	0.8
	0.33	FCS3BAX334*100E50B	18	14	8	15	0.8
	0.33	FCS3BAX334*100EC50B	18	16	10	15	0.8
	0.33	FCS3BAX334*100ED50B	18	16	8	15	0.8
	0.33	FCS3BAX334*100EA50B	18	12.5	9	15	0.8
	0.39	FCS3BAX394*100EA50B	18	13.5	7.5	15	0.8
	0.39	FCS3BAX394*100E850B	18	14	8	15	0.8
	0.39	FCS3BAX394*100EC50B	18	16	10	15	0.8
	0.39	FCS3BAX394*100EF50B	18	18	9	15	0.8
	0.47	FCS3BAX474*100EA50B	18	12.5	9	15	0.8
	0.47	FCS3BAX474*100EG50B	18	19	11	15	0.8
	0.47	FCS3BAX474*100EF50B	18	18	9	15	0.8
	0.47	FCS3BAX474*100EC50B	18	16	10	15	0.8
	0.56	FCS3BAX564*100EC50B	18	16	10	15	0.8
	0.56	FCS3BAX564*100EA50B	18	12.5	9	15	0.8
	0.56	FCS3BAX564*100EH50B	18	18	10	15	0.8
	0.56	FCS3BAX564*100EG50B	18	19	11	15	0.8
	0.68	FCS3BAX684*100EC50B	18	16	10	15	0.8
	0.68	FCS3BAX684*100EF50B	18	18	9	15	0.8
	0.68	FCS3BAX684*100EG50B	18	19	11	15	0.8
	0.68	FCS3BAX684*100EI50B	18	22	12.5	15	0.8
	0.82	FCS3BAX824*100EH50B	18	18	10	15	0.8
	0.82	FCS3BAX824*100EG50B	18	19	11	15	0.8
	1.0	FCS3BAX105*100EG50B	18	19	11	15	0.8
	0.15	FCS3BAX154*100B270B	26.0	16.5	7.0	22.5	0.8
	0.18	FCS3BAX184*100B270B	26.0	16.5	7.0	22.5	0.8
	0.22	FCS3BAX224*100B270B	26.0	16.5	7.0	22.5	0.8
	0.27	FCS3BAX274*100B270B	26.0	16.5	7.0	22.5	0.8
	0.33	FCS3BAX334*100B270B	26.0	16.5	7.0	22.5	0.8
	0.33	FCS3BAX334*100B370B	26.0	17	8.5	22.5	0.8
	0.39	FCS3BAX394*100B270B	26.0	16.5	7.0	22.5	0.8
	0.39	FCS3BAX394*100B370B	26.0	17	8.5	22.5	0.8
	0.47	FCS3BAX474*100B270B	26.0	16.5	7.0	22.5	0.8
	0.47	FCS3BAX474*100B370B	26.0	17.0	8.5	22.5	0.8
	0.47	FCS3BAX474*100B470B	26.0	19	10	22.5	0.8
	0.56	FCS3BAX564*100B270B	26.0	16.5	7.0	22.5	0.8
	0.56	FCS3BAX564*100B370B	26.0	17.0	8.5	22.5	0.8
	0.56	FCS3BAX564*100B470B	26.0	19.0	10.0	22.5	0.8
	0.68	FCS3BAX684*100B270B	26.0	16.5	7.0	22.5	0.8
	0.68	FCS3BAX684*100B370B	26.0	17.0	8.5	22.5	0.8
	0.68	FCS3BAX684*100B470B	26.0	19.0	10.0	22.5	0.8
	0.82	FCS3BAX824*100B370B	26.0	17.0	8.5	22.5	0.8
	0.82	FCS3BAX824*100B470B	26.0	19.0	10.0	22.5	0.8
	0.82	FCS3BAX824*100B570B	26.0	20.0	11.0	22.5	0.8
	1.0	FCS3BAX105*100B470B	26.0	19.0	10.0	22.5	0.8
	1.0	FCS3BAX105*100B570B	26.0	20.0	11.0	22.5	0.8
	1.0	FCS3BAX105*100B670B	26.0	23.0	13.0	22.5	0.8
	1.2	FCS3BAX125*100B470B	26.0	19.0	10.0	22.5	0.8
	1.2	FCS3BAX125*100B570B	26.0	20.0	11.0	22.5	0.8
	1.2	FCS3BAX125*100B770B	26.0	22.0	12.0	22.5	0.8
	1.2	FCS3BAX125*100B670B	26.0	23.0	13.0	22.5	0.8
	1.5	FCS3BAX155*100B770B	26.0	22.0	12.0	22.5	0.8
	1.5	FCS3BAX155*100B670B	26.0	23.0	13.0	22.5	0.8
	1.5	FCS3BAX155*100B870B	26.0	24.0	14.0	22.5	0.8
	1.8	FCS3BAX185*100B870B	26.0	24.0	14.0	22.5	0.8
	2.0	FCS3BAX205*100B970B	26.0	25	15.0	22.5	0.8
	2.0	FCS3BAX205*100BA70B	26.0	29.5	14.5	22.5	0.8
	2.2	FCS3BAX225*100B970B	26.0	25	15.0	22.5	0.8
	2.2	FCS3BAX225*100BA70B	26.0	29.5	14.5	22.5	0.8
	2.2	FCS3BAX225*100B870B	26.0	24.0	14.0	22.5	0.8
	2.2	FCS3BAX225*100B770B	26.0	22.0	12.0	22.5	0.8
275/305	0.47	FCS3BAX474*050I190B	32	18	9	27.5	0.8
	0.56	FCS3BAX564*050I190B	32	18	9	27.5	0.8
	0.68	FCS3BAX684*050I190B	32	18	9	27.5	0.8
	0.68	FCS3BAX684*050I490B	32	20	11	27.5	0.8
	0.82	FCS3BAX824*050I490B	32	20	11	27.5	0.8
	1.0	FCS3BAX105*050I490B	32	20	11	27.5	0.8
	1.0	FCS3BAX105*050I790B	32	22	13	27.5	0.8
	1.2	FCS3BAX125*050I790B	32	22	13	27.5	0.8
	1.2	FCS3BAX125*050I890B	32	24.5	13	27.5	0.8
	1.5	FCS3BAX155*050I790B	32	22	13	27.5	0.8
	1.5	FCS3BAX155*050I890B	32	24.5	13	27.5	0.8
	2.0	FCS3BAX205*050I90B	32	28	14	27.5	0.8



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
275/305	2.0	FCS3BAX205*050ID90B	32	28	18	27.5	0.8
	2.2	FCS3BAX225*050IC90B	32	28	14	27.5	0.8
	2.2	FCS3BAX225*050ID90B	32	28	18	27.5	0.8
	2.2	FCS3BAX225*050IF90B	32	22	13	27.5	0.8
	3.0	FCS3BAX305*050IF90B	32	33	18	27.5	0.8
	3.3	FCS3BAX335*050IF90B	32	33	18	27.5	0.8
	4.7	FCS3BAX475*050IF90B	32	37	22	27.5	0.8
	3.9	FCS3BAX395*050F4C0C	42.5	28	19	37.5	1.0
	4.7	FCS3BAX475*050F5C0C	42.5	32	19	37.5	1.0
	5.6	FCS3BAX565*050F5C0C	42.5	32	19	37.5	1.0
	5.6	FCS3BAX565*050F2C0C	42.5	40	20	37.5	1.0
	6.8	FCS3BAX685*050F8C0C	42.5	42	28	37.5	1.0
	6.8	FCS3BAX685*050F2C0C	42.5	40	20	37.5	1.0
	6.8	FCS3BAX685*050F9C0C	42.5	44	24	37.5	1.0
	8.2	FCS3BAX825*050F2C0C	42.5	40	20	37.5	1.0
	8.2	FCS3BAX825*050FHC0C	42.5	43	28	37.5	1.0
	10.0	FCS3BAX106*050FHC0C	42.5	43	28	37.5	1.0
	10.0	FCS3BAX106*050FFC0C	42.5	45	30	37.5	1.0
	12.0	FCS3BAX126*050F9C0C	42.5	44	24	37.5	1.0
	12.0	FCS3BAX126*050F1C0C	42.5	37	28	37.5	1.0
	15.0	FCS3BAX156*050F9C0C	42.5	44	24	37.5	1.0
	15.0	FCS3BAX156*050F1C0C	42.5	37	28	37.5	1.0
	15.0	FCS3BAX156*050FFC0C	42.5	45	30	37.5	1.0
	18.0	FCS3BAX186*050FHC0C	42.5	43	28	37.5	1.0
	18.0	FCS3BAX186*050FFC0C	42.5	45	30	37.5	1.0
	20.0	FCS3BAX206*050FHC0C	42.5	43	28	37.5	1.0
	20.0	FCS3BAX206*050FFC0C	42.5	45	30	37.5	1.0
	22.0	FCS3BAX226*050FKC0C	42.5	50	35	37.5	1.0
	11.0	FCS3BAX116*050HHF0D	57.5	45	30	52.5	1.2
	12.0	FCS3BAX126*050HHF0D	57.5	45	30	52.5	1.2
	15.0	FCS3BAX156*050HHF0D	57.5	45	30	52.5	1.2
	18.0	FCS3BAX186*050HHF0D	57.5	45	30	52.5	1.2
	20.0	FCS3BAX206*050H1F0D	57.5	45	25	52.5	1.2
	20.0	FCS3BAX206*050HHF0D	57.5	45	30	52.5	1.2
	22.0	FCS3BAX226*050HHF0D	57.5	45	30	52.5	1.2
	25.0	FCS3BAX256*050H1F0D	57.5	45	25	52.5	1.2
	25.0	FCS3BAX256*050HHF0D	57.5	45	30	52.5	1.2
	27.0	FCS3BAX276*050HHF0D	57.5	45	30	52.5	1.2
	30.0	FCS3BAX306*050HHF0D	57.5	45	30	52.5	1.2
	30.0	FCS3BAX306*050HLF0D	57.5	50	35	52.5	1.2
	33.0	FCS3BAX336*050HHF0D	57.5	45	30	52.5	1.2
	33.0	FCS3BAX336*050HLF0D	57.5	50	35	52.5	1.2
	39.0	FCS3BAX396*050HHF0D	57.5	45	30	52.5	1.2
	39.0	FCS3BAX396*050HLF0D	57.5	50	35	52.5	1.2
	40.0	FCS3BAX406*050HLF0D	57.5	50	35	52.5	1.2
	45.0	FCS3BAX456*050H2F0D	57.5	60	45	52.5	1.2
	45.0	FCS3BAX456*050H3F0D	57.5	70	55	52.5	1.2

\*推荐最大额定电源电压250Vac应用;

Recommend for max rated supply mains voltage 250Vac application;

\*以上规格参数为标准品尺寸推荐，如需更高性能的规格，请与我司技术部工程师联系，可根据客户要求定制。

The above specifications and parameters are recommended for standard size. If you need higher performance specifications, please contact our technical engineer., Customer products are available on request.



# CBB312(高温) AH SERIES



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
F	C	S	3	B	A	H	2	2	4	K	0	3	5	E	7	5	0	B	H			
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		引线类型 Pin Style		引线长度 Lead Length		外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1		引线 间距 Pitch P2		引线 直径 Lead diameter		高性能 附加条件 subsidiary conditions	
Film Capacitor =FC	Square=S	305=3B	CBB312 125℃高温膜=AH	0.22=224	±5%=J	2pin, straight =0		long-lead 20min=00		18*13.5*7.5=E7	5=1	0=0	0.5=E	125℃=H								
						±10%=K		2pin, long-leaded =1							3.5=35							
						±20%=M		4in, straight =2							13=A0							
		2pin, Straight Taping 12.7=3		15=A1		12.5=4		10.2=3		1.0=C												
		2pin, Straight Taping 15=4		17.5=A2		15=5		12.7=4		1.2=D												
		2pin, Taping 5&5=5		25=B0		20=6		15=5														
		2pin, Taping 7.5&5=6		30=C0		22.5=7		15.2=6														
		2pin, Taping 7.5&7.5=7		35=C1		25=8		16.1=7														
		2pin, Taping 10&7.5=8		55=E0		27.5=9		20=8														
		2pin, Taping 10&10=9		100=J0		30=A		20.3=9														
		2pin, Taping 15&7.5=A		32.5=B																		
		2pin, Taping 15&10=B		37.5=C																		
		2pin, Taping 15&15=C		42.5=D																		
		2pin, Kinked 5&5=D		45=E																		
		2pin, Kinked 7.5&5=E		52.5=F																		
		2pin, Kinked 7.5&7.5=F																				
		2pin, Kinked 10&7.5=G																				
		2pin, Kinked 10&10=H																				
		2pin, Kinked 15&7.5=I																				
		2pin, Kinked 15&10=J																				
		2pin, Kinked 15&15 =K																				
		2pin, Y Kinked =L																				
		2pin, Z Kinked =M																				

\*外壳尺寸表



## Features

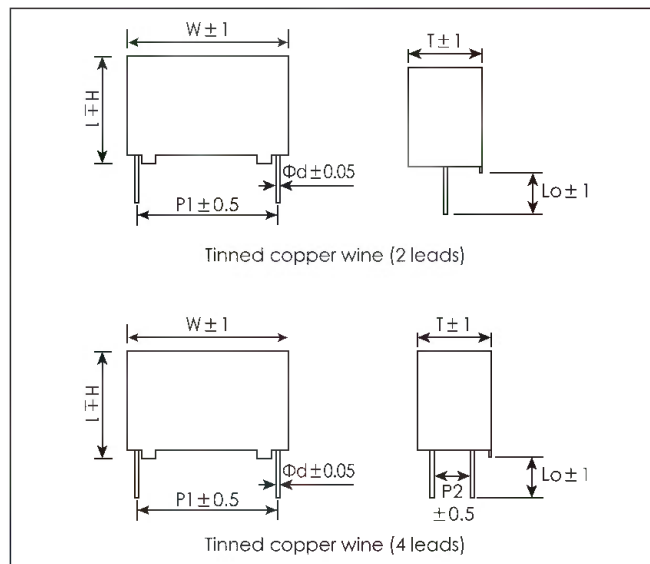
- Self-healing properties
- High moisture resistance.
- Overvoltage stress withstanding.
- Flame-retardant plastic case and epoxy resin.

## 特点

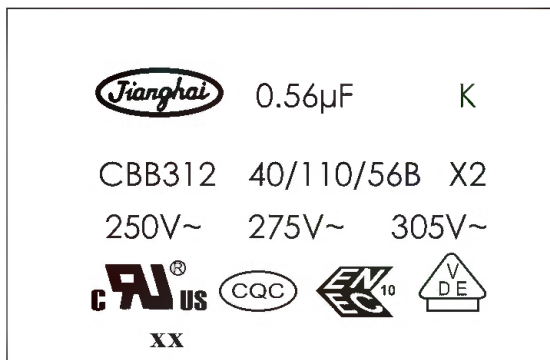
- 自愈特性
- 耐湿强度高
- 能承受过压冲击
- 阻燃胶壳和环氧树脂

## 外形图 Dimensions

Unit: mm



## 标识 Marking



NO.	项目 Item
1	商标、产品系列以及额定电压 Brand、Products series and Rated voltage
2	容量、偏差以及年度标记 Capacitance、Tolerance and Year code
3	安全认证 Safety Approvals

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	GB/T 14472 (IEC 60384-14), AEC-Q200
工作温度范围 Operating Temperature Range	-40~+125℃
电容量范围 Capacitance Range	0.01~25.0μF
电容量偏差 Capacitance Tolerance	±10% (K), ±20% (M)
额定电压 U <sub>R</sub> Rated Voltage	275Vac, 305Vac (50Hz/60Hz)
损耗 Dissipation Factor	0.0047μF ≤ C < 1.0μF : ≤ 0.15% (1KHz, 25℃) 1.0μF ≤ C < 10μF : ≤ 0.25% (1KHz, 25℃) 10μF ≤ C < 45μF : ≤ 0.30% (1KHz, 25℃)
绝缘电阻 Insulation Resistance (IR <sub>C<sub>N</sub></sub> )	R ≥ 15000MΩ, C <sub>R</sub> ≤ 0.33μF RC <sub>R</sub> ≥ 5000s, C <sub>R</sub> > 0.33μF (20℃, 100Vdc, 1min)
端子与端子间耐压U <sub>TT</sub> Voltage Between Terminals	4.3U <sub>R</sub> (Vdc), 2s
端子与外壳间耐压U <sub>TC</sub> Voltage Between Terminals and Case	2120Vac, 1min



## 规格标准 Standard Ratings

$U_r$	$C_r$	P/N	W	H	T	P1	d
(Vac)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(mm)
275/305	0.010	FCS3BAH103*100C430A	13	11	5.0	10	0.6
	0.022	FCS3BAH223*100C430A	13	11	5.0	10	0.6
	0.033	FCS3BAH333*100C430A	13	11	5.0	10	0.6
	0.047	FCS3BAH473*100C530A	13	12	6.0	10	0.6
	0.1	FCS3BAH104*100C530A	13	12	6.0	10	0.6
	0.1	FCS3BAH104*100E250A	18	11	5.0	15	0.6
	0.15	FCS3BAH154*100E550A	18	12	6.0	15	0.6
	0.22	FCS3BAH224*100E750B	18	13.5	7.5	15	0.8
	0.33	FCS3BAH334*100E850B	18	14.5	8.5	15	0.8
	0.47	FCS3BAH474*100E50B	18	16	10	15	0.8
	0.68	FCS3BAH684*100E50B	18	19	11	15	0.8
	0.33	FCS3BAH334*100B370B	26.0	17	8.5	22.5	0.8
	0.47	FCS3BAH474*100B370B	26.0	17	8.5	22.5	0.8
	0.68	FCS3BAH684*100B470B	26.0	19	10	22.5	0.8
	1.0	FCS3BAH105*100B570B	26.0	20	11	22.5	0.8
	1.5	FCS3BAH155*100B870B	26.0	24	14	22.5	0.8
	2.2	FCS3BAH225*100B970B	26.0	25	15	22.5	0.8
	0.33	FCS3BAH474*050I190B	32	18	9	27.5	0.8
	0.68	FCS3BAH684*050I490B	32	20	11	27.5	0.8
	1.0	FCS3BAH105*050I490B	32	20	11	27.5	0.8
	1.5	FCS3BAH155*050I790B	32	22	13	27.5	0.8
	2.2	FCS3BAH225*050I90B	32	28	14	27.5	0.8
	3.3	FCS3BAH335*050I90B	32	33	18	27.5	0.8
	4.7	FCS3BAH475*050I90B	32	37	22	27.5	0.8
	10.0	FCS3BAH106*050FFC0C	42.5	45	30	37.5	1.0
	15.0	FCS3BAH156*050HHF0D	57.5	45	30	52.5	1.2
	20.0	FCS3BAH206*050HHF0D	57.5	45	30	52.5	1.2
	25.0	FCS3BAH256*050HLF0D	57.5	50	35	52.5	1.2

\*推荐最大额定电源电压250Vac应用;

Recommend for max rated supply mains voltage 250Vac application;

\*以上规格参数为标准品尺寸推荐, 如需更高性能的规格, 请与我司技术部工程师联系, 可根据客户要求定制。

The above specifications and parameters are recommended for standard size. If you need higher performance specifications, please contact our technical engineer., Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	3	A	A	F	1	0	3	M	0	3	5	E	2	5	0	A	G
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (AC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance		引线类型 Pin Style	引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code	引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions				
Film Capacitor =FC	Square=S	300=3A	CBB322=AF			0.01=103	±10%=K		2pin, straight =0	long-lead 20min=00	18*11*5=E2	5=1	0=0	0.6=A	Standard product=None				
		330=3D					±20%=M		2pin, long-leaded =1	3.5=35		7.5=2	5.1=1	0.8=B	High temperature high humidity loading=G				
									4in, straight =2	13=A0		10=3	10=2	1.0=C	Automotive grade=I				
									2pin, Straight Taping 12.7=3	15=A1		12.5=4	10.2=3	1.2=D	Security film=S				
									2pin, Straight Taping 15=4	17.5=A2		15=5	12.7=4	0.5=E	Smaller=X				
									2pin, Taping 5&5=5	25=B0		20=6	15=5		Halogen-free =N				
									2pin, Taping 7.5&5=6	30=C0		22.5=7	15.2=6		Low noise=F				
									2pin, Taping 7.5&7.5=7	35=C1		25=8	16.1=7						
									2pin, Taping 10&7.5=8	55=E0		27.5=9	20=8						
									2pin, Taping 10&10=9	100=J0		30=A	20.3=9						
									2pin, Taping 15&7.5=A			32.5=B							
									2pin, Taping 15&10=B			37.5=C							
									2pin, Taping 15&15=C			42.5=D							
									2pin, Kinked 5&5=D			45=E							
									2pin, Kinked 7.5&5=E			52.5=F							
									2pin, Kinked 7.5&7.5=F										
									2pin, Kinked 10&7.5=G										
									2pin, Kinked 10&10=H										
									2pin, Kinked 15&7.5=I										
									2pin, Kinked 15&10=J										
									2pin, Kinked 15&15=K										
									2pin, Y Kinked =L										
									2pin, Z Kinked =M										



## Features

- Self-healing properties
- High temperature (110°C)
- Overvoltage stress withstanding.
- Flame-retardant plastic case and epoxy resin

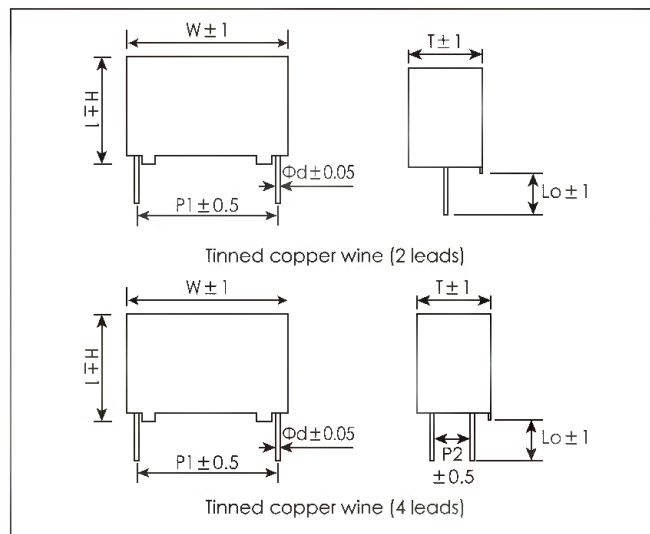
## 特点

- 自愈特性
- 耐温强度高(110°C)
- 能承受过压冲击
- 阻燃胶壳和环氧树脂

## 外形图 Dimensions




Unit: mm

## 标识 Marking



NO.	项目 Item
1	商标、产品系列以及额定电压 Brand、Products series and Rated voltage
2	容量、偏差以及年度标记 Capacitance、Tolerance and Year code
3	安全认证 Safety Approvals

## Approvals:

Mark	structure	File no
	UL / CUL	E483922
	ENEC	ENEC-03710
	CQC	CQC21001303067

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC 60384-14, EN 60384-14, UL 60384-14, AEC-Q200
气候类别 Climatic Category	40/110/56 IEC60068-1
工作温度范围 Operating Temperature Range	-40°C~+110°C
电容量范围 Capacitance Range	0.001μF~1.0μF
电容量偏差 Capacitance Tolerance	±10% or ±20% at +25°C
额定电压 U <sub>R</sub> Rated Voltage	300Vac/330Vac(50Hz/60Hz)
损耗 Dissipation Factor	≤ 0.003 (0.3%) at 1kHz at +25°C
绝缘电阻 Insulation Resistance (IR* <i>C<sub>R</sub></i> )	R ≥ 15000 MΩ, C <sub>R</sub> ≤ 0.33μF RC <sub>R</sub> ≥ 5000 s, C <sub>R</sub> > 0.33μF (20°C, 100Vdc, 1min)
端子与端子耐压U <sub>TT</sub> Voltage Between Terminals	4000Vdc 2s, C <sub>R</sub> ≤ 0.33μF 3700Vdc 2s, C <sub>R</sub> > 0.33μF
端子与铝壳耐压U <sub>TC</sub> Voltage Between Terminals and Case	2 <sub>UR</sub> +1500 Vac 50/60Hz for 60 sec at +25°C



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
300/330	0.001	FCS3AAF102*100C430A	13	11	5	10	0.6
	0.0022	FCS3AAF222*100C430A	13	11	5	10	0.6
	0.0047	FCS3AAF472*100C430A	13	11	5	10	0.6
	0.0056	FCS3AAF562*100C430A	13	12	6	10	0.6
	0.0068	FCS3AAF682*100C430A	13	12	6	10	0.6
	0.0082	FCS3AAF822*100C530A	13	12	6	10	0.6
	0.01	FCS3AAF103*100C530A	13	12	6	10	0.6
	0.012	FCS3AAF123*100C530A	13	12	6	10	0.6
	0.015	FCS3AAF153*100C530A	13	12	6	10	0.6
	0.0022	FCS3AAF222*100E250A	18	11	5	15	0.6
	0.0027	FCS3AAF272*100E250A	18	11	5	15	0.6
	0.0033	FCS3AAF332*100E250A	18	11	5	15	0.6
	0.0039	FCS3AAF392*100E250A	18	11	5	15	0.6
	0.0047	FCS3AAF472*100E250A	18	11	5	15	0.6
	0.0056	FCS3AAF562*100E250A	18	11	5	15	0.6
	0.0068	FCS3AAF682*100E250A	18	11	5	15	0.6
	0.0082	FCS3AAF822*100E250A	18	11	5	15	0.6
	0.01	FCS3AAF103*100E250A	18	11	5	15	0.6
	0.012	FCS3AAF123*100E250A	18	11	5	15	0.6
	0.015	FCS3AAF153*100E250A	18	11	5	15	0.6
	0.018	FCS3AAF183*100E550A	18	12	6	15	0.6
	0.022	FCS3AAF223*100E550A	18	12	6	15	0.6
	0.027	FCS3AAF273*100E950B	18	13	7	15	0.8
	0.033	FCS3AAF333*100E950B	18	13.5	7.5	15	0.8
	0.039	FCS3AAF393*100E950B	18	13.5	7.5	15	0.8
	0.047	FCS3AAF473*100E850B	18	14.5	8.5	15	0.8
	0.056	FCS3AAF563*100EC50B	18	16	10	15	0.8
	0.068	FCS3AAF683*100EC50B	18	16	10	15	0.8
	0.082	FCS3AAF823*100EG50B	18	19	11	15	0.8
	0.033	FCS3AAF333*100BE70A	26	15.5	6	22.5	0.6
	0.039	FCS3AAF393*100BE70A	26	15.5	6	22.5	0.6
	0.047	FCS3AAF473*100BE70A	26	15.5	6	22.5	0.6
	0.056	FCS3AAF563*100BE70A	26	15.5	6	22.5	0.6
	0.068	FCS3AAF683*100B270B	26	16.5	7	22.5	0.8
	0.082	FCS3AAF823*100B270B	26	16.5	7	22.5	0.8
	0.1	FCS3AAF104*100B370B	26	17	8.5	22.5	0.8
	0.12	FCS3AAF124*100B370B	26	17	8.5	22.5	0.8
	0.15	FCS3AAF154*100B470B	26	19	10	22.5	0.8
	0.18	FCS3AAF184*100B570B	26	20	11	22.5	0.8
	0.22	FCS3AAF224*100B770B	26	22	12	22.5	0.8
	0.27	FCS3AAF274*100BD70B	26	24.5	13	22.5	0.8
	0.33	FCS3AAF334*100B970B	26	25	15	22.5	0.8
	0.39	FCS3AAF394*100BA70B	26	29.5	14.5	22.5	0.8
	0.1	FCS3AAF104*050I190B	32	18	9	27.5	0.8
	0.12	FCS3AAF124*050I190B	32	18	9	27.5	0.8
	0.15	FCS3AAF154*050I190B	32	18	9	27.5	0.8
	0.18	FCS3AAF184*050I490B	32	20	11	27.5	0.8
	0.22	FCS3AAF224*050I490B	32	20	11	27.5	0.8
	0.27	FCS3AAF274*050I790B	32	22	13	27.5	0.8
	0.33	FCS3AAF334*050I890B	32	24.5	13	27.5	0.8
	0.39	FCS3AAF394*050I90B	32	28	14	27.5	0.8
	0.47	FCS3AAF474*050ID90B	32	28	18	27.5	0.8
	0.56	FCS3AAF564*050ID90B	32	28	18	27.5	0.8
	0.68	FCS3AAF684*050IF90B	32	33	18	27.5	0.8
	0.82	FCS3AAF824*050I190B	32	37	22	27.5	0.8
	1.00	FCS3AAF105*050I190B	32	37	22	27.5	0.8
	0.39	FCS3AAF394*050FZC0C	42.5	24	13	37.5	1.0
	0.47	FCS3AAF474*050FZC0C	42.5	24	13	37.5	1.0
	0.56	FCS3AAF564*050FPC0C	42.5	26	15	37.5	1.0
	0.82	FCS3AAF824*050F4C0C	42.5	28	19	37.5	1.0
	1.00	FCS3AAF105*050F5C0C	42.5	32	19	37.5	1.0

U <sub>r</sub>	C <sub>r</sub>	P/N	W	H	T	P1	d
(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(mm)
300/330	0.82	FCS3AAF824*050F4C0C	42.5	28	19	37.5	1.0
	1.00	FCS3AAF105*050F5C0C	42.5	32	19	37.5	1.0
	0.033	FCS3AAF333*100BE70A	26	15.5	6	22.5	0.6
	0.039	FCS3AAF393*100BE70A	26	15.5	6	22.5	0.6
	0.047	FCS3AAF473*100BE70A	26	15.5	6	22.5	0.6
	0.056	FCS3AAF563*100BE70A	26	15.5	6	22.5	0.6
	0.068	FCS3AAF683*100B270B	26	16.5	7	22.5	0.8
	0.082	FCS3AAF823*100B270B	26	16.5	7	22.5	0.8
	0.1	FCS3AAF104*100B370B	26	17	8.5	22.5	0.8
	0.12	FCS3AAF124*100B370B	26	17	8.5	22.5	0.8
	0.15	FCS3AAF154*100B470B	26	19	10	22.5	0.8
	0.18	FCS3AAF184*100B570B	26	20	11	22.5	0.8
	0.22	FCS3AAF224*100B770B	26	22	12	22.5	0.8
	0.27	FCS3AAF274*100BD70B	26	24.5	13	22.5	0.8
	0.33	FCS3AAF334*100B970B	26	25	15	22.5	0.8
	0.39	FCS3AAF394*100BA70B	26	29.5	14.5	22.5	0.8
	0.1	FCS3AAF104*050I190B	32	18	9	27.5	0.8
	0.12	FCS3AAF124*050I190B	32	18	9	27.5	0.8
	0.15	FCS3AAF154*050I190B	32	18	9	27.5	0.8
	0.18	FCS3AAF184*050I490B	32	20	11	27.5	0.8
	0.22	FCS3AAF224*050I490B	32	20	11	27.5	0.8
	0.27	FCS3AAF274*050I790B	32	22	13	27.5	0.8
	0.33	FCS3AAF334*050I890B	32	24.5	13	27.5	0.8
	0.39	FCS3AAF394*050I90B	32	28	14	27.5	0.8
	0.47	FCS3AAF474*050ID90B	32	28	18	27.5	0.8
	0.56	FCS3AAF564*050ID90B	32	28	18	27.5	0.8
	0.68	FCS3AAF684*050IF90B	32	33	18	27.5	0.8
	0.82	FCS3AAF824*050I190B	32	37	22	27.5	0.8
	1.00	FCS3AAF105*050I190B	32	37	22	27.5	0.8
	0.39	FCS3AAF394*050FZC0C	42.5	24	13	37.5	1.0
	0.47	FCS3AAF474*050FZC0C	42.5	24	13	37.5	1.0
	0.56	FCS3AAF564*050FPC0C	42.5	26	15	37.5	1.0
	0.82	FCS3AAF824*050F4C0C	42.5	28	19	37.5	1.0
	1.00	FCS3AAF105*050F5C0C	42.5	32	19	37.5	1.0

以上规格参数为标准品尺寸推荐，如需更高性能的规格，请与我司技术部工程师联系，可根据客户要求定制。

The above specifications and parameters are recommended for standard size. If you need higher performance specifications, please contact our technical engineer., Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	2	E	I	M	2	2	4	K	0	3	5	E	2	5	0	A	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)			系列代码 Series Code		容量代码 Capacitance Code			容量偏差 Capacitance Tolerance	引线类型 Pin Style	引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code		引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions	
Film Capacitor =FC	Square=S	250=2E			CBB21=IM		0.22=224			±5%=J	2pin, straight =0	long-lead 20min=00	18*11*5 =E2		5=1	0=0	0.5=E	Standard product=None	
										±10%=K	2pin, long-leaded =1	3.5=35			7.5=2	5.1=1	0.6=A	High temperature high humidity loading=G	
										±20%=M	4in, straight =2	13=A0			10=3	10=2	0.8=B	Automotive grade=I	
											2pin, Straight Taping 12.7=3	15=A1			12.5=4	10.2=3	1.0=C	Security film=S	
											2pin, Straight Taping 15=4	17.5=A2			15=5	12.7=4	1.2=D	Smaller=X	
											2pin, Taping 5&5=5	25=B0			20=6	15=5		Halogen-free =N	
											2pin, Taping 7.5&5=6	30=C0			22.5=7	15.2=6		Low noise=F	
											2pin, Taping 7.5&7.5=7	35=C1			25=8	16.1=7			
											2pin, Taping 10&7.5=8	55=E0			27.5=9	20=8			
											2pin, Taping 10&10=9	100=J0			30=A	20.3=9			
											2pin, Taping 15&7.5=A				32.5=B				
											2pin, Taping 15&10=B				37.5=C				
											2pin, Taping 15&15=C				42.5=D				
											2pin, Kinked 5&5=D				45=E				
											2pin, Kinked 7.5&5=E				52.5=F				
											2pin, Kinked 7.5&7.5=F								
											2pin, Kinked 10&7.5=G								
											2pin, Kinked 10&10=H								
											2pin, Kinked 15&7.5=I								
											2pin, Kinked 15&10=J								
											2pin, Kinked 15&15=K								
											2pin, Y Kinked =L								
											2pin, Z Kinked =M								



## Features

- High ripple current
- Self-healing property
- Low losses.
- Small inherent temperature rise
- High contact reliability
- Suitable for high frequency applications

## Applications

- Widely used in high frequency, DC, AC and pulse circuits
- S-correction circuits for TV sets and monitors
- ballasts and compa

## 特点

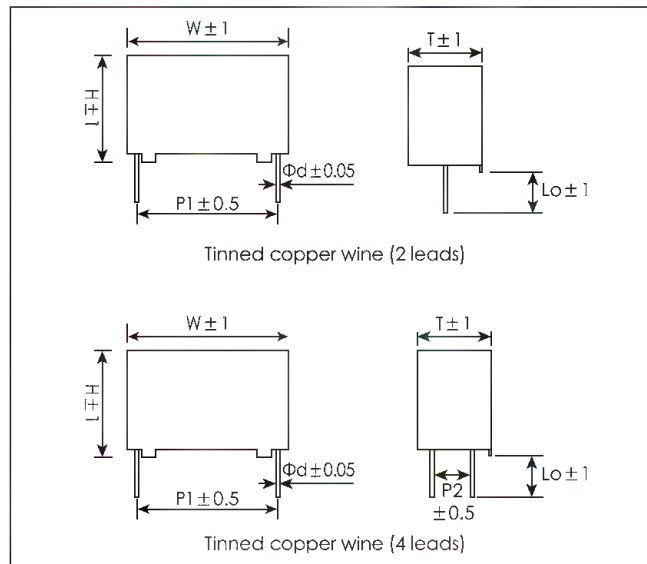
- 高电流
- 自愈性好
- 低功耗
- 内部温升小
- 高可靠性
- 适用于高频应用

## 应用场合

- 广泛应用于高频、直流、交流和脉冲电路
- 应用在显示器及 TV 的 S 校正电路
- 镇流器和紧凑型灯具

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	1
CBB21	2
0.1 μF J 250VDC	3
F11	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC60384-16
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ (+85℃to+105℃: decreasing factor 1.25% per℃for UR)
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_r$ Rated Voltage	100~630Vdc
电容量范围 Capacitance Range	0.01~33μF
电容量偏差 Capacitance Tolerance	± 5%(J), ± 10%(K)
端子与端子电压 $U_{tr}$ Voltage Between Terminals	1.5 $U_r$ , 10s (20℃)
端子与铝壳电压 $U_{tc}$ Voltage Between Terminals and Case	2000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	0.001 (20℃, 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $I R \cdot C_N$ )	$R \geq 100\,000\,M\Omega$ , $C_N \leq 0.33\,\mu F$ $R C_N \geq 30\,000s$ , $C_N > 0.33\,\mu F$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_r$ , $\theta_{hotspot} = 70\,^{\circ}C$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

