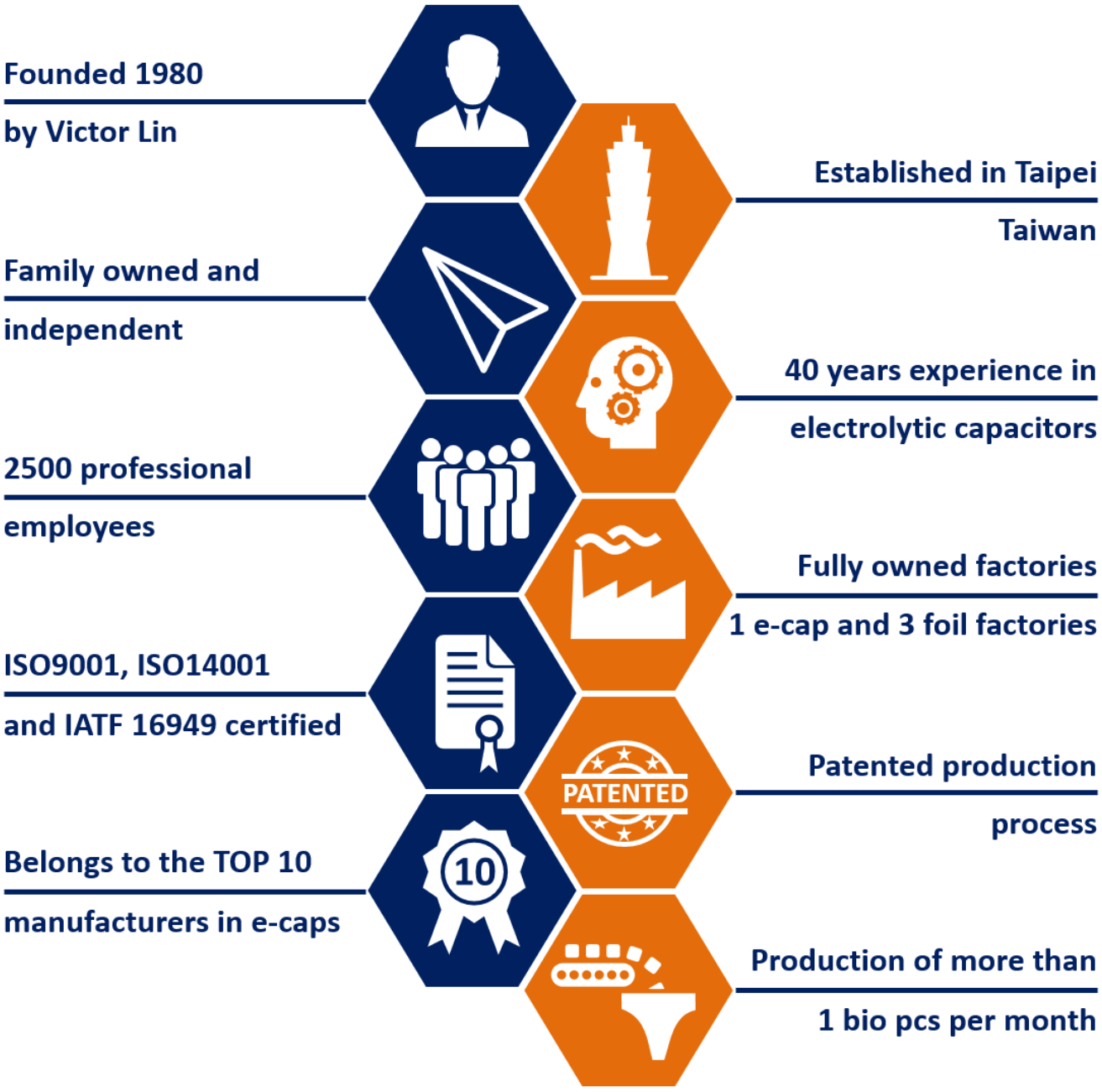
CapXon

ELECTROLYTIC CAPACITORS

LIGHTING APPLICATIONS

CONTENT

10 FACTS ABOUT CAPXON



SELECTING CAPACITORS

Except for the bipolar versions already all other electrolytic capacitors are polarized components.

Polarized electrolytic capacitors may only be operated with DC voltage, the anode being the positive pole. Due to their high capacities and very small dimensions, they are predestined for DC applications in lighting applications such as **low frequency and high frequency smoothing**.

In such applications, the focus is on the size, weight, long lifetime and high reliability.

The following explanations are intended to help the user select the right capacitors.

LOW FREQUENCY INPUT SMOOTHING

A SMPS “switch mode power supply” in Flyback topology (figure 1) was chosen as an example of a smoothing application.

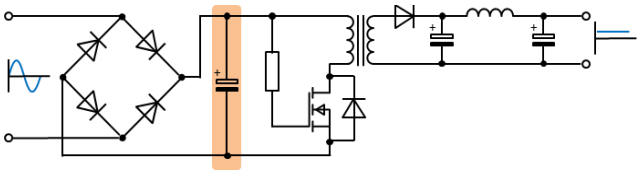


Fig. 1: Input smoothing capacitor in a Flyback SMPS

On the primary side (before the transformer) the input voltage from the AC power supply is first rectified by a diode bridge and converted into a DC voltage. The DC voltage is converted back into an AC voltage by a fast switching MOSFET and chopped into the required power amounts.

The voltage coming from the diodes, with double the line frequency (120Hz) has still a very high alternating ripple, so that an input capacitor is necessary to smooth the voltage accordingly. It is therefore also spoken of low-frequency input smoothing.

The electrolytic capacitor is extremely stressed because a flyback converter operates in two-phases. This means that during the primary load phase, nothing is supplied on the secondary side, so that the load is supplied exclusively by the electrolytic capacitor.

The capacitor is therefore periodically (partially) charged and discharged. A too small sized electrolytic capacitor would constantly overloaded and fail prematurely, which is why this point must be observed when designing.

Function:

- Input smoothing of the rectified AC line voltage (50Hz/60Hz)

Requirements:

- High rated capacitance and rated voltage (450VDC for 230VAC and 220VDC for 115VAC line voltage)
- High ripple current
- High reliability
- Resistant to voltage fluctuations

Table 1 shows the recommended CapXon series, depending on the preferred design, for input DC smoothing.

Feature	105°C			130°C
	Standard	Long Life	Ultra Long Life	High Temp
Series	FR, FS	FT	FU, FW	FX

Table 1: Recommended CapXon lighting series for input smoothing

HIGH FREQUENCY OUTPUT SMOOTHING

In the output stage on the secondary side, a rectification and smoothing circuit converts the AC voltage supplied by the fast switching MOSFET into the desired DC voltage. For example, 12VDC. The smoothing circuit can consist capacitors or the combination of capacitor and inductor. See figure 2. The output circuit smooth ripples in the rectified voltage and, also ensure the stability during transient increase in the load current.

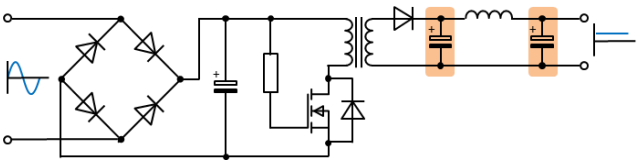


Fig. 2: Output smoothing capacitors in a Flyback SMPS

When the MOSFET is not turned on, no current flows through the secondary diode and the output capacitors must supply the load with power. When the MOSFET is turned off, the diode conducts, supplies the load and charges the output capacitors too.

The selection of the output capacitors depends on the tolerable peak-peak ripple voltage (V_{pp}), and the ripple current (I_A (RMS)). Since the load allows only low ripple voltages, corresponding capacitors with very low ESR / impedance values and very high ripple currents are to be considered.

Function:

- Output smoothing and ensure stability during transient increase in the load current

Requirements:

- High ripple current
- Very low impedance / ESR to reduce output ripple
- Long lifetime
- Small dimensions
- High temperatures (≥ 105°C)

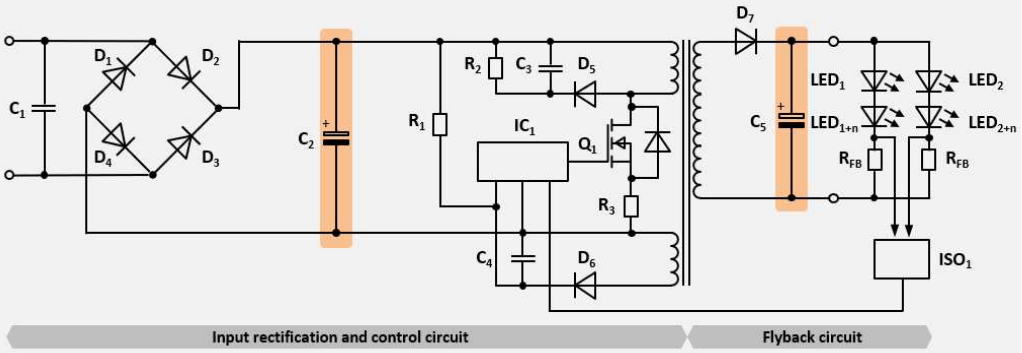
CapXon recommends the technologies and series listed in table 2 for output smoothing.

Feature	105°C			130°C
	Standard	Long Life	Ultra Long Life	High Temp
Series	FB	FC, FD	FE, FF	FG

Table 2: Recommended CapXon lighting series for output smoothing

LED LIGHTING

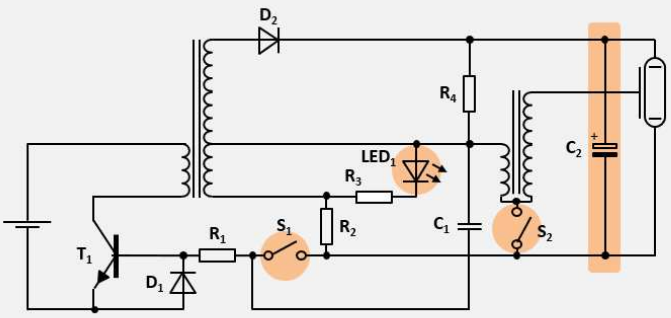
Example of a LED lighting power supply in Flyback topology with recommend products for different environment conditions.



Designation	Circuit	Purpose	Specification	Series	Part Number
C_2	Input rectification and control circuit	Input smoothing	10µF; 400V; 105°C; ±20%; D8xL16mm; 0.13A@120Hz; 15000h	FW	FW100M400F160A
C_2	Input rectification and control circuit	Input smoothing	120µF; 400V; 130°C; ±20%; D18xL35.5mm; 0.8A@120Hz; 5000h	FX	FX121M400K355A
C_5	Flyback circuit	Output smoothing	33µF; 100V; 105°C; ±20%; D8xL11.5mm; 0.36A@100kHz; 10000h	FF	FF330M100F115A
C_5	Flyback circuit	Output smoothing	680µF; 63V; 130°C; ±20%; D13xL25mm; 2A@100kHz; 5000h	FG	FG681M063I250A

PHOTO FLASH LIGHTING

Example of a Photo flash generator driver circuit with recommend products.

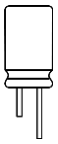


Designation	Circuit	Purpose	Specification	Series	Part Number
C_2	Photo flash	Energy buffer	50µF; 330V; 55°C; -10+20%; D10xL25mm	RF	RF050M330G250A

TECHNICAL TERMS

Item	Description	SI units
V_R	Rated voltage	V
V_S	Surge voltage	V
V_{Ripple_AC}	Ripple voltage	V
$V_{Reverse}$	Reverse voltage	V
V_A	Application voltage, operating voltage	A
I_R	Rated ripple current, rated alternating current	A
I_A	Application current, operating current	A
I_{A_Max}	Maximum application current, maximum operating current	A
I_{Leak}	Leakage current	A
T_{0_Max}	Upper category temperature	°C
T_{0_Min}	Lower category temperature	°C
T_A	Application temperature, operating temperature	°C
T_S	Capacitor surface temperature	°C
ΔT_0	Core temperature increase by internal heating due to rated ripple current	°C
ΔT_A	Core temperature increase by internal heating due to application ripple current	°C
C_R	Rated capacitance	F
ΔC	Capacitance tolerance	%
C/C_R	Capacitance drift	-
tan δ	Dissipation factor	-
Z	Impedance	Ω
ESR	Equivalent series resistance	Ω
ESL	Equivalent series inductance	H
X_C	Capacitive reactance	Ω
X_L	Inductive reactance	Ω
f	Frequency	Hz
ω	Angular frequency	Hz
λ	FIT = failure in time	-
K_f	Multiplier for ripple current vs. frequency	-
K_T	Multiplier for ripple current vs. temperature	-
K_0	Dielectric constant derating coefficient at high temperature	-
L_0	Specified lifetime at max. capacitor temperature, rated voltage (and rated ripple current)	h
L_A	Expected lifetime at application conditions	h

OVERVIEW ▪ LIGHTING RADIAL ALUMINUM ELECTROLYTIC CAPACITORS



Features

Series	Page	High Temperature	High Voltage	Long Life	Photo Flash	Standard	Ultra Long Life	Temperature Range (°C)		Voltage Range (V)		Capacitance Range (µF)		Endurance (hours)
FB	8					●		-40	+105	6.3	120	1	22000	2000
FC	19					●		-40	+105	6.3	120	1	22000	3000 to 6000
FD	30			●				-40	+105	6.3	120	1	22000	4000 to 8000
FE	41			●			●	-40	+105	6.3	120	1	22000	5000 to 10000
FF	52						●	-40	+105	6.3	120	1	22000	6000 to 12000
FR	73		●			●		-40	+105	160	500	1	560	2000
								-25		550		10	68	
FS	81		●			●		-40	+105	160	500	1	560	3000
FT	89		●	●				-40	+105	160	500	1	560	6000
FU	97		●				●	-40	+105	160	500	1	560	10000
FW	105		●				●	-40	+105	160	450	1	560	12000 to 20000
FG	63	●						-40	+130	6.3	100	1	22000	2000 to 5000
FX	112	●	●					-40	+130	160	450	1	560	2000 to 5000
RF	119				●			-20	+55	330	350	100	450	5000 times