U <sub>R</sub>	U <sub>R</sub>	C <sub>ap</sub>	P/N	W	H	T	P1	I	dv/dt	D
(Vdc)	(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
100	50	0.10	FCS2AIM104*100C430A	13.0	11.0	5.0	10.0	18.0	180	0.6
100	50	0.12	FCS2AIM124*100C430A	13.0	11.0	5.0	10.0	21.6	180	0.6
100	50	0.15	FCS2AIM154*100C430A	13.0	11.0	5.0	10.0	27.0	180	0.6
100	50	0.18	FCS2AIM184*100C530A	13.0	12.0	6.0	10.0	32.4	180	0.6
100	50	0.22	FCS2AIM224*100C530A	13.0	12.0	6.0	10.0	39.6	180	0.6
100	50	0.27	FCS2AIM274*100E550A	18.0	12.0	6.0	15.0	27.0	100	0.6
100	50	0.33	FCS2AIM334*100E550A	18.0	12.0	6.0	15.0	33.0	100	0.6
100	50	0.39	FCS2AIM394*100E750B	18.0	13.5	7.5	15.0	39.0	100	0.8
100	50	0.47	FCS2AIM474*100E750B	18.0	13.5	7.5	15.0	47.0	100	0.8
100	50	0.56	FCS2AIM564*100E850B	18.0	14.5	8.5	15.0	56.0	100	0.8
100	50	0.68	FCS2AIM684*100E850B	18.0	14.5	8.5	15.0	68.0	100	0.8
100	50	0.82	FCS2AIM824*100EC50B	18.0	16.0	10.0	15.0	82.0	100	0.8
100	50	1.00	FCS2AIM105*100EC50B	18.0	16.0	10.0	15.0	100.0	100	0.8
100	50	1.20	FCS2AIM125*100B370B	26.0	17.0	8.5	22.5	72.0	60	0.8
100	50	1.50	FCS2AIM155*100B470B	26.0	19.0	10.0	22.5	90.0	60	0.8
100	50	1.80	FCS2AIM185*100B470B	26.0	19.0	10.0	22.5	108.0	60	0.8
100	50	2.20	FCS2AIM225*050I490B	32.0	20.0	11.0	27.5	110.0	50	0.8
100	50	2.70	FCS2AIM275*050I490B	32.0	20.0	11.0	27.5	135.0	50	0.8
100	50	3.30	FCS2AIM335*050I790B	32.0	22.0	13.0	27.5	165.0	50	0.8
100	50	3.90	FCS2AIM395*050I790B	32.0	22.0	13.0	27.5	195.0	50	0.8
100	50	4.70	FCS2AIM475*050I890B	32.0	24.5	13.0	27.5	235.0	50	0.8
100	50	5.60	FCS2AIM565*050IC90B	32.0	28.0	14.0	27.5	280.0	50	0.8
100	50	6.80	FCS2AIM685*050IF90B	32.0	33.0	18.0	27.5	340.0	50	0.8
100	50	8.20	FCS2AIM825*050IF90B	32.0	33.0	18.0	27.5	410.0	50	0.8
100	50	10.0	FCS2AIM106*050IF90B	32.0	31.0	21.0	27.5	500.0	50	0.8
100	50	10.0	FCS2AIM106*050II90B	32.0	37.0	22.0	27.5	500.0	50	0.8
100	50	12.0	FCS2AIM126*050II90B	32.0	37.0	22.0	27.5	600.0	50	0.8
100	50	12.0	FCS2AIM126*050F5C0C	42.5	32.0	19.0	37.5	420.0	35	1.0
100	50	15.0	FCS2AIM156*050F2C0C	42.5	40.0	20.0	37.5	525.0	35	1.0
100	50	18.0	FCS2AIM186*050F2C0C	42.5	40.0	20.0	37.5	630.0	35	1.0
100	50	22.0	FCS2AIM226*050F9C0C	42.5	44.0	24.0	37.5	770.0	35	1.0
100	50	27.0	FCS2AIM276*050FFC0C	42.5	45.0	30.0	37.5	945.0	35	1.0
100	50	33.0	FCS2AIM336*050FFC0C	42.5	45.0	30.0	37.5	1155.0	35	1.0
250	160	0.033	FCS2EIM333*100C430A	13.0	11.0	5.0	10.0	18.2	550	0.6
250	160	0.039	FCS2EIM393*100C430A	13.0	11.0	5.0	10.0	21.5	550	0.6
250	160	0.047	FCS2EIM473*100C430A	13.0	11.0	5.0	10.0	25.9	550	0.6
250	160	0.056	FCS2EIM563*100C430A	13.0	11.0	5.0	10.0	30.8	550	0.6
250	160	0.068	FCS2EIM683*100C430A	13.0	11.0	5.0	10.0	37.4	550	0.6
250	160	0.082	FCS2EIM823*100C430A	13.0	11.0	5.0	10.0	45.1	550	0.6
250	160	0.10	FCS2EIM104*100C430A	13.0	11.0	5.0	10.0	55.0	550	0.6
250	160	0.12	FCS2EIM124*100C530A	13.0	12.0	6.0	10.0	66.0	550	0.6
250	160	0.15	FCS2EIM154*100C530A	13.0	12.0	6.0	10.0	82.5	550	0.6
250	160	0.18	FCS2EIM184*100E250A	18.0	11.0	5.0	15.0	54.0	300	0.6
250	160	0.22	FCS2EIM224*100E250A	18.0	11.0	5.0	15.0	66.0	300	0.6
250	160	0.27	FCS2EIM274*100E550A	18.0	12.0	6.0	15.0	81.0	300	0.6
250	160	0.33	FCS2EIM334*100E550A	18.0	12.0	6.0	15.0	99.0	300	0.6
250	160	0.39	FCS2EIM394*100E750B	18.0	13.5	7.5	15.0	117.0	300	0.8
250	160	0.47	FCS2EIM474*100E750B	18.0	13.5	7.5	15.0	141.0	300	0.8
250	160	0.56	FCS2EIM564*100E750B	18.0	13.5	7.5	15.0	168.0	300	0.8
250	160	0.68	FCS2EIM684*100E850B	18.0	14.5	8.5	15.0	204.0	300	0.8
250	160	0.82	FCS2EIM824*100EC50B	18.0	16.0	10.0	15.0	246.0	300	0.8
250	160	1.00	FCS2EIM105*100EC50B	18.0	16.0	10.0	15.0	300.0	300	0.8
250	160	1.20	FCS2EIM125*100EG50B	18.0	19.0	11.0	15.0	360.0	300	0.8
250	160	1.20	FCS2EIM125*100B370B	26.0	17.0	8.5	22.5	150.0	125	0.8
250	160	1.50	FCS2EIM155*100B470B	26.0	19.0	10.0	22.5	187.5	125	0.8
250	160	1.80	FCS2EIM185*100B470B	26.0	19.0	10.0	22.5	225.0	125	0.8
250	160	2.20	FCS2EIM225*100B570B	26.0	20.0	11.0	22.5	275.0	125	0.8
250	160	2.70	FCS2EIM275*100B670B	26.0	23.0	13.0	22.5	337.5	125	0.8
250	160	3.30	FCS2EIM335*100B670B	26.0	23.0	13.0	22.5	412.5	125	0.8
250	160	3.90	FCS2EIM395*050I790B	32.0	22.0	13.0	27.5	390.0	100	0.8
250	160	4.70	FCS2EIM475*050I890B	32.0	24.5	13.0	27.5	470.0	100	0.8
250	160	5.60	FCS2EIM565*050IC90B	32.0	28.0	14.0	27.5	560.0	100	0.8



## 规格标准 Standard Ratings

U <sub>r</sub>	U <sub>r</sub>	C <sub>ap</sub>	P/N	W	H	T	P1	I	dv/dt	D
(Vdc)	(Vac)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
250	160	6.80	FCS2EIM685*050IF90B	32.0	33.0	18.0	27.5	680.0	100	0.8
250	160	8.20	FCS2EIM825*050IF90B	32.0	33.0	18.0	27.5	820.0	100	0.8
250	160	10.0	FCS2EIM106*050IF90B	32.0	37.0	22.0	27.5	1000.0	100	0.8
250	160	12.0	FCS2EIM126*050F5C0C	42.0	32.0	19.0	37.5	480.0	40	1.0
250	160	15.0	FCS2EIM156*050F2C0C	42.0	40.0	20.0	37.5	600.0	40	1.0
250	160	22.0	FCS2EIM226*050F9C0C	42.0	44.0	22.0	37.5	880.0	40	1.0
250	160	30.0	FCS2EIM306*050FFC0C	42.0	45.0	30.0	37.5	1200.0	40	1.0
400	220	0.015	FCS2GIM153*100C430A	13.0	11.0	5.0	10.0	18.0	1200	0.6
400	220	0.018	FCS2GIM183*100C430A	13.0	11.0	5.0	10.0	21.6	1200	0.6
400	220	0.022	FCS2GIM223*100C430A	13.0	11.0	5.0	10.0	26.4	1200	0.6
400	220	0.027	FCS2GIM273*100C430A	13.0	11.0	5.0	10.0	32.4	1200	0.6
400	220	0.033	FCS2GIM333*100C430A	13.0	11.0	5.0	10.0	39.6	1200	0.6
400	220	0.039	FCS2GIM393*100C430A	13.0	11.0	5.0	10.0	46.8	1200	0.6
400	220	0.047	FCS2GIM473*100C430A	13.0	11.0	5.0	10.0	56.4	1200	0.6
400	220	0.056	FCS2GIM563*100C530A	13.0	12.0	6.0	10.0	67.2	1200	0.6
400	220	0.068	FCS2GIM683*100C530A	13.0	12.0	6.0	10.0	81.6	1200	0.6
400	220	0.082	FCS2GIM823*100E250A	18.0	11.0	5.0	15.0	65.6	800	0.6
400	220	0.10	FCS2GIM104*100E250A	18.0	11.0	5.0	15.0	80.0	800	0.6
400	220	0.12	FCS2GIM124*100E550A	18.0	12.0	6.0	15.0	96.0	800	0.6
400	220	0.15	FCS2GIM154*100E550A	18.0	12.0	6.0	15.0	120.0	800	0.6
400	220	0.18	FCS2GIM184*100E750B	18.0	13.5	7.5	15.0	144.0	800	0.8
400	220	0.22	FCS2GIM224*100E750B	18.0	13.5	7.5	15.0	176.0	800	0.8
400	220	0.27	FCS2GIM274*100E750B	18.0	13.5	7.5	15.0	216.0	800	0.8
400	220	0.33	FCS2GIM334*100E850B	18.0	14.5	8.5	15.0	264.0	800	0.8
400	220	0.39	FCS2GIM394*100EC50B	18.0	16.0	10.0	15.0	312.0	800	0.8
400	220	0.47	FCS2GIM474*100EC50B	18.0	16.0	10.0	15.0	376.0	800	0.8
400	220	0.56	FCS2GIM564*100EG50B	18.0	19.0	11.0	15.0	448.0	800	0.8
400	220	0.68	FCS2GIM684*100B470B	26.0	19.0	10.0	22.5	204.0	300	0.8
400	220	0.82	FCS2GIM824*100B470B	26.0	19.0	10.0	22.5	246.0	300	0.8
400	220	1.00	FCS2GIM105*100B570B	26.0	20.0	11.0	22.5	300.0	300	0.8
400	220	1.20	FCS2GIM125*100B670B	26.0	23.0	13.0	22.5	360.0	300	0.8
400	220	1.50	FCS2GIM155*100B670B	26.0	23.0	13.0	22.5	450.0	300	0.8
400	220	1.80	FCS2GIM185*050I790B	32.0	22.0	13.0	27.5	234.0	130	0.8
400	220	2.20	FCS2GIM225*050I890B	32.0	24.5	13.0	27.5	286.0	130	0.8
400	220	2.70	FCS2GIM275*050IC90B	32.0	28.0	14.0	27.5	351.0	130	0.8
400	220	3.30	FCS2GIM335*050IF90B	32.0	33.0	18.0	27.5	429.0	130	0.8
400	220	3.90	FCS2GIM395*050IF90B	32.0	33.0	18.0	27.5	507.0	130	0.8
400	220	4.70	FCS2GIM475*050II90B	32.0	37.0	22.0	27.5	611.0	130	0.8
400	220	5.60	FCS2GIM565*050F5C0C	42.0	32.0	19.0	37.5	392.0	70	1.0
400	220	6.80	FCS2GIM685*050F2C0C	42.0	40.0	20.0	37.5	476.0	70	1.0
400	220	8.20	FCS2GIM825*050F2C0C	42.0	40.0	20.0	37.5	574.0	70	1.0
400	220	10.0	FCS2GIM106*050F9C0C	42.0	44.0	22.0	37.5	700.0	70	1.0
400	220	12.0	FCS2GIM126*050FFC0C	42.0	45.0	30.0	37.5	840.0	70	1.0
630	250	0.010	FCSJ2IM103*100C430A	13.0	11.0	5.0	10.0	15.0	1500	0.6
630	250	0.012	FCSJ2IM123*100C430A	13.0	11.0	5.0	10.0	18.0	1500	0.6
630	250	0.015	FCSJ2IM153*100C430A	13.0	11.0	5.0	10.0	22.5	1500	0.6
630	250	0.018	FCSJ2IM183*100C430A	13.0	11.0	5.0	10.0	27.0	1500	0.6
630	250	0.022	FCSJ2IM223*100C530A	13.0	12.0	6.0	10.0	33.0	1500	0.6
630	250	0.027	FCSJ2IM273*100E250A	18.0	11.0	5.0	15.0	27.0	1000	0.6
630	250	0.033	FCSJ2IM333*100E250A	18.0	11.0	5.0	15.0	33.0	1000	0.6
630	250	0.039	FCSJ2IM393*100E250A	18.0	11.0	5.0	15.0	39.0	1000	0.6
630	250	0.047	FCSJ2IM473*100E250A	18.0	11.0	5.0	15.0	47.0	1000	0.6
630	250	0.056	FCSJ2IM563*100E250A	18.0	11.0	5.0	15.0	56.0	1000	0.6
630	250	0.068	FCSJ2IM683*100E550A	18.0	12.0	6.0	15.0	68.0	1000	0.6
630	250	0.082	FCSJ2IM823*100E550A	18.0	12.0	6.0	15.0	82.0	1000	0.6
630	250	0.10	FCSJ2IM104*100E750B	18.0	13.5	7.5	15.0	100.0	1000	0.8
630	250	0.12	FCSJ2IM124*100E750B	18.0	13.5	7.5	15.0	120.0	1000	0.8
630	250	0.15	FCSJ2IM154*100E850B	18.0	14.5	8.5	15.0	150.0	1000	0.8
630	250	0.18	FCSJ2IM184*100EC50B	18.0	16.0	10.0	15.0	180.0	1000	0.8
630	250	0.22	FCSJ2IM224*100EC50B	18.0	16.0	10.0	15.0	220.0	1000	0.8
630	250	0.27	FCSJ2IM274*100EG50B	18.0	19.0	11.0	15.0	270.0	1000	0.8
630	250	0.33	FCSJ2IM334*100EG50B	18.0	19.0	11.0	15.0	330.0	1000	0.8



## 规格标准 Standard Ratings

$U_R$	$U_R$	$C_{ap}$	P/N	W	H	T	P1	$\hat{I}$	dv/dt	D
(Vdc)	(Vac)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
630	250	0.39	FCSJ2IM394*100B470B	26.0	19.0	10.0	22.5	156.0	400	0.8
630	250	0.47	FCSJ2IM474*100B570B	26.0	20.0	11.0	22.5	188.0	400	0.8
630	250	0.56	FCSJ2IM564*100B570B	26.0	20.0	11.0	22.5	224.0	400	0.8
630	250	0.68	FCSJ2IM684*100B670B	26.0	23.0	13.0	22.5	272.0	400	0.8
630	250	0.82	FCSJ2IM824*050I790B	32.0	22.0	13.0	27.5	147.6	180	0.8
630	250	1.00	FCSJ2IM105*050I790B	32.0	22.0	13.0	27.5	180.0	180	0.8
630	250	1.20	FCSJ2IM125*050IC90B	32.0	28.0	14.0	27.5	216.0	180	0.8
630	250	1.50	FCSJ2IM155*050IC90B	32.0	28.0	14.0	27.5	270.0	180	0.8
630	250	1.80	FCSJ2IM185*050IF90B	32.0	33.0	18.0	27.5	324.0	180	0.8
630	250	2.20	FCSJ2IM225*050IF90B	32.0	33.0	18.0	27.5	396.0	180	0.8
630	250	2.70	FCSJ2IM275*050IF90B	32.0	37.0	22.0	27.5	486.0	180	0.8
630	250	3.30	FCSJ2IM335*050F5C0C	42.0	32.0	19.0	37.5	297.0	90	1.0
630	250	3.90	FCSJ2IM395*050F2C0C	42.0	40.0	20.0	37.5	351.0	90	1.0
630	250	4.70	FCSJ2IM475*050F2C0C	42.0	40.0	20.0	37.5	423.0	90	1.0
630	250	5.60	FCSJ2IM565*050F9C0C	42.0	44.0	22.0	37.5	504.0	90	1.0
630	250	6.80	FCSJ2IM685*050FFC0C	42.0	45.0	30.0	37.5	612.0	90	1.0

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	2	E	I	J	2	2	4	K	B	0	0	1	5	0	0	B	5
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		引线类型 Pin Style	外壳尺寸代码* Dimension Code	引线间距 Pitch P1	引线间距 Pitch P2	引线直径 Lead diameter	图号 Style					
FC=薄膜电容器 FC=Film Capacitor	方型=S Square=S	100=2A	CBB22=IJ		0.22=224		±5%=J		4Pin 5mm=A	阻燃性环氧粉末封装 Flame retardant epoxy resin powder coating	10=10	0=00	0.6=A	Fig1 =1					
		±10%=K					2Pin 5mm=B	15=15	0.8=B		Fig2 =2								
							2Pin 长引线=C		1.0=C		Fig3 =3								
							4pin 4mm=S		1.2=D		Fig4 =4								
							2pin 8.2mm=E		0.5=E		Fig5 =5								
							2pin 9.2mm=D												
							2pin 3.2mm=V												
							2pin 3.5mm=U												
							2pin 4.5mm=T												



## Features

- Metallized polypropylene structure
- Self-healing property
- Low losses.
- Small inherent temperature rise
- High contact reliability
- Flame retardant epoxy resin powder coating (UL 94 V-0)

## 特点

- 高电流
- 自愈性好
- 低功耗
- 内部温升小
- 高可靠性
- 阻燃性环氧粉末封装

## Applications

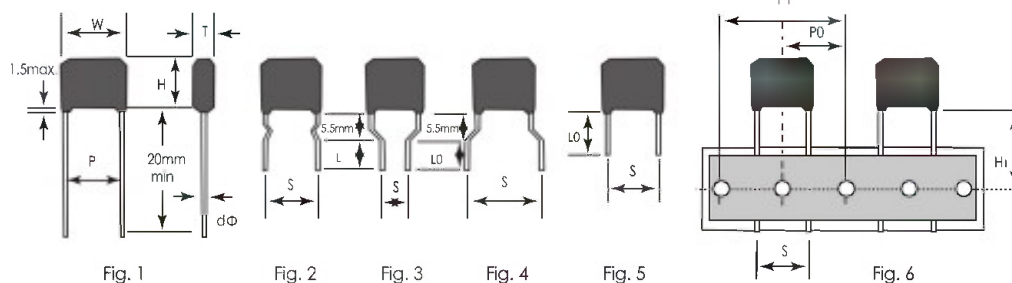
- As intermediate circuit capacitors for SMPS.
- Electronic Ballast, inverter (DC-link, DC-filter and PFC)

## 应用场合

- 用于开关电源, 电子整流器和变频器等中间电路
- 直流滤波(DC-link, DC-filter 和PFC)

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	——	1
CBB22	——	2
0.1 μF J 630VDC	——	3
N11	——	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC60384-16
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ (+85℃ to +105℃ : decreasing factor 1.25% per℃ for $U_R$ )
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	100~630Vdc
电容量范围 Capacitance Range	0.01~3.3μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20℃)
端子与外壳电压 $U_C$ Voltage Between Terminals and Case	2000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	0.001 (20℃ 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $R^*C_N$ )	$R \geq 100\,000\,M\Omega$ , $C_N \leq 0.33\,\mu F$ $R C_N \geq 30\,000s$ , $C_N > 0.33\,\mu F$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\Theta_{hotspot} = 70^\circ C$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>ap</sub>	P/N	W	H	T	PI	I	dv/dt	D
(Vdc)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
100	0.047	FCS2AIJ473**001000A*	13.0	10.5	6.0	10	8.5	180	0.6
100	0.056	FCS2AIJ563**001000A*	13.0	10.5	6.0	10	10.1	180	0.6
100	0.068	FCS2AIJ683**001000A*	13.0	10.5	6.0	10	12.2	180	0.6
100	0.082	FCS2AIJ823**001000A*	13.0	10.5	6.0	10	14.8	180	0.6
100	0.10	FCS2AIJ104**001000A*	13.0	10.5	6.0	10	18.0	180	0.6
100	0.12	FCS2AIJ124**001000A*	13.0	10.5	6.0	10	21.6	180	0.6
100	0.15	FCS2AIJ154**001000A*	13.0	11.0	6.5	10	27.0	180	0.6
100	0.18	FCS2AIJ184**001000A*	13.0	12.0	6.5	10	32.4	180	0.6
100	0.22	FCS2AIJ224**001000A*	13.0	12.5	7.0	10	39.6	180	0.6
100	0.27	FCS2AIJ274**001000A*	13.0	13.0	7.5	10	48.6	180	0.6
100	0.33	FCS2AIJ334**001500A*	18.5	12.5	6.5	15	33.0	100	0.6
100	0.39	FCS2AIJ394**001500A*	18.5	13.0	7.0	15	39.0	100	0.6
100	0.47	FCS2AIJ474**001500A*	18.5	13.5	7.5	15	47.0	100	0.6
100	0.56	FCS2AIJ564**001500B*	18.5	14.0	8.0	15	56.0	100	0.8
100	0.68	FCS2AIJ684**001500B*	18.5	14.5	9.0	15	68.0	100	0.8
100	0.82	FCS2AIJ824**001500B*	18.5	15.0	9.5	15	82.0	100	0.8
100	1.00	FCS2AIJ105**001500B*	18.5	16.0	10.5	15	100.0	100	0.8
100	1.20	FCS2AIJ125**002000B*	24.0	16.0	9.0	20	72.0	60	0.8
100	1.50	FCS2AIJ155**002000B*	24.0	17.0	10.5	20	90.0	60	0.8
100	1.80	FCS2AIJ185**002000B*	24.0	18.0	11.0	20	108.0	60	0.8
100	2.00	FCS2AIJ205**002000B*	24.0	19.5	11.5	20	120.0	60	0.8
100	2.20	FCS2AIJ225**002000B*	24.0	21.0	12.0	20	132.0	60	0.8
100	2.70	FCS2AIJ275**002500B*	29.0	20.0	11.0	25	135.0	50	0.8
100	3.00	FCS2AIJ305**002500B*	29.0	21.0	12.0	25	150.0	50	0.8
100	3.30	FCS2AIJ335**002500B*	29.0	21.5	13.0	25	165.0	50	0.8
250	0.047	FCS2EIJ473**001000A*	13.0	10.5	6.0	10	25.9	550	0.6
250	0.056	FCS2EIJ563**001000A*	13.0	10.5	6.0	10	30.8	550	0.6
250	0.068	FCS2EIJ683**001000A*	13.0	10.5	6.0	10	37.4	550	0.6
250	0.082	FCS2EIJ823**001000A*	13.0	10.5	6.0	10	45.1	550	0.6
250	0.10	FCS2EIJ104**001000A*	13.0	11.0	6.5	10	55.0	550	0.6
250	0.12	FCS2EIJ124**001000A*	13.0	11.5	7.0	10	66.0	550	0.6
250	0.15	FCS2EIJ154**001000A*	13.0	12.0	7.0	10	82.5	550	0.6
250	0.18	FCS2EIJ184**001000A*	13.0	13.0	8.5	10	99.0	550	0.6
250	0.22	FCS2EIJ224**001500A*	18.5	14.0	7.5	15	66.0	300	0.6
250	0.27	FCS2EIJ274**001500A*	18.5	13.0	7.5	15	81.0	300	0.6
250	0.33	FCS2EIJ334**001500A*	18.5	15.5	9.0	15	99.0	300	0.6
250	0.39	FCS2EIJ394**001500B*	18.5	18.5	11.0	15	117.0	300	0.8
250	0.47	FCS2EIJ474**002000B*	24.0	15.0	9.0	20	58.8	125	0.8
250	0.56	FCS2EIJ564**002000B*	24.0	16.0	10.0	20	70.0	125	0.8
250	0.68	FCS2EIJ684**002000B*	24.0	17.5	10.5	20	85.0	125	0.8
250	0.82	FCS2EIJ824**002000B*	24.0	18.5	11.0	20	102.5	125	0.8
250	1.00	FCS2EIJ105**002000B*	24.0	19.5	11.5	20	125.0	125	0.8
250	1.20	FCS2EIJ125**002000B*	24.0	21.5	12.5	20	150.0	125	0.8
250	1.50	FCS2EIJ155**002500B*	29.0	19.0	10.0	25	150.0	100	0.8
250	2.00	FCS2EIJ205**002500B*	29.0	22.0	12.0	25	200.0	100	0.8
250	2.20	FCS2EIJ225**002500B*	29.0	22.5	12.5	25	220.0	100	0.8
250	2.70	FCS2EIJ275**002500B*	29.0	24.0	14.0	25	270.0	100	0.8
250	3.00	FCS2EIJ305**002500B*	29.0	24.5	15.0	25	300.0	100	0.8
250	3.30	FCS2EIJ335**002500B*	29.0	25.5	15.5	25	330.0	100	0.8
400	0.010	FCS2GIJ103**001000A*	13.0	10.5	6.5	10	12.0	1200	0.6
400	0.012	FCS2GIJ123**001000A*	13.0	10.5	6.5	10	14.4	1200	0.6
400	0.015	FCS2GIJ153**001000A*	13.0	10.5	6.5	10	18.0	1200	0.6
400	0.018	FCS2GIJ183**001000A*	13.0	10.5	6.5	10	21.6	1200	0.6
400	0.022	FCS2GIJ223**001000A*	13.0	10.5	6.5	10	26.4	1200	0.6
400	0.027	FCS2GIJ273**001000A*	13.0	12.0	6.5	10	32.4	1200	0.6
400	0.033	FCS2GIJ333**001000A*	13.0	12.0	7.0	10	39.6	1200	0.6
400	0.039	FCS2GIJ393**001000A*	13.0	12.5	7.0	10	46.8	1200	0.6
400	0.047	FCS2GIJ473**001000A*	13.0	13.0	8.0	10	56.4	1200	0.6
400	0.056	FCS2GIJ563**001000A*	13.0	14.0	8.5	10	67.2	1200	0.6
400	0.068	FCS2GIJ683**001000A*	13.0	14.5	8.5	10	81.6	1200	0.6
400	0.082	FCS2GIJ823**001500A*	18.5	13.5	7.0	15	65.6	800	0.6
400	0.10	FCS2GIJ104**001500A*	18.5	14.5	7.5	15	80.0	800	0.6



## 规格标准 Standard Ratings

$U_R$	$C_{ap}$	P/N	W	H	T	P1	I	dv/dt	D
(Vdc)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
400	0.12	FCS2GIJ124**001500B*	18.5	15.0	8.0	15	96.0	800	0.8
400	0.15	FCS2GIJ154**001500B*	18.5	15.5	9.0	15	120.0	800	0.8
400	0.18	FCS2GIJ184**001500B*	18.5	17.5	9.5	15	144.0	800	0.8
400	0.22	FCS2GIJ224**002000B*	24.0	16.0	8.5	20	66.0	300	0.8
400	0.27	FCS2GIJ274**002000B*	24.0	16.5	9.5	20	81.0	300	0.8
400	0.33	FCS2GIJ334**002000B*	24.0	17.5	10.0	20	99.0	300	0.8
400	0.39	FCS2GIJ394**002000B*	24.0	19.5	11.0	20	117.0	300	0.8
400	0.47	FCS2GIJ474**002000B*	24.0	20.5	12.5	20	141.0	300	0.8
400	0.56	FCS2GIJ564**002500B*	29.0	19.5	11.0	25	72.8	130	0.8
400	0.68	FCS2GIJ684**002500B*	29.0	19.5	12.0	25	88.4	130	0.8
400	0.82	FCS2GIJ824**002500B*	29.0	20.5	13.5	25	106.6	130	0.8
400	1.00	FCS2GIJ105**002500B*	29.0	23.0	14.5	25	130.0	130	0.8
630	0.010	FCSJ2IJ103**001000A*	13.0	11.5	6.5	10	15.0	1500	0.6
630	0.012	FCSJ2IJ123**001000A*	13.0	11.5	6.5	10	18.0	1500	0.6
630	0.015	FCSJ2IJ153**001000A*	13.0	12.0	7.0	10	22.5	1500	0.6
630	0.018	FCSJ2IJ183**001000A*	13.0	13.0	7.0	10	27.0	1500	0.6
630	0.022	FCSJ2IJ223**001000A*	13.0	13.5	7.0	10	33.0	1500	0.6
630	0.027	FCSJ2IJ273**001000A*	13.0	13.5	7.0	10	40.5	1500	0.6
630	0.033	FCSJ2IJ333**001000A*	13.0	14.0	7.0	10	49.5	1500	0.6
630	0.039	FCSJ2IJ393**001000A*	13.0	14.5	7.5	10	58.5	1500	0.6
630	0.047	FCSJ2IJ473**001000A*	13.0	15.0	8.0	10	70.5	1500	0.6
630	0.056	FCSJ2IJ563**001500B*	18.5	14.0	8.5	15	56.0	1000	0.8
630	0.068	FCSJ2IJ683**001500B*	18.5	14.5	8.5	15	68.0	1000	0.8
630	0.082	FCSJ2IJ823**001500B*	18.5	15.5	9.5	15	82.0	1000	0.8
630	0.10	FCSJ2IJ104**001500B*	18.5	16.5	10.0	15	100.0	1000	0.8
630	0.12	FCSJ2IJ124**002000B*	24.0	16.0	9.5	20	48.0	400	0.8
630	0.15	FCSJ2IJ154**002000B*	24.0	16.5	10.0	20	60.0	400	0.8
630	0.18	FCSJ2IJ184**002000B*	24.0	17.5	11.0	20	72.0	400	0.8
630	0.22	FCSJ2IJ224**002500B*	29.0	19.0	10.0	25	39.6	180	0.8
630	0.27	FCSJ2IJ274**002500B*	29.0	20.5	11.5	25	48.6	180	0.8
630	0.33	FCSJ2IJ334**002500B*	29.0	22.0	12.0	25	59.4	180	0.8
630	0.39	FCSJ2IJ394**002500B*	29.0	19.5	11.0	25	70.2	180	0.8
630	0.47	FCSJ2IJ474**002500B*	29.0	20.5	12.5	25	84.6	180	0.8

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	2	W	I	H	4	7	4	K	0	3	5	E	7	5	0	B	T
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code (DC)	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance	引线类型 Pin Style			引线长度 Lead Length	外壳尺寸代码* W×H×T Dimension code			引线 间距 Pitch P1	引线 间距 Pitch P2	引线 直径 Lead diameter	高性能 附加条件 subsidiary conditions	
Film Capacitor =FC	Square=S	450=2W	CBB23=IH			0.47=474	±5%=J	2pin, straight=0			long-lead 20min=00	18*13.5*7.5=E7			5=1	0=0	0.5=E	Standard product=None	
							±10%=K	2pin, long-leaded=1			3.5=35				7.5=2	5.1=1	0.6=A	High temperature high humidity loading=G	
							±20%=M	4in, straight=2			13=A0				10=3	10=2	0.8=B	Automotive grade=I	
								2pin, Straight Taping 12.7=3			15=A1				12.5=4	10.2=3	1.0=C	Security film=S	
								2pin, Straight Taping 15=4			17.5=A2				15=5	12.7=4	1.2=D	Smaller=X	
								2pin, Taping 5&5=5			25=B0				20=6	15=5		Halogen-free =N	
								2pin, Taping 7.5&5=6			30=C0				22.5=7	15.2=6		Low noise=F	
								2pin, Taping 7.5&7.5=7			35=C1				25=8	16.1=7			
								2pin, Taping 10&7.5=8			55=E0				27.5=9	20=8			
								2pin, Taping 10&10=9			100=J0				30=A	20.3=9			
								2pin, Taping 15&7.5=A							32.5=B				
								2pin, Taping 15&10=B							37.5=C				
								2pin, Taping 15&15=C							42.5=D				
								2pin, Kinked 5&5=D							45=E				
								2pin, Kinked 7.5&5=E							52.5=F				
								2pin, Kinked 7.5&7.5=F											
								2pin, Kinked 10&7.5=G											
								2pin, Kinked 10&10=H											
								2pin, Kinked 15&7.5=I											
								2pin, Kinked 15&10=J											
								2pin, Kinked 15&15=K											
								2pin, Y Kinked =L											
								2pin, Z Kinked =M											



## Features

- High ripple current
- Self-healing property
- Low losses.
- Small inherent temperature rise
- High contact reliability
- Suitable for high frequency applications

## Applications

- power supplies
- power factor correction
- ballasts and compact lamps
- inverter

## 特点

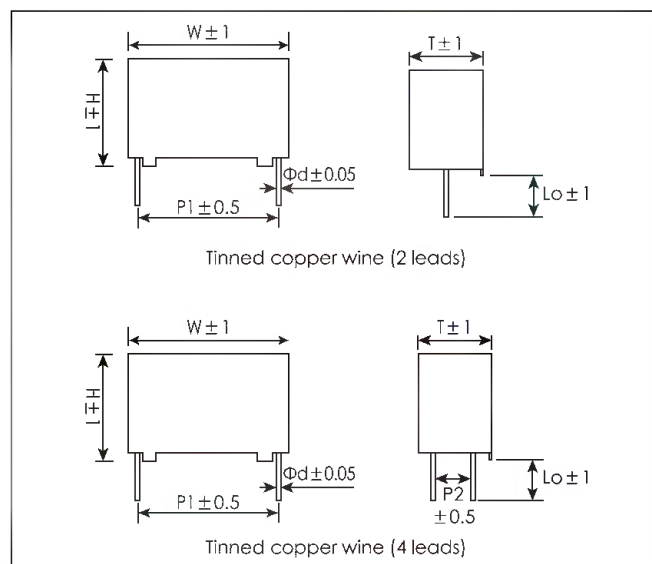
- 高电流
- 自愈性好
- 低功耗
- 内部温升小
- 高可靠性
- 适用于高频应用

## 应用场合

- 电源适配器
- 功率因数校正
- 镇流器和紧凑型灯具
- 逆变器

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	——	1
CBB23	——	2
0.1 μF J 450VDC	——	3
N11	——	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC60384-16
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105℃ (+85℃to+105℃: decreasing factor 1.25% per℃ for UR)
存储温度范围 Storage Temperature Range	-40~+105℃
额定电压 $U_R$ Rated Voltage	450~630Vdc
电容量范围 Capacitance Range	0.01~3.3μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20℃)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	2000 Vac, 10s (20℃, 50Hz)
损耗角正切 Dissipation Factor	0.001 (20℃ 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_N$ )	$R \geq 100\,000 M\Omega$ , $C_N \leq 0.33 \mu F$ $RC_N \geq 30\,000 s$ , $C_N > 0.33 \mu F$ (20℃, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot} = 70^\circ C$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	W	H	T	P	$\hat{I}$	$dv/dt$	d
(Vdc)	( $\mu F$ )	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
450	0.10	FCS2WIH104*100C430A	13.0	11.0	5.0	10.0	25.0	250	0.6
	0.15	FCS2WIH154*100C430A	13.0	11.0	5.0	10.0	37.5	250	0.6
	0.22	FCS2WIH224*100C430A	13.0	11.0	5.0	10.0	55.0	250	0.6
	0.33	FCS2WIH334*100C530A	13.0	12.0	6.0	10.0	82.5	250	0.6
	0.39	FCS2WIH394*100C830A	13.0	13.0	7.0	10.0	97.5	250	0.6
	0.47	FCS2WIH474*100C830A	13.0	13.0	7.0	10.0	117.5	250	0.6
	0.56	FCS2WIH564*100C930A	13.0	14.0	8.0	10.0	140.0	250	0.6
	0.68	FCS2WIH684*100C730A	13.0	16.0	8.0	10.0	170.0	250	0.6
	0.82	FCS2WIH824*100CE30A	13.0	19.0	10.0	10.0	205.0	250	0.6
	1.00	FCS2WIH105*100CE30A	13.0	19.0	10.0	10.0	250.0	250	0.6
	0.10	FCS2WIH104*100E250A	18.0	11.0	5.0	15.0	16.0	160	0.6
	0.15	FCS2WIH154*100E250A	18.0	11.0	5.0	15.0	24.0	160	0.6
	0.22	FCS2WIH224*100E250A	18.0	12.0	6.0	15.0	35.2	160	0.6
	0.33	FCS2WIH334*100EE50A	18.0	17.5	6.0	15.0	52.8	160	0.6
	0.47	FCS2WIH474*100E750B	18.0	13.5	7.5	15.0	75.2	160	0.8
	0.47	FCS2WIH474*100EE50A	18.0	17.5	6.0	15.0	75.2	160	0.6
	0.47	FCS2WIH474*100EA50B	18.0	12.5	9.0	15.0	75.2	160	0.8
	0.68	FCS2WIH684*100EE50A	18.0	17.5	6.0	15.0	108.8	160	0.6
	0.68	FCS2WIH684*100E850B	18.0	14.5	8.5	15.0	108.8	160	0.8
	0.68	FCS2WIH684*100J250B	18.0	12.0	13.0	15.0	108.8	160	0.8
	0.82	FCS2WIH824*100E850B	18.0	14.5	8.5	15.0	131.2	160	0.8
	0.82	FCS2WIH824*100J250B	18.0	12.0	13.0	15.0	131.2	160	0.8
	1.00	FCS2WIH105*100EC50B	18.0	16.0	10.0	15.0	160.0	160	0.8
	1.50	FCS2WIH155*100EG50B	18.0	19.0	11.0	15.0	240.0	160	0.8
	2.20	FCS2WIH225*100B470B	26.0	19.0	10.0	22.5	220.0	100	0.8
	3.30	FCS2WIH335*100B670B	26.0	23.0	13.0	22.5	330.0	100	0.8
550	0.10	FCS2YIH104*100C430A	13.0	11.0	5.0	10.0	30.0	300	0.6
	0.15	FCS2YIH154*100C530A	13.0	12.0	6.0	10.0	45.0	300	0.6
	0.22	FCS2YIH224*100C830A	13.0	13.0	7.0	10.0	66.0	300	0.6
	0.33	FCS2YIH334*100C930A	13.0	14.0	8.0	10.0	99.0	300	0.6
	0.47	FCS2YIH474*100C730A	13.0	16.0	8.0	10.0	141.0	300	0.6
	0.10	FCS2YIH104*100E250A	18.0	11.0	5.0	15.0	20.0	200	0.6
	0.15	FCS2YIH154*100E250A	18.0	11.0	5.0	15.0	30.0	200	0.6
	0.22	FCS2YIH224*100E550A	18.0	12.0	6.0	15.0	44.0	200	0.6
	0.33	FCS2YIH334*100EE50A	18.0	17.5	6.0	15.0	66.0	200	0.6
	0.33	FCS2YIH334*100E750B	18.0	13.5	7.5	15.0	66.0	200	0.8
	0.33	FCS2YIH334*100EA50B	18.0	12.5	9.0	15.0	66.0	200	0.8
	0.47	FCS2YIH474*100E850B	18.0	14.5	8.5	15.0	94.0	200	0.8
	0.47	FCS2YIH474*100EF50B	18.0	18.0	7.0	15.0	94.0	200	0.8
	0.47	FCS2YIH474*100J250B	18.0	12.0	13.0	15.0	94.0	200	0.8
	0.68	FCS2YIH684*100EC50B	18.0	16.0	10.0	15.0	136.0	200	0.8
	0.82	FCS2YIH824*100EG50B	18.0	19.0	11.0	15.0	164.0	200	0.8
	1.00	FCS2YIH105*100EG50B	18.0	19.0	11.0	15.0	200.0	200	0.8
	1.50	FCS2YIH155*100B570B	26.0	20.0	11.0	22.5	180.0	120	0.8
	2.20	FCS2YIH225*100B670B	26.0	23.0	13.0	22.5	264.0	120	0.8
630	0.010	FCSJ2IH103*100C430A	13.0	11.0	5.0	10.0	4.0	400	0.6
	0.015	FCSJ2IH153*100C430A	13.0	11.0	5.0	10.0	6.0	400	0.6
	0.022	FCSJ2IH223*100C430A	13.0	11.0	5.0	10.0	8.8	400	0.6
	0.033	FCSJ2IH333*100C430A	13.0	11.0	5.0	10.0	13.2	400	0.6
	0.047	FCSJ2IH473*100C430A	13.0	11.0	5.0	10.0	18.8	400	0.6
	0.068	FCSJ2IH683*100C530A	13.0	12.0	6.0	10.0	27.2	400	0.6
	0.082	FCSJ2IH823*100C530A	13.0	12.0	6.0	10.0	32.8	400	0.6
	0.100	FCSJ2IH104*100C530A	13.0	12.0	6.0	10.0	40.0	400	0.6
	0.047	FCSJ2IH473*100E250A	18.0	11.0	5.0	15.0	11.8	250	0.6
	0.056	FCSJ2IH563*100E250A	18.0	11.0	5.0	15.0	14.0	250	0.6
	0.068	FCSJ2IH683*100E250A	18.0	11.0	5.0	15.0	17.0	250	0.6
	0.082	FCSJ2IH823*100E250A	18.0	11.0	5.0	15.0	20.5	250	0.6
	0.10	FCSJ2IH104*100E250A	18.0	11.0	5.0	15.0	25.0	250	0.6
	0.15	FCSJ2IH154*100E550A	18.0	12.0	6.0	15.0	37.5	250	0.6
	0.22	FCSJ2IH224*100EE50A	18.0	17.5	6.0	15.0	55.0	250	0.6
	0.22	FCSJ2IH224*100E750B	18.0	13.5	7.5	15.0	55.0	250	0.8
	0.22	FCSJ2IH224*100EA50B	18.0	12.5	9.0	15.0	55.0	250	0.8



## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	W	H	T	P	$\bar{I}$	dv/dt	d
(Vdc)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
630	0.33	FCSJ2IH334*100EF50B	18.0	18.0	7.0	15.0	82.5	250	0.8
	0.33	FCSJ2IH334*100E850B	18.0	14.5	8.5	15.0	82.5	250	0.8
	0.33	FCSJ2IH334*100EA50B	18.0	12.5	9.0	15.0	82.5	250	0.8
	0.47	FCSJ2IH474*100EF50B	18.0	18.0	7.0	15.0	117.5	250	0.8
	0.47	FCSJ2IH474*100EC50B	18.0	16.0	10.0	15.0	117.5	250	0.8
	0.47	FCSJ2IH474*100J250B	18.0	12.0	13.0	15.0	117.5	250	0.8
	0.68	FCSJ2IH684*100EG50B	18.0	19.0	10.0	15.0	170.0	250	0.8
	0.82	FCSJ2IH824*100B470B	26.0	19.0	10.0	22.5	131.2	160	0.8
	1.00	FCSJ2IH105*100B570B	26.0	20.0	11.0	22.5	160.0	160	0.8

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	C	S	2	W	I	D	2	2	4	K	B	0	0	1	5	0	0	A	5
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code			容量代码 Capacitance Code	容量偏差 Capacitance Tolerance			引线类型 Pin Style	外壳尺寸代码* Dimension Code	引线间距 Pitch P1	引线间距 Pitch P2	引线直径 Lead diameter	图号 Style				
FC=薄膜电容器 FC=Film Capacitor	方型=S Square=S	450=2W	CBB24=ID			0.22=224	±5%=J			4Pin 5mm=A	阻燃性环氧粉末封装 Flame retardant epoxy resin powder coating	10=10	0=00	0.6=A	Fig1 =1				
		500=2H					±10%=K			2Pin 5mm=B				0.8=B	Fig2 =2				
		550=5F								2Pin 长引线=C		15=15		1.0=C	Fig3 =3				
		630=J2								4pin 4mm=S				1.2=D	Fig4 =4				
										2pin 8.2mm=E				0.5=E	Fig5 =5				
										2pin 9.2mm=D									
										2pin 3.2mm=V									
										2pin 3.5mm=U									
										2pin 4.5mm=T									



## Features

- Metallized polypropylene structure
- Self-healing property
- Low losses.
- Small inherent temperature rise
- High contact reliability
- Flame retardant epoxy resin powder coating (UL 94 V-0)

## 特点

- 金属化聚丙烯膜结构
- 自愈性好
- 低功耗
- 内部温升小
- 高可靠性
- 阻燃性环氧粉末包封

## Applications

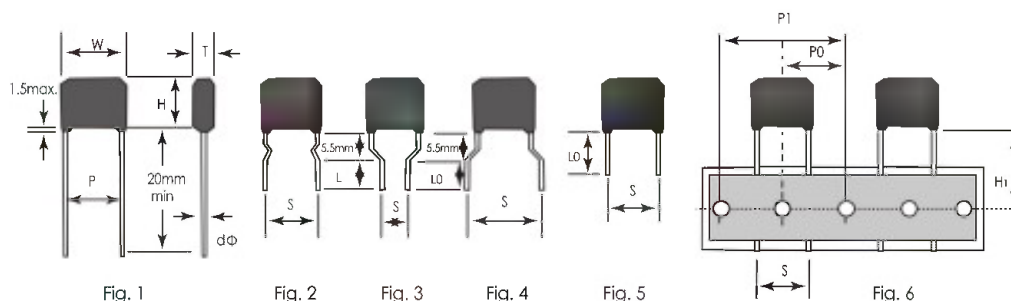
- As intermediate circuit capacitors for SMPS.
- Electronic Ballast, inverter (DC-link, DC-filter and PFC)

## 应用场合

- 用于开关电源, 电子整流器和变频器等中间电路
- 直流滤波(DC-link, DC-filter 和 PFC)

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	——	1
CBB24	——	2
0.1 μF J 550VDC	——	3
N11	——	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC60384-16
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105°C (+85°C to +105°C : decreasing factor 1.25% per°C for $U_R$ )
存储温度范围 Storage Temperature Range	-40~+105°C
额定电压 $U_R$ Rated Voltage	450~630Vdc
电容量范围 Capacitance Range	0.1~2.2μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_{IT}$ Voltage Between Terminals	1.5 $U_R$ , 10s (20°C)
端子与外壳电压 $U_{IC}$ Voltage Between Terminals and Case	2000 Vac, 10s (20°C, 50Hz)
损耗角正切 Dissipation Factor	0.001 (20°C 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $IR \cdot C_N$ )	$R \geq 100\,000 M\Omega$ , $C_N \leq 0.33 \mu F$ $RC_N \geq 30\,000 s$ , $C_N > 0.33 \mu F$ (20°C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot} = 70^\circ C$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

U <sub>r</sub>	C <sub>ap</sub>	P/N	W	H	T	P	I	dv/dt	D
(Vdc)	(μF)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
450	0.10	FCS2WID104**001000A*	13.0	11.0	5.0	10.0	40.0	400	0.6
450	0.12	FCS2WID124**001000A*	13.0	11.0	5.0	10.0	48.0	400	0.6
450	0.15	FCS2WID154**001000A*	13.0	11.0	5.0	10.0	60.0	400	0.6
450	0.18	FCS2WID184**001000A*	13.0	11.5	6.0	10.0	72.0	400	0.6
450	0.22	FCS2WID224**001000A*	13.0	12.0	6.0	10.0	88.0	400	0.6
450	0.27	FCS2WID274**001000A *	13.0	12.5	6.5	10.0	108.0	400	0.6
450	0.33	FCS2WID334**001000A*	13.0	14.0	7.0	10.0	132.0	400	0.6
450	0.39	FCS2WID394**001000A*	13.0	15.0	8.0	10.0	156.0	400	0.6
450	0.47	FCS2WID474**001000A*	13.0	16.5	8.0	10.0	188.0	400	0.6
450	0.56	FCS2WID564**001000A*	13.0	17.5	9.0	10.0	224.0	400	0.6
450	0.68	FCS2WID684**001000A*	13.0	18.5	10.0	10.0	272.0	400	0.6
450	0.82	FCS2WID824**001000A*	13.0	20.5	10.5	10.0	328.0	400	0.6
450	1.00	FCS2WID105**001000A*	13.0	21.5	11.5	10.0	400.0	400	0.6
450	0.10	FCS2WID104**001500A*	18.0	11.0	5.0	15.0	25.0	250	0.6
450	0.12	FCS2WID124**001500A*	18.0	11.0	5.0	15.0	30.0	250	0.6
450	0.15	FCS2WID154**001500A*	18.0	11.0	5.0	15.0	37.5	250	0.6
450	0.18	FCS2WID184**001500A*	18.0	11.0	5.0	15.0	45.0	250	0.6
450	0.22	FCS2WID224**001500A*	18.0	11.0	5.0	15.0	55.0	250	0.6
450	0.33	FCS2WID334**001500A*	18.0	12.0	6.0	15.0	82.5	250	0.6
450	0.39	FCS2WID394**001500A*	18.0	12.5	6.5	15.0	97.5	250	0.6
450	0.47	FCS2WID474**001500A*	18.0	13.5	7.5	15.0	117.5	250	0.6
450	0.56	FCS2WID564**001500B*	18.0	14.0	8.0	15.0	140.0	250	0.8
450	0.68	FCS2WID684**001500B*	18.0	14.5	8.5	15.0	170.0	250	0.8
450	0.82	FCS2WID824**001500B*	18.0	15.5	9.0	15.0	205.0	250	0.8
450	1.00	FCS2WID105**001500B*	18.0	17.0	9.0	15.0	250.0	250	0.8
450	1.20	FCS2WID125**001500B*	18.0	18.5	10.5	15.0	300.0	250	0.8
450	1.50	FCS2WID155**002200B*	25.5	15.0	9.0	22.5	150.0	100	0.8
450	2.20	FCS2WID225**002200B*	25.5	18.0	12.0	22.5	220.0	100	0.8
550	0.10	FCS2YID104**001000A*	13.0	11.0	5.0	10.0	40.0	400	0.6
550	0.12	FCS2YID124**001000A*	13.0	11.0	5.0	10.0	48.0	400	0.6
550	0.15	FCS2YID154**001000A*	13.0	12.0	6.0	10.0	60.0	400	0.6
550	0.18	FCS2YID184**001000A*	13.0	13.0	7.0	10.0	72.0	400	0.6
550	0.22	FCS2YID224**001000A*	13.0	14.5	7.5	10.0	88.0	400	0.6
550	0.27	FCS2YID274**001000A*	13.0	16.5	7.5	10.0	108.0	400	0.6
550	0.33	FCS2YID334**001000A*	13.0	17.5	8.5	10.0	132.0	400	0.6
550	0.39	FCS2YID394**001000A*	13.0	18.0	9.5	10.0	156.0	400	0.6
550	0.47	FCS2YID474**001000A*	13.0	19.0	10.0	10.0	188.0	400	0.6
550	0.10	FCS2YID104**001500A*	18.0	12.0	6.0	15.0	25.0	250	0.6
550	0.12	FCS2YID124**001500A*	18.0	12.0	6.0	15.0	30.0	250	0.6
550	0.15	FCS2YID154**001500A*	18.0	12.0	6.0	15.0	37.5	250	0.6
550	0.18	FCS2YID184**001500A*	18.0	12.0	6.0	15.0	45.0	250	0.6
550	0.22	FCS2YID224**001500A*	18.0	12.0	6.0	15.0	55.0	250	0.6
550	0.27	FCS2YID274**001500A*	18.0	12.5	6.5	15.0	67.5	250	0.6
550	0.33	FCS2YID334**001500A*	18.0	13.5	7.5	15.0	82.5	250	0.6
550	0.47	FCS2YID474**001500A*	18.0	14.5	8.5	15.0	117.5	250	0.6
550	0.56	FCS2YID564**001500B*	18.0	16.5	8.5	15.0	140.0	250	0.8
550	0.68	FCS2YID684**001500B*	18.0	17.5	9.0	15.0	170.0	250	0.8
550	0.82	FCS2YID824**001500B*	18.0	19.0	10.0	15.0	205.0	250	0.8
550	1.00	FCS2YID105**001500B*	18.0	20.5	11.0	15.0	250.0	250	0.8
550	1.20	FCS2YID125**002200B*	25.5	17.5	9.0	22.5	120.0	100	0.8
550	1.50	FCS2YID155**002200B*	25.5	19.5	10.5	22.5	150.0	100	0.8
550	2.20	FCS2YID225**002200B*	25.5	22.0	12.0	22.5	220.0	100	0.8
630	0.10	FCSJ2ID104**001000A*	13.0	12.0	6.0	10.0	45.0	450	0.6
630	0.12	FCSJ2ID124**001000A*	13.0	13.0	7.0	10.0	54.0	450	0.6
630	0.15	FCSJ2ID154**001000A*	13.0	13.0	7.0	10.0	67.5	450	0.6
630	0.18	FCSJ2ID184**001000A*	13.0	15.0	8.0	10.0	81.0	450	0.6
630	0.10	FCSJ2ID104**001500A*	18.0	12.0	6.0	15.0	30.0	300	0.6
630	0.12	FCSJ2ID124**001500A*	18.0	12.0	6.0	15.0	36.0	300	0.6
630	0.15	FCSJ2ID154**001500A*	18.0	12.0	6.0	15.0	45.0	300	0.6
630	0.18	FCSJ2ID184**001500A*	18.0	13.0	7.0	15.0	54.0	300	0.6
630	0.22	FCSJ2ID224**001500A*	18.0	13.0	7.0	15.0	66.0	300	0.6
630	0.27	FCSJ2ID274**001500A*	18.0	14.0	7.5	15.0	81.0	300	0.6



## 规格标准 Standard Ratings

$U_R$	$C_{ap}$	P/N	W	H	T	P1	I	dv/dt	D
(Vdc)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
630	0.33	FCSJ2ID334**001500A*	18.0	14.5	8.0	15.0	99.0	300	0.6
630	0.39	FCSJ2ID394**001500A*	18.0	15.5	8.5	15.0	117.0	300	0.6
630	0.47	FCSJ2ID474**001500A*	18.0	16.5	9.0	15.0	141.0	300	0.6
630	0.56	FCSJ2ID564**001500B*	18.0	17.0	10.0	15.0	168.0	300	0.8
630	0.68	FCSJ2ID684**001500B*	18.0	18.5	11.5	15.0	204.0	300	0.8
630	0.82	FCSJ2ID824**001500B*	18.0	20.0	11.5	15.0	246.0	300	0.8
630	1.00	FCSJ2ID105**001500B*	18.0	22.0	13.0	15.0	300.0	300	0.8
630	1.20	FCSJ2ID125**002200B*	25.5	19.0	11.0	22.5	180.0	150	0.8
630	1.50	FCSJ2ID155**002200B*	25.5	22.0	12.0	22.5	225.0	150	0.8
630	1.80	FCSJ2ID185**002200B*	25.5	23.0	13.0	22.5	270.0	150	0.8
630	2.20	FCSJ2ID225**002200B*	25.5	25.0	15.0	22.5	330.0	150	0.8

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
F	C	C	3	A	D	Q	5	0	6	K	C	0	6	4	C	0
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		直径 Diameter	总高度 Total height		引线长度 Lead diameter	底部螺栓 bottom bolt			
FC=薄膜电容器 FC=Film Capacitor	圆柱型=C Column=C	800=2K	CBB122=DQ		50=506		± 5%=J		56=C	64=064		200=A	Without=0			
		1000=3A			200=207		± 10%=K		63.5=E	71=071		235=B	M8*10=4			
		1200=3B			800=807		Special=S					300=C				
		1600=3C			2000=208							350=D				
		2000=3D			1000=108							端子=E				
		3000=3F			3000=308											
		4000=3G														
		5000=3H														



## Features

- Metallized polypropylene structure
- Miniaturization design
- Self-healing property
- Low losses.
- Small inherent temperature rise
- High contact reliability
- Flame retardant epoxy resin powder coating (UL 94 V-0)

## 特点

- 金属化聚丙烯膜结构
- 小型化设计
- 自愈性好
- 低功耗
- 内部温升小
- 高可靠性
- 阻燃性环氧粉末包封

## Applications

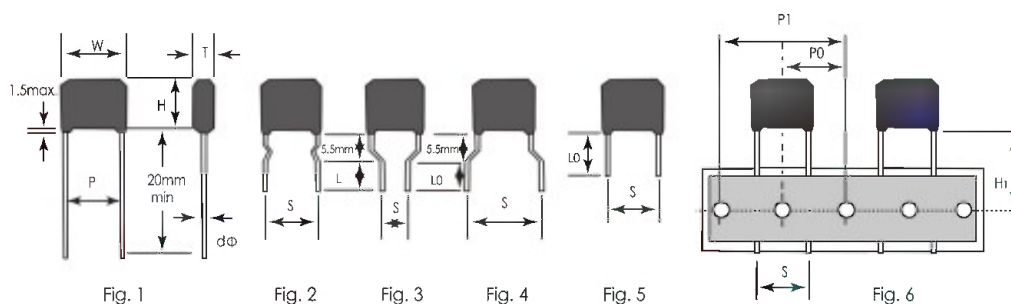
- As intermediate circuit capacitors for SMPS.
- Electronic Ballast, inverter (DC-link, DC-filter and PFC)

## 应用场合

- 用于开关电源, 电子整流器和变频器等中间电路
- 直流滤波 (DC-link, DC-filter 和 PFC)

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	——	1
CBB25	——	2
0.1 μF J 520VDC	——	3
N11	——	4

NO.	项目 Item
1	商标 Brand
2	产品系列 Products series
3	容量、偏差以及额定电压 Capacitance, Tolerance and Rated voltage
4	日期代码 Date code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	IEC60384-16
气候类别 Climatic Category	40/105/56
工作温度范围 Operating Temperature Range	-40~+105°C (+85°C to +105°C : decreasing factor 1.25% per°C for $U_R$ )
存储温度范围 Storage Temperature Range	-40~+105°C
额定电压 $U_R$ Rated Voltage	450~520Vdc
电容量范围 Capacitance Range	0.047~2.2 μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.5 $U_R$ , 10s (20°C)
端子与外壳电压 $U_C$ Voltage Between Terminals and Case	2000 Vac, 10s (20°C, 50Hz)
损耗角正切 Dissipation Factor	0.001 (20°C 1KHz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance ( $I_R \cdot C_N$ )	$R \geq 100\,000\,M\Omega$ , $C_N \leq 0.33\,\mu F$ $RC_N \geq 30\,000s$ , $C_N > 0.33\,\mu F$ (20°C, 100Vdc, 1min)
预期寿命 Life Expectancy	100000 hours ( $U_R$ , $\theta_{hotspot}=70^\circ C$ )
失效率 Failure Rate	100 FIT



## 规格标准 Standard Ratings

$U_R$	$C_{AP}$	P/N	W	H	T	P	$\hat{i}$	dv/dt	D
(Vdc)	( $\mu$ F)	-	(mm)	(mm)	(mm)	(mm)	(A)	(V/us)	(mm)
450	0.068	FCS2WIF683**001000A*	13.0	10.5	5.5	10	27.2	400	0.6
450	0.082	FCS2WIF823**001000A*	13.0	10.5	5.5	10	32.8	400	0.6
450	0.10	FCS2WIF104**001000A*	13.0	10.5	5.5	10	40.0	400	0.6
450	0.12	FCS2WIF124**001000A*	13.0	10.5	6.0	10	48.0	400	0.6
450	0.15	FCS2WIF154**001000A *	13.0	10.5	6.0	10	60.0	400	0.6
450	0.18	FCS2WIF184**001000A*	13.0	10.5	6.0	10	72.0	400	0.6
450	0.22	FCS2WIF224**001000A*	13.0	12.0	6.0	10	88.0	400	0.6
450	0.27	FCS2WIF274**001000A*	13.0	12.0	6.5	10	108.0	400	0.6
450	0.33	FCS2WIF334**001000A*	13.0	13.0	6.5	10	132.0	400	0.6
450	0.39	FCS2WIF394**001000A*	13.0	14.0	7.0	10	156.0	400	0.6
450	0.47	FCS2WIF474**001000A*	13.0	15.0	7.5	10	188.0	400	0.6
450	1.00	FCS2WIF105**001000A*	13.0	18.5	10.5	10	400.0	400	0.6
450	0.22	FCS2WIF224**001500A*	18.0	10.0	5.0	15	55.0	250	0.6
450	0.33	FCS2WIF334**001500A*	18.0	10.5	6.0	15	82.5	250	0.6
450	0.47	FCS2WIF474**001500A *	18.0	12.0	6.0	15	117.5	250	0.6
450	0.56	FCS2WIF564**001500A*	18.0	13.5	6.0	15	140.0	250	0.6
450	0.68	FCS2WIF684**001500A*	18.0	14.5	6.5	15	170.0	250	0.6
450	0.82	FCS2WIF824**001500A *	18.0	15.0	7.5	15	205.0	250	0.6
450	1.00	FCS2WIF105**001500B*	18.0	15.5	8.0	15	250.0	250	0.8
450	1.20	FCS2WIF125**001500B*	18.0	16.0	9.0	15	300.0	250	0.8
450	1.50	FCS2WIF155**001500B*	18.0	17.5	10.0	15	375.0	250	0.8
450	1.80	FCS2WIF185**001500B*	18.0	18.0	11.0	15	450.0	250	0.8
450	2.20	FCS2WIF225**001500B*	18.0	19.0	12.5	15	550.0	250	0.8
520	0.047	FCSH2IF473**001000A*	13.0	10.0	5.0	10	18.8	400	0.6
520	0.056	FCSH2IF563**001000A*	13.0	10.0	5.0	10	22.4	400	0.6
520	0.068	FCSH2IF683**001000A*	13.0	10.5	5.5	10	27.2	400	0.6
520	0.082	FCSH2IF823**001000A*	13.0	10.5	5.5	10	32.8	400	0.6
520	0.10	FCSH2IF104**001000A*	13.0	10.5	5.5	10	40.0	400	0.6
520	0.12	FCSH2IF124**001000A*	13.0	10.5	6.0	10	48.0	400	0.6
520	0.15	FCSH2IF154**001000A*	13.0	11.0	6.5	10	60.0	400	0.6
520	0.18	FCSH2IF184**001000A*	13.0	12.0	7.0	10	72.0	400	0.6
520	0.22	FCSH2IF224**001000A*	13.0	13.5	7.0	10	88.0	400	0.6
520	0.33	FCSH2IF334**001000A*	13.0	16.0	8.0	10	132.0	400	0.6
520	0.27	FCSH2IF274**001500A*	18.0	12.5	6.0	15	67.5	250	0.6
520	0.33	FCSH2IF334**001500A*	18.0	13.0	6.5	15	82.5	250	0.6
520	0.47	FCSH2IF474**001500B *	18.0	15.0	7.0	15	117.5	250	0.6
520	0.56	FCSH2IF564**001500B*	18.0	15.5	8.0	15	140.0	250	0.8
520	0.68	FCSH2IF684**001500B*	18.0	16.5	8.5	15	170.0	250	0.8
520	0.82	FCSH2IF824**001500B*	18.0	17.0	9.0	15	205.0	250	0.8
520	1.00	FCSH2IF105**001500B*	18.0	18.0	10.0	15	250.0	250	0.8
520	1.20	FCSH2IF125**001500B*	18.0	18.5	12.0	15	300.0	250	0.8
520	1.50	FCSH2IF155**001500B*	18.0	20.5	12.5	15	375.0	250	0.8

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
F	C	C	3	A	D	Q	5	0	6	K	C	0	6	4	C	0
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code		系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		直径 Diameter	总高度 Total height			引线长度 Lead diameter		底部螺栓 bolt/bolt
FC=薄膜电容器 FC=Film Capacitor	圆柱型=C Column=C	800=2K		CBB122=DQ		50=506		± 5%=J		56=C	64=064			200=A		Without=0
		1000=3A				200=207		± 10%=K		63.5=E	71=071			235=B		M8*10=4
		1200=3B				800=807		Special=S					300=C			
		1600=3C				2000=208							350=D			
		2000=3D				1000=108							端子=E			
		3000=3F				3000=308										
		4000=3G														
		5000=3H														



## Features

- Round plastic case, small size, light weight, high energy storage density
- Small loss, low internal temperature rise
- self-healing performance is excellent, the reliability is high

## Recommended circuit

- Small and medium power pulse laser power supply: pulse laser power supply, marking machine, engraving machine, spot welding machine and other pulse laser power supply
- Multiplexing laser power supply, pressurized Q module, continuous laser power supply
- Special capacitance of electronic police flash lamp

## 特点

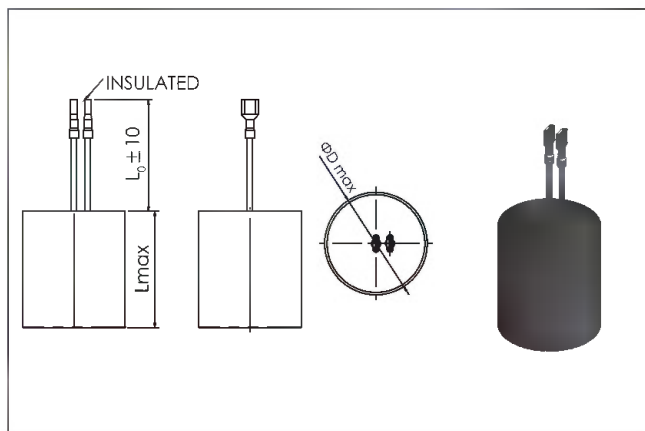
- 圆形塑壳, 体积小, 重量轻, 高储能密度
- 损耗小, 内部温升低
- 自愈性能优异, 可靠性高

## 应用线路

- 中小功率脉冲激光电源如: 医疗用脉冲激光电源、打标机、雕刻机、点焊机脉冲激光电源
- 多路激光电源、加压调Q模块、连续激光电源
- 电子警察闪光灯具专用电容

## 外形图 Dimensions

Unit: mm



## 标识 Marking

	1
FCC3ADQ506KC064C0	2
CBB 122	3
50µF K 1000 V	4
25 J	5
N35F15	6

NO.	项目 Item
1	商标 Brand
2	产品代码 Products code
3	产品系列 Products series
4	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
5	储存能量 Storage of energy
6	年度标记 Year code

## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	JB/T 8168
气候类别 Climatic Category	40/70/21
工作环境温度范围 Operating environment Temperature Range	-40~+55℃ ( $\theta_{\text{hotspot}} \leq 70^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+55℃
额定电压 $U_R$ Rated Voltage	800~5000V <sub>DC</sub>
电容量范围 Capacitance Range	50~3000µF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.2~1.5 × $U_R$ V <sub>DC</sub> , 10s (20 ± 5℃)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	>3000 V <sub>AC</sub> , 10s (20 ± 5℃, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 5000s$ (20 ± 5℃, 100V <sub>DC</sub> , 1min)
预期寿命 Life Expectancy	>10000次( $U_R$ )
失效率 Failure Rate	50 FIT



## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	IP	ESR	E
(V)	( $\mu$ F)	-	(A)	(m $\Omega$ )	(J)
800	100	FCC2KDQ107*****	177	15	32
	200	FCC2KDQ207*****	355	10	64
	300	FCC2KDQ307*****	450	13	96
	500	FCC2KDQ507*****	600	9	160
	800	FCC2KDQ807*****	980	6	256
	1000	FCC2KDQ108*****	1200	5	320
	2000	FCC2KDQ208*****	2100	3.5	640
1000	3000	FCC2KDQ308*****	2250	2.5	960
	50	FCC3ADQ506*****	100	20	25
	100	FCC3ADQ107*****	198	11	50
	200	FCC3ADQ207*****	253	10	100
	500	FCC3ADQ507*****	415	10	250
	1000	FCC3ADQ108*****	750	8	500
2000	1500	FCC3ADQ158*****	1126	5	750
	50	FCC3DDQ506*****	150	15	100
	100	FCC3DDQ107*****	236	15	200
	200	FCC3DDQ207*****	272	9	400
3000	300	FCC3DDQ307*****	410	10	600
	50	FCC3FDQ506*****	600	15	225
	65	FCC3FDQ656*****	720	13	292.5
	100	FCC3FDQ107*****	1050	9	450
	120	FCC3FDQ127*****	1259	8	540
	150	FCC3FDQ137*****	1415	8	675
	200	FCC3FDQ207*****	1800	6	900
4000	50	FCC3GDQ506*****	760	15	400
	75	FCC3GDQ756*****	1050	12	600
	100	FCC3GDQ107*****	1350	8	800
	150	FCC3GDQ157*****	2000	6	1200
	200	FCC3GDQ207*****	2600	5	1600
5000	50	FCC3HDQ506*****	880	12	625
	80	FCC3HDQ806*****	1250	9	1000
	100	FCC3HDQ107*****	1600	7	1250
	150	FCC3HDQ157*****	2300	5	1875

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
F	C	S	3	G	D	T	1	5	7	K	0	1	7	0	2	9	0	1	5	X
电容器类型 Capacitor Type		产品外形 Product Shape	额定电压代码 Rated Voltage Code		系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance	尺寸特征码 Dimension characteristic code										内部特征码
FC=薄膜电容器 FC=Film Capacitor		方型=S Square=S	1200=3B		CBB123=DW		150=157		±5%=J	017029015										X
			3000=3F				8200=828		±10%=K											
			4000=3G				10000=109		Special=S											
			5000=3H				15000=159													
			6000=3X				20000=209													
			8000=3K				65000=659													



## Features

- Metal case, high energy storage density
- Loss is small, the internal temperature is low
- Self-healing performance is excellent, the reliability is high

## Recommended circuit

- High power pulse laser power, Weld power supply
- Dc-Dc energy storage cabinet, voltage smoothing system
- Marx generator, LC double voltage and other lines
- Cable fault detection instrument

## 特点

- 金属外壳, 高储能密度
- 损耗小, 内部温升低
- 自愈性能优异, 可靠性高

## 应用线路

- 大功率脉冲激光电源, 焊接电源
- DC-DC 能库柜电压平滑系统
- 马克思发生器, LC 倍压等线路
- 电缆线故障检测仪器

## 外型图 Dimension

Unit: mm

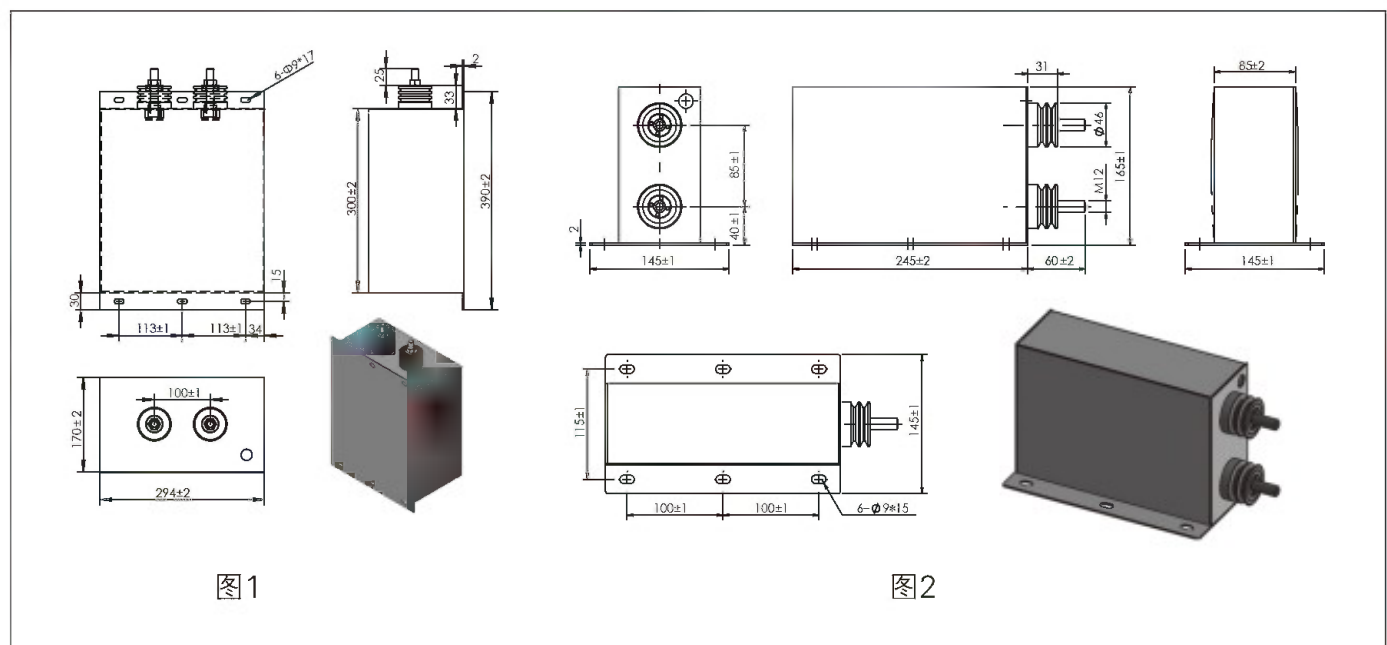


图 1

图 2

## 标识 Marking

	1
CBB123	2
FCS3GDT157K017029015	3
150μF ± 10%	4
U <sub>R</sub> = 4000VDC SH	5
U <sub>TC</sub> = 3000V 50/60Hz	6
-40~+55°C IEC61071	7
Discharge before handling	8
E:50KJ	9
N37F26104	10

NO.	项目 Item
1	商标 Brand
2	产品代码 Products code
3	产品系列 Products series
4	容量和偏差 Capacitance and Tolerance
5	额定电压和自愈性 Rated voltage and Self-healing property
6	端子与铝壳电压 U <sub>TC</sub> Voltage Between Terminals and Case
7	温度范围 Temperature Range 存储能量 Energy storage 引用标准 Reference Standard
8	安全警示 Safety Warning
9	年度标记 Year code 二维码 QR Code



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	JB/T 8168
气候类别 Climatic Category	40/70/56
工作环境温度范围 Operating environment Temperature Range	-40~+55℃ ( $\theta_{\text{hotspot}} \leq 70^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+55℃
额定电压 $U_R$ Rated Voltage	1~50K V <sub>DC</sub>
电容量范围 Capacitance Range	1~120000μF
电容量偏差 Capacitance Tolerance	±5%(J), ±10%(K)
端子与端子电压 $U_T$ Voltage Between Terminals	1.1~1.5 × $U_R$ V <sub>DC</sub> , 10s (20±5℃)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	>3000 V <sub>AC</sub> , 10s (20±5℃, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 10000s$ (20±5℃, 100V <sub>DC</sub> , 1min)
预期寿命 Life Expectancy	>5000次 ( $U_R$ )
失效率 Failure Rate	50 FIT

## 规格标准 Standard Ratings

$U_R$	$C_R$	P/N	$\hat{I}$	ESR	ESL	E
(V)	(μF)	-	(KA)	(mΩ)	(nH)	(KJ)
1200	20000	FCS3BDW209*****	30	1	100	14.4
	65000	FCS3BDW659*****	100	1	100	46.8
3000	10000	FCS3FDW109*****	20	1.5	120	45
	15000	FCS3FDW159*****	30	1	120	67.5
4000	150	FCS3GDW157*****	3	2	80	120
5000	8200	FCS3HDW828*****	25	1.5	125	102.5
	11000	FCS3HDW119*****	33	1	125	137.5
6000	100	FCS3XDW107*****	3	1.3	80	180
8000	130	FCS3KDW137*****	5	1	80	416

可根据客户要求定制。Customer products are available on request.