FB SERIES ▪ STANDARD 105°C TYPE

KEY FEATURES

LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 2 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications from an economic point of view

SPECIFICATIONS

Items		Performance Characteristics									
Operating Temperature Range		-40 ~ +105°C									
Rated Voltage Range	V_R	6.3 ~ 120V DC									
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$									
Capacitance Range	C_R	1 ~ 22000µF									
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)									
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]									
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		tanδ (%)	22	17	16	14	12	10	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		Z-25°C/Z+20°C	2	2	2	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	3	3	3	3	3	3	3	3	3	3
		For capacitance > 1000µF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value									

Lifetime Test		
Endurance 105°C (V_R & I_R applied)	Test	**2 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4	

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	1190	80	FB330M6R3C110A
	39	5	11	1120	85	FB390M6R3C110A
	47	5	11	1050	90	FB470M6R3C110A
	56	5	11	1008	100	FB560M6R3C110A
	68	5	11	980	110	FB680M6R3C110A
	82	5	11	910	120	FB820M6R3C110A
	100	5	11	840	135	FB101M6R3C110A
	120	5	11	770	145	FB121M6R3C110A
	150	5	11	700	160	FB151M6R3C110A
	180	5	11	672	180	FB181M6R3C110A
	220	5	11	630	200	FB221M6R3C110A
	270	5	11	420	260	FB271M6R3C110A
	330	6.3	11	350	300	FB331M6R3E110A
	390	6.3	11	322	350	FB391M6R3E110A
	470	6.3	11	252	410	FB471M6R3E110A
	560	6.3	11	210	470	FB561M6R3E110A
	680	6.3	11	168	500	FB681M6R3E110A
	820	8	11.5	140	550	FB821M6R3F115A
	1000	8	11.5	112	620	FB102M6R3F115A
	1200	8	14	109	700	FB122M6R3F140A
	1500	10	12.5	105	1000	FB152M6R3G125A
	1800	10	16	84	1200	FB182M6R3G160A
	2200	8	20	77	1320	FB222M6R3F200A
	2700	10	20	70	1440	FB272M6R3G200A
	3300	10	20	62	1560	FB332M6R3G200A
	3900	12.5	20	49	1800	FB392M6R3Z200A
	4700	12.5	20	63	2000	FB472M6R3Z200A
	5600	12.5	25	56	2150	FB562M6R3Z250A
	6800	12.5	25	45	2260	FB682M6R3Z250A
	8200	16	25	39	2800	FB822M6R3J250A
	10000	16	25	35	2900	FB103M6R3J250A
	12000	16	31.5	31	3100	FB123M6R3J315A
	15000	16	35.5	28	3500	FB153M6R3J355A
	18000	18	35.5	25	3700	FB183M6R3K355A
	22000	18	41	21	3900	FB223M6R3K410A
10	22	5	11	1400	85	FB220M010C110A
	27	5	11	1260	90	FB270M010C110A
	33	5	11	1190	110	FB330M010C110A
	39	5	11	1120	116	FB390M010C110A
	47	5	11	1050	130	FB470M010C110A
	56	5	11	980	150	FB560M010C110A
	68	5	11	910	162	FB680M010C110A
	82	5	11	868	175	FB820M010C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
10	100	5	11	812	190	FB101M010C110A
	120	5	11	770	210	FB121M010C110A
	150	5	11	700	230	FB151M010C110A
	180	5	11	644	260	FB181M010C110A
	220	5	11	560	290	FB221M010C110A
	270	6.3	11	448	315	FB271M010E110A
	330	6.3	11	308	330	FB331M010E110A
	390	6.3	11	224	360	FB391M010E110A
	470	6.3	11	210	420	FB471M010E110A
	560	8	9	168	520	FB561M010F090A
	680	8	9	134	550	FB681M010F090A
	820	8	11.5	119	660	FB821M010F115A
	1000	8	11.5	109	700	FB102M010F115A
	1200	8	16	98	1000	FB122M010F160A
	1500	10	12.5	95	1100	FB152M010G125A
	1800	10	16	84	1250	FB182M010G160A
	2200	10	20	63	1400	FB222M010G200A
	2700	10	20	59	1550	FB272M010G200A
	3300	10	20	56	1680	FB332M010G200A
	3900	13	20	53	1950	FB392M010I200A
	4700	13	20	49	2250	FB472M010I200A
	5600	13	25	39	2400	FB562M010I250A
	6800	13	25	35	2500	FB682M010I250A
	8200	16	25	28	2820	FB822M010J250A
	10000	16	31.5	25	3000	FB103M010J315A
	12000	16	35.5	21	3150	FB123M010J355A
	15000	18	35.5	17	3560	FB153M010K355A
16	6.8	5	11	5180	60	FB6R8M016C110A
	8.2	5	11	4760	75	FB8R2M016C110A
	10	5	11	1582	80	FB100M016C110A
	12	5	11	1540	86	FB120M016C110A
	15	5	11	1512	95	FB150M016C110A
	18	5	11	1442	100	FB180M016C110A
	22	5	11	1428	110	FB220M016C110A
	27	5	11	1330	122	FB270M016C110A
	33	5	11	1260	133	FB330M016C110A
	39	5	11	1120	140	FB390M016C110A
	47	5	11	840	150	FB470M016C110A
	56	5	11	784	175	FB560M016C110A
	68	5	11	490	195	FB680M016C110A
	82	5	11	434	220	FB820M016C110A
	100	5	11	420	235	FB101M016C110A
	120	5	11	406	260	FB121M016C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
16	150	5	11	364	285	FB151M016C110A
	180	6.3	11	350	315	FB181M016E110A
	220	6.3	11	308	360	FB221M016E110A
	270	6.3	11	294	390	FB271M016E110A
	330	6.3	11	224	415	FB331M016E110A
	390	8	11.5	196	580	FB391M016F115A
	470	8	11.5	154	610	FB471M016F115A
	560	8	11.5	140	650	FB561M016F115A
	680	8	11.5	133	800	FB681M016F115A
	820	10	12.5	119	1000	FB821M016G125A
	1000	10	16	73	1100	FB102M016G160A
	1200	10	16	91	1200	FB122M016G160A
	1500	10	16	87	1250	FB152M016G160A
	1800	10	20	84	1500	FB182M016G200A
	2200	10	20	77	1700	FB222M016G200A
	2700	13	20	70	1900	FB272M016I200A
	3300	13	20	67	2000	FB332M016I200A
	3900	13	25	64	2200	FB392M016I250A
	4700	13	25	59	2300	FB472M016I250A
	5600	16	25	56	2600	FB562M016J250A
	6800	16	31.5	53	2900	FB682M016J315A
	8200	16	35.5	50	3200	FB822M016J355A
	10000	18	35.5	49	3400	FB103M016K355A
25	4.7	5	11	5740	68	FB4R7M025C110A
	5.6	5	11	5320	73	FB5R6M025C110A
	6.8	5	11	4900	80	FB6R8M025C110A
	8.2	5	11	4620	86	FB8R2M025C110A
	10	5	11	4200	90	FB100M025C110A
	12	5	11	4172	100	FB120M025C110A
	15	5	11	4130	110	FB150M025C110A
	18	5	11	4102	120	FB180M025C110A
	22	5	11	1260	130	FB220M025C110A
	27	5	11	1120	142	FB270M025C110A
	33	5	11	868	152	FB330M025C110A
	39	5	11	840	165	FB390M025C110A
	47	5	11	784	180	FB470M025C110A
	56	5	11	742	210	FB560M025C110A
	68	5	11	700	235	FB680M025C110A
	82	5	11	532	265	FB820M025C110A
	100	5	11	490	290	FB101M025C110A
	120	6.3	11	462	320	FB121M025E110A
	150	6.3	11	420	350	FB151M025E110A
	180	6.3	11	280	390	FB181M025E110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
25	220	6.3	11	252	425	FB221M025E110A
	270	8	11.5	210	500	FB271M025F115A
	330	8	11.5	168	610	FB331M025F115A
	390	8	11.5	140	700	FB391M025F115A
	470	8	11.5	120	800	FB471M025F115A
	560	10	12.5	101	900	FB561M025G125A
	680	10	12.5	91	1100	FB681M025G125A
	820	10	16	84	1300	FB821M025G160A
	1000	10	16	77	1400	FB102M025G160A
	1200	10	20	70	1500	FB122M025G200A
	1500	13	20	67	1700	FB152M025I200A
	1800	13	20	63	2000	FB182M025I200A
	2200	13	20	56	2200	FB222M025I200A
	2700	13	25	53	2400	FB272M025I250A
	3300	13	25	49	2650	FB332M025I250A
	3900	16	25	45	2850	FB392M025J250A
	4700	16	25	42	3000	FB472M025J250A
	5600	16	31.5	36	3100	FB562M025J315A
	6800	18	31.5	34	3300	FB682M025K315A
	8200	18	35.5	31	3500	FB822M025K355A
35	4.7	5	11	4200	70	FB4R7M035C110A
	5.6	5	11	4130	80	FB5R6M035C110A
	6.8	5	11	4088	90	FB6R8M035C110A
	8.2	5	11	4060	100	FB8R2M035C110A
	10	5	11	4032	110	FB100M035C110A
	12	5	11	3990	120	FB120M035C110A
	15	5	11	2660	132	FB150M035C110A
	18	5	11	2380	145	FB180M035C110A
	22	5	11	1050	160	FB220M035C110A
	27	5	11	840	180	FB270M035C110A
	33	5	11	770	200	FB330M035C110A
	39	5	11	700	225	FB390M035C110A
	47	5	11	630	235	FB470M035C110A
	56	5	11	420	245	FB560M035C110A
	68	6.3	11	350	300	FB680M035E110A
	82	6.3	11	336	330	FB820M035E110A
	100	6.3	11	322	360	FB101M035E110A
	120	6.3	12	294	400	FB121M035E120A
	150	8	9	280	500	FB151M035F090A
	180	8	11.5	252	560	FB181M035F115A
	220	8	11.5	182	610	FB221M035F115A
	270	8	16	140	800	FB271M035F160A
	330	8	16	136	900	FB331M035F160A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
35	390	8	16	133	1000	FB391M035F160A
	470	10	12.5	126	1100	FB471M035G125A
	560	10	16	104	1200	FB561M035G160A
	680	10	16	101	1300	FB681M035G160A
	820	10	20	99	1400	FB821M035G200A
	1000	10	20	84	1500	FB102M035G200A
	1200	13	20	70	2000	FB122M035I200A
	1500	13	20	62	2100	FB152M035I200A
	1800	13	25	59	2200	FB182M035I250A
	2200	13	25	59	2300	FB222M035I250A
	2700	16	25	53	2500	FB272M035J250A
	3300	18	25	42	2900	FB332M035K250A
	3900	18	31.5	39	3300	FB392M035K315A
	4700	18	35.5	36	3600	FB472M035K355A
50	1	5	11	6440	30	FB010M050C110A
	2.2	5	11	4900	40	FB2R2M050C110A
	3.3	5	11	4228	50	FB3R3M050C110A
	4.7	5	11	3808	80	FB4R7M050C110A
	5.6	5	11	5180	90	FB5R6M050C110A
	6.8	5	11	5040	100	FB6R8M050C110A
	8.2	5	11	3640	110	FB8R2M050C110A
	10	5	11	3570	120	FB100M050C110A
	12	5	11	3360	132	FB120M050C110A
	15	5	11	3220	145	FB150M050C110A
	18	5	11	2660	160	FB180M050C110A
	22	5	11	2356	180	FB220M050C110A
	27	5	11	2268	200	FB270M050C110A
	33	5	11	1974	225	FB330M050C110A
	39	6.3	11	1260	235	FB390M050E110A
	47	6.3	11	994	245	FB470M050E110A
	56	6.3	11	952	270	FB560M050E110A
	68	6.3	11	910	310	FB680M050E110A
	82	8	11.5	616	400	FB820M050F115A
	100	8	11.5	532	440	FB101M050F115A
	120	8	11.5	490	500	FB121M050F115A
	150	8	11.5	448	540	FB151M050F115A
	180	10	12.5	420	650	FB181M050G125A
	220	10	12.5	364	850	FB221M050G125A
	270	10	16	336	1000	FB271M050G160A
	330	10	16	308	1100	FB331M050G160A
	390	10	20	294	1200	FB391M050G200A
	470	10	20	210	1250	FB471M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
50	560	10	20	239	1350	FB561M050G200A
	680	10	25	420	1600	FB681M050G250A
	820	13	20	130	1800	FB821M050I200A
	1000	13	25	147	2100	FB102M050I250A
	1200	16	25	105	2400	FB122M050J250A
	1500	16	25	102	2500	FB152M050J250A
	1800	18	25	99	2600	FB182M050K250A
	2200	16	31.5	168	2700	FB222M050J315A
	2700	18	31.5	154	2900	FB272M050K315A
	3300	18	35.5	55	3200	FB332M050K355A
63	1	5	11	7560	39	FB010M063C110A
	2.2	5	11	5880	50	FB2R2M063C110A
	3.3	5	11	2800	60	FB3R3M063C110A
	4.7	5	11	5460	90	FB4R7M063C110A
	5.6	5	11	4480	100	FB5R6M063C110A
	6.8	5	11	4200	110	FB6R8M063C110A
	8.2	5	11	3780	120	FB8R2M063C110A
	10	5	11	3598	132	FB100M063C110A
	12	5	11	3220	145	FB120M063C110A
	15	5	11	3080	160	FB150M063C110A
	18	5	11	2800	190	FB180M063C110A
	22	5	11	2478	200	FB220M063C110A
	27	5	11	2240	215	FB270M063C110A
	33	6.3	11	1680	230	FB330M063E110A
	39	6.3	11	1540	245	FB390M063E110A
	47	6.3	11	1400	260	FB470M063E110A
	56	8	9	1050	310	FB560M063F090A
	68	8	9	910	380	FB680M063F090A
	82	8	11.5	826	430	FB820M063F115A
	100	8	11.5	700	500	FB101M063F115A
	120	10	12.5	630	600	FB121M063G125A
	150	8	16	966	670	FB151M063F160A
	180	10	16	420	850	FB181M063G160A
	220	10	16	378	1000	FB221M063G160A
	270	10	16	364	1100	FB271M063G160A
	330	10	20	308	1200	FB331M063G200A
	390	13	20	252	1300	FB391M063I200A
	470	13	20	210	1350	FB471M063I200A
	560	13	20	182	1600	FB561M063I200A
	680	13	25	122	1800	FB681M063I250A
	820	16	21	105	2100	FB821M063J210A
	1000	16	25	99	2450	FB102M063J250A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
63	1200	18	25	91	2750	FB122M063K250A
	1500	16	31.5	154	2950	FB152M063J315A
	1800	16	35.5	88	3000	FB182M063J355A
	2200	18	35.5	84	3200	FB222M063K355A
	2700	18	41	71	3350	FB272M063K410A
80	1	5	11	8120	41	FB010M080C110A
	2.2	5	11	6300	55	FB2R2M080C110A
	3.3	5	11	5880	70	FB3R3M080C110A
	4.7	5	11	5460	100	FB4R7M080C110A
	5.6	5	11	5320	105	FB5R6M080C110A
	6.8	5	11	5180	115	FB6R8M080C110A
	8.2	5	11	3920	125	FB8R2M080C110A
	10	5	11	3682	145	FB100M080C110A
	12	5	11	3528	160	FB120M080C110A
	15	5	11	5880	190	FB150M080C110A
	18	6.3	11	3080	200	FB180M080E110A
	22	6.3	11	2730	215	FB220M080E110A
	27	6.3	11	2520	230	FB270M080E110A
	33	6.3	11	1113	245	FB330M080E110A
	39	8	9	1050	260	FB390M080F090A
	47	8	11.5	910	310	FB470M080F115A
	56	8	11.5	630	380	FB560M080F115A
	68	8	11.5	820	400	FB680M080F115A
	82	10	12.5	560	480	FB820M080G125A
	100	10	12.5	490	550	FB101M080G125A
	120	8	20	392	620	FB121M080F200A
	150	10	16	364	700	FB151M080G160A
	180	10	20	280	870	FB181M080G200A
	220	10	20	322	1020	FB221M080G200A
	270	10	25	490	1120	FB271M080G250A
	330	13	20	210	1220	FB331M080I200A
	390	13	25	196	1320	FB391M080I250A
	470	13	25	336	1400	FB471M080I250A
	560	16	25	126	1650	FB561M080J250A
	680	16	25	109	1850	FB681M080J250A
	820	18	25	105	2120	FB821M080K250A
	1000	16	31.5	98	2500	FB102M080J315A
	1200	18	31.5	77	2800	FB122M080K315A
	1500	18	35.5	59	3050	FB152M080K355A
	1800	18	41	55	3150	FB182M080K410A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
100	1	5	11	4480	55	FB010M100C110A
	2.2	5	11	4200	65	FB2R2M100C110A
	3.3	5	11	3920	85	FB3R3M100C110A
	4.7	5	11	4620	110	FB4R7M100C110A
	5.6	5	11	3640	115	FB5R6M100C110A
	6.8	5	11	3500	125	FB6R8M100C110A
	8.2	5	11	3220	135	FB8R2M100C110A
	10	5	11	2940	160	FB100M100C110A
	12	6.3	11	1680	190	FB120M100E110A
	15	6.3	11	1540	200	FB150M100E110A
	18	6.3	11	1470	215	FB180M100E110A
	22	6.3	11	1400	230	FB220M100E110A
	27	8	11.5	1050	300	FB270M100F115A
	33	8	11.5	1008	340	FB330M100F115A
	39	8	11.5	952	380	FB390M100F115A
	47	8	11.5	700	400	FB470M100F115A
	56	10	12.5	630	440	FB560M100G125A
	68	10	12.5	616	500	FB680M100G125A
	82	10	16	364	620	FB820M100G160A
	100	10	16	336	700	FB101M100G160A
	120	10	16	4900	760	FB121M100G160A
	150	10	20	4760	850	FB151M100G200A
	180	13	20	238	1000	FB181M100I200A
	220	13	20	210	1100	FB221M100I200A
	270	13	25	196	1250	FB271M100I250A
	330	13	25	182	1400	FB331M100I250A
	390	16	25	126	1650	FB391M100J250A
	470	16	25	118	1850	FB471M100J250A
	560	18	25	101	1920	FB561M100K250A
	680	16	31.5	105	2050	FB681M100J315A
	820	18	31.5	95	2300	FB821M100K315A
	1000	18	35.5	88	2600	FB102M100K355A
120	1	5	11	12040	60	FB010M120C110A
	2.2	5	11	8960	70	FB2R2M120C110A
	3.3	5	11	8400	90	FB3R3M120C110A
	4.7	5	11	7840	115	FB4R7M120C110A
	5.6	5	11	6300	125	FB5R6M120C110A
	6.8	5	11	5880	130	FB6R8M120C110A
	8.2	5	11	5320	140	FB8R2M120C110A
	10	6.3	11	3150	175	FB100M120E110A
	12	6.3	11	2940	195	FB120M120E110A
	15	6.3	11	2660	205	FB150M120E110A
	18	8	11.5	1680	255	FB180M120F115A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