## 代码编制规则 Part Number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
F	C	R	3	K	D	U	1	0	5	K	A	1	9	0	8	2	9	
电容器类型 Capacitor Type	产品外形 Product Shape	额定电压代码 Rated Voltage Code	系列代码 Series Code		容量代码 Capacitance Code		容量偏差 Capacitance Tolerance		样式 Plate style		尺寸特征码 Dimension characteristic code							
FC=薄膜电容器 FC=Film Capacitor	轴向=R Axial=R	8000=3K	CBB129=DU		0.1=104		± 5%=J		Style1=A		190829							
		15000=4C			± 10%=K		Style2=B											
		20000=4D			1.0=105		Special=S		Style3=C									
		100000=5A			10=106													



## Features

- Round PET tape package, small size, light weight, high energy storage density
- Small ESR, low internal temperature rise, high dv/dt
- Self-healing performance is excellent, the reliability is high

## Recommended circuit

- Medium and small power induction heating power, medium power plasma power supply
- High voltage pulse dc power supply, high voltage LC power supply, high voltage load switch, and the lightning device
- Partial pressure, double - pressure energy storage and high speed charge and discharge, pulse with inductance combination, smooth energy

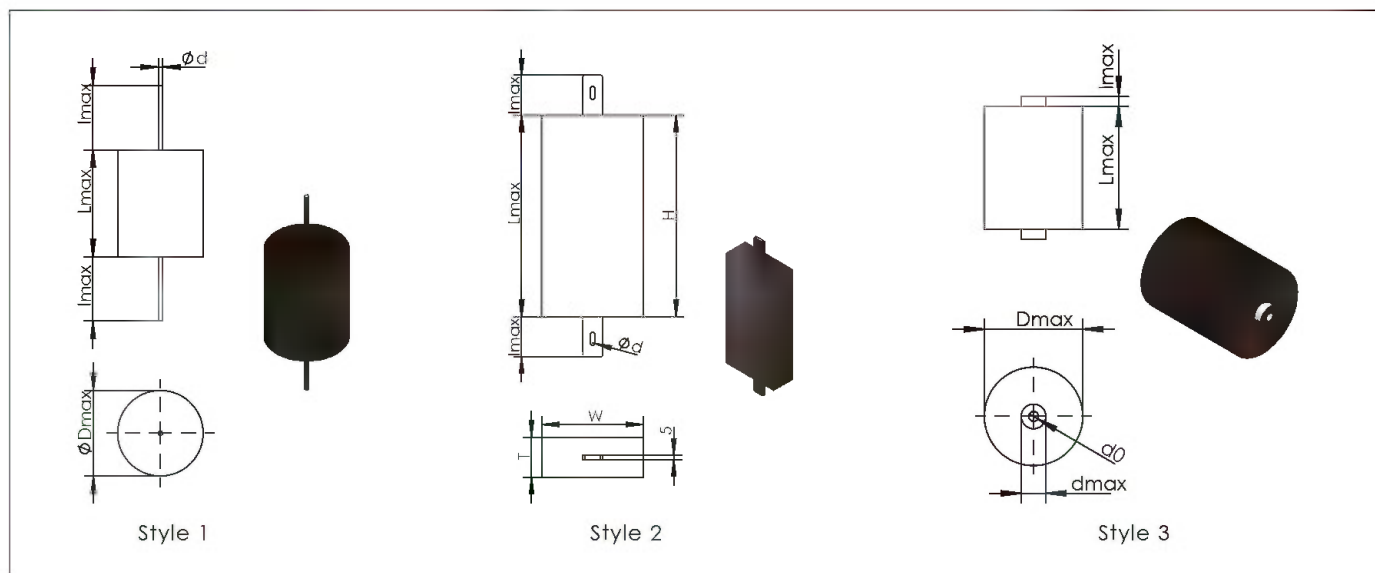
## 特点

- 圆形胶带包裹, 体积小, 重量轻, 高储能密度
- ESR小, 内部温升低, dv/dt高
- 自愈性能优异, 中高频特性好, 可靠性高

## 应用线路

- 中小功率感应加热电源, 中功率等离子体电源
- 高压脉冲直流电源, 高压LC电源, 高压负载开关, 避雷器等
- 分压, 倍压储能和高速充放电, 与电感组合形成脉冲, 平滑能量。

## 外形图 Dimensions



## 标识 Marking

	1
FCR3KDU105KA190829	2
CBB129	3
1µF K 8000V	4
N35F18	5

NO.	项目 Item
1	商标 Brand
2	产品代码 Products code
3	产品系列 Products series
4	容量、偏差以及额定电压 Capacitance、Tolerance and Rated voltage
5	年度标记 Year code



## 性能特性 Specifications

项目 Item	特性 Characteristics
引用标准 Reference Standard	JB/T 8168 / IEC60384-17
气候类别 Climatic Category	40/70/21
工作环境温度范围 Operating environment Temperature Range	-40~+55°C ( $\theta_{\text{hotspot}} \leq 70^\circ\text{C}$ )
存储温度范围 Storage Temperature Range	-40~+55°C
额定电压 $U_R$ Rated Voltage	3KV—100KV <sub>DC</sub>
电容量范围 Capacitance Range	0.1nF ~ 100μF
电容量偏差 Capacitance Tolerance	± 5%(J), ± 10%(K)
端子与端子电压 $U_{TT}$ Voltage Between Terminals	1.2~1.5 × $U_R$ V <sub>DC</sub> , 10s (20±5°C)
端子与外壳电压 $U_{TC}$ Voltage Between Terminals and Case	>3000 V <sub>AC</sub> , 10s (20±5°C, 50Hz)
介质损耗角正切 Dielectric Dissipation Factor	0.0002
绝缘电阻 Insulation Resistance	$IR \cdot C \geq 10000s$ (20±5°C, 100V <sub>DC</sub> , 1min)
预期寿命 Life Expectancy	100000h ( $U_R, \theta_{\text{hotspot}} = 55^\circ\text{C}$ )

## 规格标准 Standard Ratings

$U_R$ (V)	$C_R$ (μF)	P/N -	ESR (mΩ)	tgδ 10kHz (‰)
8000	0.33	FCR3KDU334*A*****	8	/
	1	FCR3KDU105*A*****	6	/
	10	FCR3KDU106*A*****	5	/
15000	0.1	FCR4CDU104*C*****	/	1.5
	0.3	FCR4CDU304*A*****	5	/
20000	0.1	FCR4DDU104*C*****	/	1.5
	0.2	FCR4DDU204*C*****	/	1.5
	0.3	FCR4DDU304*C*****	/	1.5
100K	0.5	FCS5ADU504*B*****	10	/
	1	FCS5ADU105*B*****	8	/
	1.5	FCS5ADU155*B*****	6	/

可根据客户要求定制。Customer products are available on request.



## Dimension Code

8				10				11			
W	H	T		W	H	T		W	H	T	
8	9.5	5.5	M1	10	8	4	A1	11	10	5.5	J1
8	8	5	M3	10	9	4	A2	11.5	11	7	J2
8	8.5	5	M2	10	10	5	A3				
7.5	8	3.5	M4	10	12	6	A4				
				10	9	5	A5				
				10	11	5	A6				
				10	13	7	A7				
				10	14	8	A8				
				10.5	12.5	10.5	A9				
				10	6	7.5	AA				
				10.5	10	6	AC				

13				14				15			
W	H	T		W	H	T		W	H	T	
13	8	4	C1	14	13	8	K1	15	11.5	6	D1
13	9	4	C2	14	11	6	K2	15	11.5	7	D2
13	10	5	C3					15	12.5	7	D3
13	11	5	C4					15	13.5	7	D4
13	12	6	C5					15	14	8.5	D5
13	12.5	6.5	C6					15	16	10	D6
13	16	8	C7					15	17	11	D7
13	13	7	C8								
13	14	8	C9								
13	16	9	CA								
13	16	10	CB								
13	14	5.5	CC								
13	15.5	6.5	CD								
13	19	10	CE								
13	19	9	CF								
13	16	7	CG								
13	12	7.5	CH								
13	11	6	CI								
13	12.5	8.5	CJ								
13	9	5	CK								

18				19				20			
W	H	T		W	H	T		W	H	T	
18	8	4	E1	19	16	11	Q1	20	18.5	10.5	L1
18	11	5	E2	19	17.5	9.5	Q2				
18	9	4	E3	19	17.5	9.5	Q3				
18	10	4	E4	19	14	7.5	Q4				
18	12	6	E5								
18	13.5	6	E6								
18	13.5	7.5	E7								
18	14.5	8.5	E8								
18	13	7	E9								
18	12.5	9	EA								
18	14	8	EB								
18	16	10	EC								
18	16	8	ED								
18	17.5	6	EE								
18	18	9	EF								
18	19	11	EG								
18	18	10	EH								
18	22	12.5	EI								
18	11	6	EJ								
18	15	10	EK								
18	16.5	9.5	EL								
18.5	15	6	EM								
18	12	8	EN								
18	15	7	EO								
18	17	10	EP								
18	9.5	9	EQ								
18	10	9.5	ER								
18	10.5	10	ES								
18	11	10.5	ET								
18	12	11.5	EU								
18.2	12.3	7.1	EX								



## Dimension Code

57.5				81				83			
W	H	T		W	H	T		W	H	T	
57.5	45	25	H1	81	112	63	Z1	83	59	30	NG
57.5	60	45	H2								
57.5	70	55	H3								
57.5	70	70	H4								
57.5	30	35	H5								
57.5	60	35	H6								
57.5	65	45	H7								
57.5	70	35	H8								
57.5	60	30	H9								
57.5	53	50	HA								
57.5	54	38	HB								
57	39	28	HC								
58	40	28	HF								
57.5	43.5	29.5	HG								
57.5	45	30	HH								
57.5	45	35	HJ								
57.5	45	45	HK								
57.5	50	35	HL								
57.5	55	40	HM								
57.5	45	60	HN								
57.5	35	45	HO								
57.5	33	29.5	HP								
58	40	26	HQ								
57.5	65	45	HR								
57.5	55	45	HS								
57.5	30	40	HU								
56.5	45	20	HV								
57.5	50	56	HX								
57.5	50	70	HY								
56.5	43	20	HZ								

90				130			
W	H	T		W	H	T	
90	58	75	OG	130	57	57.5	U1



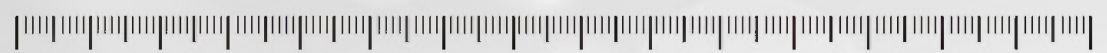
## Dimension Code

25.5				26.5				31			
W	H	T		W	H	T		W	H	T	
25.5	22.5	13.5	P1	26.5	13.5	6	B1	31	22	11	G1
				26.5	16.5	7	B2	31	26.5	16	G2
				26.5	17	8.5	B3				
				26.5	19	10	B4				
				26.5	20	11	B5				
				26.5	23	13	B6				
				26.5	22	12	B7				
				26.5	24	14	B8				
				26.5	25	15	B9				
				26.5	29.5	14.5	BA				
				26	18.5	10.5	BB				
				26	25.5	6	BC				
				26	24.5	13	BD				
				26	15.5	6	BE				

32				37				42.5			
W	H	T		W	H	T		W	H	T	
32	18	9	I1	37	25	15	S1	42.5	37	28	F1
32	20	9.5	I2	37	26	18	S2	42.5	40	20	F2
32	15.5	6.5	I3					42.5	32	16	F3
32	20	11	I4					42.5	28	19	F4
32	16	7.5	I5					42.5	32	19	F5
32	17	8	I6					42.5	36	19	F6
32	22	13	I7					42.5	38	21	F7
32	24.5	13	I8					42.5	42	28	F8
32	19	10	I9					42.5	44	24	F9
32	25	16	IA					42.5	28	24	FA
32	28	19.5	IB					42.5	33	33	FB
32	28	14	IC					42.5	35.5	33.5	FC
32	28	18	ID					42.5	36	24	FD
32	31	21	IE					42.5	43	42	FE
32	33	18	IF					42.5	45	30	FF
32	31	23	IG					42.5	38	25	FG
32	35	26	IH					42.5	43	28	FH
32	37	22	II					42.5	45	33	FI
32	24.5	15	IJ					42.5	47	34	FJ
32	22	13	IK					42.5	50	35	FK
32	33	30	IL					42	18	24	FL
32	30	24	IM					42	20	26	FM
32	30	16	IN					42	24	32	FN
32	38	15	IO					42	28	17	FO
32	55	15	IP					41	26	15	FP
32	40	25	IQ					42.5	37	22	FQ
								41	30	16	FR
								42.5	30	17	FS
								42.5	33.5	22	FT
								41	32	17	FU
								42.5	22	11	FV
								42	60	45	FW
								42.5	18	27	FX
								42.5	24	30	FY
								42.5	24	13	FZ

45				47				50			
W	H	T		W	H	T		W	H	T	
45	45	31	V1	47	43	32	R1	50	40	30	T1
				47	34	26	R2				
				47	34	22	R3				
				47	38	28	R4				
				47	40	30	R5				





## Super capacitors





Part Number System for EDLC Cell (Coin, Radial, Snap-in/Lug/Welded Column, Screw), LIC Cell (Radial), 2-in-series EDLC Module EDLC扣式、引线式、焊针式/焊片式/焊柱式、螺栓式、LIC引线式、EDLC两串模组

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
SC		C		D		P	R	2	R	7	1	0	5	S		R	H	0	8	0	0	1	2	E	*	*
电容器类型 Capacitor Type Code			超级电容器类型 supercapacitor Type	系列代码 Series Code		额定电压 Rated Voltage Code(V)		容量 Capacitance Code (F)		容差 Capacitance Tolerance Code (%)		引出方式 Lead Form Code	尺寸 Dimension Code				套管 Sleeve Code		客户特殊要求 Customer Special Requirement							
SC= Super capacitor	C	Cell	D	EDLC	SCV	VC	2.7	2R7	0.1	104	-30 +50	A	VC	6.3×12									E	PET		
	M	Module	H	Hybrid	SVT	VT	3	3R0	0.22	224	+5 -20	B	VH	6.3×22									V	PVC		
					SVD	VD	3.6	3R6	0.33	334	+20 -10	C	VV	8×12									S	Plastic		
					SVH	VH	3.8	3R8	0.47	474	+30 -10	D	RA	8×14												
					SVX	VX	5.5	5R5	0.5	504	+30 -10	E	RF	8×20												
					SVY	VY	6.0	6R0	0.68	684	+30 -10	F	RH	8×25												
					SRP	PR			1	105	+70 -20	G	RL	10×16												
					SRE	ER			1.5	155	+20 -10	H	RM	10×20												
					SRQ	QR			2	205	+10 -5	I	RX	10×25												
					SSP	PS			2.5	255	+10 -5	J	RY	10×30												
					SSE	ES			3	305	+10 -5	K	RZ	11.5×4.8												
					SSL	LS			3.3	335	+10 -5	L	SA	13.5×7												
					SGP	PG			3.5	355	+20 -10	M	SB	13.5×9												
					SGE	EG			5	505	+50 -10	N	SC	12.5×9												
					HBR	BR			7	705	+100 -20	P	SD	12.5×20												
					HBRL	BL			10	106	+30 -10	Q	SL	12.5×25												
					HBE	BE			13	136	+20 -10	R	SV	12.5×30												
					SRM	MR			15	156	+50 -10	S	ST	12.5×35												
					SRS	SR			20	206	+50 -10	T	GA	16×20												
					SRO	OR			25	256	+75 -10	U	GB	16×25												
									30	306	+20 -10	V	RB	16×31.5												
									35	356	+50 -10	W	RN	16×35												
									40	406	+200 -10	X	YH	18×40												
									45	456	+20 -10	Y	YN	18×50												
									50	506	+50 -20	Z	ZH	18×60												
									55	556			ZN	19×4.8												
									60	606			XH	20.5×7.8												
									65	656			XN	20.5×9.8												
									70	706			YK	20.5×10												
									80	806				22×45												
									85	856				22×55												
									100	107				25×50												
									110	117				30×50												
									120	127				33×62												
									150	157				33×77												
									160	167				35×60												
									200	207				35×62												
									220	227				35×67												
									250	257				35×70												
									270	277				35×88												
									350	357				40×70												
									400	407				40×75												
									450	457				40×90												
									470	477				40×105												
									550	557				61×52												
									600	607				61×74												
									650	657				61×85												
									800	807				61×102												
									850	857				61×138												
									900	907				8.5×17×17												
									1000	108				8.5×17×23												
									1200	128				11×21×23												
									1400	148				11×21×27												
									1500	158				13×26×27												
									2000	208																
									3000	308																
									3400	348																



# PART NUMBER SYSTEM



Part Number System for LIC Cell(Soft Pack, Screw), Other Supercapacitor Module LIC 软包、螺栓, 其他模组

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
SC	C		H		A	A	4	R	0	1	0	8	M		*	*
电容器类型 Capacitor Type Code			超级电容器类型 supercapacitor Type		系列代码 Series Code		额定电压 Rated Voltage Code(V)		容量 Capacitance Code(F)		容差 Capacitance Tolerance Code (%)		客户特殊要求 Customer Special Requirement			
SC= Super Capacitor	C	Cell	D	EDLC	HAA	AA	3.8	3R8		3	305	+30 +0	F			
	M	Module	H	Hybrid	HAE	AE	4	4R0		11.1	116	+70 +10	G			
					HAH	AH	7.5	7R5		13	136	+20 +10	M			
					HGA	GA	13.5	013		19.4	196	+30 -10	Q			
					SMRP	PR	64	064		21.7	216	+20 +0	R			
					SMRE	ER	90	090		165	167	+50 +0	T			
					SMRQ	QR	160	160		1000	108	+20 -10	V			
					SMSP	PS				2000	208					
					SMSE	ES				3000	308					
					SMGP	PG				3200	328					
					HMBL	BL				5000	508					
					HMBRL	BR				6000	608					
					HMAA	AA				7200	728					
					HMAL	AL				10000	109					
					HMAE	AE				15000	159					
					HMGA	GA				16000	169					
										17000	179					
										20000	209					
										25000	259					
										32000	329					



## Coin Type Terminal Type

Unit:mm



VC-Type

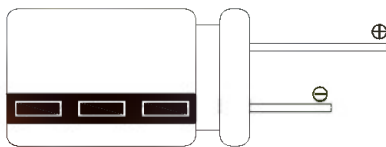


VH-Type



VV-Type

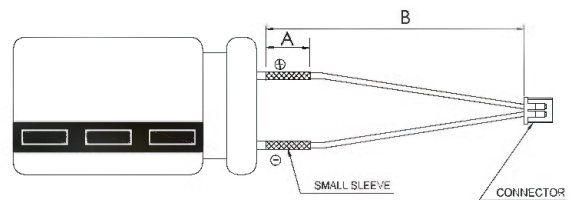
## Radial Type Terminal Code



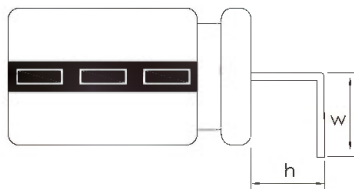
RH-Type



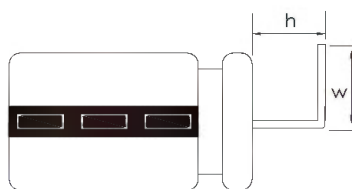
RL-Type



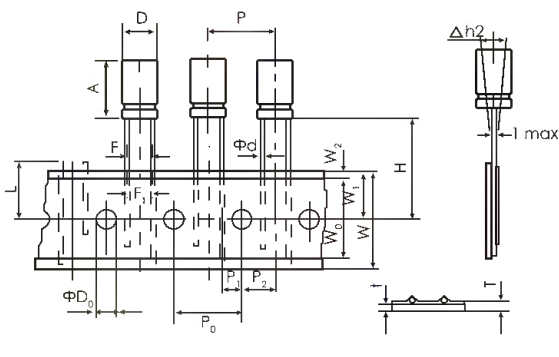
RX-Type



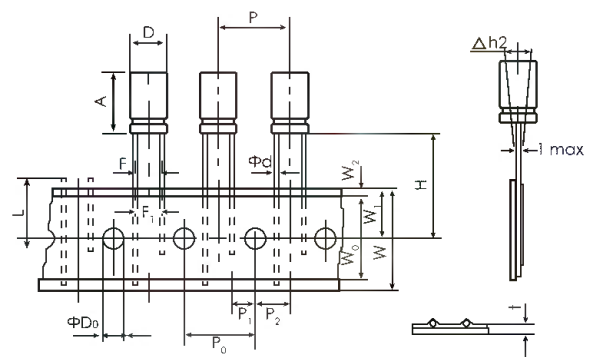
RY-Type



RZ-Type



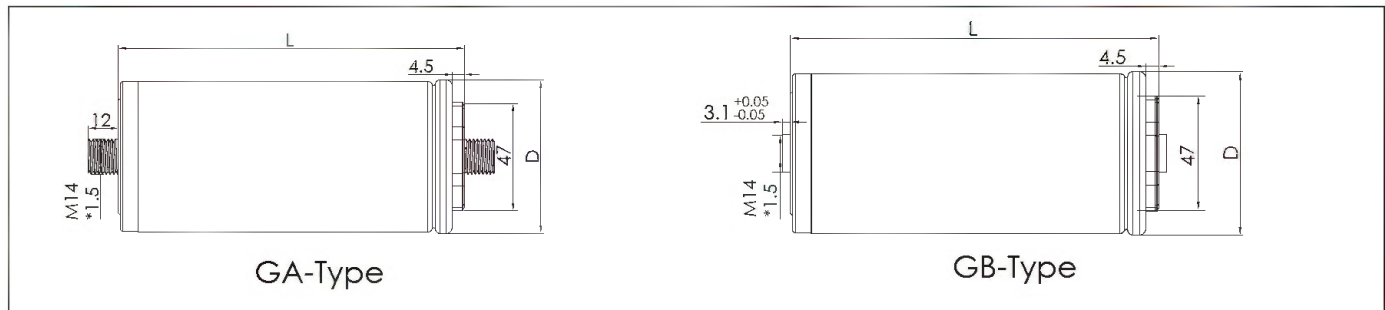
RA-Type





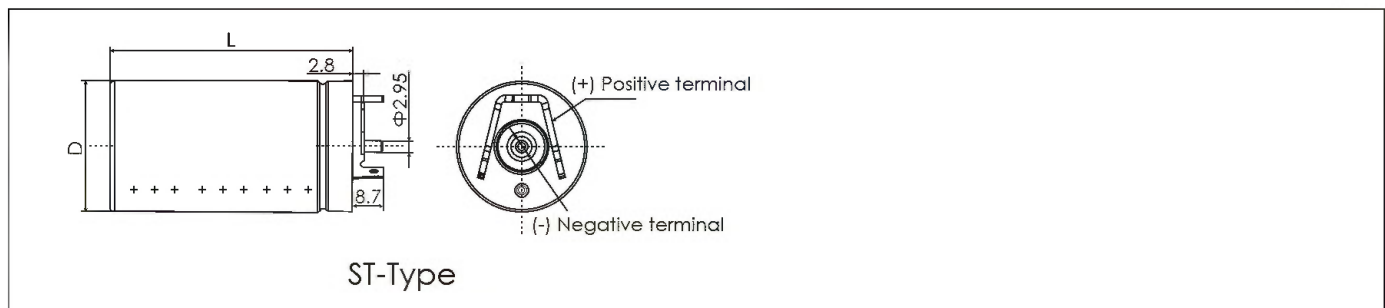
## Screw Terminal Code

Unit:mm



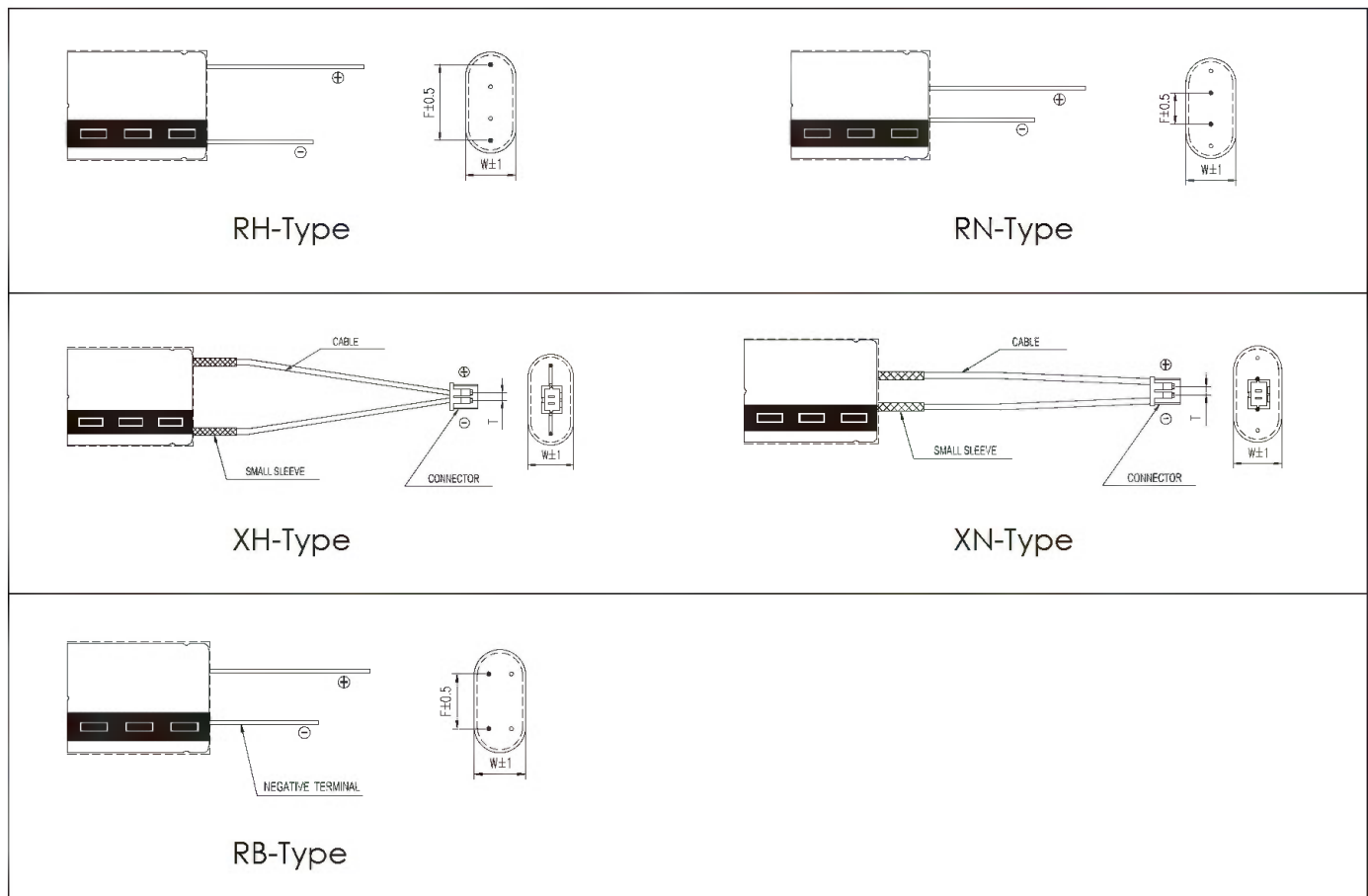
## Welded Column Terminal Code

Unit:mm



## 2 Series Type Terminal Code

Unit:mm





## Lug/Snap-in Terminal Code

Unit:mm

<b>SA-Type</b> 	<b>SB-Type</b> 
<b>SC-Type</b> 	<b>SD-Type</b> 
<b>SV-Type</b> 	<b>SL-Type</b> 



## ■ TECHNICAL NOTES of EDLC

### 1. General Description of Electric Double Layer Capacitors

#### 1-1. Operating Principle

By externally applying a voltage below a certain voltage to the boundary, higher charges can be accumulated. Charge and discharge of capacitor utilize adsorption and desorption of ions to the ionic adsorption layer (electric double layer) formed on the electrode surface of the activated carbon used for electrodes. The capacitors have electric charges oriented at the very short distance on boundary of electrolyte and electrodes what is called the "electric double layer capacitor."

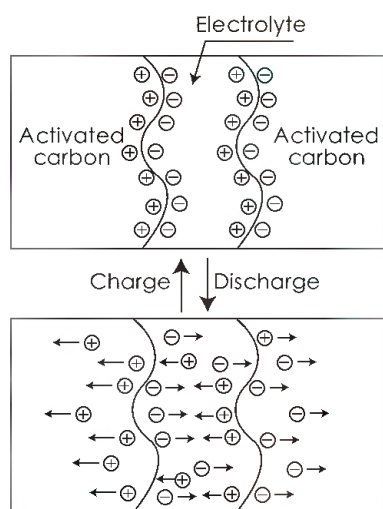


Fig. 1

#### 1-2. Advantages and Disadvantages of Electric Double Layer Capacitor

EDLC differs from rechargeable batteries, not causing chemical reaction, with surface of activated carbon with energy accumulation by ionic physical attachment only, therefore it holds the characteristics stated below:

##### ■Advantages

- (1) Small size and capacitance in farads (F) available by utilizing the activated carbon electrode with a large surface area
- (2) With low degradation, million cycles of charge-discharge and long life is possible
- (3) With a high power density, rapid (high current) charge-discharge is possible
- (4) Ease of maintenance
- (5) Environment-friendly without using heavy metal for its structure material

##### ■Disadvantages

- (1) Low energy density
- (2) Series connection is required when used with a low resistance of voltage at a high voltage
- (3) Cannot be used in AC circuits

### 1、双电层电容器的基本概要

#### 1-1、工作原理

在额定电压范围内，通过外部施加电压使得电荷在界面积聚。电容的充放电通过在活性炭电极表面形成的离子吸附界面（双电层）处离子的吸附和脱附来实现。利用电解液和电极的界面之间相隔的距离极其短，电荷在界面处集中排列从而形成物理储电的电容，称为“双电层电容”。

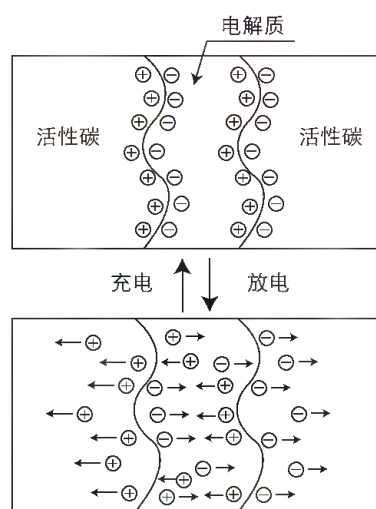


图. 1

#### 1-2、EDLC的特点

EDLC不同于二次电池，不发生化学反应，利用活性炭表面离子的物理吸附实现储能，因此具有以下特征：

##### ■优势：

- (1) 利用活性炭的比表面获得小体积和大容量
- (2) EDLC劣化缓慢，具有长寿命和上百万次的循环寿命
- (3) 具有高输出功率特性，实现快速充放电
- (4) 易于维护
- (5) 构成材料中没有使用重金属元素，环境友好

##### ■劣势：

- (1) 低能量密度
- (2) 由于单体电压低，在高电压使用时需要多只串联。
- (3) 不能使用在AC电路中。



## 2. Description of life expectancy

Generally, the life of Electric Double Layer Capacitors is largely affected by the ambient temperature and operating voltage. Take EDLC SRP as an example, The expected life is approximated by the equation as shown below:

SRP 2.7V EDLC:

$$L = L_0 \times 3.25^{\frac{T_0 - T}{10}} \times 1.52^{\frac{V_0 - V}{0.1}}$$

Where:

- L : Expected lifetime at temperature T
- $L_0$  : Lifetime at temperature  $T_0$
- T : Expected working temperature
- $T_0$  : Upper category temperature
- V : Actual working voltage
- $V_0$  : Upper rated working voltage

## 3. Handling Precautions and Guidelines

For safety application, please contact company directly for any technical specifications, handling precautions and guidelines critical to application.

### 3-1. Precautions

#### (1) Prohibition of disassembly

The disassembling may generate internal short circuit in the cell, which may cause gassing, leakage, explosion, or other problems. Electrolyte is harmful: In case the electrolyte comes into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

#### (2) Prohibition of dumping of cells into fire

These may cause explosion of the cells, which is very dangerous and is prohibited.

#### (3) Prohibition of cells immersion into liquid.

The cells shall never be soaked with liquids such as water, seawater, drinks such as juices, coffee or others.

#### (4) Prohibition of use of damaged cells.

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

### 3-2. Handling Guidelines

(1) It is not suitable that cell is used under such conditions: AC circuit and wave filtering.

## 2、寿命估算

一般来说, 环境温度和工作电压对EDLC的寿命影响很大。以引线式EDLC SRP型为例, 其理论估算寿命的计算公式参照如下:

SRP型双电层电容器:

$$L = L_0 \times 3.25^{\frac{T_0 - T}{10}} \times 1.52^{\frac{V_0 - V}{0.1}}$$

其中:

- L: T温度下理论寿命
- $L_0$ : 最高额定工作温度的工作寿命
- T: 实际工作温度
- $T_0$ : 最高额定工作温度
- V: 实际工作电压
- $V_0$ : 最高额定工作电压

## 3、使用注意事项和使用指导

为了确保安全, 当设计的设备需使用电容时, 请与公司联系咨询电容的技术规格以及使用要求。

### 3-1、注意事项

#### (1) 禁止拆卸

拆卸电容器可能产生内部短路, 导致产气, 电解液泄漏。电解液有害, 如果电解液接触皮肤或者眼睛, 应该立即用清水冲洗并且寻求医生的治疗。

#### (2) 禁止将电容器投入火中

将电容器投入火中可能导致爆炸, 这种行为是非常危险, 是被禁止的。

#### (3) 禁止将电容器浸没于液体中

电容器不允许被浸泡在液体中, 例如水, 盐水, 饮料例如果汁, 咖啡或者其它。

#### (4) 禁止使用已经损坏的电容器

如果使用前发现电容的外包装破裂, 闻到电解液的气味, 电解液泄漏或者其它非正常情况, 请勿继续使用。

### 3-2、使用指导

(1) 不可用于以下场合: 不能用于交流线路中; 不能用于滤波。



## (2) Voltage

Work voltage of cell should not exceed Max. work voltage of cell during using. Otherwise, will shorten shelf life, even cause swelling, leakage or crack.

## (3) Polarity

Please check the polarity before using. If working under reverse polarity, cell will not only shorten shelf life, but also heavy damage, such as swelling, electrolyte leakage etc.

## (4) Environment

Work temperature will have an influence on life of cell. As usual, higher work temperature will shorten life. So, it is better that cell works under as possible as low environmental temperature.

Work temperature of cell should consider internal environmental temperature in the unit and temperature rise when cell works.

Please do not use in environments with water droplets, condensation, toxic gases, etc. Wet environments and rapid temperature changes can become the cause of condensation on the surface of cell, and may lead to rapid degradation and leakage of the cell. Please avoid storing and using cell in such environments.

## (5) IR drop

When main power sources shut down, cell will change into work mode from failure mode, at the same time, OCV will decrease due to IR drop. So please choose proper product type according to impedance specified in product datasheet and applied current.

## (6) Cells in series connection

When multiple cells are used in series to improve the working voltage, the cell of the same gear must be used and the corresponding equalization circuit must be configured, it should be assured that work voltage of any single cell must not exceed Max. work voltage of single cell, otherwise, will shorten shelf life, even cause swelling, leakage or crack.

## (7) Soldering

Heat shock will decrease electric performance of cell, even cause swelling, leakage or crack.

Manual soldering temperature should not exceed 350°C, soldering time should not exceed 4s. Wave soldering temperature should not exceed 260°C, soldering time should not exceed 5s, while preheating temperature should be limited to less than 100°C and maximum preheating time of 60 seconds for PC boards 0.8mm or thicker.

Unless the EDLC is specifically rated to withstand reflow soldering temperature, please don't use reflow soldering, infrared heating and air heating methods on the EDLC.

## (2) 电压

使用过程中，电容器的工作电压不能超过其最大工作电压。否则，将缩短其使用寿命，甚至导致气胀，泄露，或者开裂。

## (3) 极性

使用前一定要检查电容器的极性，电容长时间在相反的极性下工作，不仅会缩短其使用寿命，而且可能导致严重的损毁，例如导致气胀，电解液泄漏等。

## (4) 环境

电容的寿命会受到工作温度的影响，一般而言，电容的工作环境温度越高，其寿命越短。因此，应使电容的工作温度在最大容许温度下尽可能地降低。

工作温度应该同时考虑工作环境温度以及工作时电容内部产生的温升。

请不要在有水滴、结露、有毒气体等环中使用。潮湿的环境和急剧的温度变化会成为电容表面结露的原因，并可能导致电容的快速劣化和漏液，请避免在此类环境中存放和使用电容。

## (5) IR压降

在主电源关闭时，电容将从电源失效检验模式转为后备电源工作模式，此时由于瞬间启动电流及电容内阻将导致开路电压下降。请根据相关产品介绍中所列出的阻抗和使用电流确定正确的产品型号。

## (6) 电容串联

当多个单体电容串联使用以提高工作电压时，必须采用同档位单体并且配置对应均衡电路，确保每只单体电容两端的电压不超过其最大工作电压，否则，将缩短其使用寿命，甚至导致气胀，泄露，或者开裂。

## (7) 焊接

热冲击会影响电容的电性能，甚至会导致电容的鼓气、漏液以及开裂。

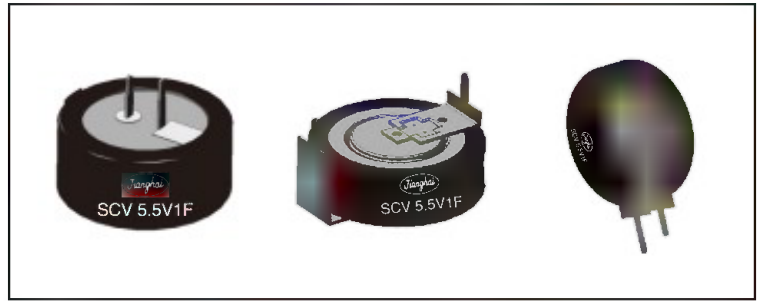
手工焊的温度建议低于350°C，焊接持续时间少于4s。波峰焊的温度建议低于260°C，焊接持续时间少于5s，其中预热温度应低于100°C，最多给PCB预热60s，PC板达0.8mm或更厚。

除非EDLC有明确的额定耐回流焊接温度，否则不应EDLC使用回流焊，而应使用红外线或空气加热方式。



## Typical application 典型应用

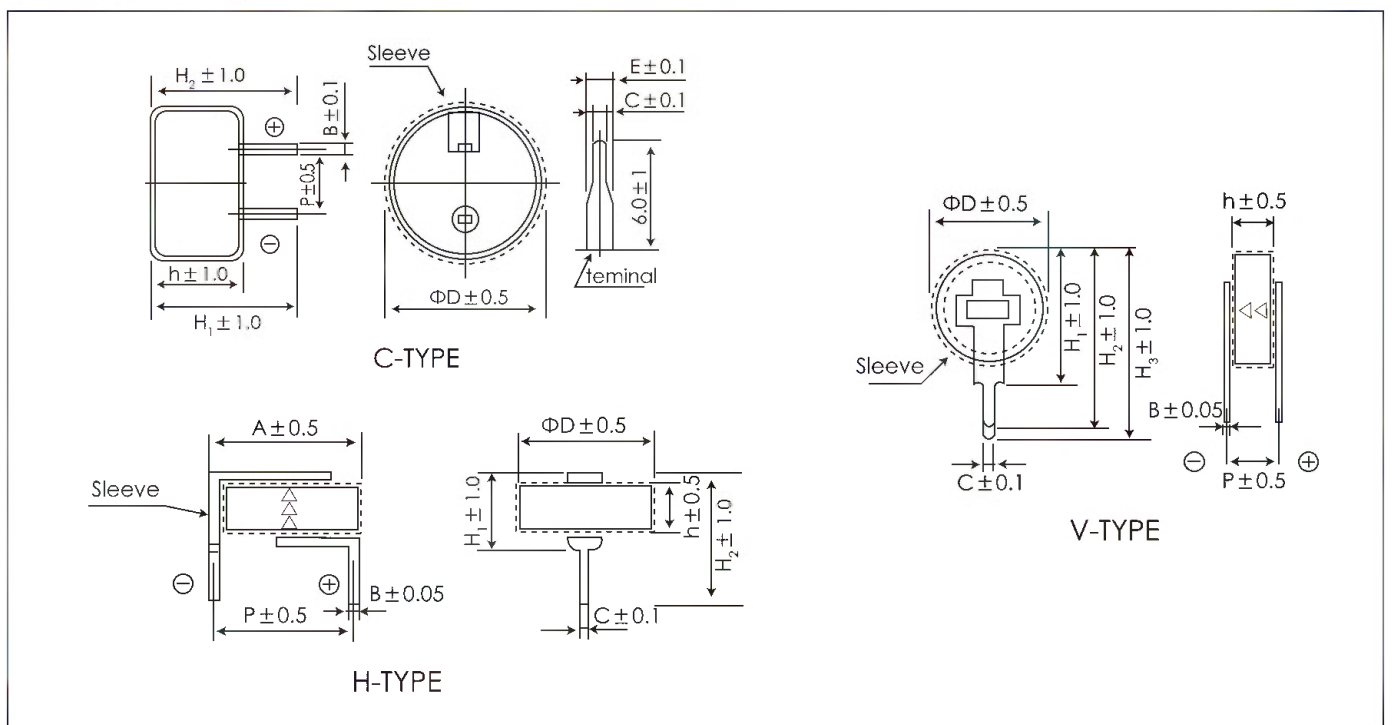
- Computer & peripherals  
计算机及外围设备
- DSL modems & routers DSL  
调制解调器和路由器
- Remote controller Boiler controller Automatic meter reader  
遥控器 锅炉控制器 自动抄表器
- Car audio Intelligent instrument  
汽车音响 智能仪器
- DVD/Blue ray recorder  
DVD/蓝光记录器
- Backup power supply of RTC  
时钟芯片后备电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5V		
Operating Temperature Rang 工作温度范围	-25 ~ +70°C		
Surge Voltage 浪涌电压	5.6 V		
Capacitance Range 容量范围	0.22~1.5 F		
Capacitance Tolerance 容差范围(25°C)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 70°C 在-25°C至70°C的温度范围内,应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 5 times of the initial specified value 不超过初始规定值的5倍
High Temperature Loaded 高温负荷	The specifications shall be met after 5V applied at 70°C for 1000 hours 在70°C下施加5V电压1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C下储存1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SCV Series SCV系列额定值

U <sub>R</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25 °C) 额定容量 (25 °C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C	E	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 C-TYPE	0.22	75	0.005	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVC5R5224ZVC135007E
	0.33	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVC5R5334ZVC135007E
	0.47	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVC5R5474ZVC135007E
	1.0	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVC5R5105ZVC205007E
	1.5	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVC5R5155ZVC205007E

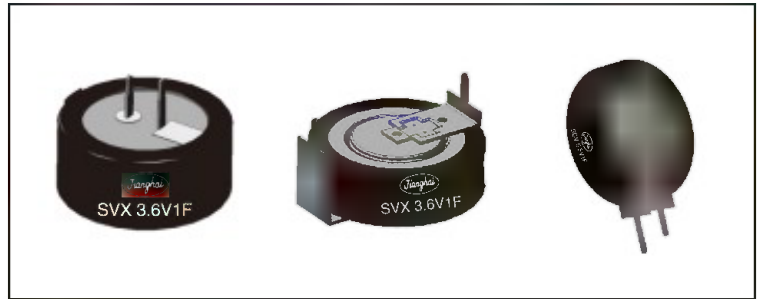
U <sub>R</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25 °C) 额定容量 (25 °C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	A	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 H-TYPE	0.22	75	0.005	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVC5R5224ZVH115004E
	0.33	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVC5R5334ZVH115004E
	0.47	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVC5R5474ZVH115004E
	1.0	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVC5R5105ZVH190004E
	1.5	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVC5R5155ZVH190004E

U <sub>R</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25 °C) 额定容量 (25 °C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 V-TYPE	0.22	75	0.005	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVC5R5224ZVV115004E
	0.33	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVC5R5334ZVV115004E
	0.47	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVC5R5474ZVV115004E
	1.0	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVC5R5105ZVV190004E
	1.5	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVC5R5155ZVV190004E



## Typical application 典型应用

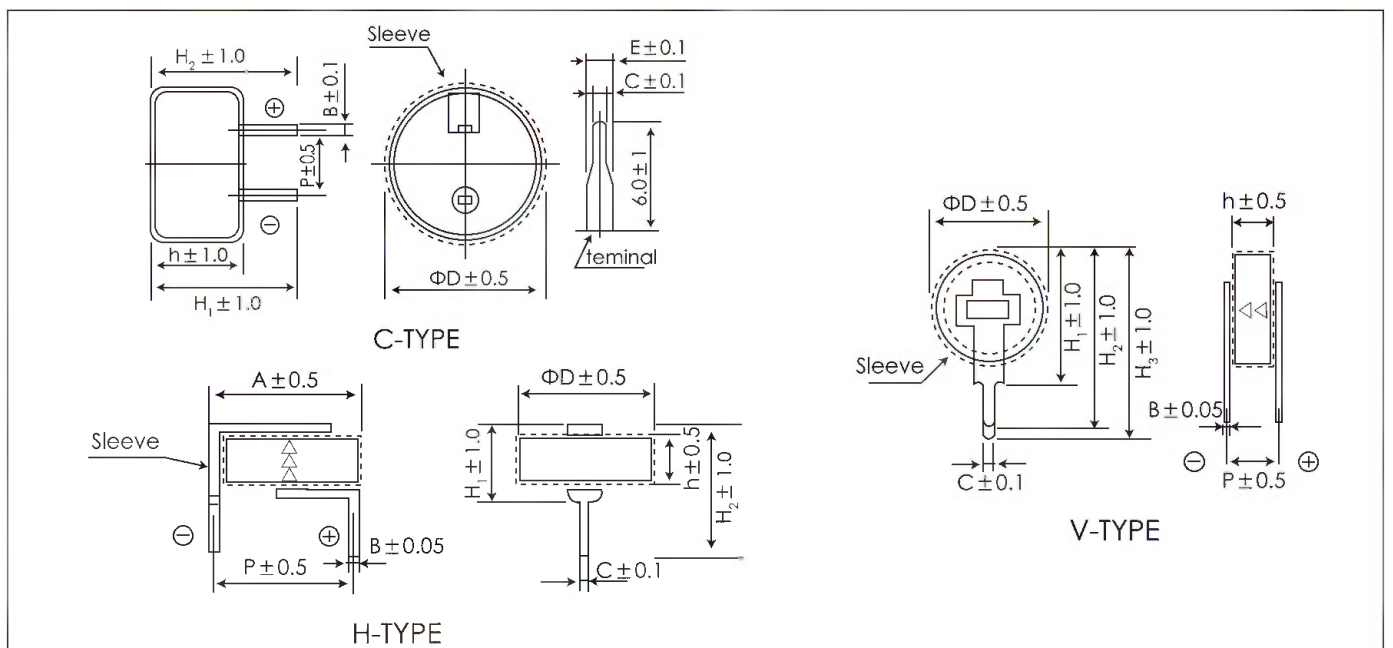
- Computer & peripherals  
计算机及外围设备
- DSL modems & routers DSL  
调制解调器和路由器
- Remote controller Boiler controller Automatic meter reader  
遥控器 锅炉控制器 自动抄表器
- Car audio Intelligent instrument  
汽车音响 智能仪器
- DVD/Blue ray recorder  
DVD/蓝光记录器
- Backup power supply of RTC  
时钟芯片后备电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3.6 V		
Operating Temperature Rang 工作温度范围	-25~+85°C		
Surge Voltage 浪涌电压	4.0 V		
Capacitance Range 容量范围	0.22~1.5 F		
Capacitance Tolerance 容差范围(25°C)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 85°C 在-25°C至85°C的温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C 时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 5 times of the initial specified value 不超过初始规定值的5倍
High Temperature Loaded 高温负荷	The specifications shall be met after 3.6V applied at 85°C for 1000 hours 在85°C下施加3.6V电压1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85°C for 1000 hours 在85°C下储存1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SVX Series SVX 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25℃) 额定容量 (25℃)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸							P/N 部品号	
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C		E
(V)	(F)	(Ω)	(mA)	(mm)							-	
3.6 (4.0) 3R6 C-TYPE	0.22	75	0.005	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVX3R6224ZVC135007E
	0.33	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVX3R6334ZVC135007E
	0.47	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVX3R6474ZVC135007E
	1.0	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVX3R6105ZVC205007E
	1.5	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVX3R6155ZVC205007E

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25℃) 额定容量 (25℃)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	A	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
3.6 (4.0) 3R6 H-TYPE	0.22	75	0.005	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVX3R6224ZVH115004E
	0.33	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVX3R6334ZVH115004E
	0.47	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVX3R6474ZVH115004E
	1.0	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVX3R6105ZVH190004E
	1.5	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVX3R6155ZVH190004E

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25℃) 额定容量 (25℃)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸							P/N 部品号	
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	B		C
(V)	(F)	(Ω)	(mA)	(mm)							-	
3.6 (4.0) 3R6 V-TYPE	0.22	75	0.005	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVX3R6224ZVV115004E
	0.33	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVX3R6334ZVV115004E
	0.47	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVX3R6474ZVV115004E
	1.0	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVX3R6105ZVV190004E
	1.5	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVX3R6155ZVV190004E



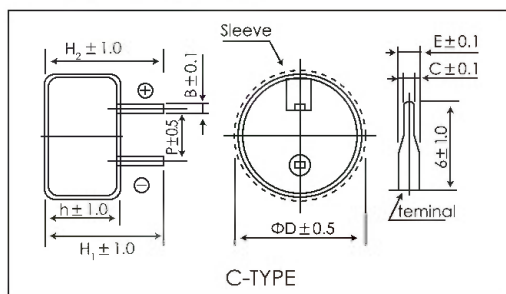
## Typical application 典型应用

- Computer & peripherals, DSL modems & routers DSL 计算机及外围设备、调制解调器和路由器
- Automatic meter reader, Rotary encoder 自动抄表器、旋转编码器
- Car Navigation 汽车导航
- Machine Controller, Breaker 机器控制、断路器
- Backup power supply of RTC, Electric power meter 时钟芯片后备电源、电能表



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-25~+85 °C		
Surge Voltage 浪涌电压	5.6 V		
Capacitance Range 容量范围	0.1~1 F		
Capacitance Tolerance 容差范围(25°C)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 85°C 在-25°C至85°C的温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 5 times of the initial specified value 不超过初始规定值的5倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 85°C for 1000 hours 在85°C下施加额定电压1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85°C for 1000 hours 在85°C下储存1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸 mm



## Ratings for SVH Series SVH 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C	E	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 C-TYPE	0.1	75	0.005	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVH5R5104ZVC135009E
	0.22	75	0.005	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVH5R5224ZVC135009E
	0.33	50	0.008	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVH5R5334ZVC135009E
	0.68	30	0.012	20.5	10	5	15.5	16	0.5	0.8	1.2	SCMDVH5R5684ZVC205010E
	1.0	30	0.012	20.5	10	5	15.5	16	0.5	0.8	1.2	SCMDVH5R5105ZVC205010E



## Typical application 典型应用

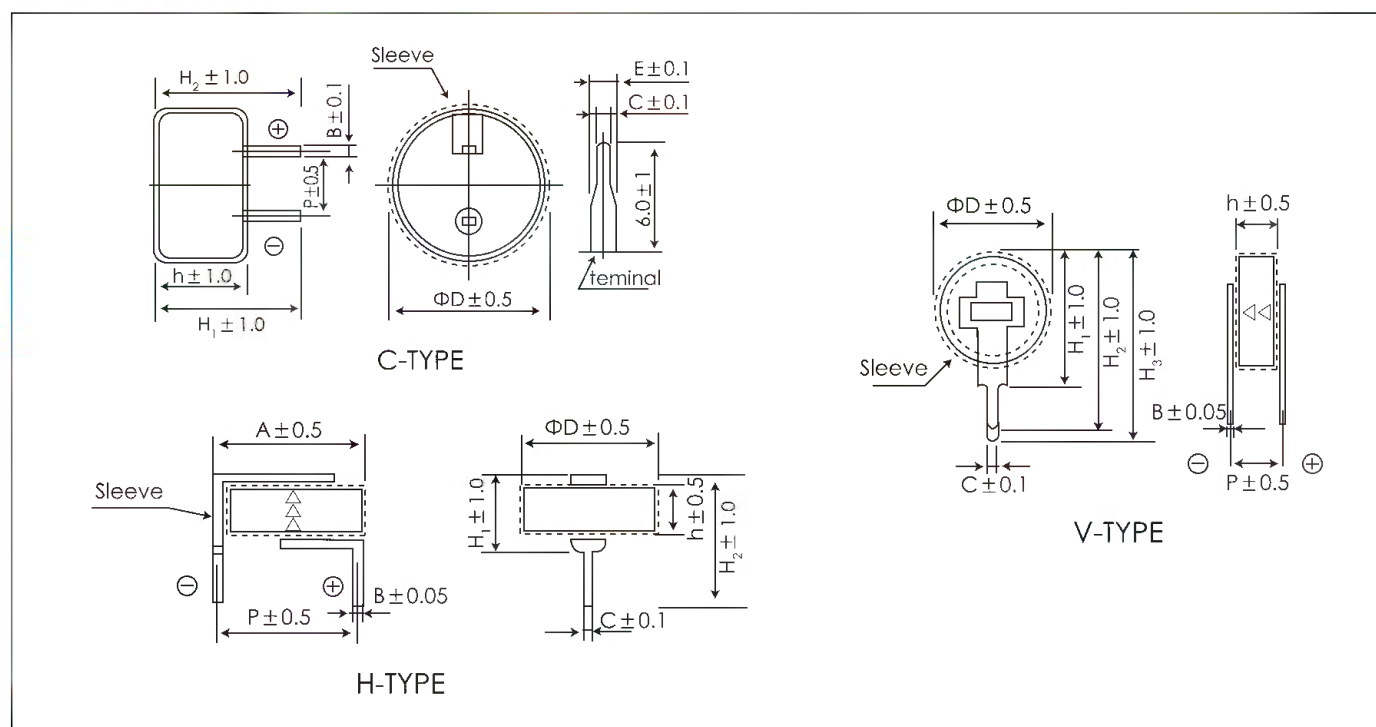
- Computer & peripherals  
计算机及外围设备
- DSL modems & routers DSL  
调制解调器和路由器
- Remote controller Boiler controller Automatic meter reader  
遥控器 锅炉控制器 自动抄表器
- Car audio Intelligent instrument  
汽车音响 智能仪器
- DVD/Blue ray recorder  
DVD/蓝光记录器
- Backup power supply of RTC  
时钟芯片后备电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+70℃		
Surge Voltage 浪涌电压	5.6 V		
Capacitance Range 容量范围	0.22~1.5 F		
Capacitance Tolerance 容差范围(25℃)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 70℃ 在-40℃至70℃的温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 7 times of the initial specified value 不超过初始规定值的7倍
High Temperature Loaded 高温负荷	The specifications shall be met after 5V applied at 70℃ for 1000 hours 在70℃下施加5V电压1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃下储存1000小时后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SVD Series SVD 系列额定值

U <sub>r</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C	E	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 C-TYPE	0.22	75	0.005	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVD5R5224ZVC135007E
	0.33	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVD5R5334ZVC135007E
	0.47	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVD5R5474ZVC135007E
	1.0	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVD5R5105ZVC205007E
	1.5	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVD5R5155ZVC205007E

U <sub>r</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	A	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 H-TYPE	0.22	75	0.005	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVD5R5224ZVH115004E
	0.33	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVD5R5334ZVH115004E
	0.47	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVD5R5474ZVH115004E
	1.0	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVD5R5105ZVH190004E
	1.5	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVD5R5155ZVH190004E

U <sub>r</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 V-TYPE	0.22	75	0.005	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVD5R5224ZVV115004E
	0.33	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVD5R5334ZVV115004E
	0.47	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVD5R5474ZVV115004E
	1.0	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVD5R5105ZVV190004E
	1.5	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVD5R5155ZVV190004E



## Typical application 典型应用

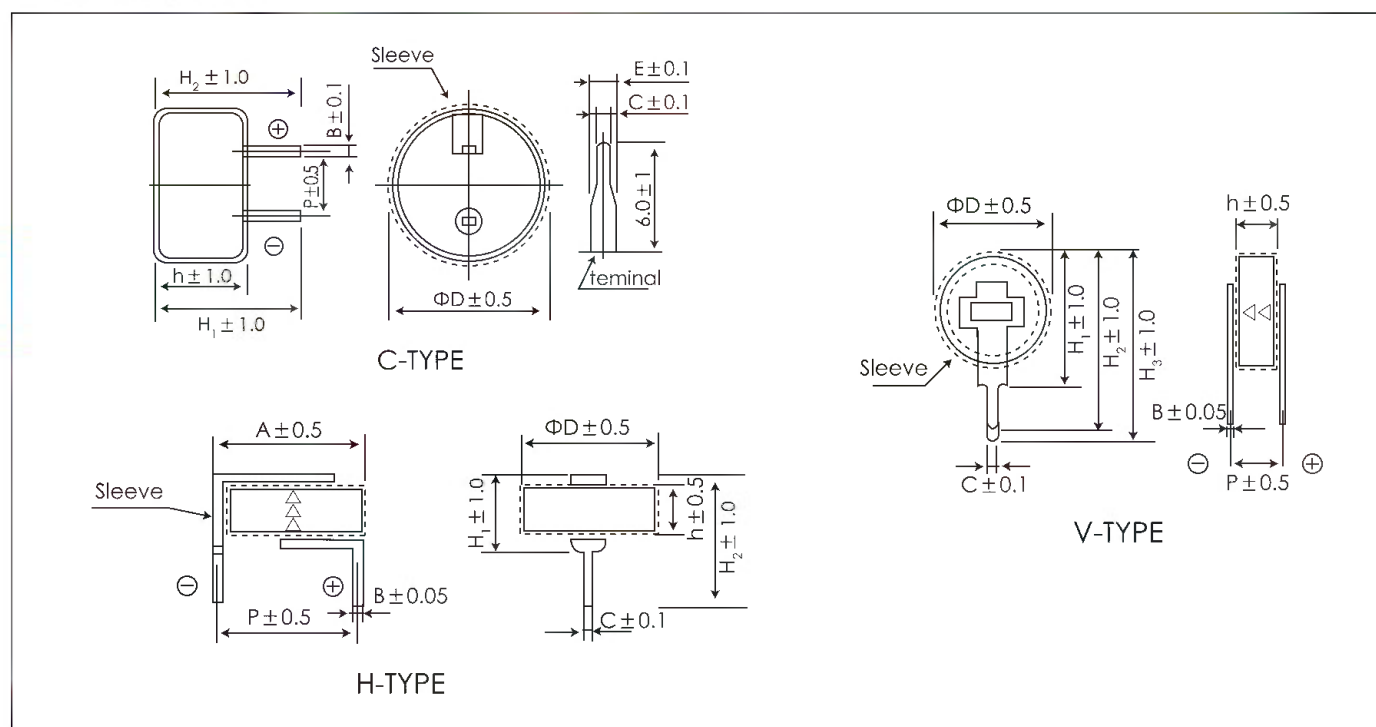
- Computer & peripherals  
计算机及外围设备
- DSL modems & routers DSL  
调制解调器和路由器
- Remote controller Boiler controller Automatic meter reader  
遥控器 锅炉控制器 自动抄表器
- Car audio Intelligent instrument  
汽车音响 智能仪器
- DVD/Blue ray recorder  
DVD/蓝光记录器
- Backup power supply of RTC  
时钟芯片后备电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3.6 V		
Operating Temperature Rang 工作温度范围	-40~+85°C		
Surge Voltage 浪涌电压	4.0 V		
Capacitance Range 容量范围	0.22~1.5 F		
Capacitance Tolerance 容差范围(25°C)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 85°C 在-40°C至85°C的温度范围内,应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 7 times of the initial specified value 不超过初始规定值的7倍
High Temperature Loaded 高温负荷	The specifications shall be met after 3.6V applied at 85°C for 1000 hours 在85°C下施加3.6V电压1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85°C for 1000 hours 在85°C下储存1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SVY Series SVY 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C	E	
(V)	(F)	(Ω)	(mA)	(mm)								-
3.6 (4.0) 3R6 C-TYPE	0.22	75	0.005	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVY3R6224ZVC135007E
	0.33	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVY3R6334ZVC135007E
	0.47	50	0.008	13	7	5	12.5	13	0.4	0.8	1.2	SCMDVY3R6474ZVC135007E
	1.0	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVY3R6105ZVC205007E
	1.5	30	0.012	20.5	7.8	5	13.4	13.8	0.5	0.8	1.2	SCMDVY3R6155ZVC205007E

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	A	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
3.6 (4.0) 3R6 H-TYPE	0.22	75	0.005	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVY3R6224ZVH115004E
	0.33	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVY3R6334ZVH115004E
	0.47	50	0.008	11.5	4.8	10	6	9	12.5	0.2	0.8	SCMDVY3R6474ZVH115004E
	1.0	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVY3R6105ZVH190004E
	1.5	30	0.012	19	4.8	20	6.5	9.5	20	0.2	1	SCMDVY3R6155ZVH190004E

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	B	C	
(V)	(F)	(Ω)	(mA)	(mm)								-
3.6 (4.0) 3R6 V-TYPE	0.22	75	0.005	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVY3R6224ZVV115004E
	0.33	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVY3R6334ZVV115004E
	0.47	50	0.008	11.5	4.8	5	13	16.5	16.5	0.2	0.8	SCMDVY3R6474ZVV115004E
	1.0	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVY3R6105ZVV190004E
	1.5	30	0.012	19	4.8	5	20.5	24.5	25.5	0.2	1	SCMDVY3R6155ZVV190004E



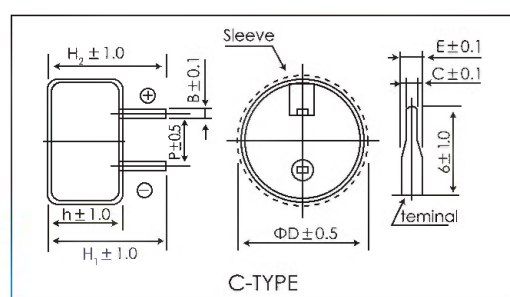
## Typical application 典型应用

- Computer & peripherals, DSL modems & routers 计算机及外围设备、调制解调器和路由器
- Automatic meter reader, Rotary encoder 自动抄表器、旋转编码器
- Car Navigation 汽车导航
- Machine Controller, Breaker 机器控制、断路器
- Backup power supply of RTC, Electric power meter 时钟芯片后备电源、电能表



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+85 °C		
Surge Voltage 浪涌电压	5.6 V		
Capacitance Range 容量范围	0.1~1 F		
Capacitance Tolerance 容差范围(25°C)	Z: -20~+80%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 85°C 在-40°C至85°C的温度范围内,应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 7 times of the initial specified value 不超过初始规定值的7倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 85°C for 1000 hours 在85°C下施加额定电压1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85°C for 1000 hours 在85°C下储存1000小时后,应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸 mm



## Ratings for SVT Series SVT 系列额定值

U <sub>r</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 引出脚型	Rated Capacitance (25°C) 额定容量 (25°C)	ESR <sub>AC</sub> (1KHz) 交流内阻 (1KHz)	Leakage Current (72hrs) 漏电流 (72小时)	Size 尺寸								P/N 部品号
				D	h	P	H <sub>1</sub>	H <sub>2</sub>	B	C	E	
(V)	(F)	(Ω)	(mA)	(mm)								-
5.5 (5.6) 5R5 C-TYPE	0.1	75	0.005	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVT5R5104ZVC135009E
	0.22	75	0.005	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVT5R5224ZVC135009E
	0.33	50	0.008	13	9	5	14.5	15	0.4	0.8	1.2	SCMDVT5R5334ZVC135009E
	0.68	30	0.015	20.5	9.8	5	15.5	16	0.5	0.8	1.2	SCMDVT5R5684ZVC205009E
	1.0	30	0.015	20.5	9.8	5	15.5	16	0.5	0.8	1.2	SCMDVT5R5105ZVC205009E



## Typical application 典型应用

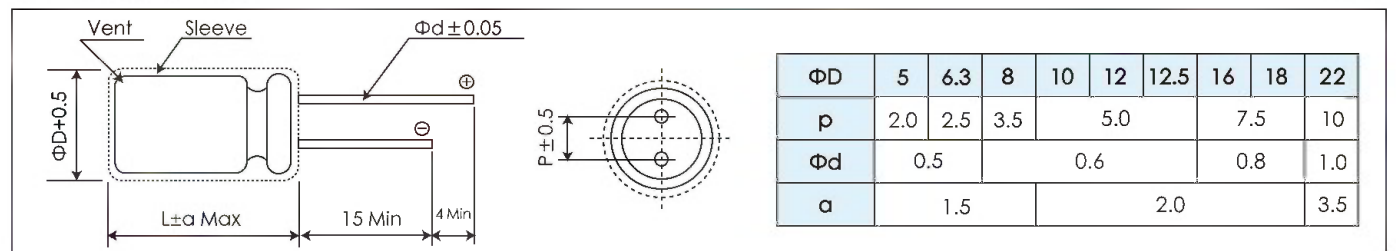
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter  
智能仪表: 国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40 ~ +70°C (-40 ~ +85°C @2.3V)		
Surge Voltage 浪涌电压	2.85V (≤1s,1次)		
Capacitance Range 容量范围	0.5~180 F		
Capacitance Tolerance 容差范围(25°C)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 70°C 在70°C时应满足的规范	Capacitance change 容量变化	Within 10% of the initial value 在初始值的10%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40°C 在-40°C时应满足的规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70°C for 1000 hours 在70°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm





## Ratings for SRP Series SRP 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	0.5	900	450	0.005	5×12	0.40	SCCDPR2R7504QRH050012EP
	0.8	700	350	0.006	6.3×12	0.66	SCCDPR2R7804QRH063012EP
	1	400	200	0.008	8×12	0.85	SCCDPR2R7105QRH080012EP
	1	400	200	0.008	8×14	0.90	SCCDPR2R7105QRH080014EP
	2	280	140	0.010	8×14	1.00	SCCDPR2R7205QRH080014EP
	3.3	180	90	0.014	8×20	1.43	SCCDPR2R7335QRH080020EP
	5	180	90	0.016	8×25	1.70	SCCDPR2R7505QRH080025EP
	5	120	60	0.016	10×20	2.10	SCCDPR2R7505QRH100020EP
	7	130	65	0.020	10×20	2.20	SCCDPR2R7705QRH100020EP
	7	110	55	0.020	10×25	2.70	SCCDPR2R7705QRH100025EP
	10	90	45	0.040	10×25	2.80	SCCDPR2R7106QRH100025EP
	10	80	40	0.040	10×30	3.20	SCCDPR2R7106QRH100030EP
	10	80	40	0.040	12.5×20	3.40	SCCDPR2R7106QRH125020EP
	10	80	40	0.040	12.5×25	3.60	SCCDPR2R7106QRH125025EP
	15	60	30	0.045	12.5×25	4.30	SCCDPR2R7156QRH125025EP
	20	50	25	0.060	16×20	5.90	SCCDPR2R7206QRH160020ET
	25	44	22	0.080	16×25	7.40	SCCDPR2R7256QRH160025ET
	30	36	18	0.100	16×30	8.40	SCCDPR2R7306QRH160030EP
	40	36	18	0.120	16×35	9.90	SCCDPR2R7406QRH160035ET
	50	32	16	0.140	18×40	13.6	SCCDPR2R7506QRH180040ET
	60	32	16	0.140	18×40	13.6	SCCDPR2R7606QRH180040ET
	70	36	18	0.200	18×50	16.9	SCCDPR2R7706QRH180050ET
	100	36	18	0.300	18×60	16.9	SCCDPR2R7107QRH180060ET
	100	32	16	0.300	22×45	22.5	SCCDPR2R7107QRH220045EP
	120	32	16	0.300	22×45	22.5	SCCDPR2R7127QRH220045EP
	180	32	16	0.900	22×55	27.0	SCCDPR2R7187QRH220055EP



## Typical application 典型应用

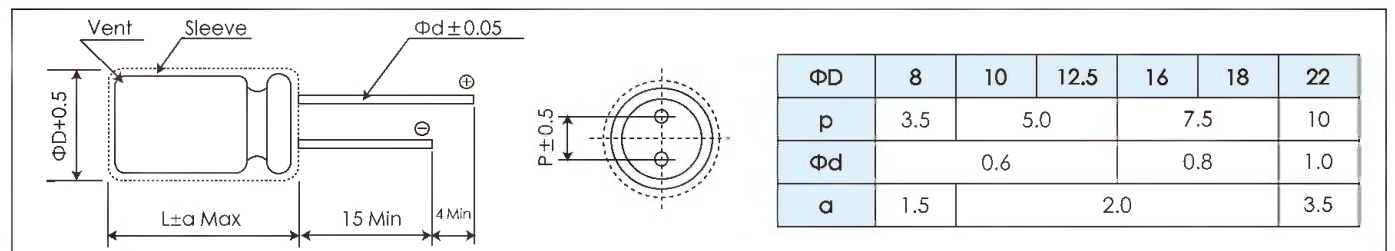
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter  
智能仪表: 国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3 V		
Operating Temperature Rang 工作温度范围	-40 ~ +65℃ (-40 ~ +85℃ @2.4V)		
Surge Voltage 浪涌电压	3.2 V (≤1s,1次)		
Capacitance Range 容量范围	1~180 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 65℃ 在65℃时应满足的规范	Capacitance change 容量变化	Within 10% of the initial value 在初始值的10%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40℃ 在-40℃时应满足的规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25℃温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SRE Series SRE 系列额定值