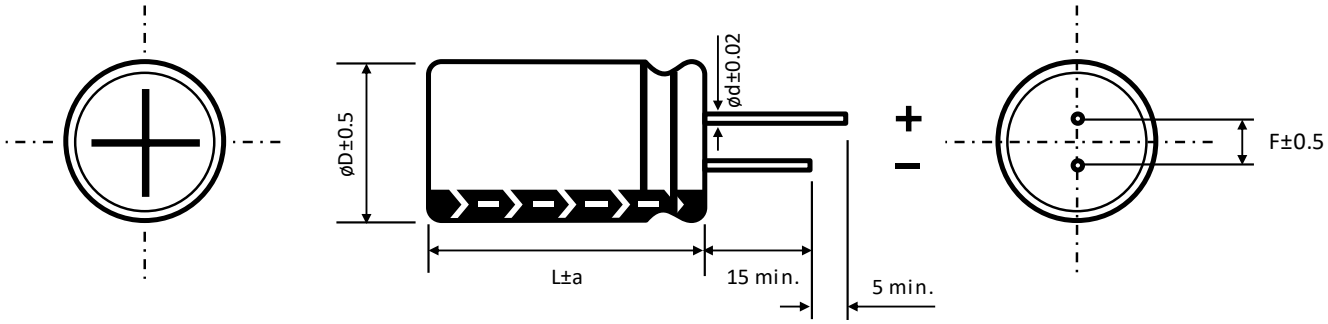
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
120	22	8	11.5	1120	280	FB220M120F115A
	27	8	11.5	1050	330	FB270M120F115A
	33	8	11.5	742	370	FB330M120F115A
	39	10	12.5	602	400	FB390M120G125A
	47	10	12.5	574	450	FB470M120G125A
	56	10	16	490	500	FB560M120G160A
	68	10	16	392	550	FB680M120G160A
	82	10	16	350	650	FB820M120G160A
	100	10	20	322	750	FB101M120G200A
	120	10	25	252	850	FB121M120G250A
	150	13	20	168	1000	FB151M120I200A
	180	13	25	154	1100	FB181M120I250A
	220	16	21	392	1200	FB221M120J210A
	270	16	21	448	1300	FB271M120J210A
	330	16	25	420	1650	FB331M120J250A
	390	18	25	140	1850	FB391M120K250A
	470	18	25	126	2000	FB471M120K250A
	560	18	31.5	119	2100	FB561M120K315A
	680	18	35.5	108	2200	FB681M120K355A

See "PACKAGING INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
$C_R < 220$	0.4	0.75	0.9	1
$220 \le C_R < 680$	0.5	0.85	0.94	1
$680 \le C_R < 2200$	0.6	0.87	0.95	1
$2200 \le C_R < 4700$	0.75	0.9	0.95	1
$4700 \le C_R$	0.85	0.95	0.98	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FC SERIES ▪ LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 3 000 hours up to 6 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications with longer life expectancies

HF Halogen Free

RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +105°C										
Rated Voltage Range	V_R	6.3 ~ 120V DC										
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$										
Capacitance Range	C_R	1 ~ 22000µF										
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)										
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]										
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		tanδ (%)	15	14	12	10	10	10	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	3	3	3	3	3	3	4
		For capacitance > 1000µF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value									