U <sub>r</sub> (Surge Voltage) Code (额定电压) (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1 KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
3 (3.2) 3R0	1	800	400	0.010	8×14	0.9	SCCDE3R0105QRH080014EP
	2	400	200	0.012	8×14	1.0	SCCDE3R0205QRH080014EP
	3.3	200	100	0.016	8×20	1.4	SCCDE3R0335QRH080020EP
	5	190	95	0.020	8×25	1.7	SCCDE3R0505QRH080025EP
	5	160	80	0.020	10×20	2.2	SCCDE3R0505QRH100020EP
	7	120	60	0.030	10×25	2.7	SCCDE3R0705QRH100025EP
	10	180	90	0.045	10×25	2.8	SCCDE3R0106QRH100025EP
	10	100	50	0.045	10×30	3.2	SCCDE3R0106QRH100030EP
	15	70	35	0.055	12.5×25	4.3	SCCDE3R0156QRH125025EP
	20	56	28	0.070	12.5×30	5.2	SCCDE3R0206QRH125030EP
	25	50	25	0.100	16×25	7.4	SCCDE3R0256QRH160025ET
	50	40	20	0.350	18×40	13.8	SCCDE3R0506QRH180040ET
	60	40	20	0.400	18×40	13.3	SCCDE3R0606QRH180040ET
	70	40	20	0.500	16×50	16.9	SCCDE3R0706QRH160050ET
	100	36	18	0.550	22×45	22.5	SCCDE3R0107QRH220045EP
	180	32	16	0.900	22×55	27.0	SCCDE3R0187QRH220055EP



## Typical application 典型应用

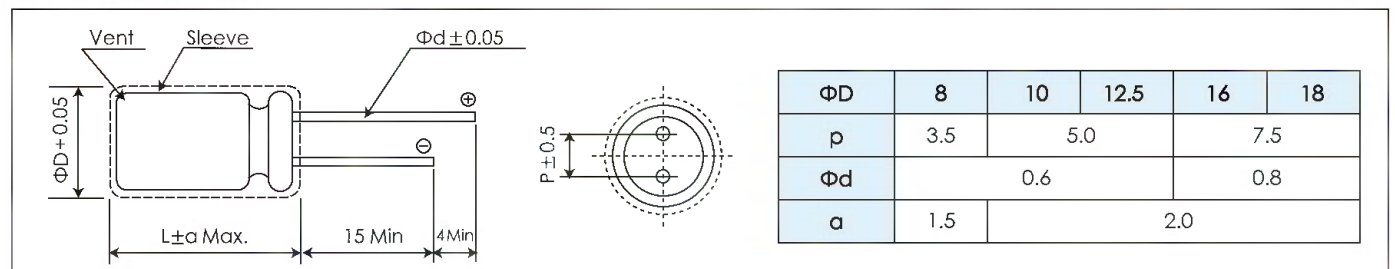
- Intelligent instruments: electronic meter, water meter, gas meter, hot meter  
智能仪表: 国网电表、水表、燃气表、热表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~ +85℃		
Surge Voltage 浪涌电压	2.85V (≤1s,1次)		
Capacitance Range 容量范围	1~50 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature of 85℃ 在85℃时应满足的规范	Capacitance change 容量变化	Within 10% of the initial specified value 在规格值的10%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than the initial specified value 不超过初始规定值
	The specifications shall be met at category temperature of -40℃ 在-40℃时应满足的规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after 2.5V applied at 85℃ for 1000 hours 在85℃温度下, 以2.5V恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85℃ for 1000 hours 在85℃温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25℃温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial specified value 在规格值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

## Dimensions 尺寸

mm





## Ratings for SRQ Series SRQ 系列额定值

U <sub>r</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	1	800	400	0.010	8×14	0.9	SCCDQR2R7105QRH080014EP
	2	320	160	0.012	8×14	1.0	SCCDQR2R7205QRH080014EP
	3.3	200	100	0.016	8×20	1.4	SCCDQR2R7335QRH080020EP
	5	160	80	0.020	10×20	2.2	SCCDQR2R7505QRH100020EP
	7	120	60	0.030	10×25	2.7	SCCDQR2R7705QRH100025EP
	10	180	90	0.045	10×25	2.8	SCCDQR2R7106QRH100025EP
	10	100	50	0.045	10×30	3.2	SCCDQR2R7106QRH100030EP
	10	100	50	0.045	12.5×20	3.4	SCCDQR2R7106QRH125020EP
	15	70	35	0.055	12.5×25	4.3	SCCDQR2R7156QRH125025EP
	20	56	28	0.070	12.5×30	5.2	SCCDQR2R7206QRH125030EP
	25	50	25	0.100	16×25	7.4	SCCDQR2R7256QRH160025ET
	50	40	20	0.350	18×40	13.8	SCCDQR2R7506QRH180040ET



## Typical application 典型应用

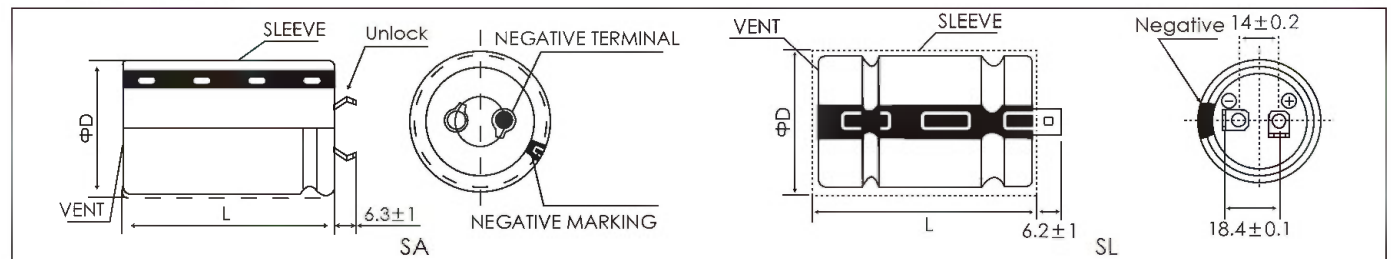
- Backup power supply of fan pitch control system  
风机变桨控制系统的后备电源
- Energy storage system of construction machinery  
工程机械储能系统
- Electric tool  
电动工具
- Industrial standby power supply  
工业备用电源
- AGV on-board power supply  
AGV车载电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65°C (-40 ~+85°C @2.3V)		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	100~800 F		
Capacitance Tolerance 容差范围(25°C)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1500 hours 在65°C温度下, 以额定电压恒压1500h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C 温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C 温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环 500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm



EDLC



## Ratings for SSP Series SSP 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Cap. 25°C (额定容量 25°C (*))	Impedance 内阻		Leakage Current 漏电流(72hrs)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	100	12	8	0.3	22×45	21	SCCDPS2R7107QSA220045E
	120	12	8	0.3	22×45	21	SCCDPS2R7127QSA220045E
	160	12	8	0.5	22×55	30	SCCDPS2R7167QSA220055E
	150	11	7	0.5	25×50	30	SCCDPS2R7157QSA250050E
	200	10	6	0.7	30×50	36	SCCDPS2R7207QSA300050ES
	220	10	6	0.7	30×50	39	SCCDPS2R7227QSA300050ES
	240	9	5	0.7	30×50	45	SCCDPS2R7247QSA300050ES
	350	3.5	3	1.0	35×60	73	SCCDPS2R7357QSL350060ES
	400	3.2	2.8	1.0	35×60	73	SCCDPS2R7407QSL350060ES
	470	3.5	3	1.3	35×60	73	SCCDPS2R7477QSL350060ES
	500	3.4	2.9	1.3	35×67	76	SCCDPS2R7507QSL350067ES
	600	3	2.5	1.5	35×70	90	SCCDPS2R7607QSL350070ES
	800	3	2.5	2	40×70	120	SCCDPS2R7807QSL400070ES



## Typical application 典型应用

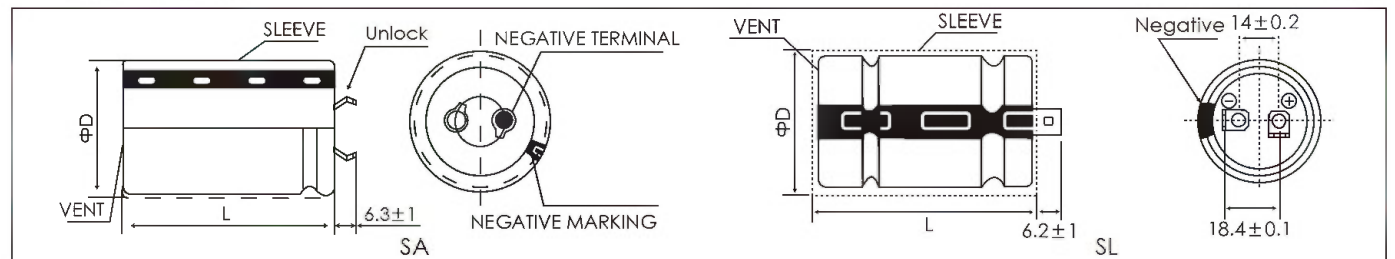
- Backup power supply of fan pitch control system  
风机变桨控制系统的后备电源
- Energy storage system of construction machinery  
工程机械储能系统
- Electric tool  
电动工具
- Industrial standby power supply  
工业备用电源
- AGV on-board power supply  
AGV车载电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3 V		
Operating Temperature Rang 工作温度范围	-40~+65°C (-40 ~+85°C @2.5V)		
Surge Voltage 浪涌电压	3.15 V		
Capacitance Range 容量范围	100~600 F		
Capacitance Tolerance 容差范围(25°C)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1000 hours 在65°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C 温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C 温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm



EDLC



## Ratings for SSE Series SSE 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Cap. 25°C (额定容量 25°C (*))	Impedance 内阻		Leakage Current 漏电流(72hrs) (mA)	Size 尺寸 ΦD×L (mm)	Weight 重量 (g)	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻 (mΩ)	ESR <sub>AC</sub> 交流内阻 (1 KHz) (mΩ)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
3 (3.15) 3R0	100	12	8	0.3	22×45	21	SCCDES3R0107QSA220045E
	120	12	8	0.3	22×45	21	SCCDES3R0127QSA220045E
	160	12	8	0.5	22×55	30	SCCDES3R0167QSA220055E
	150	11	7	0.5	25×50	30	SCCDES3R0157QSA250050E
	200	10	6	0.7	30×50	36	SCCDES3R0207QSA300050ES
	220	11	7	0.7	30×50	39	SCCDES3R0227QSA300050ES
	240	11	7	0.7	30×50	45	SCCDES3R0247QSA300050ES
	350	3.6	3.1	1.0	35×60	73	SCCDES3R0357QSL350060ES
	400	3.3	2.9	1.2	35×60	73	SCCDES3R0407QSL350060ES
	470	3.6	3.1	1.3	35×60	73	SCCDES3R0477QSL350060ES
	500	3.5	3	1.3	35×67	76	SCCDES3R0507QSL350067ES
	600	3	2.5	1.5	35×70	90	SCCDES3R0607QSL350070ES



## Typical application 典型应用

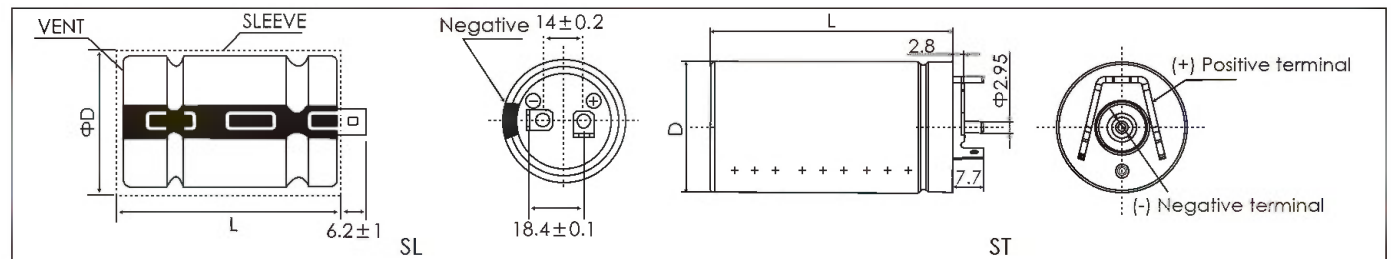
- PaSSLnger car power supply system  
乘用车电源系统
- Energy storage system of construction machinery  
工程机械储能系统
- Industrial standby power supply  
工业备用电源
- AGV on-board power supply  
AGV车载电源
- Microgrid energy storage  
微网储能



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65°C (-40~+85°C @2.3V)		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	250~1200 F		
Capacitance Tolerance 容差范围(25°C)	Q: -10~+30%, I: 0~+10%, R: 0~+20%, F: 0~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the rated value at 25°C 在25°C时额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1500 hours 在65°C温度下, 以额定电压恒压1500h后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C 温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the rated value 在额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from $V_R$ to $1/2V_R$ 在25°C 温度下, $V_R \sim 1/2V_R$ 充放电循环 500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the rated value 在额定值的30%以内
		ESR change 内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

## Dimensions 尺寸

mm





## Ratings for SSL Series SSL 系列额定值

U <sub>B</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (F)	Impedance 内阻		Leakage Current 漏电流(72hrs) (mA)	Size 尺寸 ΦD×L (mm)	Weight 重量 (g)	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻 (mΩ)	ESR <sub>AC</sub> 交流内阻 (1KHz) (mΩ)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	350	2.8	2.3	1.0	35×60	73	SCCDLS2R7357QSL350060ES
	400	2.7	2.2	1.2	35×60	73	SCCDLS2R7407QSL350060ES
	600	2.6	2.4	1.5	35×70	90	SCCDLS2R7607QSL350070ES
	800	2.7	2.2	1.5	40×70	120	SCCDLS2R7807QSL400070ES
	900	2.5	2.0	2.0	40×75	125	SCCDLS2R7907QSL400075ED
	1000	2.5	2.0	2.0	40×90	150	SCCDLS2R7108QSL400090ED
	1200	2.3	1.8	2.5	40×105	175	SCCDLS2R7128QSL400105ED

U <sub>B</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (F)	Impedance 内阻		Leakage Current 漏电流(72hrs) (mA)	Size 尺寸 ΦD×L (mm)	Weight 重量 (g)	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻 (mΩ)	ESR <sub>AC</sub> 交流内阻 (1KHz) (mΩ)				
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(g)	-
2.7 (2.85) 2R7	250	1	0.85	0.6	33×62	70	SCCDLS2R7257RST330062E
	350	1.9	1.4	0.7	33×62	65	SCCDLS2R7357RST330062E
	500	2	1.5	1.2	33×77	85	SCCDLS2R7507RST330077E
	400	1.9	1.4	1.2	35×62	90	SCCDLS2R7407RST350062E
	600	2	1.5	1.5	35×88	104	SCCDLS2R7607RST350088E



## Typical application 典型应用

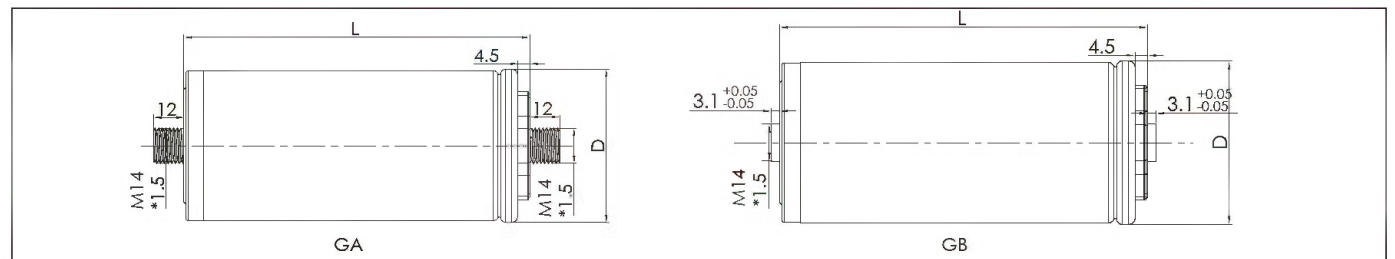
- Subway energy storage system  
地铁线路储能系统
- Start power module of passenger car  
乘用车启动电源模块
- Backup power supply for fan rotor control system  
风机变桨控制系统的后备电源
- Energy storage system for construction machinery  
工程机械储能系统
- Micro network storage  
微网储能



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.7 V		
Operating Temperature Rang 工作温度范围	-40~+65°C		
Surge Voltage 浪涌电压	2.85 V		
Capacitance Range 容量范围	650~3400 F		
Capacitance Tolerance 容差范围(25°C)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value at 25°C 在25°C时额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1500 hours 在65°C温度下, 以额定电压恒压1500h后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C 温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 1,000,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C 温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环 1,000,000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

## Dimensions 尺寸

mm



EDLC



## Ratings for SGP Series SGP 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流(72hrs)	Maximum Continuous Current 最大持续电流 (Δt=15°C)	Maximum Continuous Current 最大持续电流 (Δt=40°C)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(A)	(mm)	(g)	-
2.7 (2.85) 2R7	650	0.8	1.5	54	88	61×52	160	SCCDPG2R7657RGB610052E
								SCCDPG2R7657RGA610052E
	1200	0.58	2.7	70	110	61×74	260	SCCDPG2R7128RGB610074E
								SCCDPG2R7128RGA610074E
	1500	0.47	3	84	140	61×85	280	SCCDPG2R7158RGB610085E
								SCCDPG2R7158RGA610085E
	2000	0.35	4.2	110	170	61×102	360	SCCDPG2R7208RGB610102E
								SCCDPG2R7208RGA610102E
	3000	0.29	5.2	130	210	61×138	510	SCCDPG2R7308RGB610138E
								SCCDPG2R7308RGA610138E
	3400	0.28	10	130	210	61×138	513	SCCDPG2R7348RGB610138E
								SCCDPG2R7348RGA610138E



## Typical application 典型应用

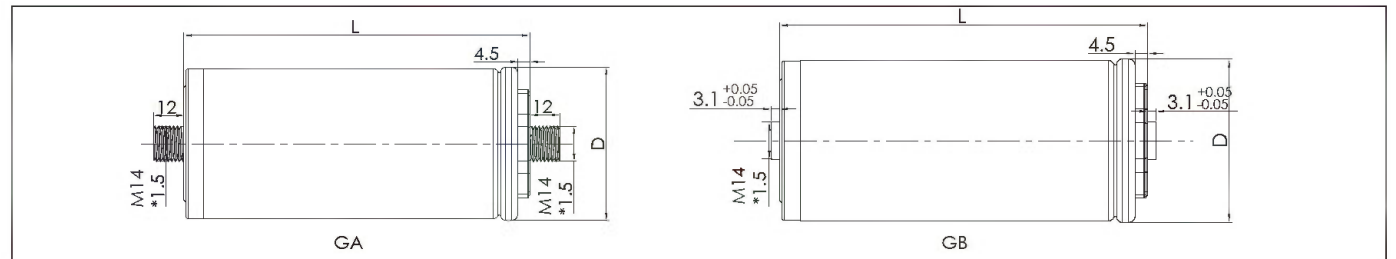
- Subway energy storage system  
地铁线路储能系统
- Start power module of passenger car  
乘用车启动电源模块
- Backup power supply for fan rotor control system  
风机变桨控制系统的后备电源
- Energy storage system for construction machinery  
工程机械储能系统
- Micro network storage  
微网储能



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	3.0 V		
Operating Temperature Rang 工作温度范围	-40~+65°C		
Surge Voltage 浪涌电压	3.15 V		
Capacitance Range 容量范围	650~3400 F		
Capacitance Tolerance 容差范围(25°C)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value at 25°C 在25°C时额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1500 hours 在65°C温度下, 以额定电压恒压1500h后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C 温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 1,000,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C 温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环 1,000,000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the rated value 在额定值的20%以内
		ESR <sub>DC</sub> change 直流内阻变化	Not more than 2 times of the rated value 不超过额定值的2倍

## Dimensions 尺寸

mm





## Ratings for SGE Series SGE 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压) (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流(72hrs)	Maximum Continuous Current 最大持续电流 (Δt=15°C)	Maximum Continuous Current 最大持续电流 (Δt=40°C)	Size 尺寸 ΦD×L	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(A)	(mm)	(g)	-
3 (3.15) 3R0	650	0.79	3	54	88	61×52	160	SCCDEG3R0657RGB610052E
								SCCDEG3R0657RGA610052E
	1200	0.55	5	73	110	61×74	260	SCCDEG3R0128RGB610074E
								SCCDEG3R0128RGA610074E
	1500	0.47	7	83	140	61×85	280	SCCDEG3R0158RGB610085E
								SCCDEG3R0158RGA610085E
	2000	0.36	8	102	170	61×102	360	SCCDEG3R0208RGB610102E
								SCCDEG3R0208RGA610102E
	3000	0.27	12	130	210	61×138	510	SCCDEG3R0308RGB610138E
								SCCDEG3R0308RGA610138E
	3400	0.24	15	140	225	61×138	513	SCCDEG3R0348RGB610138E
								SCCDEG3R0348RGA610138E



## ■ TECHNICAL NOTES OF LIC

### 1. Operating Principle

As a new system in the super capacitor field, the lithium-ion capacitor is based on the adoption of the new & advanced material technology, and uses the hybrid electrode material according to the design to realize the combination of principle & technology of the lithium-ion battery and super capacitor in one electrolytic cell by electrochemical calculation. In this way, the features of high specific power, long lifetime and fast charging of the super capacitor can be well maintained, and meanwhile the specific energy will be greatly enhanced with the performance blank between the double layer capacitor and lithium-ion battery effectively filled up, showing excellent application prospect. Lithium Ion Capacitors are hybrid capacitors that use a carbon-based material as the negative electrode. Just as in a conventional EDLC, they use activated carbon for the positive electrode.

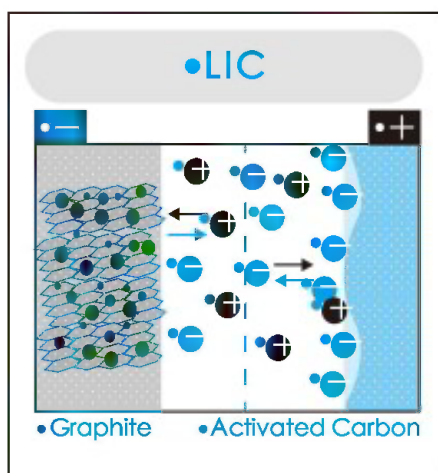


Fig. 1

### 2. Features

- (1) High working voltage: 4.0/3.8V
- (2) High energy density: 20~90Wh/Kg
- (3) Fast charge/discharge at high current: 3~15min
- (4) Low self discharge:  $\leq 5\%$ /3 months
- (5) Long life: 50000~500,000 charge/discharge cycles
- (6) Wide operation temperature range:  $-25\sim 55\&65^{\circ}\text{C}$  (Soft pack) /  $70\&85^{\circ}\text{C}$  (Al can)
- (7) High safety/reliability

### 3. Application

#### (1) Electric Vehicle

The lithium-ion capacitor is of tremendous market values in the area of hybrid power cars & coaches and pure electric buses. Some well-known car manufacturers have already conducted systematic testing and evaluation on the lithium-ion capacitor products. The conclusion they have drawn shows that to compare with the present batteries in use, the lithium-ion capacitor possesses significant performance advantages, and will have a bright future in the follow-up development of hybrid power cars and take up an important market share.

### 1、工作原理

锂离子电容器作为超级电容器领域中的一种新体系，以采用新型先进材料技术为基础，通过电化学计算，按照设计使用混合电极材料，在一个电解池中实现了锂离子电池和双电层电容器的原理和技术的结合，使其在保持双电层电容器高比功率、长寿命和快速充电特性的同时，大幅度提高了比能量，有效的填补了双电层超级电容器和锂离子电池之间的性能空白，表现出了良好的应用前景。锂离子电容器是一种混合型电容器，其使用碳基材料为负极，而正极与普通的双电层电容器一样，使用活性炭材料。

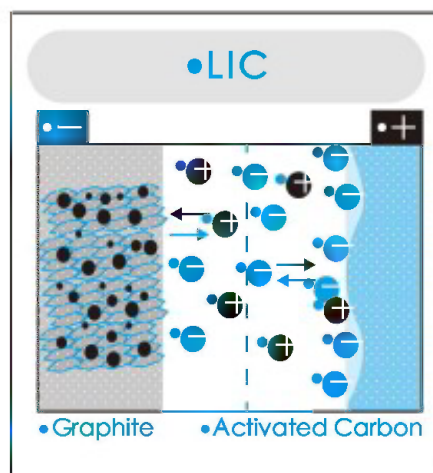


图. 1

### 2、特点

- (1) 高工作电压：4.0/3.8V
- (2) 高能量密度：10~90Wh/Kg
- (3) 大电流快速充放电：3~15min
- (4) 低自放电：2~10%/3个月
- (5) 长寿命：5~50万次充放电循环
- (6) 宽工作温度范围： $-25\sim 55\&65^{\circ}\text{C}$  (软包) /  $70\&85^{\circ}\text{C}$  (铝壳)
- (7) 高安全性与高可靠性

### 3、应用

#### (1) 电动汽车

锂离子电容器在混合动力轿车和大客车，以及纯电动公交车等电动汽车领域中具有巨大的市场价值。众多知名汽车公司都对锂离子电容器产品进行了系统的检测和评估，认为与目前使用的电池相比，锂离子电容器具有显著的性能优势，非常看好锂离子电容器在混合动力轿车后续开发中的应用前景，未来将占据重要的市场份额。



## (2) Rail Transit

Off-line operation is one of the technical development directions of the modern tram, and enterprises both at home and abroad highly value this point. Under the premise of keeping the reasonable weight and cost, the adoption of the lithium-ion capacitors can satisfy the off-line operation requirement for the whole journey after a fast charging at the terminal station. Thus a great amount of infrastructure expenditure can be saved, and the remarkable cost/performance advantage demonstrated.

## (3) Hybrid power driven engineering machinery and harbor machinery

The engineering machinery and harbor machinery have the common problem of low engine energy efficiency, and are unable to recover the regenerated energy. The hybrid power driven engineering machinery and harbor machinery using the lithium-ion capacitors take the full advantage of the characteristics of the lithium-ion capacitor, and are of very high energy-saving rate and excellent cost performance.

## (4) Energy-saving elevator

The adoption of the Li-ion capacitors can recycle the stored potential energy into electricity to be firstly used in the next operation cycle. Thus, the energy-saving is realized. Meanwhile, it can also be used as an emergency back-up power supply of the elevator to greatly improve its safety performance.

## (5) Golf Cart and AGV

The golf cart and AGV using the lithium-ion capacitors make the power supply smaller in size, light in weight, lower in cost, longer in lifetime and easy to use. It is a brand new application model worthy to be developed.

## (6) Electric Tools

The fast charging electric tools need the combination of high power and energy, long lifetime, excellent safety performance and consistency. The adoption of the lithium-ion capacitor will further improve the performance of the fast charging electric tools, and prolong the lifetime and reduce the cost. It is of a very broad market prospect.

## (7) DC Circuit and Smart Meters

Compared with EDLC, the lithium-ion capacitor can offer much higher capacitance. Therefore, it will have a very bright future, and be widely used in electric appliances such as smart meter, mobile DVR, tachograph, hand-held GPRS equipment, and ETC etc.

## 4. Handling Precautions and Guidelines

For safety application, please contact company directly for any technical specifications, handling precautions and guidelines critical to application.

### 4.1 Precautions

#### (1) Prohibition of disassembly

The disassembling may generate internal short circuit in the cell, which may cause gassing, leakage, explosion, or other problems. Electrolyte is harmful: In case the electrolyte comes into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

#### (2) Prohibition of dumping of cells into fire

These may cause explosion of the cells, which is very dangerous and is prohibited.

#### (3) Prohibition of cells immersion into liquid.

The cells shall never be soaked with liquids such as water, seawater, drinks such as juices, coffee or others.

#### (4) Prohibition of use of damaged cells.

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more. The Cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

## (2) 轨道交通

脱线运行是现代有轨电车的技术发展方向之一，国内外企业对此均予以高度重视。应用锂离子电容器作为电源，在保持合理重量和成本的前提下，在终点站一次快速充电即可满足全程脱线运营的要求，节约了大量的基建费用，具有显著的成本和性能优势。

## (3) 混合动力工程机械及港口机械

工程机械和港口机械普遍出现发动机能量效率低下，具备能量回收的条件。混合动力工程机械及港口机械充分利用了锂离子电容器的特性，具有优秀的节能效率和高性价比。

## (4) 节能电梯

使用锂离子电容器，回收储存势能所转化的电能，下一工作循环时优先使用，实现节能；同时用作为电梯应急后备电源，能够大幅度提高电梯使用的安全性。

## (5) 高尔夫球车及AGV

高尔夫球车和AGV使用锂离子电容器，电源体积、重量和成本更低，寿命更长，使用更方便，能够开拓崭新的应用模式。

## (6) 电动工具

快充式电动工具需要电源兼顾高功率和高能量、长寿命、高安全性和高一致性等，使用超级电容器能进一步提高快充式电动工具使用性能、延长寿命、降低成本，具有非常广阔的市场前景。

## (7) 直流电路和智能仪表

相比双电层电容器，锂离子电容器能提供更高的容量。因此，它具有更广阔的应用前景，如智能仪表、车载DVR，行驶记录仪、手持GPRS设备、ETC等电器。

## 4、使用注意事项和使用指导

为了确保安全，当设计的设备需使用电容时，请与公司联系咨询电容的技术规格以及使用要求。

### 4-1、注意事项

#### (1) 禁止拆卸

拆卸电容器可能产生内部短路，导致产气，电解液泄漏。电解液有害，如果电解液接触皮肤或者眼睛，应该立即用清水冲洗并且寻求医生的治疗。

#### (2) 禁止将电容器投入火中

将电容器投入火中可能导致爆炸，这种行为是非常危险，是被禁止的。

#### (3) 禁止将电容器浸没于液体中

电容器不允许被浸泡在液体中，例如水，盐水，饮料例如果汁，咖啡或者其它。

#### (4) 禁止使用已经损坏的电容器

如果使用前发现电容的外包装破裂，闻到电解液的气味，电解液泄漏或者其它非正常情况，请勿继续使用。



(5) Prohibition of short-circuit or using for outside the working voltage.

Which may cause to gas, leakage or other problems.

(6) Prohibition of reversing the positive(+) and negative(-) terminals.

Which may cause to gas, leakage or other problems.

## 4.2 Handling Guidelines for monomer

(1) It is not suitable that cell is used under such conditions: AC circuit and wave filtering.

(2) Work voltage of cell should not exceed rated max operating voltage and min allowable operating voltage of cell during using. Otherwise, will shorten shelf life, even cause swelling, leakage or crack.

(3) Please check the polarity before using. If working under reverse polarity, cell will not only shorten shelf life, but also heavy damage, such as swelling, electrolyte leakage etc.

### (4) Environment

Work temperature will have an influence on service life of cell. As usual, higher work temperature will shorten service life. So, it is better that cell works under as possible as low environmental temperature.

Work temperature of cell should consider internal work temperature in the unit and temperature rise when cell works.

### (5) IR drop

When main power sources shut down, cell will change into work mode from failure mode, at the same time, OCV will decrease due to IR drop. So please choose proper product type according to internal resistance and operating current in product datasheet.

### (6) Cells in series connection

When multiple cells are used in series to improve the working voltage, the cell of the same gear must be used and the corresponding equalization circuit must be configured, it should be assured that work voltage of any single cell must not exceed Max. work voltage of single cell, otherwise, will shorten shelf life, even cause swelling, leakage or crack.

### (7) Soldering

Heat shock will decrease electric performance of cell, even cause swelling, leakage or crack.

Manual soldering is recommended, soldering temperature should not exceed 350 °C, soldering time should not exceed 5s.

Please don't use wave soldering, reflow soldering of infrared heating and air heating.

## 4.3 Handling Guidelines for Modules

### (1) Cell pairing

When using cells in series to form modules, cells in the same gear should be used to ensure the voltage consistency of cells in the group.

### (2) Protection mechanism

Modules need to be equipped with over voltage, under voltage, temperature and other protection functions to extend the service life of the module.

### (3) Self-discharge

When the module is placed for a long time, it is necessary to pay attention to the self-discharge of the module, in addition to the self-discharge consumption of the single capacitor, there is also the circuit power discharge. The storage time is recommended for 6 months to 2 years.

### (4) Insulation protection

Lithium supercapacitive cell is charged storage, modules can reach high voltage through series, so it is necessary to pay attention to insulation protection during use.

(5) 禁止短路或使用超过电容器的允许的工作电压  
可能导致产气、泄漏、或其他问题。

### (6) 禁止反向充电

可能导致产气、泄漏、或其他问题。

## 4-2、单体使用指导

(1) 不可以用于以下场合：交流电路和滤波电路。

(2) 电容的工作电压不应超过电容额定最高工作电压和最低允许工作电压。否则，会导致缩短使用寿命，甚至引起气胀、泄漏或开裂。

(3) 使用前请检查极性。如果在反极性下工作，电容不仅会缩短使用寿命，甚至还会造成严重的损坏，如气胀、电解液泄漏等。

### (4) 环境

工作温度会影响电容的使用寿命。通常，较高的工作温度会缩短使用寿命。因此，最好是在低环境温度下工作。

电容的工作温度应考虑机组内部工作温度和电容工作时的内部温升。

### (5) IR下降

当主电源关闭，电容会从电源失效检测模式转变为后备电源工作模式，此时由于瞬间启动电流和电容内阻会导致开路电压下降。因此，请根据产品规格书中指定的内阻和工作电流选择合适的产品类型。

### (6) 串联连接的电容

当多个单体电容串联使用以提高工作电压时，必须采用同档位单体并且配置对应均衡电路，确保每只单体电容两端的电压不超过其最大工作电压，否则，将缩短其使用寿命，甚至导致气胀、泄露，或者开裂。

### (7) 焊接

热冲击会降低电容的电性能，甚至引起气胀、泄漏或开裂。

推荐使用手工焊接，焊接温度不应超过350度，焊接时间不应超过5s。

请不要使用波峰焊、红外线加热和空气加热的回流焊。

## 4-3、模组使用指导

### (1) 单体配组

使用单体串联组成模组时，需要采用同一档位内单体，保证成组内单体电压一致性。

### (2) 保护机制

模组需要配备过压、欠压、温度等保护功能，延长模组的使用寿命。

### (3) 自放电

模组长期放置时，需要关注模组自放电，除了单体电容自放电消耗之外还有电路功耗放电。存放时间建议6个月~2年。

### (4) 绝缘防护

锂超容单体是带电储存，模组通过串联可以达到高电压，因此使用过程中需要注意绝缘防护。



## Typical application 典型应用

- Smart Meter: water meter, gas meter, hot meter  
智能仪表: 水表、气表、热表
- Scanner  
扫描枪
- Electric Tools  
电动工具
- Electric equipment  
电力设备

- Driving recorder  
行车记录仪
- Wireless charging smart home remote control  
无线充电智能家用遥控器
- Backup power: IoT Power, Server backup power, ETC  
后备电源: 物联网电源、服务器后备电源、ETC



Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	3.8 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.2 V		
Operating Temperature Rang 工作温度范围	-15~+70°C/85°C (3.5V)		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	5~550 F		
Capacitance Tolerance 容差范围(25°C)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -15°C to 70°C 在-15°C至70°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 10 times of the initial specified value at 25°C 不超过25°C时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70°C for 1000 hours 在70°C以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from 3.8~2.5V 在25°C, 3.8~2.5V充放电循环500000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm

Side view diagram of the LIC cell. The diagram shows a cylindrical component with a vent and a sleeve. The vent is located at the top left, and the sleeve is at the top right. The diameter of the vent is labeled  $\Phi D$ . The diameter of the sleeve is labeled  $\Phi d \pm 0.05$ . The length of the vent is labeled  $L+a \text{ Max}$ . The length of the sleeve is labeled  $22 \text{ Min}$ . The distance from the end of the sleeve to the end of the vent is labeled  $5 \text{ Min}$ . The vent is marked with a positive polarity symbol (+) and the sleeve with a negative polarity symbol (-).

Top view diagram of the LIC cell. The diagram shows a circular component with a central hole. The diameter of the central hole is labeled  $\Phi d$ . The diameter of the outer circle is labeled  $\Phi D$ . The distance from the center of the hole to the edge of the outer circle is labeled  $P \pm 0.5$ .

$\Phi D$	6.3	8	10	12.5	16	18
p	2.6	3.5	5.0	5.0	7.5	7.5
$\Phi d$	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	2.0	2.0	2.0	2.0





## Ratings for HBR Series HBR 系列额定值

UR (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25℃	Impedance 内阻		Rated. Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	5	5.7	6000	2000	0.025	0.15	2.0	6.3×12	SCCHBR3R8505SRH063012E
	13	14.8	1800	600	0.065	0.65	2.1	6.3×22	SCCHBR3R8136MRH063022E
	10	11.4	1800	500	0.05	0.5	2.0	8×14	SCCHBR3R8106TRH080014E
	25	28.4	1200	350	0.125	0.8	2.5	8×20	SCCHBR3R8256MRH080020E
	30	34.1	900	250	0.15	0.9	3.0	8×25	SCCHBR3R8306MRH080025E
	30	34.1	900	250	0.15	1.0	3.0	10×16	SCCHBR3R8306TRH100016E
	50	56.9	700	200	0.25	1.8	4.5	10×20	SCCHBR3R8506MRH100020E
	70	79.6	480	120	0.35	3.0	5.0	10×25	SCCHBR3R8706MRH100025E
	110	125.1	450	100	0.55	4.5	6.5	10×30	SCCHBR3R8117MRH100030E
	120	136.5	400	90	0.6	5.0	7.0	12.5×25	SCCHBR3R8127MRH125025E
	220	250.3	240	60	1.1	8.0	12.0	16×25	SCCHBR3R8227MRH160025E
	550	625.6	120	40	2.75	20	35.0	18×40	SCCHBR3R8557MRH180040E

\*Note: Special customization is possible.

\*注: 可以特殊定制。



## Typical application 典型应用

- Smart Meter: water meter, gas meter, hot meter  
智能仪表: 水表、气表、热表
- Scanner  
扫描枪
- Electric Tools  
电动工具
- Electric equipment  
电力设备
- Driving recorder  
行车记录仪
- Wireless charging smart home remote control  
无线充智能家用遥控器
- Backup power: IoT Power, Server backup power, ETC  
后备电源: 物联网电源、服务器后备电源、ETC



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Rated Max. Operating Voltage 额定最高工作电压	3.8 V		
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Min. Allowable Operating Voltage 最低允许工作电压	2.2 V		
Operating Temperature Rang 工作温度范围	-25~+70°C		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	5~550 F		
Capacitance Tolerance 容差范围(25°C)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 70°C 在-25°C至70°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 10 times of the initial specified value at 25°C 不超过25°C时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70°C for 1000 hours 在70°C以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 250,000 cycles at 25°C, cycle of charge/discharge from 3.8~2.5V 在25°C, 3.8~2.5V充放电循环250000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm

Side view diagram of the LIC cell. The diagram shows a cylindrical component with a 'Vent' at the top left and a 'Sleeve' at the top right. The diameter is labeled  $\Phi D$ . The length of the main body is labeled  $L+a \text{ Max}$ . The length of the sleeve is labeled  $22 \text{ Min}$ . The distance from the end of the sleeve to the right edge is labeled  $5 \text{ Min}$ . The diameter of the sleeve is labeled  $\Phi d \pm 0.05$ . The diagram also shows electrical connections with a positive terminal (+) and a negative terminal (-).

Top view diagram of the LIC cell. The diagram shows a circular component with a central hole. The diameter of the central hole is labeled  $\Phi d$ . The diameter of the outer circle is labeled  $\Phi D$ . The distance from the center to the edge of the central hole is labeled  $P \pm 0.5$ .

$\Phi D$	6.3	8	10	12.5	16	18
p	2.6	3.5	5.0	5.0	7.5	7.5
$\Phi d$	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	2.0	2.0	2.0	2.0



## Ratings for HBRL Series HBRL 系列额定值

U <sub>R</sub> (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25℃	Impedance 内阻		Rated. Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	5	5.7	6000	2000	0.025	0.15	2.5	6.3×12	SCCHBL3R8505SRH063012E
	13	14.8	1200	500	0.065	0.65	3.1	6.3×22	SCCHBL3R8136MRH063022E
	10	11.4	1500	500	0.05	0.5	3.0	8×14	SCCHBL3R8106TRH080014E
	25	28.4	650	300	0.125	0.8	3.3	8×20	SCCHBL3R8256MRH080020E
	30	34.1	700	250	0.15	0.9	4.0	8×25	SCCHBL3R8306MRH080025E
	30	34.1	550	250	0.15	1.0	4.0	10×16	SCCHBL3R8306TRH100016E
	50	56.9	450	200	0.25	1.8	6.0	10×20	SCCHBL3R8506MRH100020E
	70	79.6	250	100	0.35	3.0	8.0	10×25	SCCHBL3R8706MRH100025E
	110	125.1	220	90	0.55	4.5	10.0	10×30	SCCHBL3R8117MRH100030E
	120	136.5	200	80	0.6	5.0	12.0	12.5×25	SCCHBL3R8127MRH125025E
	220	250.3	100	60	1.1	8.0	25.0	16×25	SCCHBL3R8227MRH160025E
	550	625.6	80	40	2.75	20	65	18×40	SCCHBL3R8557MRH180040E

\*Note: Special customization is possible.  
\*注: 可以特殊定制。



## Typical application 典型应用

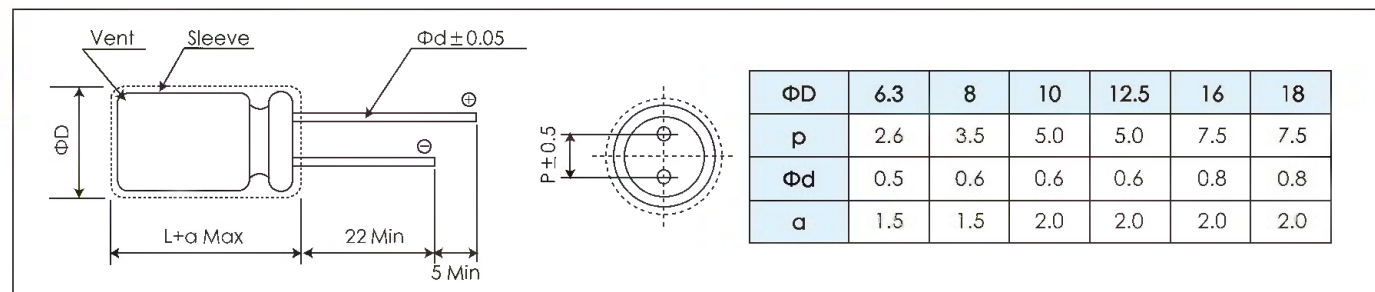
- Smart Meter: water meter, gas meter, hot meter  
智能仪表: 水表、气表、热表
- Scanner  
扫描枪
- Electric Tools  
电动工具
- Electric equipment  
电力设备
- Driving recorder  
行车记录仪
- Wireless charging smart home remote control  
无线充智能家用遥控器
- Backup power: IoT Power, Server backup power, ETC  
后备电源: 物联网电源、服务器后备电源、ETC



Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	3.8 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.2 V		
Operating Temperature Rang 工作温度范围	-25~+70°C		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	8~1400 F		
Capacitance Tolerance 容差范围(25°C)	M: -20~+20%, T: 0~+50%, S: -20~+50%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 70°C 在-25°C至70°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 10 times of the initial specified value at 25°C 不超过25°C时初始规定值的10倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70°C for 1000 hours 在70°C以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 250,000 cycles at 25°C, cycle of charge/discharge from 3.8~2.5V 在25°C, 3.8~2.5V充放电循环250000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm







# RADIAL LIC CELL: HBE SERIES 引线式LIC 单体: HBE系列

## Ratings for HBE Series HBE 系列额定值

U <sub>r</sub> (Surge Voltage) (浪涌电压) Code	Rated Cap. 额定容量 25℃	Storage Energy 储存能量 25℃	Impedance 内阻		Rated Current 额定电流	Max. Current 最大电流 (≤3sec)	Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	P/N 部品号
			ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mWh)	(mΩ)	(mΩ)	(A)	(A)	(μA)	(mm)	-
3.8 (4.35) 3R8	8	9.1	2600	1200	0.04	0.25	2.0	6.3×12	SCCHBE3R8805SRH063012E
	22	25.0	1000	450	0.11	0.7	3.5	6.3×22	SCCHBE3R8226SRH063022E
	25	28.4	900	400	0.125	0.8	2.5	8×14	SCCHBE3R8256MRH080014E
	40	45.5	550	250	0.2	1.2	3.2	8×20	SCCHBE3R8406MRH080020E
	55	62.6	450	200	0.275	1.8	5.0	8×25	SCCHBE3R8556MRH080025E
	55	62.6	450	200	0.275	1.8	5.0	10×16	SCCHBE3R8556MRH100016E
	85	96.7	250	120	0.425	3.5	8.0	10×20	SCCHBE3R8856MRH100020E
	110	125.1	220	90	0.55	4	9.0	10×25	SCCHBE3R8117MRH100025E
	150	170.6	140	70	0.75	6	15.0	10×30	SCCHBE3R8157MRH100030E
	200	227.5	120	60	1	7	22.0	10×40	SCCHBE3R8207MRH100040E
	200	227.5	135	65	1	6	18.0	12.5×25	SCCHBE3R8207MRH125025E
	300	341.3	100	50	1.5	10	30.0	12.5×35	SCCHBE3R8307MRH125035E
	350	398.1	90	45	1.75	11	35.0	12.5×40	SCCHBE3R8357MRH125040E
	400	455.0	80	45	2	12	70.0	12.5×45	SCCHBE3R8407MRH125045E
	450	511.9	60	40	2.25	15	70.0	16×30	SCCHBE3R8457MRH160030E
	850	966.9	70	35	4.25	28	70.0	18×40	SCCHBE3R8857MRH180040E
	1000	1137.5	65	30	5	30	100.0	18×50	SCCHBE3R8108TRH180050E
	1400	1592.5	50	28	7	31	120.0	18×60	SCCHBE3R8148MRH180060E

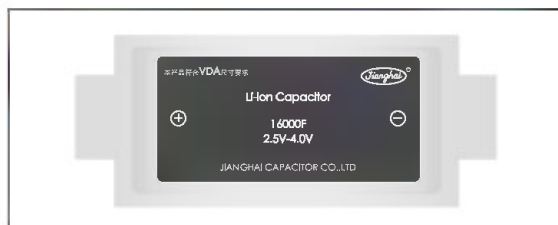
\*Note: Special customization is possible.

\*注：可以特殊定制。



## Typical application 典型应用

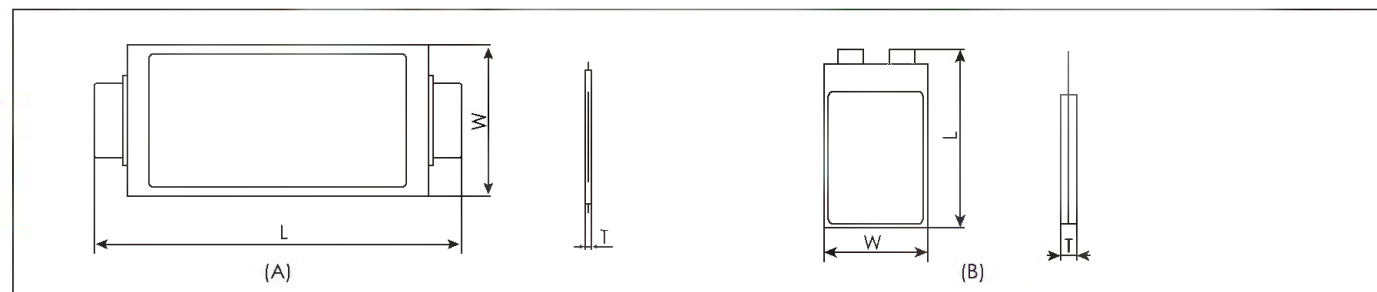
- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5~4.0V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	1000~16000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge /discharge from 2.5~4.0V 在25℃温度下, 2.5~4.0V充放电循环50000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm







## Ratings for HAA Series HAA 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 浪涌电压) 代码	Rated Capacitance 额定容量 25°C (F)	Storage Energy 储存能量 25 °C (Wh)	Impedance 内阻		Rated Current 额定电流 (A)	Self-discharge 自放电 (72hrs) (V)	Dimension 尺寸 (L*W*T) (mm)	P/N 产品代码
			ESR <sub>DC</sub> 直流内阻 (mΩ)	ESR <sub>AC</sub> 交流内阻 (1KHz) (mΩ)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	1000	1.36	≤20	≤9	5	≥3.92	100×71×3.0(B)	SCCHAA4R0108M
	2000	2.92	≤10	≤6	10	≥3.92	100×71×5.5(B)	SCCHAA4R0208M
	3200	4.65	≤6.5	≤3.2	16	≥3.92	100×60×9.0(B)	SCCHAA4R0328M
	6000	8.10	≤4.5	≤3.0	30	≥3.92	300×123×3.5(A)	SCCHAA4R0608M
	10000	13.20	≤1.8	≤1.2	50	≥3.92	300×123×5.2(A)	SCCHAA4R0109M
	16000	22.00	≤1.5	≤1.2	50	≥3.92	300×123×8.0(A)	SCCHAA4R0169M

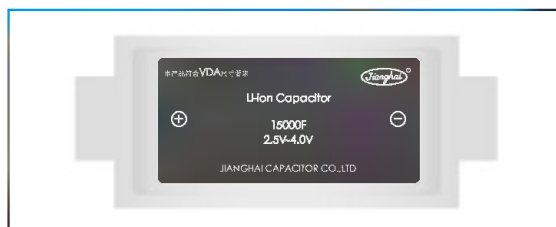
\*Note: Special customization is possible.

\*注：可以特殊定制。



## Typical application 典型应用

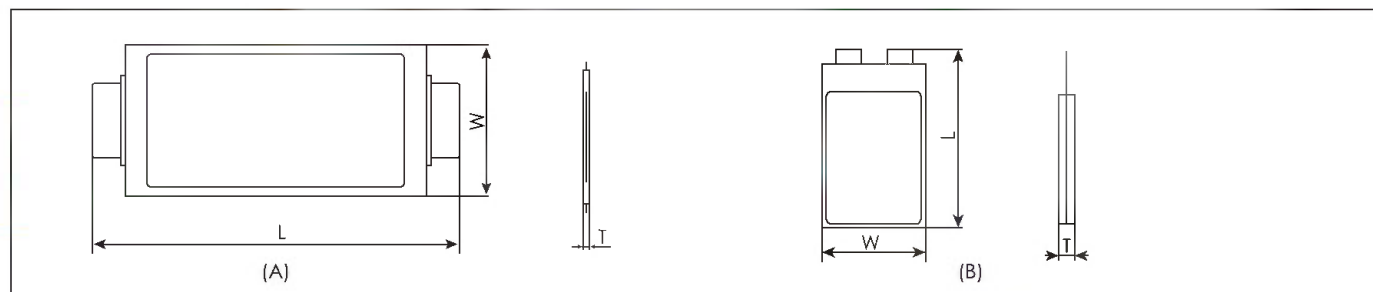
- Pure electric bus 纯电动公交车
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Rail transit 轨道交通
- Smart power grids 智能电网
- Wind power, solar and other renewable energy storag 风电、光伏等可再生能源储能
- Ferry, sightseeing car, golf cart ,AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Emergency UPS 应急后备电源
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Electric tools 电动工具
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5~4.0V		
Operating Temperature Rang 工作温度范围	-25~+55℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	3000~20000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 55℃ 在-25℃至55℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55℃ for 1000 hours 在55℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55℃ for 1000 hours 在55℃ 温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge /discharge from 2.5~4.0V 在25℃ 温度下, 2.5~4.0V充放电循环50000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm





## Ratings for HAE Series HAE 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25℃	Impedance 内阻		Rated Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (L*W*T)	P/N 产品代码
			ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	3000	5.95	≤6.5	≤3.5	8	≥3.92	100×60×9.2(B)	SCCHAE4R0308M
	7500	15.3	≤2.2	≤1.8	18.75	≥3.92	176×115×7.9(A)	SCCHAE4R0758M
	10000	18.5	≤2.5	≤1.5	25	≥3.92	300×123×5.2(A)	SCCHAE4R0109M
	15000	30.0	≤1.5	≤1.2	37.5	≥3.92	300×123×8.2(A)	SCCHAE4R0159M
	17000	34.0	≤1.2	≤1.2	42.5	≥3.92	300×123×8.3(A)	SCCHAE4R0179M
	20000	42.0	≤1.1	≤1.0	50	≥3.92	300×123×10.8(A)	SCCHAE4R0209M

\* Refer to 《Ultra-capacitor for electric vehicles QC/T-741-2014》 for the test method of rated cap.

\*额定容量的测试方法参见《车用超级电容器 QC/T-741-2014》

\*Special customization is possible.

\*可以特殊定制。



## Typical application 典型应用

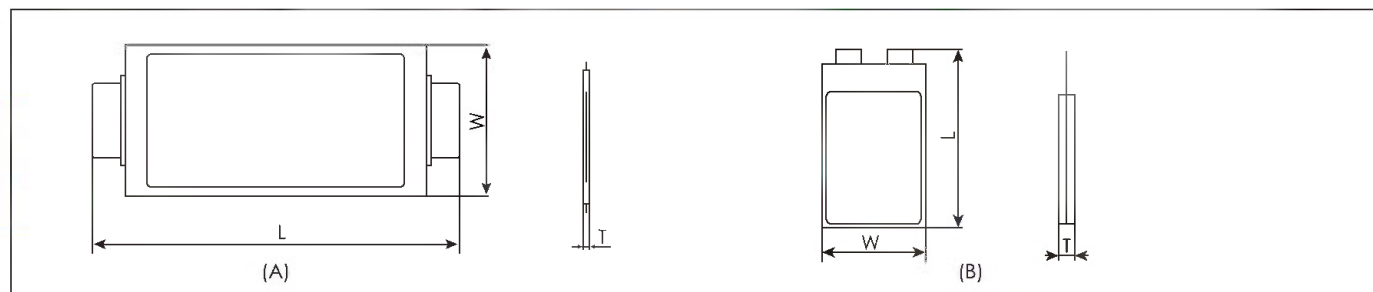
- Backup power (computer, server, UPS) 后备电源 (电脑、服务器、UPS)
- Medical power supplies (Portable X-ray machine) 医疗器械电源 (便携式X光机)
- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能
- Other high power, high energy and high temperature applications 其他对功率、能量和温度要求比较高的工况应用



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	2.5V~4.0V		
Operating Temperature Rang 工作温度范围	0~+65℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	1000~16000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from 0℃ to 65℃ 在0℃至65℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge/discharge from 2.5~4.0V 在25℃温度下, 2.5~4.0V充放电循环50000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm







## Ratings for HAH Series HAH 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Capacitance 额定容量 25℃ (*)	Storage Energy 储存能量 25℃	Impedance 内阻		Rated Current 额定电流	Self-discharge 自放电 (72hrs)	Dimension 尺寸 (L*W*T)	P/N 产品代码
			ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1kHz)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	1000	1.36	≤25	≤11.5	5	≥3.92	100×71×3.0(B)	SCCHAH4R0108M
	2000	2.92	≤11.5	≤6.5	10	≥3.92	100×71×5.5(B)	SCCHAH4R0208M
	3200	4.65	≤7.0	≤4.0	16	≥3.92	100×60×9.0(B)	SCCHAH4R0328M
	6000	8.10	≤4.5	≤3.5	30	≥3.92	300×123×3.5(A)	SCCHAH4R0608M
	10000	13.20	≤2.2	≤1.5	50	≥3.92	300×123×5.2(A)	SCCHAH4R0109M
	16000	22.00	≤1.8	≤1.4	50	≥3.92	300×123×8.0(A)	SCCHAH4R0169M

\*Note: Special customization is possible.

\*注：可以特殊定制。



## Typical application 典型应用

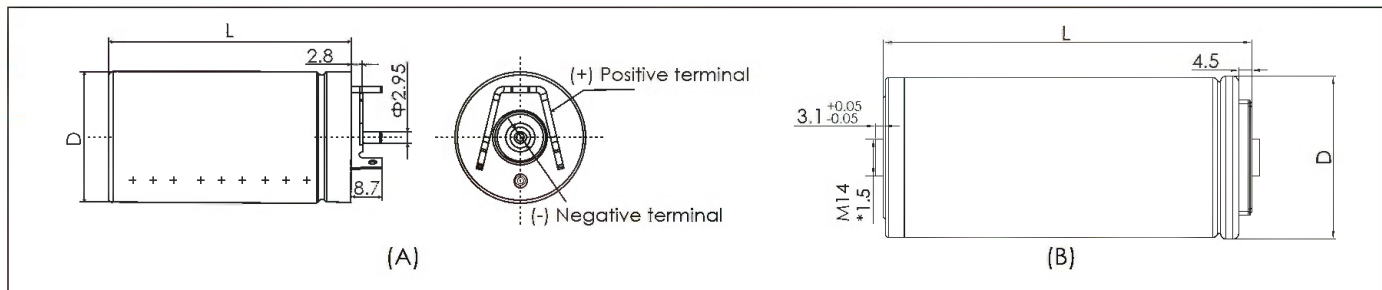
- Rail transit 轨道交通
- Smart power grids 智能电网
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能
- Other high power and high energy applications 其他对功率和能量要求比较高的工况应用



Items 项目	Characteristics 特性		
Rated Max. Operating Voltage 额定最高工作电压	4.0 V		
Rated Min. Operating Voltage 额定最低工作电压	2.5 V		
Min. Allowable Operating Voltage 最低允许工作电压	2.0 V		
Operating Temperature Rang 工作温度范围	-25~+65℃		
Surge Voltage 浪涌电压	4.35 V		
Capacitance Range 容量范围	3000~32000 F		
Capacitance Tolerance 容差范围(25℃)	M: -20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25℃ to 65℃ 在-25℃至65℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25℃ 在25℃时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25℃ 不超过25℃时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65℃ for 1000 hours 在65℃温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25℃, cycle of charge/discharge from 2.5~4.0V 在25℃温度下, 2.5~4.0V充放电循环50000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Dimensions 尺寸

mm





## Ratings for HGA Series HGA 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 浪涌电压) 代码	Rated Capacitance 额定容量 25℃ (F)	Storage Energy 储存能量 25℃ (Wh)	Impedance 内阻		Rated Current 额定电流 (A)	Self-discharge 自放电 (72hrs) (V)	Dimension 尺寸 (ΦD×L) (mm)	P/N 产品代码
			ESR <sub>DC</sub> 直流内阻 (mΩ)	ESR <sub>AC</sub> 交流内阻 (1KHz) (mΩ)				
(V)	(F)	(Wh)	(mΩ)	(mΩ)	(A)	(V)	(mm)	-
4.0 (4.35) 4R0	3000	5.00	≤3.0	≤2.5	13	≥3.92	33×62(A)	SCCHGA4R0308M
	4000	6.50	≤2.8	≤2.3	16.3	≥3.92	33×77(A)	SCCHGA4R0408M
	5000	8.30	≤2.7	≤2.2	21	≥3.92	33×90(A)	SCCHGA4R0508M
	6000	10.00	≤2.5	≤2.0	26	≥3.92	33×105(A)	SCCHGA4R0608M
	6500	10.80	≤2.3	≤1.8	28	≥3.92	35×105(A)	SCCHGA4R0658M
	11000	15.50	≤0.47	≤0.46	55	≥3.92	60×74(B)	SCCHGA4R0119M
	25000	36.00	≤0.46	≤0.45	100	≥3.92	60×138(B)	SCCHGA4R0259M
	32000	50.00	≤0.50	≤0.48	52	≥3.92	60×138(B)	SCCHGA4R0329M

\* Refer to 《GB/T 34870.1-2017 Super capacitors - Part 1: General》 for the test method of rated cap.

\*额定容量的测试方法参见《GB/T 34870.1-2017 超级电容器 第1部分：总则》



## Typical application 典型应用

- Intelligent instruments: electronic meter, water meter, gas meter  
智能仪表: 国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械

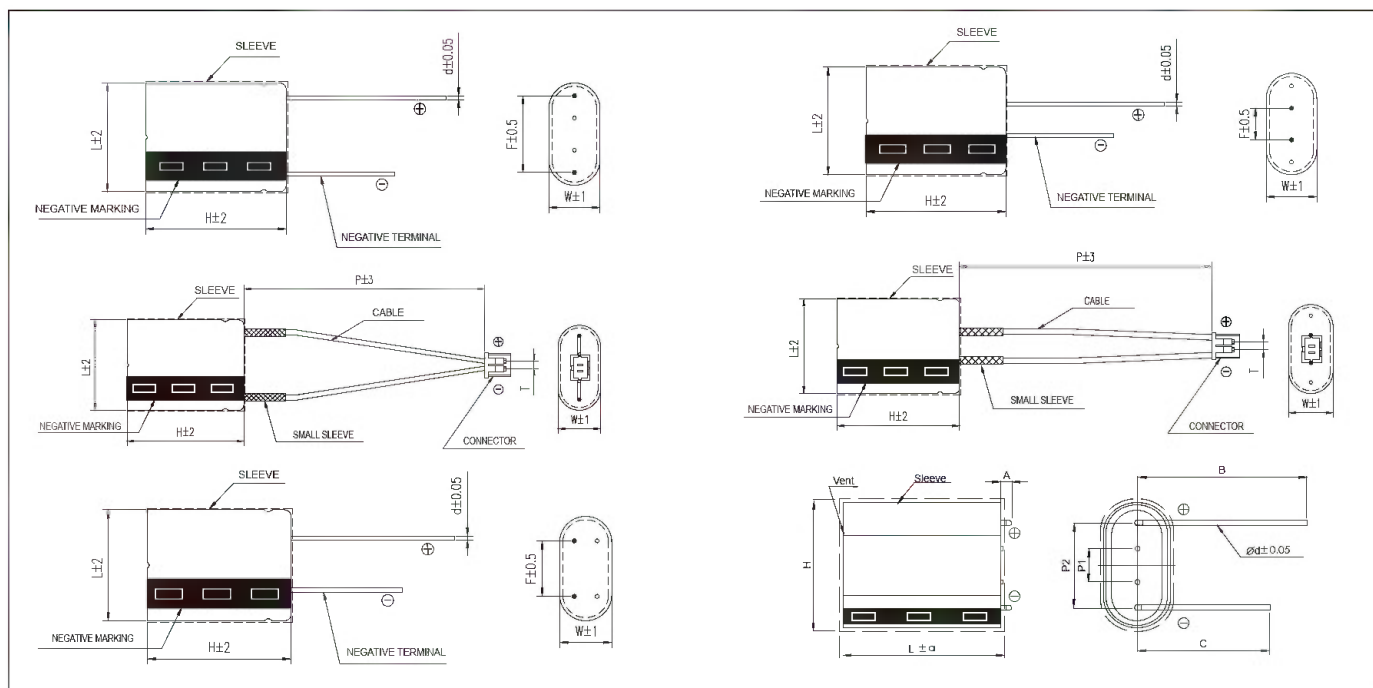


Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+70℃ (-40~+85℃@4.6V)		
Surge Voltage 浪涌电压	5.7 V		
Capacitance Range 容量范围	0.22~50 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 70℃ 在-40℃至70℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 70℃ for 1000 hours 在70℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25℃温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍



## Dimensions 尺寸

mm



## Ratings for SRM Series SRM 系列额定值

U <sub>p</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
5.5 (5.7) 5R5	0.22	1800	900	0.005	5.5×11×13	7.5/3.5	0.5	SCMDMR5R5224QRH051114ETOHOP079A
	0.33	1400	700	0.006	6.5×13×14	8.8/4.2	0.5	SCMDMR5R53344QRH061314ETOHOP088A
	0.5	820	420	0.008	8.5×17×16	12/5.0	0.6	SCMDMR5R5504QRH081716ETOHOP120A
	1	500	260	0.01	8.5×17×16	12/5.0	0.6	SCMDMR5R5105QRH081716ETOHOP120A
	1.5	380	200	0.012	8.5×17×22	12/5.0	0.6	SCMDMR5R5155QRH081722ETOHOP120A
	2.5	380	200	0.016	8.5×17×27	12/5.0	0.6	SCMDMR5R5255QRH081727ETOHOP120A
	2.5	260	140	0.016	11×21×22	15.5/5.5	0.6	SCMDMR5R5255QRH112122ETOHOP155A
	3.5	340	180	0.02	8.5×17×32	12/5.0	0.6	SCMDMR5R5355QRH081732ETOHOP120A
	3.5	280	150	0.02	11×21×22	15.5/5.5	0.6	SCMDMR5R5355QRH112122ETOHOP155A
	3.5	240	130	0.02	11×21×27	15.5/5.5	0.6	SCMDMR5R5355QRH112127ETOHOP155A
	5	200	110	0.03	11×21×27	15.5/5.5	0.6	SCMDMR5R5505QRH112127ETOHOP155A
	5	180	100	0.03	13×26×23	18/8	0.6	SCMDMR5R5505QRH132623ETOHOP180A
	5	180	100	0.03	11×21×33	15.5/5.5	0.6	SCMDMR5R5505QRH112133ETOHOP155A
	5	180	100	0.03	13×26×28	18/8	0.6	SCMDMR5R5505QRH132627ETOHOP180A
	7.5	140	80	0.045	13×26×28	18/8	0.6	SCMDMR5R5755QRH132627ETOHOP180A
	7.5	140	80	0.045	13×26×33	18/8	0.6	SCMDMR5R5755QRH132633ETOHOP180A
	10	120	70	0.06	17×33×24	24/9	0.8	SCMDMR5R5106QRH173324ETOHOP240A
	10	120	70	0.06	17×33×29	24/9	0.8	SCMDMR5R5106QRH173329ETOHOP240A
	10	140	80	0.06	13×26×33	18/8	0.6	SCMDMR5R5106QRH132633ETOHOP180A
	12.5	108	64	0.08	17×33×29	24/9	0.8	SCMDMR5R5126QRH173329ETOHOP240A
	15	92	56	0.1	17×33×35	24/9	0.8	SCMDMR5R5156QRH173335ETOHOP240A
	17.5	92	56	0.12	17×33×39	24/9	0.8	SCMDMR5R5176QRH173339ETOHOP240A
	20	92	56	0.12	17×33×39	24/9	0.8	SCMDMR5R5206QRH173339ETOHOP240A
	25	84	52	0.14	18×37×43	26/11	0.8	SCMDMR5R5256QRH183743ETOHOP260A
35	92	56	0.2	18×37×53	26/11	0.8	SCMDMR5R5356QRH183753ETOHOP260A	
50	84	52	0.3	18×37×63	26/11	0.8	SCMDMR5R5506QRH183761ETOHOP260A	



## Typical application 典型应用

- Intelligent instruments: electronic meter, water meter, gas meter  
智能仪表: 国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械

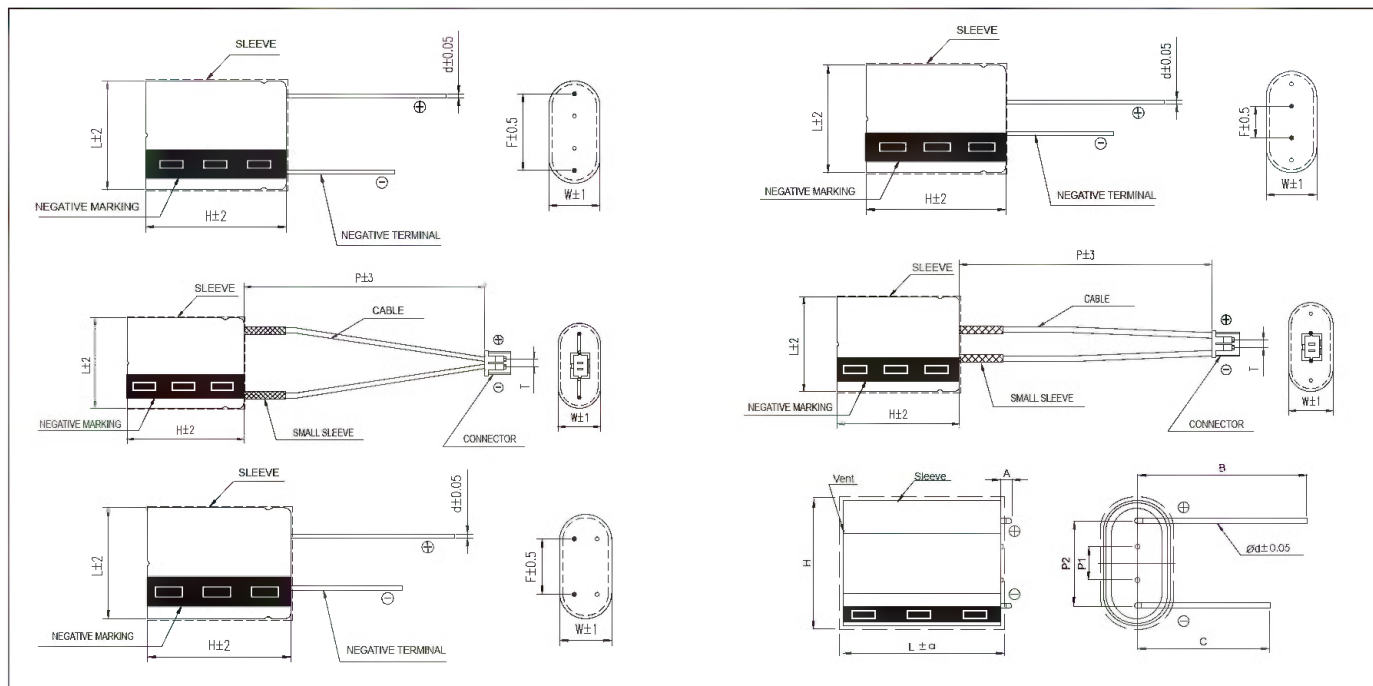


Items 项目	Characteristics 特性		
Rated Voltage 额定电压	6 V		
Operating Temperature Rang 工作温度范围	-40~+65°C (-40~+85°C @5V)		
Surge Voltage 浪涌电压	6.4 V		
Capacitance Range 容量范围	0.5~50 F		
Capacitance Tolerance 容差范围(25°C)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1000 hours 在65°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 65°C for 1000 hours 在65°C温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍



## Dimensions 尺寸

mm



## Ratings for SRS Series SRS 系列额定值

U <sub>p</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25℃ 额定容量 25℃ (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
6.0 (6.4) 6R0	0.5	1600	800	0.01	8.5×17×16	12/5.0	0.6	SCMDSR6R0504QRH081716ETOHOP120A
	1	660	340	0.012	8.5×17×16	12/5.0	0.6	SCMDSR6R0105QRH081716ETOHOP120A
	1.5	420	220	0.014	8.5×17×22	12/5.0	0.6	SCMDSR6R0155QRH081722ETOHOP120A
	2.5	780	400	0.02	8.5×17×27	12/5.0	0.6	SCMDSR6R0255QRH081727ETOHOP120A
	2.5	340	180	0.02	11×21×22	15.5/5.5	0.6	SCMDSR6R0255QRH112122ETOHOP155A
	3.5	420	220	0.03	8.5×17×32	12/5.0	0.6	SCMDSR6R0355QRH081732ETOHOP120A
	3.5	340	180	0.03	11×21×22	15.5/5.5	0.6	SCMDSR6R0355QRH112122ETOHOP155A
	3.5	260	140	0.03	11×21×27	15.5/5.5	0.6	SCMDSR6R0355QRH112127ETOHOP155A
	5	380	200	0.045	11×21×27	15.5/5.5	0.6	SCMDSR6R0505QRH112127ETOHOP155A
	5	220	120	0.045	13×26×23	18/8	0.6	SCMDSR6R0505QRH132623ETOHOP180A
	5	220	120	0.045	11×21×33	15.5/5.5	0.6	SCMDSR6R0505QRH112133ETOHOP155A
	5	220	120	0.045	13×26×28	18/8	0.6	SCMDSR6R0505QRH132627ETOHOP180A
	7.5	160	90	0.055	13×26×28	18/8	0.6	SCMDSR6R0755QRH132627ETOHOP180A
	7.5	160	90	0.055	13×26×33	18/8	0.6	SCMDSR6R0755QRH132633ETOHOP180A
	10	132	76	0.055	17×33×24	24/9	0.8	SCMDSR6R0106QRH173324ETOHOP240A
	10	132	76	0.07	13×26×27	18/8	0.6	SCMDSR6R0106QRH132627ETOHOP180A
	10	132	76	0.07	13×26×33	18/8	0.6	SCMDSR6R0106QRH132633ETOHOP180A
	12.5	120	70	0.1	17×33×29	24/9	0.8	SCMDSR6R0126QRH173329ETOHOP240A
	15	120	70	0.12	17×33×35	24/9	0.8	SCMDSR6R0156QRH173335ETOHOP240A
	17.5	104	62	0.15	17×33×35	24/9	0.8	SCMDSR6R0176QRH173335ETOHOP240A
20	104	62	0.25	17×33×39	24/9	0.8	SCMDSR6R0206QRH173339ETOHOP240A	
25	100	60	0.35	18×37×43	26/11	0.8	SCMDSR6R0256QRH183743ETOHOP260A	
35	100	60	0.45	18×37×53	26/11	0.8	SCMDSR6R0356QRH183753ETOHOP260A	
50	92	56	0.55	18×37×63	26/11	0.8	SCMDSR6R0506QRH183761ETOHOP260A	