Lifetime Test			
Endurance 105°C (V_R & I_R applied)	Test	**3 000 hours**	ø D ≤ 6.3 mm
		4 000 hours	ø D = 8 mm
		5 000 hours	ø D = 10 mm
		6 000 hours	ø D ≥ 12.5 mm
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	1105	82	FC330M6R3C110A
	39	5	11	1040	87	FC390M6R3C110A
	47	5	11	975	92	FC470M6R3C110A
	56	5	11	936	102	FC560M6R3C110A
	68	5	11	910	112	FC680M6R3C110A
	82	5	11	845	122	FC820M6R3C110A
	100	5	11	780	140	FC101M6R3C110A
	120	5	11	715	150	FC121M6R3C110A
	150	5	11	650	165	FC151M6R3C110A
	180	5	11	624	185	FC181M6R3C110A
	220	5	11	585	210	FC221M6R3C110A
	270	5	11	390	265	FC271M6R3C110A
	330	6.3	11	325	305	FC331M6R3E110A
	390	6.3	11	299	360	FC391M6R3E110A
	470	6.3	11	234	420	FC471M6R3E110A
	560	6.3	11	195	475	FC561M6R3E110A
	680	6.3	11	156	505	FC681M6R3E110A
	820	8	11.5	130	560	FC821M6R3F115A
	1000	8	11.5	104	630	FC102M6R3F115A
	1200	8	14	101	710	FC122M6R3F140A
	1500	10	12.5	98	1050	FC152M6R3G125A
	1800	10	16	78	1220	FC182M6R3G160A
	2200	8	20	72	1340	FC222M6R3F200A
	2700	10	20	65	1460	FC272M6R3G200A
	3300	10	20	57	1580	FC332M6R3G200A
	3900	12.5	20	46	1820	FC392M6R3Z200A
	4700	12.5	20	59	2050	FC472M6R3Z200A
	5600	12.5	25	52	2170	FC562M6R3Z250A
	6800	12.5	25	42	2280	FC682M6R3Z250A
	8200	16	25	36	2820	FC822M6R3J250A
	10000	16	25	33	2920	FC103M6R3J250A
	12000	16	31.5	29	3200	FC123M6R3J315A
	15000	16	35.5	26	3550	FC153M6R3J355A
	18000	18	35.5	23	3720	FC183M6R3K355A
	22000	18	41	20	3950	FC223M6R3K410A
10	22	5	11	1300	86	FC220M010C110A
	27	5	11	1170	92	FC270M010C110A
	33	5	11	1105	111	FC330M010C110A
	39	5	11	1040	118	FC390M010C110A
	47	5	11	975	132	FC470M010C110A
	56	5	11	910	152	FC560M010C110A
	68	5	11	845	164	FC680M010C110A
	82	5	11	806	178	FC820M010C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
10	100	5	11	754	192	FC101M010C110A
	120	5	11	715	212	FC121M010C110A
	150	5	11	650	235	FC151M010C110A
	180	5	11	598	265	FC181M010C110A
	220	5	11	520	295	FC221M010C110A
	270	6.3	11	416	320	FC271M010E110A
	330	6.3	11	286	335	FC331M010E110A
	390	6.3	11	208	370	FC391M010E110A
	470	6.3	11	195	430	FC471M010E110A
	560	8	9	156	525	FC561M010F090A
	680	8	9	125	555	FC681M010F090A
	820	8	11.5	111	665	FC821M010F115A
	1000	8	11.5	101	710	FC102M010F115A
	1200	8	16	91	1010	FC122M010F160A
	1500	10	12.5	88	1120	FC152M010G125A
	1800	10	16	78	1280	FC182M010G160A
	2200	10	20	59	1450	FC222M010G200A
	2700	10	20	55	1600	FC272M010G200A
	3300	10	20	52	1690	FC332M010G200A
	3900	13	20	49	2000	FC392M010I200A
	4700	13	20	46	2260	FC472M010I200A
	5600	13	25	36	2410	FC562M010I250A
	6800	13	25	33	2520	FC682M010I250A
	8200	16	25	26	2840	FC822M010J250A
	10000	16	31.5	23	3020	FC103M010J315A
	12000	16	35.5	20	3250	FC123M010J355A
	15000	18	35.5	16	3580	FC153M010K355A
16	6.8	5	11	4810	62	FC6R8M016C110A
	8.2	5	11	4420	76	FC8R2M016C110A
	10	5	11	1469	81	FC100M016C110A
	12	5	11	1430	87	FC120M016C110A
	15	5	11	1404	96	FC150M016C110A
	18	5	11	1339	102	FC180M016C110A
	22	5	11	1326	112	FC220M016C110A
	27	5	11	1235	124	FC270M016C110A
	33	5	11	1170	135	FC330M016C110A
	39	5	11	1040	142	FC390M016C110A
	47	5	11	780	155	FC470M016C110A
	56	5	11	728	180	FC560M016C110A
	68	5	11	455	200	FC680M016C110A
	82	5	11	403	225	FC820M016C110A
	100	5	11	390	240	FC101M016C110A
	120	5	11	377	265	FC121M016C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
16	150	5	11	338	290	FC151M016C110A
	180	6.3	11	325	320	FC181M016E110A
	220	6.3	11	286	365	FC221M016E110A
	270	6.3	11	273	395	FC271M016E110A
	330	6.3	11	208	420	FC331M016E110A
	390	8	11.5	182	585	FC391M016F115A
	470	8	11.5	143	615	FC471M016F115A
	560	8	11.5	130	655	FC561M016F115A
	680	8	11.5	124	810	FC681M016F115A
	820	10	12.5	111	1010	FC821M016G125A
	1000	10	16	68	1110	FC102M016G160A
	1200	10	16	85	1210	FC122M016G160A
	1500	10	16	81	1260	FC152M016G160A
	1800	10	20	78	1510	FC182M016G200A
	2200	10	20	72	1710	FC222M016G200A
	2700	13	20	65	1910	FC272M016I200A
	3300	13	20	62	2010	FC332M016I200A
	3900	13	25	60	2210	FC392M016I250A
	4700	13	25	55	2350	FC472M016I250A
	5600	16	25	52	2650	FC562M016J250A
	6800	16	31.5	49	2950	FC682M016J315A
	8200	16	35.5	47	3250	FC822M016J355A
	10000	18	35.5	46	3450	FC103M016K355A
25	4.7	5	11	5330	69	FC4R7M025C110A
	5.6	5	11	4940	74	FC5R6M025C110A
	6.8	5	11	4550	81	FC6R8M025C110A
	8.2	5	11	4290	87	FC8R2M025C110A
	10	5	11	3900	91	FC100M025C110A
	12	5	11	3874	102	FC120M025C110A
	15	5	11	3835	112	FC150M025C110A
	18	5	11	3809	122	FC180M025C110A
	22	5	11	1170	132	FC220M025C110A
	27	5	11	1040	144	FC270M025C110A
	33	5	11	806	154	FC330M025C110A
	39	5	11	780	168	FC390M025C110A
	47	5	11	728	185	FC470M025C110A
	56	5	11	689	215	FC560M025C110A
	68	5	11	650	240	FC680M025C110A
	82	5	11	494	270	FC820M025C110A
	100	5	11	455	295	FC101M025C110A
	120	6.3	11	429	325	FC121M025E110A
	150	6.3	11	390	355	FC151M025E110A
	180	6.3	11	260	395	FC181M025E110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
25	220	6.3	11	234	430	FC221M025E110A
	270	8	11.5	195	520	FC271M025F115A
	330	8	11.5	156	620	FC331M025F115A
	390	8	11.5	130	710	FC391M025F115A
	470	8	11.5	112	810	FC471M025F115A
	560	10	12.5	94	920	FC561M025G125A
	680	10	12.5	85	1120	FC681M025G125A
	820	10	16	78	1310	FC821M025G160A
	1000	10	16	72	1410	FC102M025G160A
	1200	10	20	65	1520	FC122M025G200A
	1500	13	20	62	1750	FC152M025I200A
	1800	13	20	59	2050	FC182M025I200A
	2200	13	20	52	2220	FC222M025I200A
	2700	13	25	49	2450	FC272M025I250A
	3300	13	25	46	2700	FC332M025I250A
	3900	16	25	42	2860	FC392M025J250A
	4700	16	25	39	3020	FC472M025J250A
	5600	16	31.5	34	3150	FC562M025J315A
	6800	18	31.5	31	3350	FC682M025K315A
	8200	18	35.5	29	3550	FC822M025K355A
35	4.7	5	11	3900	71	FC4R7M035C110A
	5.6	5	11	3835	81	FC5R6M035C110A
	6.8	5	11	3796	91	FC6R8M035C110A
	8.2	5	11	3770	101	FC8R2M035C110A
	10	5	11	3744	111	FC100M035C110A
	12	5	11	3705	122	FC120M035C110A
	15	5	11	2470	134	FC150M035C110A
	18	5	11	2210	147	FC180M035C110A
	22	5	11	975	162	FC220M035C110A
	27	5	11	780	182	FC270M035C110A
	33	5	11	715	205	FC330M035C110A
	39	5	11	650	227	FC390M035C110A
	47	5	11	585	237	FC470M035C110A
	56	5	11	390	250	FC560M035C110A
	68	6.3	11	325	305	FC680M035E110A
	82	6.3	11	312	335	FC820M035E110A
	100	6.3	11	299	365	FC101M035E110A
	120	6.3	11	273	410	FC121M035E110A
	150	8	9	260	510	FC151M035F090A
	180	8	11.5	234	565	FC181M035F115A
	220	8	11.5	169	620	FC221M035F115A
	270	8	16	130	810	FC271M035F160A
	330	8	16	126	920	FC331M035F160A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
35	390	8	16	124	1010	FC391M035F160A
	470	10	12.5	117	1110	FC471M035G125A
	560	10	16	96	1220	FC561M035G160A
	680	10	16	94	1320	FC681M035G160A
	820	10	20	92	1420	FC821M035G200A
	1000	10	20	78	1520	FC102M035G200A
	1200	13	20	65	2020	FC122M035I200A
	1500	13	20	57	2120	FC152M035I200A
	1800	13	25	55	2220	FC182M035I250A
	2200	13	25	55	2320	FC222M035I250A
	2700	16	25	49	2550	FC272M035J250A
	3300	18	25	39	2950	FC332M035K250A
	3900	18	31.5	36	3350	FC392M035K315A
	4700	18	35.5	34	3650	FC472M035K355A
50	1	5	11	5980	30	FC010M050C110A
	2.2	5	11	4550	40	FC2R2M050C110A
	3.3	5	11	3926	52	FC3R3M050C110A
	4.7	5	11	3536	81	FC4R7M050C110A
	5.6	5	11	4810	91	FC5R6M050C110A
	6.8	5	11	4680	101	FC6R8M050C110A
	8.2	5	11	3380	111	FC8R2M050C110A
	10	5	11	3315	122	FC100M050C110A
	12	5	11	3120	134	FC120M050C110A
	15	5	11	2990	147	FC150M050C110A
	18	5	11	2470	162	FC180M050C110A
	22	5	11	2188	182	FC220M050C110A
	27	5	11	2106	205	FC270M050C110A
	33	5	11	1833	227	FC330M050C110A
	39	6.3	11	1170	237	FC390M050E110A
	47	6.3	11	923	250	FC470M050E110A
	56	6.3	11	884	275	FC560M050E110A
	68	6.3	11	845	315	FC680M050E110A
	82	8	11.5	572	405	FC820M050F115A
	100	8	11.5	494	445	FC101M050F115A
	120	8	11.5	455	510	FC121M050F115A
	150	8	11.5	416	550	FC151M050F115A
	180	10	12.5	390	660	FC181M050G125A
	220	10	12.5	338	860	FC221M050G125A
	270	10	16	312	1010	FC271M050G160A
	330	10	16	286	1110	FC331M050G160A
	390	10	20	273	1210	FC391M050G200A
	470	10	20	195	1260	FC471M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
50	560	10	20	222	1360	FC561M050G200A
	680	10	25	390	1620	FC681M050G250A
	820	13	20	121	1850	FC821M050I200A
	1000	13	25	137	2120	FC102M050I250A
	1200	16	25	98	2420	FC122M050J250A
	1500	16	25	95	2520	FC152M050J250A
	1800	18	25	92	2620	FC182M050K250A
	2200	16	31.5	156	2720	FC222M050J315A
	2700	18	31.5	143	2920	FC272M050K315A
	3300	18	35.5	51	3250	FC332M050K355A
63	1	5	11	7020	39	FC010M063C110A
	2.2	5	11	5460	50	FC2R2M063C110A
	3.3	5	11	2600	62	FC3R3M063C110A
	4.7	5	11	5070	92	FC4R7M063C110A
	5.6	5	11	4160	101	FC5R6M063C110A
	6.8	5	11	3900	111	FC6R8M063C110A
	8.2	5	11	3510	122	FC8R2M063C110A
	10	5	11	3341	134	FC100M063C110A
	12	5	11	2990	147	FC120M063C110A
	15	5	11	2860	162	FC150M063C110A
	18	5	11	2600	192	FC180M063C110A
	22	5	11	2301	202	FC220M063C110A
	27	5	11	2080	220	FC270M063C110A
	33	6.3	11	1560	235	FC330M063E110A
	39	6.3	11	1430	245	FC390M063E110A
	47	6.3	11	1300	260	FC470M063E110A
	56	8	9	975	315	FC560M063F090A
	68	8	9	845	385	FC680M063F090A
	82	8	11.5	767	435	FC820M063F115A
	100	8	11.5	650	510	FC101M063F115A
	120	10	12.5	585	610	FC121M063G125A
	150	8	16	897	680	FC151M063F160A
	180	10	16	390	860	FC181M063G160A
	220	10	16	351	1010	FC221M063G160A
	270	10	16	338	1110	FC271M063G160A
	330	10	20	286	1210	FC331M063G200A
	390	13	20	234	1310	FC391M063I200A
	470	13	20	195	1360	FC471M063I200A
	560	13	20	169	1620	FC561M063I200A
	680	13	25	113	1850	FC681M063I250A
	820	16	21	98	2120	FC821M063J210A
	1000	16	25	92	2500	FC102M063J250A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
63	1200	18	25	85	2800	FC122M063K250A
	1500	16	31.5	143	2960	FC152M063J315A
	1800	16	35.5	82	3020	FC182M063J355A
	2200	18	35.5	78	3250	FC222M063K355A
	2700	18	41	66	3400	FC272M063K410A
80	1	5	11	7540	41	FC010M080C110A
	2.2	5	11	5850	55	FC2R2M080C110A
	3.3	5	11	5460	72	FC3R3M080C110A
	4.7	5	11	5070	101	FC4R7M080C110A
	5.6	5	11	4940	106	FC5R6M080C110A
	6.8	5	11	4810	116	FC6R8M080C110A
	8.2	5	11	3640	127	FC8R2M080C110A
	10	5	11	3419	147	FC100M080C110A
	12	5	11	3276	162	FC120M080C110A
	15	5	11	5460	192	FC150M080C110A
	18	6.3	11	2860	202	FC180M080E110A
	22	6.3	11	2535	220	FC220M080E110A
	27	6.3	11	2340	235	FC270M080E110A
	33	6.3	11	1034	245	FC330M080E110A
	39	8	9	975	260	FC390M080F090A
	47	8	11.5	845	315	FC470M080F115A
	56	8	11.5	585	385	FC560M080F115A
	68	8	11.5	800	405	FC680M080F115A
	82	10	12.5	520	485	FC820M080G125A
	100	10	12.5	455	560	FC101M080G125A
	120	8	20	364	630	FC121M080F200A
	150	10	16	338	710	FC151M080G160A
	180	10	20	260	880	FC181M080G200A
	220	10	20	299	1030	FC221M080G200A
	270	10	25	455	1130	FC271M080G250A
	330	13	20	195	1230	FC331M080I200A
	390	13	25	182	1330	FC391M080I250A
	470	13	25	312	1450	FC471M080I250A
	560	16	25	117	1700	FC561M080J250A
	680	16	25	101	1860	FC681M080J250A
	820	18	25	98	2140	FC821M080K250A
	1000	16	31.5	91	2550	FC102M080J315A
	1200	18	31.5	72	2850	FC122M080K315A
	1500	18	35.5	55	3060	FC152M080K355A
	1800	18	41	51	3160	FC182M080K410A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
100	1	5	11	4160	56	FC010M100C110A
	2.2	5	11	3900	66	FC2R2M100C110A
	3.3	5	11	3640	86	FC3R3M100C110A
	4.7	5	11	4290	111	FC4R7M100C110A
	5.6	5	11	3380	116	FC5R6M100C110A
	6.8	5	11	3250	127	FC6R8M100C110A
	8.2	5	11	2990	136	FC8R2M100C110A
	10	5	11	2730	162	FC100M100C110A
	12	6.3	11	1560	192	FC120M100E110A
	15	6.3	11	1430	202	FC150M100E110A
	18	6.3	11	1365	220	FC180M100E110A
	22	6.3	11	1300	235	FC220M100E110A
	27	8	11.5	975	305	FC270M100F115A
	33	8	11.5	936	345	FC330M100F115A
	39	8	11.5	884	385	FC390M100F115A
	47	8	11.5	650	405	FC470M100F115A
	56	10	12.5	585	445	FC560M100G125A
	68	10	12.5	572	510	FC680M100G125A
	82	10	16	338	630	FC820M100G160A
	100	10	16	312	710	FC101M100G160A
	120	10	16	4550	770	FC121M100G160A
	150	10	20	4420	860	FC151M100G200A
	180	13	20	221	1010	FC181M100I200A
	220	13	20	195	1120	FC221M100I200A
	270	13	25	182	1260	FC271M100I250A
	330	13	25	169	1450	FC331M100I250A
	390	16	25	117	1700	FC391M100J250A
	470	16	25	109	1860	FC471M100J250A
	560	18	25	94	1940	FC561M100K250A
	680	16	31.5	98	2060	FC681M100J315A
	820	18	31.5	88	2350	FC821M100K315A
	1000	18	35.5	82	2650	FC102M100K355A
120	1	5	11	11180	61	FC010M120C110A
	2.2	5	11	8320	72	FC2R2M120C110A
	3.3	5	11	7800	92	FC3R3M120C110A
	4.7	5	11	7280	116	FC4R7M120C110A
	5.6	5	11	5850	126	FC5R6M120C110A
	6.8	5	11	5460	132	FC6R8M120C110A
	8.2	5	11	4940	142	FC8R2M120C110A
	10	6.3	11	2925	177	FC100M120E110A
	12	6.3	11	2730	197	FC120M120E110A
	15	6.3	11	2470	207	FC150M120E110A
	18	8	11.5	1560	260	FC180M120F115A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

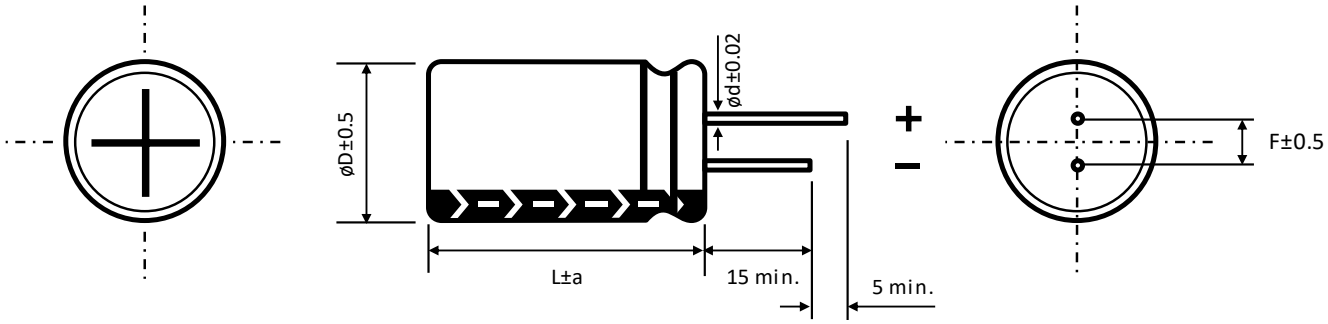
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
120	22	8	11.5	1040	285	FC220M120F115A
	27	8	11.5	975	335	FC270M120F115A
	33	8	11.5	689	375	FC330M120F115A
	39	10	12.5	559	405	FC390M120G125A
	47	10	12.5	533	455	FC470M120G125A
	56	10	16	455	510	FC560M120G160A
	68	10	16	364	560	FC680M120G160A
	82	10	16	325	660	FC820M120G160A
	100	10	20	299	760	FC101M120G200A
	120	10	25	234	860	FC121M120G250A
	150	13	20	156	1020	FC151M120I200A
	180	13	25	143	1120	FC181M120I250A
	220	16	21	364	1220	FC221M120J210A
	270	16	21	416	1320	FC271M120J210A
	330	16	25	390	1700	FC331M120J250A
	390	18	25	130	1870	FC391M120K250A
	470	18	25	117	2020	FC471M120K250A
	560	18	31.5	111	2120	FC561M120K315A
	680	18	35.5	100	2250	FC681M120K355A

See "PACKAGING INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
$C_R < 220$	0.4	0.75	0.9	1
$220 \le C_R < 680$	0.5	0.85	0.94	1
$680 \le C_R < 2200$	0.6	0.87	0.95	1
$2200 \le C_R < 4700$	0.75	0.9	0.95	1
$4700 \le C_R$	0.85	0.95	0.98	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

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For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FD SERIES ▪ LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 4 000 hours up to 8 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications with long life expectancies

HF Halogen Free RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +105°C										
Rated Voltage Range	V_R	6.3 ~ 120V DC										
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$										
Capacitance Range	C_R	1 ~ 22000µF										
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)										
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]										
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		tanδ (%)	22	17	16	14	12	10	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	3	3	3	3	3	3	4
		For capacitance > 1000µF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value									

Lifetime Test			
Endurance 105°C (V_R & I_R applied)	Test	**4 000 hours**	ø D ≤ 6.3 mm
		5 000 hours	ø D = 8 mm
		6 000 hours	ø D = 10 mm
		8 000 hours	ø D ≥ 12.5 mm
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	1020	84	FD330M6R3C110A
	39	5	11	960	89	FD390M6R3C110A
	47	5	11	900	94	FD470M6R3C110A
	56	5	11	864	104	FD560M6R3C110A
	68	5	11	840	114	FD680M6R3C110A
	82	5	11	780	124	FD820M6R3C110A
	100	5	11	720	145	FD101M6R3C110A
	120	5	11	660	155	FD121M6R3C110A
	150	5	11	600	170	FD151M6R3C110A
	180	5	11	576	190	FD181M6R3C110A
	220	5	11	540	220	FD221M6R3C110A
	270	5	11	360	270	FD271M6R3C110A
	330	6.3	11	300	310	FD331M6R3E110A
	390	6.3	11	276	370	FD391M6R3E110A
	470	6.3	11	216	430	FD471M6R3E110A
	560	6.3	11	180	480	FD561M6R3E110A
	680	6.3	11	144	510	FD681M6R3E110A
	820	8	11.5	120	570	FD821M6R3F115A
	1000	8	11.5	96	640	FD102M6R3F115A
	1200	8	14	94	720	FD122M6R3F140A
	1500	10	12.5	90	1100	FD152M6R3G125A
	1800	10	16	72	1240	FD182M6R3G160A
	2200	8	20	66	1360	FD222M6R3F200A
	2700	10	20	60	1480	FD272M6R3G200A
	3300	10	20	53	1600	FD332M6R3G200A
	3900	12.5	20	42	1840	FD392M6R3Z200A
	4700	12.5	20	54	2070	FD472M6R3Z200A
	5600	12.5	25	48	2190	FD562M6R3Z250A
	6800	12.5	25	38	2300	FD682M6R3Z250A
	8200	16	25	34	2840	FD822M6R3J250A
	10000	16	25	30	2940	FD103M6R3J250A
	12000	16	31.5	26	3300	FD123M6R3J315A
	15000	16	35.5	24	3580	FD153M6R3J355A
	18000	18	35.5	22	3750	FD183M6R3K355A
	22000	18	41	18	3960	FD223M6R3K410A
10	22	5	11	1200	87	FD220M010C110A
	27	5	11	1080	94	FD270M010C110A
	33	5	11	1020	112	FD330M010C110A
	39	5	11	960	120	FD390M010C110A
	47	5	11	900	134	FD470M010C110A
	56	5	11	840	154	FD560M010C110A
	68	5	11	780	168	FD680M010C110A
	82	5	11	744	180	FD820M010C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
10	100	5	11	696	194	FD101M010C110A
	120	5	11	660	214	FD121M010C110A
	150	5	11	600	240	FD151M010C110A
	180	5	11	552	270	FD181M010C110A
	220	5	11	480	300	FD221M010C110A
	270	6.3	11	384	322	FD271M010E110A
	330	6.3	11	264	340	FD331M010E110A
	390	6.3	11	192	380	FD391M010E110A
	470	6.3	11	180	440	FD471M010E110A
	560	8	9	144	530	FD561M010F090A
	680	8	9	115	560	FD681M010F090A
	820	8	11.5	102	670	FD821M010F115A
	1000	8	11.5	94	720	FD102M010F115A
	1200	8	16	84	1020	FD122M010F160A
	1500	10	12.5	82	1140	FD152M010G125A
	1800	10	16	72	1300	FD182M010G160A
	2200	10	20	54	1500	FD222M010G200A
	2700	10	20	50	1620	FD272M010G200A
	3300	10	20	48	1700	FD332M010G200A
	3900	13	20	46	2050	FD392M010I200A
	4700	13	20	42	2270	FD472M010I200A
	5600	13	25	34	2420	FD562M010I250A
	6800	13	25	30	2540	FD682M010I250A
	8200	16	25	24	2860	FD822M010J250A
	10000	16	31.5	22	3040	FD103M010J315A
	12000	16	35.5	18	3350	FD123M010J355A
	15000	18	35.5	14	3600	FD153M010K355A
16	6.8	5	11	4440	64	FD6R8M016C110A
	8.2	5	11	4080	77	FD8R2M016C110A
	10	5	11	1356	82	FD100M016C110A
	12	5	11	1320	88	FD120M016C110A
	15	5	11	1296	97	FD150M016C110A
	18	5	11	1236	104	FD180M016C110A
	22	5	11	1224	114	FD220M016C110A
	27	5	11	1140	126	FD270M016C110A
	33	5	11	1080	137	FD330M016C110A
	39	5	11	960	144	FD390M016C110A
	47	5	11	720	160	FD470M016C110A
	56	5	11	672	185	FD560M016C110A
	68	5	11	420	205	FD680M016C110A
	82	5	11	372	228	FD820M016C110A
	100	5	11	360	245	FD101M016C110A
	120	5	11	348	270	FD121M016C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
16	150	5	11	312	295	FD151M016C110A
	180	6.3	11	300	325	FD181M016E110A
	220	6.3	11	264	370	FD221M016E110A
	270	6.3	11	252	400	FD271M016E110A
	330	6.3	11	192	425	FD331M016E110A
	390	8	11.5	168	590	FD391M016F115A
	470	8	11.5	132	620	FD471M016F115A
	560	8	11.5	120	660	FD561M016F115A
	680	8	11.5	114	820	FD681M016F115A
	820	10	12.5	102	1020	FD821M016G125A
	1000	10	16	62	1120	FD102M016G160A
	1200	10	16	78	1220	FD122M016G160A
	1500	10	16	74	1270	FD152M016G160A
	1800	10	20	72	1520	FD182M016G200A
	2200	10	20	66	1720	FD222M016G200A
	2700	13	20	60	1920	FD272M016I200A
	3300	13	20	58	2020	FD332M016I200A
	3900	13	25	55	2220	FD392M016I250A
	4700	13	25	50	2400	FD472M016I250A
	5600	16	25	48	2700	FD562M016J250A
	6800	16	31.5	46	3000	FD682M016J315A
	8200	16	35.5	43	3300	FD822M016J355A
	10000	18	35.5	42	3500	FD103M016K355A
25	4.7	5	11	4920	70	FD4R7M025C110A
	5.6	5	11	4560	75	FD5R6M025C110A
	6.8	5	11	4200	82	FD6R8M025C110A
	8.2	5	11	3960	88	FD8R2M025C110A
	10	5	11	3600	92	FD100M025C110A
	12	5	11	3576	103	FD120M025C110A
	15	5	11	3540	114	FD150M025C110A
	18	5	11	3516	124	FD180M025C110A
	22	5	11	1080	134	FD220M025C110A
	27	5	11	960	146	FD270M025C110A
	33	5	11	744	156	FD330M025C110A
	39	5	11	720	170	FD390M025C110A
	47	5	11	672	190	FD470M025C110A
	56	5	11	636	220	FD560M025C110A
	68	5	11	600	245	FD680M025C110A
	82	5	11	456	275	FD820M025C110A
	100	5	11	420	300	FD101M025C110A
	120	6.3	11	396	330	FD121M025E110A
	150	6.3	11	360	360	FD151M025E110A
	180	6.3	11	240	400	FD181M025E110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
25	220	6.3	11	216	435	FD221M025E110A
	270	8	11.5	180	540	FD271M025F115A
	330	8	11.5	144	630	FD331M025F115A
	390	8	11.5	120	720	FD391M025F115A
	470	8	11.5	103	820	FD471M025F115A
	560	10	12.5	86	940	FD561M025G125A
	680	10	12.5	78	1140	FD681M025G125A
	820	10	16	72	1320	FD821M025G160A
	1000	10	16	66	1420	FD102M025G160A
	1200	10	20	60	1540	FD122M025G200A
	1500	13	20	58	1800	FD152M025I200A
	1800	13	20	54	2100	FD182M025I200A
	2200	13	20	48	2240	FD222M025I200A
	2700	13	25	46	2500	FD272M025I250A
	3300	13	25	42	2750	FD332M025I250A
	3900	16	25	38	2870	FD392M025J250A
	4700	16	25	36	3040	FD472M025J250A
	5600	16	31.5	31	3200	FD562M025J315A
	6800	18	31.5	29	3400	FD682M025K315A
	8200	18	35.5	26	3600	FD822M025K355A
35	4.7	5	11	3600	72	FD4R7M035C110A
	5.6	5	11	3540	82	FD5R6M035C110A
	6.8	5	11	3504	92	FD6R8M035C110A
	8.2	5	11	3480	102	FD8R2M035C110A
	10	5	11	3456	112	FD100M035C110A
	12	5	11	3420	124	FD120M035C110A
	15	5	11	2280	136	FD150M035C110A
	18	5	11	2040	149	FD180M035C110A
	22	5	11	900	164	FD220M035C110A
	27	5	11	720	184	FD270M035C110A
	33	5	11	660	210	FD330M035C110A
	39	5	11	600	229	FD390M035C110A
	47	5	11	540	239	FD470M035C110A
	56	5	11	360	255	FD560M035C110A
	68	6.3	11	300	310	FD680M035E110A
	82	6.3	11	288	340	FD820M035E110A
	100	6.3	11	276	370	FD101M035E110A
	120	6.3	12	252	420	FD121M035E120A
	150	8	9	240	520	FD151M035F090A
	180	8	11.5	216	570	FD181M035F115A
	220	8	11.5	156	630	FD221M035F115A
	270	8	16	120	820	FD271M035F160A
	330	8	16	116	940	FD331M035F160A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
35	390	8	16	114	1020	FD391M035F160A
	470	10	12.5	108	1120	FD471M035G125A
	560	10	16	89	1240	FD561M035G160A
	680	10	16	86	1340	FD681M035G160A
	820	10	20	85	1440	FD821M035G200A
	1000	10	20	72	1540	FD102M035G200A
	1200	13	20	60	2040	FD122M035I200A
	1500	13	20	53	2140	FD152M035I200A
	1800	13	25	50	2240	FD182M035I250A
	2200	13	25	50	2340	FD222M035I250A
	2700	16	25	46	2600	FD272M035J250A
	3300	18	25	36	3000	FD332M035K250A
	3900	18	31.5	34	3400	FD392M035K315A
	4700	18	35.5	31	3700	FD472M035K355A
50	1	5	11	5520	31	FD010M050C110A
	2.2	5	11	4200	42	FD2R2M050C110A
	3.3	5	11	3624	54	FD3R3M050C110A
	4.7	5	11	3264	82	FD4R7M050C110A
	5.6	5	11	4440	92	FD5R6M050C110A
	6.8	5	11	4320	102	FD6R8M050C110A
	8.2	5	11	3120	112	FD8R2M050C110A
	10	5	11	3060	124	FD100M050C110A
	12	5	11	2880	136	FD120M050C110A
	15	5	11	2760	149	FD150M050C110A
	18	5	11	2280	164	FD180M050C110A
	22	5	11	2020	184	FD220M050C110A
	27	5	11	1944	210	FD270M050C110A
	33	5	11	1692	229	FD330M050C110A
	39	6.3	11	1080	239	FD390M050E110A
	47	6.3	11	852	255	FD470M050E110A
	56	6.3	11	816	280	FD560M050E110A
	68	6.3	11	780	320	FD680M050E110A
	82	8	11.5	528	410	FD820M050F115A
	100	8	11.5	456	450	FD101M050F115A
	120	8	11.5	420	520	FD121M050F115A
	150	8	11.5	384	560	FD151M050F115A
	180	10	12.5	360	670	FD181M050G125A
	220	10	12.5	312	870	FD221M050G125A
	270	10	16	288	1020	FD271M050G160A
	330	10	16	264	1120	FD331M050G160A
	390	10	20	252	1220	FD391M050G200A
	470	10	20	180	1270	FD471M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
50	560	10	20	205	1370	FD561M050G200A
	680	10	25	360	1640	FD681M050G250A
	820	13	20	112	1900	FD821M050I200A
	1000	13	25	126	2140	FD102M050I250A
	1200	16	25	90	2440	FD122M050J250A
	1500	16	25	88	2540	FD152M050J250A
	1800	18	25	85	2640	FD182M050K250A
	2200	16	31.5	144	2740	FD222M050J315A
	2700	18	31.5	132	2940	FD272M050K315A
	3300	18	35.5	47	3300	FD332M050K355A
63	1	5	11	6480	40	FD010M063C110A
	2.2	5	11	5040	51	FD2R2M063C110A
	3.3	5	11	2400	64	FD3R3M063C110A
	4.7	5	11	4680	94	FD4R7M063C110A
	5.6	5	11	3840	102	FD5R6M063C110A
	6.8	5	11	3600	112	FD6R8M063C110A
	8.2	5	11	3240	124	FD8R2M063C110A
	10	5	11	3084	136	FD100M063C110A
	12	5	11	2760	149	FD120M063C110A
	15	5	11	2640	164	FD150M063C110A
	18	5	11	2400	194	FD180M063C110A
	22	5	11	2124	204	FD220M063C110A
	27	5	11	1920	220	FD270M063C110A
	33	6.3	11	1440	240	FD330M063E110A
	39	6.3	11	1320	250	FD390M063E110A
	47	6.3	11	1200	265	FD470M063E110A
	56	8	9	900	320	FD560M063F090A
	68	8	9	780	390	FD680M063F090A
	82	8	11.5	708	440	FD820M063F115A
	100	8	11.5	600	520	FD101M063F115A
	120	10	12.5	540	620	FD121M063G125A
	150	8	16	828	690	FD151M063F160A
	180	10	16	360	870	FD181M063G160A
	220	10	16	324	1020	FD221M063G160A
	270	10	16	312	1120	FD271M063G160A
	330	10	20	264	1220	FD331M063G200A
	390	13	20	216	1320	FD391M063I200A
	470	13	20	180	1370	FD471M063I200A
	560	13	20	156	1640	FD561M063I200A
	680	13	25	104	1900	FD681M063I250A
	820	16	21	90	2140	FD821M063J210A
	1000	16	25	85	2550	FD102M063J250A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
63	1200	18	25	78	2850	FD122M063K250A
	1500	16	31.5	132	2970	FD152M063J315A
	1800	16	35.5	76	3040	FD182M063J355A
	2200	18	35.5	72	3250	FD222M063K355A
	2700	18	41	61	3450	FD272M063K410A
80	1	5	11	6960	42	FD010M080C110A
	2.2	5	11	5400	56	FD2R2M080C110A
	3.3	5	11	5040	74	FD3R3M080C110A
	4.7	5	11	4680	102	FD4R7M080C110A
	5.6	5	11	4560	107	FD5R6M080C110A
	6.8	5	11	4440	117	FD6R8M080C110A
	8.2	5	11	3360	129	FD8R2M080C110A
	10	5	11	3156	149	FD100M080C110A
	12	5	11	3024	164	FD120M080C110A
	15	5	11	5040	194	FD150M080C110A
	18	6.3	11	2640	204	FD180M080E110A
	22	6.3	11	2340	220	FD220M080E110A
	27	6.3	11	2160	240	FD270M080E110A
	33	6.3	11	954	250	FD330M080E110A
	39	8	9	900	265	FD390M080F090A
	47	8	11.5	780	320	FD470M080F115A
	56	8	11.5	540	390	FD560M080F115A
	68	8	11.5	780	410	FD680M080F115A
	82	10	12.5	480	490	FD820M080G125A
	100	10	12.5	420	570	FD101M080G125A
	120	8	20	336	640	FD121M080F200A
	150	10	16	312	720	FD151M080G160A
	180	10	20	240	890	FD181M080G200A
	220	10	20	276	1040	FD221M080G200A
	270	10	25	420	1140	FD271M080G250A
	330	13	20	180	1240	FD331M080I200A
	390	13	25	168	1340	FD391M080I250A
	470	13	25	288	1500	FD471M080I250A
	560	16	25	108	1720	FD561M080J250A
	680	16	25	94	1870	FD681M080J250A
	820	18	25	90	2160	FD821M080K250A
	1000	16	31.5	84	2600	FD102M080J315A
	1200	18	31.5	66	2900	FD122M080K315A
	1500	18	35.5	50	3070	FD152M080K355A
	1800	18	41	47	3170	FD182M080K410A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
100	1	5	11	3840	57	FD010M100C110A
	2.2	5	11	3600	67	FD2R2M100C110A
	3.3	5	11	3360	87	FD3R3M100C110A
	4.7	5	11	3960	112	FD4R7M100C110A
	5.6	5	11	3120	117	FD5R6M100C110A
	6.8	5	11	3000	129	FD6R8M100C110A
	8.2	5	11	2760	137	FD8R2M100C110A
	10	5	11	2520	164	FD100M100C110A
	12	6.3	11	1440	194	FD120M100E110A
	15	6.3	11	1320	204	FD150M100E110A
	18	6.3	11	1260	220	FD180M100E110A
	22	6.3	11	1200	240	FD220M100E110A
	27	8	11.5	900	310	FD270M100F115A
	33	8	11.5	864	350	FD330M100F115A
	39	8	11.5	816	390	FD390M100F115A
	47	8	11.5	600	410	FD470M100F115A
	56	10	12.5	540	450	FD560M100G125A
	68	10	12.5	528	520	FD680M100G125A
	82	10	16	312	640	FD820M100G160A
	100	10	16	288	720	FD101M100G160A
	120	10	16	4200	780	FD121M100G160A
	150	10	20	4080	870	FD151M100G200A
	180	13	20	204	1020	FD181M100I200A
	220	13	20	180	1140	FD221M100I200A
	270	13	25	168	1270	FD271M100I250A
	330	13	25	156	1500	FD331M100I250A
	390	16	25	108	1720	FD391M100J250A
	470	16	25	101	1870	FD471M100J250A
	560	18	25	86	1960	FD561M100K250A
	680	16	31.5	90	2070	FD681M100J315A
	820	18	31.5	82	2400	FD821M100K315A
	1000	18	35.5	76	2700	FD102M100K355A
120	1	5	11	10320	62	FD010M120C110A
	2.2	5	11	7680	74	FD2R2M120C110A
	3.3	5	11	7200	94	FD3R3M120C110A
	4.7	5	11	6720	117	FD4R7M120C110A
	5.6	5	11	5400	127	FD5R6M120C110A
	6.8	5	11	5040	134	FD6R8M120C110A
	8.2	5	11	4560	144	FD8R2M120C110A
	10	6.3	11	2700	179	FD100M120E110A
	12	6.3	11	2520	199	FD120M120E110A
	15	6.3	11	2280	209	FD150M120E110A
	18	8	11.5	1440	265	FD180M120F115A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