## Typical application 典型应用

- Intelligent instruments: electronic meter, water meter, gas meter  
智能仪表: 国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械

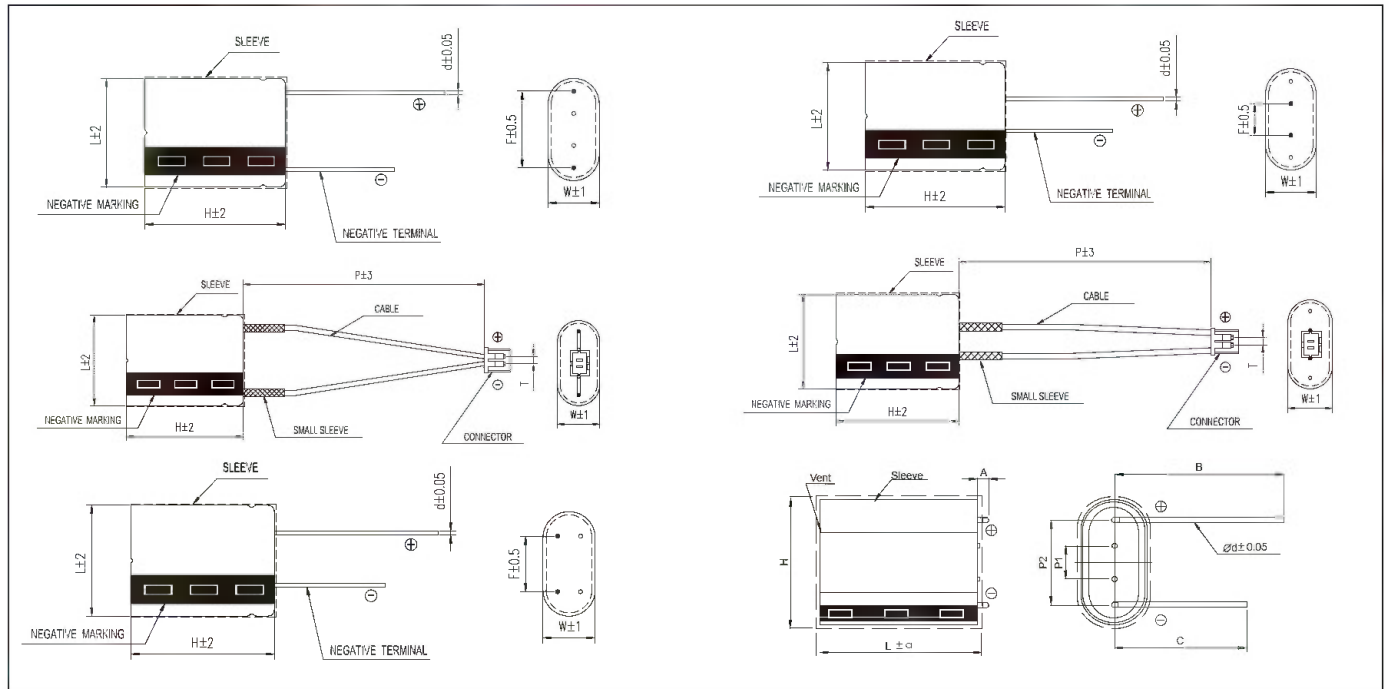


Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5 V		
Operating Temperature Rang 工作温度范围	-40~+85℃		
Surge Voltage 浪涌电压	5.7 V		
Capacitance Range 容量范围	0.5~25 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 85℃ 在-40℃至85℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25℃ 在25℃时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after 5.0V applied at 85℃ for 1000 hours 在85℃温度下, 以5.0V恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 85℃ for 1000 hours 在85℃温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25℃温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍



## Dimensions 尺寸

mm



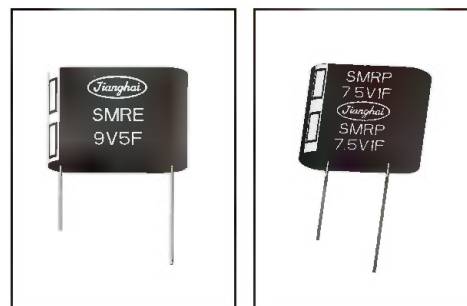
## Ratings for SRO Series SRO 系列额定值

U <sub>s</sub> (Surge Voltage) Code 额定电压 (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (*)	Impedance 内阻		Leakage Current 漏电流 (72hrs)	Size 尺寸 ΦD×L	Pin spacing 引脚间距	Wire diameter 引线直径	P/N 产品代码
		ESR <sub>DC</sub> 直流内阻	ESR <sub>AC</sub> 交流内阻 (1KHz)					
(V)	(F)	(mΩ)	(mΩ)	(mA)	(mm)	(mm)	(mm)	-
5.5 (5.7) 5R5	0.5	1600	800	0.01	8.5×17×16	12/5.0	0.6	SCMDOR5R5504QRH081716TCHOP120A
	1	660	340	0.012	8.5×17×16	12/5.0	0.6	SCMDOR5R5105QRH081716TCHOP120A
	1.5	420	220	0.014	8.5×17×22	12/5.0	0.6	SCMDOR5R5155QRH081722TCHOP120A
	2.5	780	400	0.02	8.5×17×27	12/5.0	0.6	SCMDOR5R5255QRH081727TCHOP120A
	2.5	340	180	0.02	11×21×22	15.5/5.5	0.6	SCMDOR5R5255QRH112122TCHOP155A
	3.5	420	220	0.03	8.5×17×32	12/5.0	0.6	SCMDOR5R5355QRH081732TCHOP120A
	3.5	340	180	0.03	11×21×22	15.5/5.5	0.6	SCMDOR5R5355QRH112122TCHOP155A
	3.5	260	140	0.03	11×21×27	15.5/5.5	0.6	SCMDOR5R5355QRH112127TCHOP155A
	5	380	200	0.045	11×21×27	15.5/5.5	0.6	SCMDOR5R5505QRH112127TCHOP155A
	5	220	120	0.045	13×26×23	18/8	0.6	SCMDOR5R5505QRH132623TCHOP180A
	5	220	120	0.045	11×21×33	15.5/5.5	0.6	SCMDOR5R5505QRH112133TCHOP155A
	5	220	120	0.045	13×26×28	18/8	0.6	SCMDOR5R5505QRH132628TCHOP180A
	7.5	160	90	0.055	13×26×28	18/8	0.6	SCMDOR5R5755QRH132628TCHOP180A
	7.5	160	90	0.055	13×26×33	18/8	0.6	SCMDOR5R5755QRH132633TCHOP180A
	10	132	76	0.055	17×33×24	24/9	0.8	SCMDOR5R5106QRH173324TCHOP240A
	10	132	76	0.07	13×26×27	18/8	0.6	SCMDOR5R5106QRH132627TCHOP180A
	10	132	76	0.07	13×26×33	18/8	0.6	SCMDOR5R5106QRH132633TCHOP180A
	12.5	120	70	0.1	17×33×29	24/9	0.8	SCMDOR5R5126QRH173329TCHOP240A
	15	120	70	0.12	17×33×35	24/9	0.8	SCMDOR5R5156QRH173335TCHOP240A
	17.5	104	62	0.15	17×33×35	24/9	0.8	SCMDOR5R5176QRH173335TCHOP240A
	20	104	62	0.25	17×33×39	24/9	0.8	SCMDOR5R5206QRH173339TCHOP240A
	25	100	60	0.35	18×37×43	26/11	0.8	SCMDOR5R5256QRH183743TCHOP260A



## Typical application 典型应用

- Server backup power  
服务器后备电源
- Intelligent instruments: electronic meter, water meter, gas meter  
智能仪表: 国网电表、水表、燃气表
- Communication terminal: RTU/DTU, DTU, FTU, fault current indicator  
通讯终端: 智能测控终端、智能配电终端、智能馈线终端、故障指示器
- Auto electronics: auto recorder, auto door control, audio control, auto diagnosis system, wireless charging  
汽车电子: 汽车记录仪、汽车门控、音响控制、汽车诊断系统、无线充
- Energy storage: server backup power, motor drive, brake, charging pile, security, fire protection  
储能: 服务器备电、马达驱动、闸机、充电桩、安防、消防
- Consumer: Toys, robots, smart home, medical devices  
消费类: 玩具、机器人、智能家居、医疗器械



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	7.5~25 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	0.33~10 F		
Capacitance Tolerance 容差范围(25℃)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1000 hours 在65°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value 不超过初始规定值的4倍

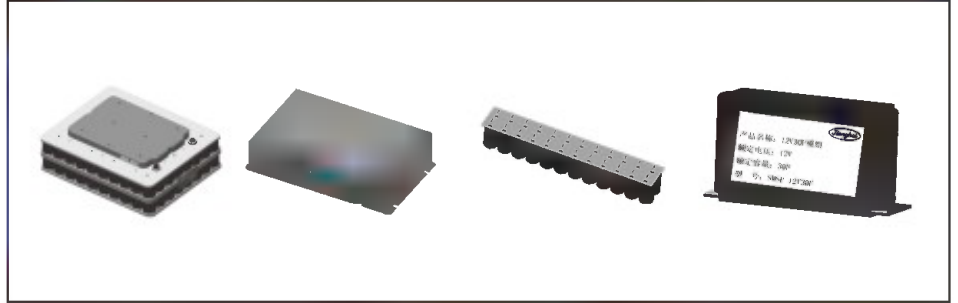
## Ratings for SMRE、SMRP Series SMRE、SMRP 系列额定值

U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Cap. 25°C 额定容量 25°C (*)	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(g)	-
7.5	3	290	0.03	6	13×39×27	20	SCMDPR7R5305QA
12.5	0.65	770	0.014	2.7	9.5×43×22	8	SCMDPR012654QA
13.5	8	350	0.25	14	13×64×51	50	SCMDER013805QA
25	10	340	0.3	28	40×100×63	230	SCMDPR025106QA



## Typical application 典型应用

- Energy controller backup power  
能源控制器后备电源
- Smart grid backup power supply  
电网后备电源
- Special vehicle power supply  
特种车辆电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	5.5~800 V		
Operating Temperature Rang 工作温度范围	-40~+65°C		
Capacitance Range 容量范围	7.5F~180 F		
Capacitance Tolerance 容差范围(25°C)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value at 25°C 在25°C时初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1000 hours 在65°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 30% of the initial value 在初始值的30%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Ratings for SMSP Series SMSP 系列额定值

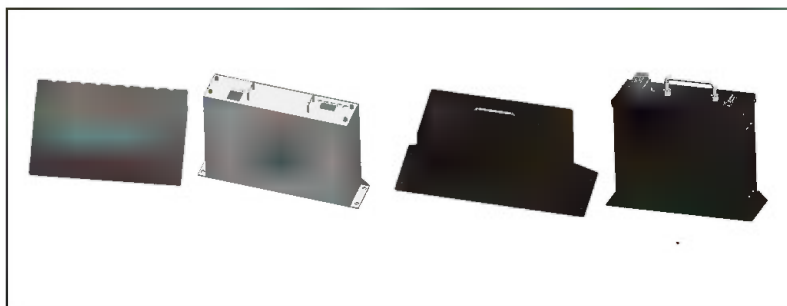
U <sub>s</sub> (Surge Voltage) Code (额定电压 (浪涌电压) 代码)	Rated Cap. 25°C (额定容量 25°C (°F))	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸 ΦL×W×H	Weight 重量	P/N 产品代码
[V]	(F)	(mΩ)	(mA)	(A)	(mm)	(g)	-
5.4	165	10	2	3	62×36×61	0.1	SCMDES5R4167RA
12	30	70	0.3	58	93×29×50	0.13	SCMDPS012306QA
	40	55	0.5	75	103×31×52	0.15	SCMDPS012406QA
27	180	30	1.8	380	400×140×92	6.5	SCMDPS027187QA
64	19.5	100	1.0	220	435×72×68	2.5	SCMDPS064196QA
432	7.5	105	2.7	930	650×520×205	56	SCMDPS432755QA
800	9.3	120	6	1900	600×700×1800	250	SCMDPS800935QA

\*Customer products are available on request.



## Typical application 典型应用

- Backup power supply for fan rotor system  
风机变桨系统后备电源
- Energy storage system of construction machinery  
工程机械储能系统
- Industrial standby power supply  
工业备用电源
- AGV on-board power supply  
AGV车载电源



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	80-160 V		
Operating Temperature Rang 工作温度范围	-40~+65℃		
Capacitance Range 容量范围	6F~21.7 F		
Capacitance Tolerance 容差范围(25℃)	0~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40℃ to 65℃ 在-40℃至65℃温度范围内, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value at 25℃ 在25℃时初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65℃ for 1000 hours 在65℃温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70℃ for 1000 hours 在70℃温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25℃, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25℃温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Ratings for SSM Series SSM 系列额定值

U <sub>s</sub> (Surge Voltage) Code (浪涌电压) 代码	Rated Cap. 25℃ 额定容量 25℃ (F)	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸 ΦL×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(mΩ)	(mA)	(A)	(mm)	(Kg)	-
80	21.7	70	60	440	465×150×207	9.5	SCMDPS080216RA
85	20.6	75	60	400	400×148×213	11	SCMDPS085206RA
90	9.6	130	30	220	305×115×263	7.5	SCMDPS090965RA
	11.1	130	30	220	305×115×263	7.5	SCMDPS090116RA
	13	130	30	220	305×115×263	7.5	SCMDPS090136RA
	19.4	75	60	440	410×150×211	11	SCMDPS090196RA
125	7.2	200	30	220	390×190×80	5.5	SCMDPS125725RA
160	6	240	30	220	379×251×83	6.5	SCMDPS160605RA
	10	220	30	320	428×90×300	9	SCMDPS160106RA
	12	220	30	320	480×90×336	11.5	SCMDPS160126RA
	13	220	30	320	480×90×336	14	SCMDPS160136RA
	13	160	30	360	428×125×300	14	SCMDPS160136RA
	15	160	35	360	428×125×300	15	SCMDPS160156RA-H
	20	160	35	380	480×128×328	20	SCMDPS160206RA

\*Customer products are available on request.



## Typical application 典型应用

- DVR voltage sag power compensation system  
DVR电压暂降功率补偿
- Low temperature cold start power module  
低温冷启动电源模块
- Hybrid electric vehicle  
混合动力汽车
- Rail  
轨道交通
- Heavy industrial equipment  
重型工业设备
- UPS system  
UPS系统



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	16-48 V		
Operating Temperature Rang 工作温度范围	-40~+65°C		
Capacitance Range 容量范围	165~500 F		
Capacitance Tolerance 容差范围(25°C)	-10~+30%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -40°C to 65°C 在-40°C至65°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value at 25°C 在25°C时初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 65°C for 1500 hours 在65°C温度下, 以额定电压恒压1500h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 70°C for 1000 hours 在70°C温度下, 不加电压储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from V <sub>R</sub> to 1/2V <sub>R</sub> 在25°C温度下, V <sub>R</sub> ~ 1/2V <sub>R</sub> 充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Ratings for SMGP Series SMGP 系列额定值

U <sub>s</sub> (Surge Voltage) Code (浪涌电压) 代码	Rated Cap. 25°C 额定容量 25°C (F)	ESR <sub>DC</sub> 直流内阻	Leakage Current 漏电流 (72hrs)	Max. Peak Current (1s) 峰值电流	Size 尺寸	Weight 重量	P/N 产品代码
[V]	(F)	(mΩ)	(mA)	(A)	(mm)	(Kg)	-
16	500	2	5.2	1900	68×418×177	5.5	SCMDPG016507RGBC
48	165	6	5.2	1900	418×194×180	14.5	SCMDPG048167RGBC
36	500	2.5	25	3800	432×276×181	18	SCMDEG036507QGGB
64	125	8	5.2	1900	432×276×181	20	SCMDPG064127QGBA
75	94	15	5.2	1900	512×262×200	28	SCMDPG075946QRBA

\*Customer products are available on request.



## Typical application 典型应用

- Smart grid primary frequency modulation  
智能电网一次调频系统
- Energy feedback system 能量回馈系统
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV  
渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery  
混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	12~720 V		
Operating Temperature Rang 工作温度范围	-25~+55°C		
Capacitance Range 容量范围	277~14000 F		
Capacitance Tolerance 容差范围(25°C)	-20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 55°C 在-25°C至55°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25°C 不超过25°C时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55°C for 1000 hours 在55°C温度下, 以额定电压恒压1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55°C for 1000 hours 在55°C温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 50,000 cycles at 25°C, cycle of charge/discharge from 2.5~4.0V 在25°C温度下, 2.5~4.0V充放电循环50000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Ratings for HMAA Series HMAA 系列额定值

### HMAA Modules HMAA 模组

U <sub>r</sub> 额定电压	U <sub>min</sub> 最低电压	Rated Cap. 25°C/额定容量	ESR <sub>DC</sub> 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
12	7.5	10600	4	100	320×140×105	5	SCMHAA012109MA
32	20	12000	5	300	650×160×345	27	SCMHAA032129MA
64	43	400	80	32	458×228×75	6.4	SCMHAA064407MA
136	90	277	100	50	305×138×415	17.5	SCMHAA136277MA

### HMAA System HMAA 系统

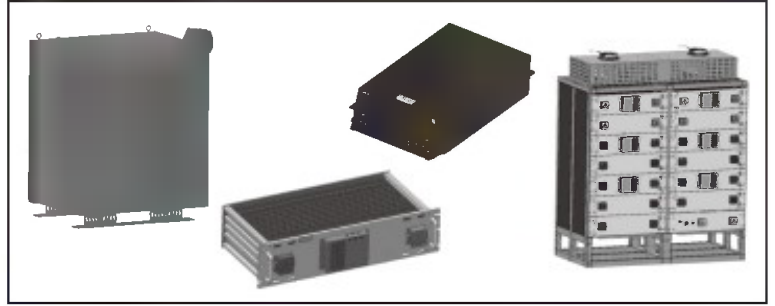
U <sub>r</sub> 额定电压	U <sub>min</sub> 最低电压	Rated Cap. 25°C/额定容量	ESR <sub>DC</sub> 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
56	35	14000	5	1000	802×725×471	665	SCMHAA056149MA
600	375	400	100	300	950×600×2350	980	SCMHAA600407MA
640	400	1250	30	1000	2872×1450×865	2500	SCMHAA640128MA
720	460	520	110	300	1500×650×2520	1325	SCMHAA720527MA

\*Customer products are available on request.



## Typical application 典型应用

- Smart grid primary frequency modulation 智能电网一次调频系统
- Energy feedback system 能量回馈系统
- Tunnel locomotive, mining locomotive 隧道机车、矿用机车
- Port truck 码头车
- Pure electric bus 纯电动公交车
- Ferry, sightseeing car, golf cart, AGV and RGV 渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery 混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Electric tools 电动工具
- Wind power, solar and other renewable energy storage 风电、光伏等可再生能源储能



Items 项目	Characteristics 特性		
Rated Voltage 额定电压	84~700 V		
Operating Temperature Rang 工作温度范围	-25~+55°C		
Capacitance Range 容量范围	1190~5710 F		
Capacitance Tolerance 容差范围(25°C)	-20~+20%		
Temperature Characteristics 温度特性	The specifications shall be met at category temperature range from -25°C to 55°C 在-25°C至55°C温度范围内, 应满足规范	Capacitance change 容量变化	Within 50% of the initial value at 25°C 在25°C时初始值的50%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 4 times of the initial specified value at 25°C 不超过25°C时初始规定值的4倍
High Temperature Loaded 高温负荷	The specifications shall be met after rated voltage applied at 55°C for 1000 hours 在55°C温度下, 以额定电压恒压1000h, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
High Temperature Storage 高温存储	The specifications shall be met after storage at 55°C for 1000 hours 在55°C温度下, 储存1000h后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍
Cycle Life 循环寿命	The specifications shall be met after 500,000 cycles at 25°C, cycle of charge/discharge from 2.5~4.0V 在25°C温度下, 2.5~4.0V充放电循环500,000次后, 应满足规范	Capacitance change 容量变化	Within 20% of the initial value 在初始值的20%以内
		ESR <sub>AC</sub> change 交流内阻变化	Not more than 2 times of the initial specified value 不超过初始规定值的2倍

## Ratings for HMAE Series HMAE 系列额定值

### HMAA Modules HMAE 模组

U <sub>r</sub> 额定电压	U <sub>min</sub> 最低电压	Rated Cap. 25°C/额定容量	ESR <sub>DC</sub> 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
4.2	2.5	900000	1	2000	286×210×1020	50	SCMHAE4R29010MA
56	35	7500	5	262	610×910×170	85	SCMHAE056758MA
72	45	8300	5	375	975×695×162	115	SCMHAE072838MA
84	52.5	5710	6.5	300	900×570×160	110	SCMHAE084578MA

### HMAA System HMAE 系统

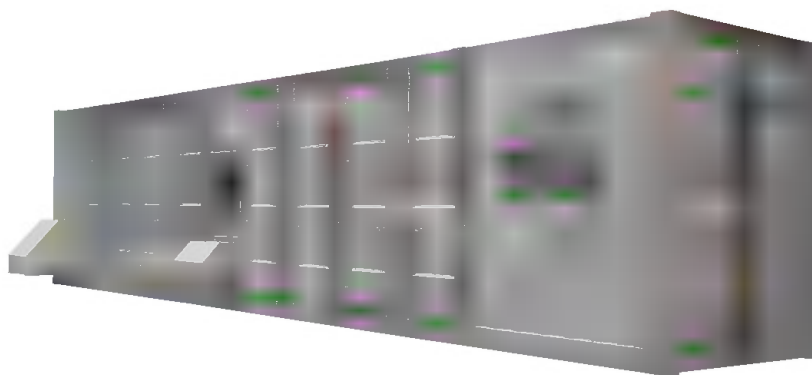
U <sub>r</sub> 额定电压	U <sub>min</sub> 最低电压	Rated Cap. 25°C/额定容量	ESR <sub>DC</sub> 直流内阻	Rated Current 额定电流	Size 尺寸 L×W×H	Weight 重量	P/N 产品代码
(V)	(F)	(F)	(mΩ)	(A)	(mm)	(Kg)	-
650	405	1480	20	600	1500×1250×1950	1790	SCMHAE650148MA
650	405	2100	18	850	1500×1350×1950	1980	SCMHAE650218MA
700	490	1190	30	500	1500×1150×2060	2250	SCMHAE700118MA

\*Customer products are available on request.



## Typical application 典型应用

- Smart grid primary frequency modulation  
智能电网一次调频系统



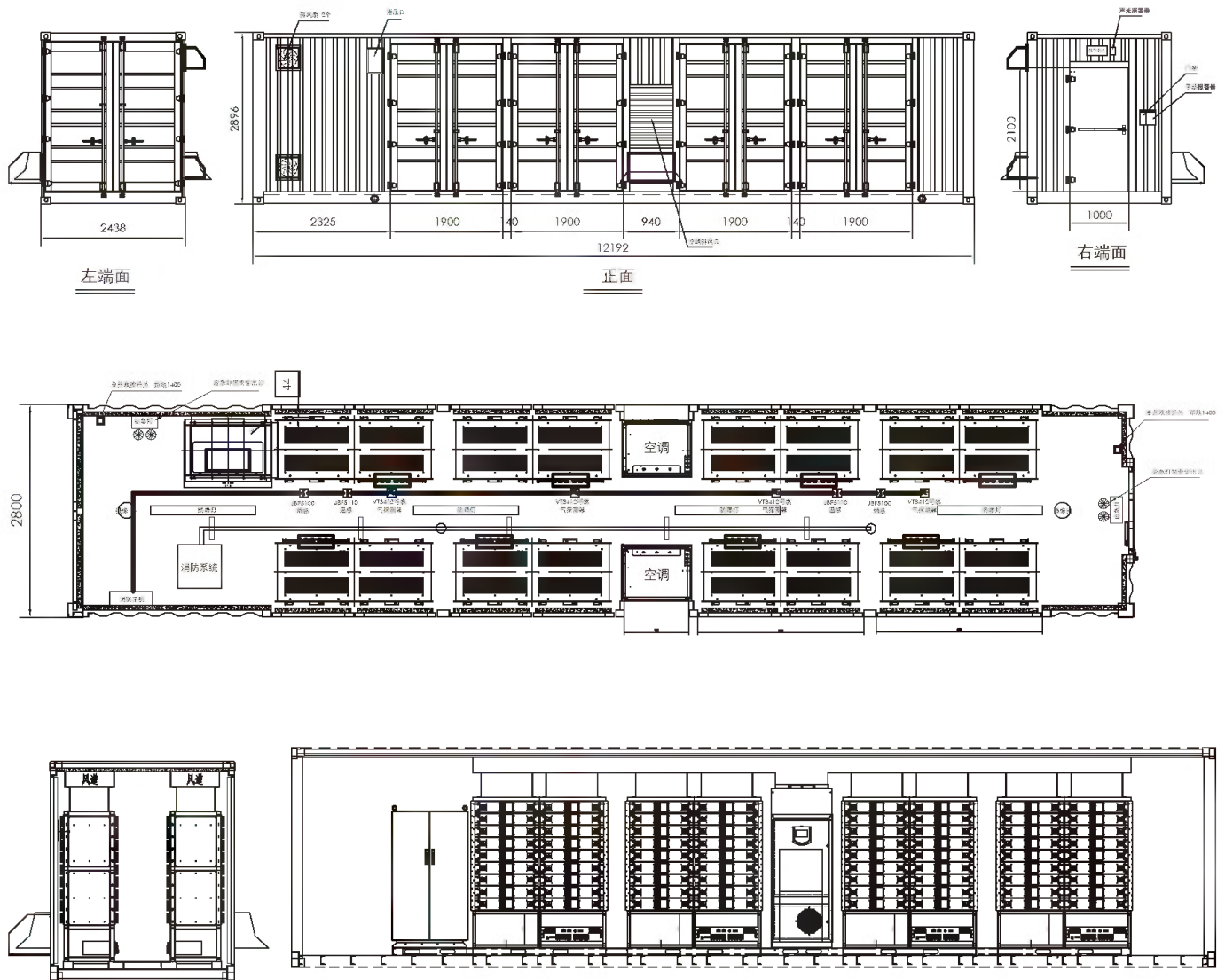
## 超级电容器系统HMAE 820V 6666F 参数

### HMAE 820V 6666F parameters for supercapacitor system

项目 Items	参数 Criteria
HMAE 820V 833F 柜体总数 Total number of cabinets	8 个
HMAE 820V 833F 柜体串联数 Number of cabinet series connections	1 串
HMAE 820V 833F 柜体并联数 Number of parallel cabinets	8 并
额定容量 Rated Capacitance (25℃)	6666 F
直流内阻 ESR <sub>DC</sub> (25℃)	10 mΩ
工作电压区间 Working voltage range	600 ~ 820 V
工作电压区间内储存能量 Energy stored within the operating voltage range	495 kwh
浪涌电压 Surge Voltage	907 V
额定工作电流 Rated current	4800 A
峰值工作电流 Peak current(≤30s)	14400 A
工作温度范围 Operating Temperature Range	-25℃ ~ +55℃
存储温度范围 Storage temperature Range	-40℃ ~ +70℃
额定工作电压 Rated Voltage	864 V
额定储能 Rated energy storage	714 kwh (超级电容装机容量Installed capacity of supercapacitors)
系统重量 System weight	28000 kg
尺寸 size	12192×2800×2896 mm
循环寿命 cycle life(600V ~ 820V)	500,000 (容量衰减capacity fade<20%) 承诺 (运行期间不起火、不爆炸) Commitment (no fire or explosion during operation)



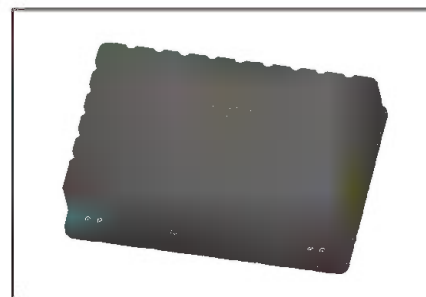
尺寸示意图 Dimensional diagram:





## Typical application 典型应用

- Backup power supply for fan rotor system  
风机变桨系统后备电源
- Energy feedback system  
能量回馈系统
- Ferry, sightseeing car, golf cart, AGV and RGV  
渡轮、观光车、高尔夫球车、AGV及RGV
- Energy saving elevator 节能电梯
- Hybrid power driven engineering machinery and harbor machinery  
混合动力工程机械及港口机械
- Emergency UPS 应急后备电源
- Wind power, solar and other renewable energy storage  
风电、光伏等可再生能源储能



Items 项目	Criteria 模组参数
Rated Capacitance 额定容量 (25°C)	50 F
Capacitance Tolerance 容量偏差	0%~20%
ESR <sub>DC</sub> 直流内阻 (25°C)	≤170 mΩ
Rated Voltage 额定电压	225 V
Maximum Normal Operating Voltage 最高正常工作电压	240 V
Rated Current 额定电流	13 A
30 Seconds Discharge Current 30秒放电电流	85 A
3 Seconds Maximum Peak Current 3秒最大峰值电流	145 A
Operating Temperature Range 工作温度范围	-25°C ~+65°C
Storage Temperature Range 存储温度范围	-25°C ~+65°C
Weight 重量	8 kg
Maximum Stored Energy 最大储存能量	390 Wh
Specific Energy 能量密度	48.7 Wh/Kg
Specific Power 功率密度	9300 W/Kg
Cycle Life 循环寿命	120V-225V: 500000 times 120V-240V: 30000 times

Life Time 寿命	Criteria 参数
High Temperature Loaded 高温负荷	1,500 hours
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Room Temperature Environment 室温环境 Rated Voltage 额定电压 (25°C)	10 years
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Cycle Life 循环寿命	500,000
Capacity Changes 容量变化	≤20%
Change In Internal Resistance 内阻变化	≤100%
Safety 安全	
Dielectric Strength 绝缘耐压	2,500 VDC

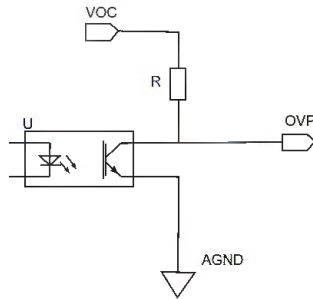


## 保护功能介绍 Introduction to protection functions:

### 1. 过压保护 Overvoltage protection

项目 Items	参数 Criteria	备注 Remark
过压报警电压 Overvoltage alarm voltage	4.15V±0.05V	过压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the overvoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
过压报警方式 Overvoltage alarm method	高电平正常，低电平报警 High level normal, low level alarm	

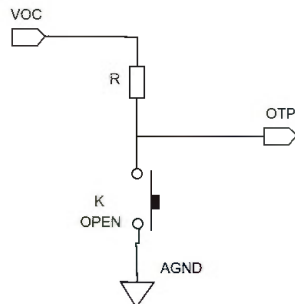
过压报警原理图 Schematic diagram of overvoltage alarm:



### 2. 过温保护 Over Temperature Protection

项目 Items	参数 Criteria	备注 Remark
欠压报警电压 Under voltage alarm voltage	2.0V±0.05V	欠压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the undervoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
欠压报警方式 Under voltage alarm mode	高电平正常，低电平报警 High level normal, low level alarm	

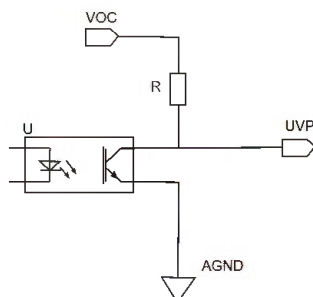
过温报警原理图 Schematic diagram of overtemperature alarm:



### 3. 欠压保护 under voltage protection

项目 Items	参数 Criteria	备注 Remark
欠压报警电压 Under voltage alarm voltage	2.0V±0.05V	欠压报警触发后，自保护开关器件切换至断开状态，模组电压无输出 After the undervoltage alarm is triggered, the self-protection switch device switches to the disconnected state, and the module voltage has no output
欠压报警方式 Under voltage alarm mode	高电平正常，低电平报警 High level normal, low level alarm	

欠压报警原理图 Undervoltage alarm schematic diagram:





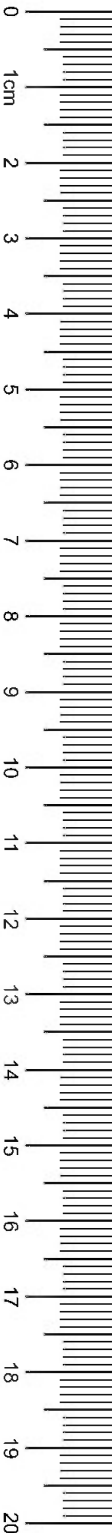
# MILLIMETER TO INCH CONVERSION TABLE

mm	inch
1	.039
1.5	.059
2	.079
2.5	.098
3	.118
3.5	.138
4	.157
5	.197
5.3	.209
6	.236
6.3	.248
7	.275
8	.314
9	.354
10	.394
11	.433
11.5	.453
12	.472
12.5	.492
12.7	.500
13	.512
14	.551
15	.591
16	.629
17	.669

mm	inch
18	.709
19	.748
20	.787
21	.827
22	.866
23	.906
24	.945
25	.984
25.4	1.000
26	1.024
27	1.063
28	1.102
28.6	1.126
29	1.142
30	1.181
30.5	1.201
31	1.220
31.5	1.240
31.8	1.252
32	1.260
33	1.299
34	1.339
34.5	1.358
36	1.417
36.5	1.437

mm	inch
37	1.457
38	1.496
39	1.535
40	1.575
41	1.614
41.5	1.634
42	1.654
43	1.693
44	1.732
45	1.772
46	1.811
47	1.850
48	1.890
49	1.929
50	1.969
51	2.008
52	2.047
53	2.087
54	2.126
55	2.165
56	2.205
57	2.244
58	2.283
59	2.323
60	2.362

mm	inch
61	2.402
62	2.441
63	2.480
64	2.520
65	2.559
66	2.598
67	2.638
68	2.677
69	2.717
70	2.756
71	2.795
72	2.835
73	2.874
74	2.913
75	2.953
76	2.992
76.2	3.000
80	3.150
90	3.543
100	3.937
120	4.724
140	5.512
160	6.299



NOTE: To convert other millimeter values to inches umitply by 0.03937

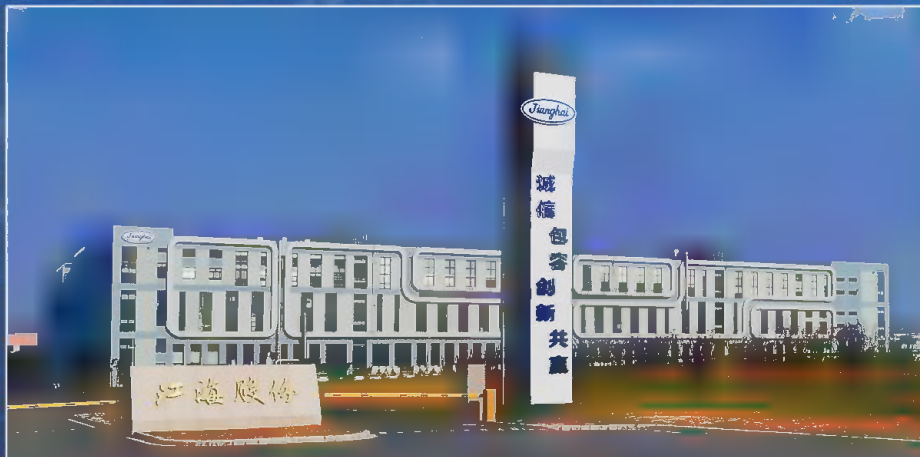
## CENTIGRADE TO FAHRENHEIT CONVERSION TABLE

$$^{\circ}\text{C} = ( ^{\circ}\text{F} - 32 ) \times 5/9$$

$$^{\circ}\text{F} = ( ^{\circ}\text{C} \times 18 ) + 32$$

°C	-55	-40	-30	-25	-20	-17.8	0	20	25	40	45	60	70	65	105	125	260
°F	-67	-40	-22	-13	-4	0	32	68	77	104	113	140	158	185	221	257	500





#### 公司概况

Brief Introduction

创建日期: 1958年10月

**Founded: in October 1958**

股票代码: 002484

Stock No: 002484

主要产品: 铝电解电容器、薄膜电容器、固体高分子电容器、超级电容器、轴向/皇冠式电容器

Main Products :Aluminum Electrolytic Capacitors、Film Capacitors、Polymer Capacitors、Super Capacitors、Axial/Crown Capacitors

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