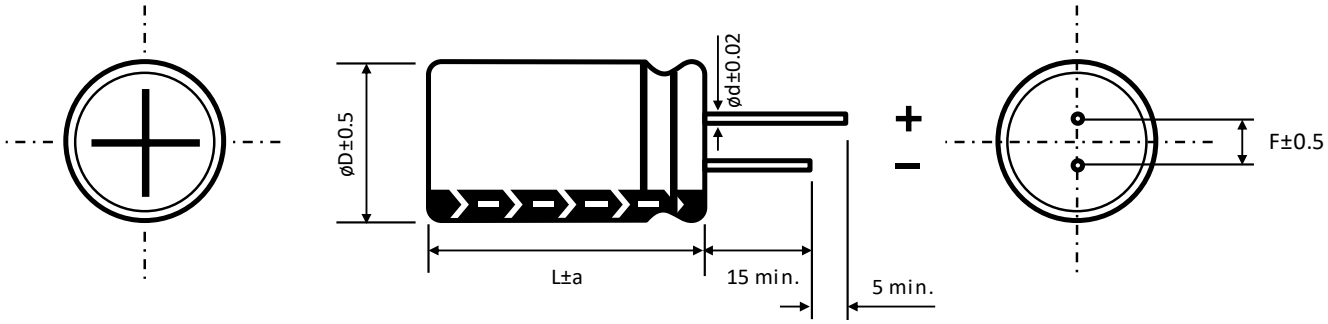
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
120	22	8	11.5	960	290	FD220M120F115A
	27	8	11.5	900	340	FD270M120F115A
	33	8	11.5	636	380	FD330M120F115A
	39	10	12.5	516	410	FD390M120G125A
	47	10	12.5	492	460	FD470M120G125A
	56	10	16	420	520	FD560M120G160A
	68	10	16	336	570	FD680M120G160A
	82	10	16	300	670	FD820M120G160A
	100	10	20	276	770	FD101M120G200A
	120	10	25	216	870	FD121M120G250A
	150	13	20	144	1040	FD151M120I200A
	180	13	25	132	1140	FD181M120I250A
	220	16	21	336	1240	FD221M120J210A
	270	16	21	384	1340	FD271M120J210A
	330	16	25	360	1750	FD331M120J250A
	390	18	25	120	1890	FD391M120K250A
	470	18	25	108	2040	FD471M120K250A
	560	18	31.5	102	2140	FD561M120K315A
	680	18	35.5	92	2300	FD681M120K355A

See "PACKAGING INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
$C_R < 100$	0.4	0.7	0.8	1
$100 \le C_R < 220$	0.5	0.8	0.88	1
$220 \le C_R < 1000$	0.7	0.87	0.9	1
$1000 \le C_R$	0.85	0.95	0.98	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FE SERIES ▪ LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 5 000 hours up to 10 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications with long life expectancies

HF Halogen Free RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics									
Operating Temperature Range		-40 ~ +105°C									
Rated Voltage Range	V_R	6.3 ~ 120V DC									
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$									
Capacitance Range	C_R	1 ~ 22000µF									
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)									
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]									
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		tanδ (%)	22	17	16	14	12	10	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	3	3	3	3	3	3	4
		For capacitance > 1000µF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value									

Lifetime Test			
Endurance 105°C (V_R & I_R applied)	Test	**5 000 hours**	ø D ≤ 6.3 mm
		6 000 hours	ø D = 8 mm
		7 000 hours	ø D = 10 mm
		10 000 hours	ø D ≥ 12.5 mm
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	935	86	FE330M6R3C110A
	39	5	11	880	91	FE390M6R3C110A
	47	5	11	825	96	FE470M6R3C110A
	56	5	11	792	106	FE560M6R3C110A
	68	5	11	770	116	FE680M6R3C110A
	82	5	11	715	126	FE820M6R3C110A
	100	5	11	660	150	FE101M6R3C110A
	120	5	11	605	160	FE121M6R3C110A
	150	5	11	550	175	FE151M6R3C110A
	180	5	11	528	195	FE181M6R3C110A
	220	5	11	495	230	FE221M6R3C110A
	270	5	11	330	275	FE271M6R3C110A
	330	6.3	11	275	320	FE331M6R3E110A
	390	6.3	11	253	380	FE391M6R3E110A
	470	6.3	11	198	440	FE471M6R3E110A
	560	6.3	11	165	485	FE561M6R3E110A
	680	6.3	11	132	520	FE681M6R3E110A
	820	8	11.5	110	580	FE821M6R3F115A
	1000	8	11.5	88	650	FE102M6R3F115A
	1200	8	14	86	730	FE122M6R3F140A
	1500	10	12.5	83	1150	FE152M6R3G125A
	1800	10	16	66	1260	FE182M6R3G160A
	2200	8	20	61	1380	FE222M6R3F200A
	2700	10	20	55	1500	FE272M6R3G200A
	3300	10	20	48	1620	FE332M6R3G200A
	3900	12.5	20	39	1860	FE392M6R3Z200A
	4700	12.5	20	50	2090	FE472M6R3Z200A
	5600	12.5	25	44	2210	FE562M6R3Z250A
	6800	12.5	25	35	2350	FE682M6R3Z250A
	8200	16	25	31	2860	FE822M6R3J250A
	10000	16	25	28	2960	FE103M6R3J250A
	12000	16	31.5	24	3400	FE123M6R3J315A
	15000	16	35.5	22	3600	FE153M6R3J355A
	18000	18	35.5	20	3780	FE183M6R3K355A
	22000	18	41	17	3980	FE223M6R3K410A
10	22	5	11	1100	88	FE220M010C110A
	27	5	11	990	96	FE270M010C110A
	33	5	11	935	113	FE330M010C110A
	39	5	11	880	122	FE390M010C110A
	47	5	11	825	135	FE470M010C110A
	56	5	11	770	156	FE560M010C110A
	68	5	11	715	170	FE680M010C110A
	82	5	11	682	182	FE820M010C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
10	100	5	11	638	196	FE101M010C110A
	120	5	11	605	216	FE121M010C110A
	150	5	11	550	245	FE151M010C110A
	180	5	11	506	275	FE181M010C110A
	220	5	11	440	305	FE221M010C110A
	270	6.3	11	352	324	FE271M010E110A
	330	6.3	11	242	345	FE331M010E110A
	390	6.3	11	176	390	FE391M010E110A
	470	6.3	11	165	450	FE471M010E110A
	560	8	9	132	535	FE561M010F090A
	680	8	9	106	565	FE681M010F090A
	820	8	11.5	94	680	FE821M010F115A
	1000	8	11.5	86	730	FE102M010F115A
	1200	8	16	77	1030	FE122M010F160A
	1500	10	12.5	75	1160	FE152M010G125A
	1800	10	16	66	1320	FE182M010G160A
	2200	10	20	50	1520	FE222M010G200A
	2700	10	20	46	1640	FE272M010G200A
	3300	10	20	44	1710	FE332M010G200A
	3900	13	20	42	2100	FE392M010I200A
	4700	13	20	39	2280	FE472M010I200A
	5600	13	25	31	2430	FE562M010I250A
	6800	13	25	28	2560	FE682M010I250A
	8200	16	25	22	2880	FE822M010J250A
	10000	16	31.5	20	3060	FE103M010J315A
	12000	16	35.5	17	3450	FE123M010J355A
	15000	18	35.5	13	3650	FE153M010K355A
16	6.8	5	11	4070	68	FE6R8M016C110A
	8.2	5	11	3740	78	FE8R2M016C110A
	10	5	11	1243	83	FE100M016C110A
	12	5	11	1210	89	FE120M016C110A
	15	5	11	1188	98	FE150M016C110A
	18	5	11	1133	106	FE180M016C110A
	22	5	11	1122	116	FE220M016C110A
	27	5	11	1045	128	FE270M016C110A
	33	5	11	990	139	FE330M016C110A
	39	5	11	880	146	FE390M016C110A
	47	5	11	660	165	FE470M016C110A
	56	5	11	616	188	FE560M016C110A
	68	5	11	385	210	FE680M016C110A
	82	5	11	341	230	FE820M016C110A
	100	5	11	330	250	FE101M016C110A
	120	5	11	319	275	FE121M016C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
16	150	5	11	286	300	FE151M016C110A
	180	6.3	11	275	330	FE181M016E110A
	220	6.3	11	242	375	FE221M016E110A
	270	6.3	11	231	405	FE271M016E110A
	330	6.3	11	176	430	FE331M016E110A
	390	8	11.5	154	595	FE391M016F115A
	470	8	11.5	121	625	FE471M016F115A
	560	8	11.5	110	665	FE561M016F115A
	680	8	11.5	105	830	FE681M016F115A
	820	10	12.5	94	1030	FE821M016G125A
	1000	10	16	57	1130	FE102M016G160A
	1200	10	16	72	1230	FE122M016G160A
	1500	10	16	68	1280	FE152M016G160A
	1800	10	20	66	1530	FE182M016G200A
	2200	10	20	61	1730	FE222M016G200A
	2700	13	20	55	1930	FE272M016I200A
	3300	13	20	53	2030	FE332M016I200A
	3900	13	25	51	2230	FE392M016I250A
	4700	13	25	46	2450	FE472M016I250A
	5600	16	25	44	2750	FE562M016J250A
	6800	16	31.5	42	3050	FE682M016J315A
	8200	16	35.5	40	3350	FE822M016J355A
	10000	18	35.5	39	3550	FE103M016K355A
25	4.7	5	11	4510	71	FE4R7M025C110A
	5.6	5	11	4180	76	FE5R6M025C110A
	6.8	5	11	3850	83	FE6R8M025C110A
	8.2	5	11	3630	89	FE8R2M025C110A
	10	5	11	3300	93	FE100M025C110A
	12	5	11	3278	105	FE120M025C110A
	15	5	11	3245	116	FE150M025C110A
	18	5	11	3223	126	FE180M025C110A
	22	5	11	990	136	FE220M025C110A
	27	5	11	880	148	FE270M025C110A
	33	5	11	682	158	FE330M025C110A
	39	5	11	660	172	FE390M025C110A
	47	5	11	616	195	FE470M025C110A
	56	5	11	583	225	FE560M025C110A
	68	5	11	550	250	FE680M025C110A
	82	5	11	418	275	FE820M025C110A
	100	5	11	385	305	FE101M025C110A
	120	6.3	11	363	335	FE121M025E110A
	150	6.3	11	330	365	FE151M025E110A
	180	6.3	11	220	405	FE181M025E110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
25	220	6.3	11	198	440	FE221M025E110A
	270	8	11.5	165	560	FE271M025F115A
	330	8	11.5	132	640	FE331M025F115A
	390	8	11.5	110	730	FE391M025F115A
	470	8	11.5	95	830	FE471M025F115A
	560	10	12.5	79	960	FE561M025G125A
	680	10	12.5	72	1160	FE681M025G125A
	820	10	16	66	1330	FE821M025G160A
	1000	10	16	61	1430	FE102M025G160A
	1200	10	20	55	1560	FE122M025G200A
	1500	13	20	53	1850	FE152M025I200A
	1800	13	20	50	2150	FE182M025I200A
	2200	13	20	44	2260	FE222M025I200A
	2700	13	25	42	2550	FE272M025I250A
	3300	13	25	39	2800	FE332M025I250A
	3900	16	25	35	2880	FE392M025J250A
	4700	16	25	33	3060	FE472M025J250A
	5600	16	31.5	29	3250	FE562M025J315A
	6800	18	31.5	26	3450	FE682M025K315A
	8200	18	35.5	24	3650	FE822M025K355A
35	4.7	5	11	3300	73	FE4R7M035C110A
	5.6	5	11	3245	83	FE5R6M035C110A
	6.8	5	11	3212	93	FE6R8M035C110A
	8.2	5	11	3190	103	FE8R2M035C110A
	10	5	11	3168	113	FE100M035C110A
	12	5	11	3135	126	FE120M035C110A
	15	5	11	2090	138	FE150M035C110A
	18	5	11	1870	151	FE180M035C110A
	22	5	11	825	166	FE220M035C110A
	27	5	11	660	186	FE270M035C110A
	33	5	11	605	215	FE330M035C110A
	39	5	11	550	230	FE390M035C110A
	47	5	11	495	241	FE470M035C110A
	56	5	11	330	260	FE560M035C110A
	68	6.3	11	275	315	FE680M035E110A
	82	6.3	11	264	345	FE820M035E110A
	100	6.3	11	253	375	FE101M035E110A
	120	6.3	12	231	430	FE121M035E120A
	150	8	9	220	530	FE151M035F090A
	180	8	11.5	198	580	FE181M035F115A
	220	8	11.5	143	640	FE221M035F115A
	270	8	16	110	830	FE271M035F160A
	330	8	16	107	960	FE331M035F160A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
35	390	8	16	105	1030	FE391M035F160A
	470	10	12.5	99	1130	FE471M035G125A
	560	10	16	81	1260	FE561M035G160A
	680	10	16	79	1360	FE681M035G160A
	820	10	20	78	1460	FE821M035G200A
	1000	10	20	66	1560	FE102M035G200A
	1200	13	20	55	2060	FE122M035I200A
	1500	13	20	48	2160	FE152M035I200A
	1800	13	25	46	2260	FE182M035I250A
	2200	13	25	46	2360	FE222M035I250A
	2700	16	25	42	2650	FE272M035J250A
	3300	18	25	33	3050	FE332M035K250A
	3900	18	31.5	31	3450	FE392M035K315A
	4700	18	35.5	29	3750	FE472M035K355A
50	1	5	11	5060	31	FE010M050C110A
	2.2	5	11	3850	42	FE2R2M050C110A
	3.3	5	11	3322	56	FE3R3M050C110A
	4.7	5	11	2992	83	FE4R7M050C110A
	5.6	5	11	4070	93	FE5R6M050C110A
	6.8	5	11	3960	103	FE6R8M050C110A
	8.2	5	11	2860	113	FE8R2M050C110A
	10	5	11	2805	126	FE100M050C110A
	12	5	11	2640	138	FE120M050C110A
	15	5	11	2530	151	FE150M050C110A
	18	5	11	2090	166	FE180M050C110A
	22	5	11	1851	186	FE220M050C110A
	27	5	11	1782	215	FE270M050C110A
	33	5	11	1551	230	FE330M050C110A
	39	6.3	11	990	241	FE390M050E110A
	47	6.3	11	781	260	FE470M050E110A
	56	6.3	11	748	285	FE560M050E110A
	68	6.3	11	715	330	FE680M050E110A
	82	8	11.5	484	415	FE820M050F115A
	100	8	11.5	418	455	FE101M050F115A
	120	8	11.5	385	530	FE121M050F115A
	150	8	11.5	352	570	FE151M050F115A
	180	10	12.5	330	680	FE181M050G125A
	220	10	12.5	286	880	FE221M050G125A
	270	10	16	264	1030	FE271M050G160A
	330	10	16	242	1130	FE331M050G160A
	390	10	20	231	1230	FE391M050G200A
	470	10	20	165	1280	FE471M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
50	560	10	20	188	1380	FE561M050G200A
	680	10	25	330	1680	FE681M050G250A
	820	13	20	102	1950	FE821M050I200A
	1000	13	25	116	2160	FE102M050I250A
	1200	16	25	83	2460	FE122M050J250A
	1500	16	25	80	2560	FE152M050J250A
	1800	18	25	78	2660	FE182M050K250A
	2200	16	31.5	132	2760	FE222M050J315A
	2700	18	31.5	121	2960	FE272M050K315A
	3300	18	35.5	43	3350	FE332M050K355A
63	1	5	11	5940	40	FE010M063C110A
	2.2	5	11	4620	51	FE2R2M063C110A
	3.3	5	11	2200	66	FE3R3M063C110A
	4.7	5	11	4290	96	FE4R7M063C110A
	5.6	5	11	3520	103	FE5R6M063C110A
	6.8	5	11	3300	113	FE6R8M063C110A
	8.2	5	11	2970	126	FE8R2M063C110A
	10	5	11	2827	138	FE100M063C110A
	12	5	11	2530	151	FE120M063C110A
	15	5	11	2420	166	FE150M063C110A
	18	5	11	2200	196	FE180M063C110A
	22	5	11	1947	206	FE220M063C110A
	27	5	11	1760	225	FE270M063C110A
	33	6.3	11	1320	240	FE330M063E110A
	39	6.3	11	1210	255	FE390M063E110A
	47	6.3	11	1100	270	FE470M063E110A
	56	8	9	825	330	FE560M063F090A
	68	8	9	715	395	FE680M063F090A
	82	8	11.5	649	445	FE820M063F115A
	100	8	11.5	550	530	FE101M063F115A
	120	10	12.5	495	630	FE121M063G125A
	150	8	16	759	700	FE151M063F160A
	180	10	16	330	880	FE181M063G160A
	220	10	16	297	1030	FE221M063G160A
	270	10	16	286	1130	FE271M063G160A
	330	10	20	242	1230	FE331M063G200A
	390	13	20	198	1330	FE391M063I200A
	470	13	20	165	1380	FE471M063I200A
	560	13	20	143	1680	FE561M063I200A
	680	13	25	96	1950	FE681M063I250A
	820	16	21	83	2160	FE821M063J210A
	1000	16	25	78	2600	FE102M063J250A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
63	1200	18	25	72	2900	FE122M063K250A
	1500	16	31.5	121	2980	FE152M063J315A
	1800	16	35.5	69	3060	FE182M063J355A
	2200	18	35.5	66	3300	FE222M063K355A
	2700	18	41	56	3500	FE272M063K410A
80	1	5	11	6380	42	FE010M080C110A
	2.2	5	11	4950	56	FE2R2M080C110A
	3.3	5	11	4620	76	FE3R3M080C110A
	4.7	5	11	4290	103	FE4R7M080C110A
	5.6	5	11	4180	108	FE5R6M080C110A
	6.8	5	11	4070	118	FE6R8M080C110A
	8.2	5	11	3080	131	FE8R2M080C110A
	10	5	11	2893	151	FE100M080C110A
	12	5	11	2772	166	FE120M080C110A
	15	5	11	4620	196	FE150M080C110A
	18	6.3	11	2420	206	FE180M080E110A
	22	6.3	11	2145	225	FE220M080E110A
	27	6.3	11	1980	240	FE270M080E110A
	33	6.3	11	875	255	FE330M080E110A
	39	8	9	825	270	FE390M080F090A
	47	8	11.5	715	330	FE470M080F115A
	56	8	11.5	495	395	FE560M080F115A
	68	8	11.5	750	415	FE680M080F115A
	82	10	12.5	440	495	FE820M080G125A
	100	10	12.5	385	580	FE101M080G125A
	120	8	20	308	650	FE121M080F200A
	150	10	16	286	730	FE151M080G160A
	180	10	20	220	900	FE181M080G200A
	220	10	20	253	1050	FE221M080G200A
	270	10	25	385	1150	FE271M080G250A
	330	13	20	165	1250	FE331M080I200A
	390	13	25	154	1350	FE391M080I250A
	470	13	25	264	1550	FE471M080I250A
	560	16	25	99	1740	FE561M080J250A
	680	16	25	86	1880	FE681M080J250A
	820	18	25	83	2180	FE821M080K250A
	1000	16	31.5	77	2650	FE102M080J315A
	1200	18	31.5	61	2950	FE122M080K315A
	1500	18	35.5	46	3080	FE152M080K355A
	1800	18	41	43	3180	FE182M080K410A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
100	1	5	11	3520	58	FE010M100C110A
	2.2	5	11	3300	68	FE2R2M100C110A
	3.3	5	11	3080	88	FE3R3M100C110A
	4.7	5	11	3630	113	FE4R7M100C110A
	5.6	5	11	2860	118	FE5R6M100C110A
	6.8	5	11	2750	131	FE6R8M100C110A
	8.2	5	11	2530	138	FE8R2M100C110A
	10	5	11	2310	166	FE100M100C110A
	12	6.3	11	1320	196	FE120M100E110A
	15	6.3	11	1210	206	FE150M100E110A
	18	6.3	11	1155	225	FE180M100E110A
	22	6.3	11	1100	240	FE220M100E110A
	27	8	11.5	825	315	FE270M100F115A
	33	8	11.5	792	355	FE330M100F115A
	39	8	11.5	748	395	FE390M100F115A
	47	8	11.5	550	415	FE470M100F115A
	56	10	12.5	495	455	FE560M100G125A
	68	10	12.5	484	525	FE680M100G125A
	82	10	16	286	650	FE820M100G160A
	100	10	16	264	730	FE101M100G160A
	120	10	16	3850	790	FE121M100G160A
	150	10	20	3740	880	FE151M100G200A
	180	13	20	187	1030	FE181M100I200A
	220	13	20	165	1160	FE221M100I200A
	270	13	25	154	1280	FE271M100I250A
	330	13	25	143	1550	FE331M100I250A
	390	16	25	99	1740	FE391M100J250A
	470	16	25	92	1880	FE471M100J250A
	560	18	25	79	1980	FE561M100K250A
	680	16	31.5	83	2080	FE681M100J315A
	820	18	31.5	75	2450	FE821M100K315A
	1000	18	35.5	69	2750	FE102M100K355A
120	1	5	11	9460	63	FE010M120C110A
	2.2	5	11	7040	76	FE2R2M120C110A
	3.3	5	11	6600	96	FE3R3M120C110A
	4.7	5	11	6160	118	FE4R7M120C110A
	5.6	5	11	4950	128	FE5R6M120C110A
	6.8	5	11	4620	136	FE6R8M120C110A
	8.2	5	11	4180	146	FE8R2M120C110A
	10	6.3	11	2475	181	FE100M120E110A
	12	6.3	11	2310	201	FE120M120E110A
	15	6.3	11	2090	211	FE150M120E110A
	18	8	11.5	1320	270	FE180M120F115A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

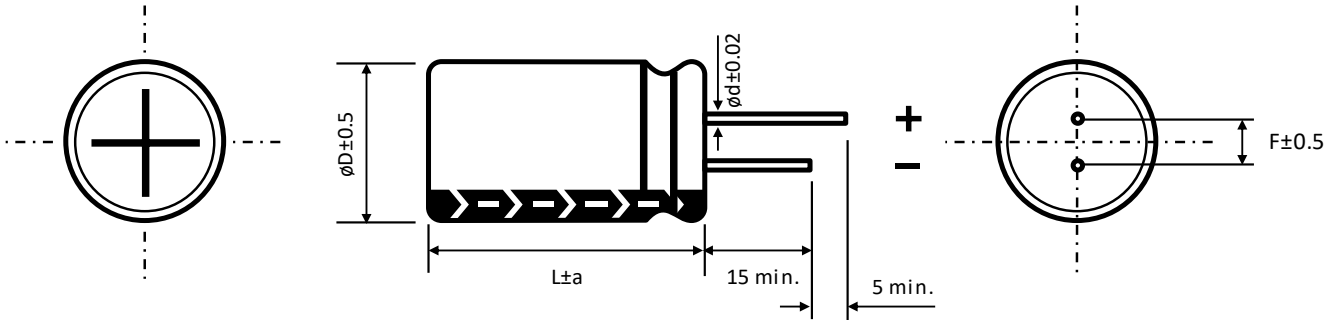
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
120	22	8	11.5	880	295	FE220M120F115A
	27	8	11.5	825	345	FE270M120F115A
	33	8	11.5	583	385	FE330M120F115A
	39	10	12.5	473	415	FE390M120G125A
	47	10	12.5	451	465	FE470M120G125A
	56	10	16	385	530	FE560M120G160A
	68	10	16	308	580	FE680M120G160A
	82	10	16	275	680	FE820M120G160A
	100	10	20	253	780	FE101M120G200A
	120	10	25	198	880	FE121M120G250A
	150	13	20	132	1060	FE151M120I200A
	180	13	25	121	1160	FE181M120I250A
	220	16	21	308	1260	FE221M120J210A
	270	16	21	352	1360	FE271M120J210A
	330	16	25	330	1800	FE331M120J250A
	390	18	25	110	1910	FE391M120K250A
	470	18	25	99	2060	FE471M120K250A
	560	18	31.5	94	2160	FE561M120K315A
	680	18	35.5	85	2350	FE681M120K355A

See "PACKAGING INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
$C_R < 100$	0.4	0.7	0.8	1
$100 \le C_R < 220$	0.5	0.8	0.88	1
$220 \le C_R < 1000$	0.7	0.87	0.9	1
$1000 \le C_R$	0.85	0.95	0.98	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FF SERIES ▪ ULTRA-LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE LIGHTING

HF Halogen Free

RoHS & REACH COMPLIANT

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 6 000 hours up to 12 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications with ultra-long life expectancies

SPECIFICATIONS

Items		Performance Characteristics									
Operating Temperature Range		-40 ~ +105°C									
Rated Voltage Range	V_R	6.3 ~ 120V DC									
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$									
Capacitance Range	C_R	1 ~ 22000µF									
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)									
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]									
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		tanδ (%)	22	17	16	14	12	10	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value										
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100	120
		Z-25°C/Z+20°C	3	2	2	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	4	3	3	3	3	3	3	3	3	3
		For capacitance > 1000µF										
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value									
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value									

Lifetime Test				
Endurance 105°C (V_R & I_R applied)	Test	**6 000 hours**	6.3 ~ 10V	ø D ≤ 6.3 mm
		7 000 hours	16 ~ 120V	ø D ≤ 6.3 mm
		8 000 hours	6.3 ~ 10V	ø D = 8 and 10 mm
		10 000 hours	16 ~ 120V	ø D = 8 and 10 mm
		12 000 hours	6.3 ~ 120V	ø D ≥ 12.5 mm
	△C/C_R	≤ ±20% of initial measured value		
	tanδ	≤ 200% of initial specified value		
	I_{Leak}	≤ the initial specified value		
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**		
	△C/C_R	≤ ±20% of initial measured value		
	tanδ	≤ 200% of initial specified value		
	I_{Leak}	≤ the initial specified value		
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4			

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	850	88	FF330M6R3C110A
	39	5	11	800	93	FF390M6R3C110A
	47	5	11	750	98	FF470M6R3C110A
	56	5	11	720	108	FF560M6R3C110A
	68	5	11	700	118	FF680M6R3C110A
	82	5	11	650	128	FF820M6R3C110A
	100	5	11	600	155	FF101M6R3C110A
	120	5	11	550	165	FF121M6R3C110A
	150	5	11	500	180	FF151M6R3C110A
	180	5	11	480	200	FF181M6R3C110A
	220	5	11	450	240	FF221M6R3C110A
	270	5	11	300	285	FF271M6R3C110A
	330	6.3	11	250	330	FF331M6R3E110A
	390	6.3	11	230	390	FF391M6R3E110A
	470	6.3	11	180	450	FF471M6R3E110A
	560	6.3	11	150	490	FF561M6R3E110A
	680	6.3	11	120	530	FF681M6R3E110A
	820	8	11.5	100	590	FF821M6R3F115A
	1000	8	11.5	80	660	FF102M6R3F115A
	1200	8	14	78	740	FF122M6R3F140A
	1500	10	12.5	75	1160	FF152M6R3G125A
	1800	10	16	60	1280	FF182M6R3G160A
	2200	8	20	55	1400	FF222M6R3F200A
	2700	10	20	50	1520	FF272M6R3G200A
	3300	10	20	44	1640	FF332M6R3G200A
	3900	12.5	20	35	1880	FF392M6R3Z200A
	4700	12.5	20	45	2100	FF472M6R3Z200A
	5600	12.5	25	40	2240	FF562M6R3Z250A
	6800	12.5	25	32	2360	FF682M6R3Z250A
	8200	16	25	28	2870	FF822M6R3J250A
	10000	16	25	25	2970	FF103M6R3J250A
	12000	16	31.5	22	3450	FF123M6R3J315A
	15000	16	35.5	20	3620	FF153M6R3J355A
	18000	18	35.5	18	3800	FF183M6R3K355A
	22000	18	41	15	4000	FF223M6R3K410A
10	22	5	11	1000	89	FF220M010C110A
	27	5	11	900	98	FF270M010C110A
	33	5	11	850	114	FF330M010C110A
	39	5	11	800	124	FF390M010C110A
	47	5	11	750	138	FF470M010C110A
	56	5	11	700	158	FF560M010C110A
	68	5	11	650	171	FF680M010C110A
	82	5	11	620	184	FF820M010C110A
	100	5	11	580	198	FF101M010C110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
10	120	5	11	550	218	FF121M010C110A
	150	5	11	500	250	FF151M010C110A
	180	5	11	460	280	FF181M010C110A
	220	5	11	400	310	FF221M010C110A
	270	5	11	320	326	FF271M010C110A
	330	6.3	11	220	349.8	FF331M010E110A
	390	6.3	11	160	400	FF391M010E110A
	470	6.3	11	150	460	FF471M010E110A
	560	8	9	120	540	FF561M010F090A
	680	8	9	96	570	FF681M010F090A
	820	8	11.5	85	690	FF821M010F115A
	1000	8	11.5	78	740	FF102M010F115A
	1200	8	16	70	1040	FF122M010F160A
	1500	10	12.5	68	1180	FF152M010G125A
	1800	10	16	60	1340	FF182M010G160A
	2200	10	20	45	1540	FF222M010G200A
	2700	10	20	42	1660	FF272M010G200A
	3300	10	20	40	1720	FF332M010G200A
	3900	13	20	38	2150	FF392M010I200A
	4700	13	20	35	2290	FF472M010I200A
	5600	13	25	28	2440	FF562M010I250A
	6800	13	25	25	2580	FF682M010I250A
	8200	16	25	20	2900	FF822M010J250A
	10000	16	31.5	18	3080	FF103M010J315A
	12000	16	35.5	15	3500	FF123M010J355A
	15000	18	35.5	12	3680	FF153M010K355A
16	6.8	5	11	3700	70	FF6R8M016C110A
	8.2	5	11	3400	79	FF8R2M016C110A
	10	5	11	1130	84	FF100M016C110A
	12	5	11	1100	90	FF120M016C110A
	15	5	11	1080	99	FF150M016C110A
	18	5	11	1030	108	FF180M016C110A
	22	5	11	1020	118	FF220M016C110A
	27	5	11	950	130	FF270M016C110A
	33	5	11	900	140	FF330M016C110A
	39	5	11	800	148	FF390M016C110A
	47	5	11	600	170	FF470M016C110A
	56	5	11	560	190	FF560M016C110A
	68	5	11	350	215	FF680M016C110A
	82	5	11	310	232	FF820M016C110A
	100	5	11	300	255	FF101M016C110A
	120	5	11	290	280	FF121M016C110A
	150	5	11	260	305	FF151M016C110A
	180	6.3	11	250	335	FF181M016E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
16	220	6.3	11	220	380	FF221M016E110A
	270	6.3	11	210	410	FF271M016E110A
	330	6.3	11	160	435	FF331M016E110A
	390	8	11.5	140	600	FF391M016F115A
	470	8	11.5	110	630	FF471M016F115A
	560	8	11.5	100	670	FF561M016F115A
	680	8	11.5	95	840	FF681M016F115A
	820	10	12.5	85	1040	FF821M016G125A
	1000	10	16	52	1140	FF102M016G160A
	1200	10	16	65	1240	FF122M016G160A
	1500	10	16	62	1290	FF152M016G160A
	1800	10	20	60	1540	FF182M016G200A
	2200	10	20	55	1740	FF222M016G200A
	2700	13	20	50	1940	FF272M016I200A
	3300	13	20	48	2040	FF332M016I200A
	3900	13	25	46	2240	FF392M016I250A
	4700	13	25	42	2500	FF472M016I250A
	5600	16	25	40	2800	FF562M016J250A
	6800	16	31.5	38	3100	FF682M016J315A
	8200	16	35.5	36	3400	FF822M016J355A
	10000	18	35.5	35	3600	FF103M016K355A
25	4.7	5	11	4100	72	FF4R7M025C110A
	5.6	5	11	3800	77	FF5R6M025C110A
	6.8	5	11	3500	84	FF6R8M025C110A
	8.2	5	11	3300	90	FF8R2M025C110A
	10	5	11	3000	94	FF100M025C110A
	12	5	11	2980	106	FF120M025C110A
	15	5	11	2950	118	FF150M025C110A
	18	5	11	2930	128	FF180M025C110A
	22	5	11	900	138	FF220M025C110A
	27	5	11	800	150	FF270M025C110A
	33	5	11	620	160	FF330M025C110A
	39	5	11	600	175	FF390M025C110A
	47	5	11	560	200	FF470M025C110A
	56	5	11	530	230	FF560M025C110A
	68	5	11	500	255	FF680M025C110A
	82	5	11	380	280	FF820M025C110A
	100	5	11	350	310	FF101M025C110A
	120	6.3	11	330	340	FF121M025E110A
	150	6.3	11	300	370	FF151M025E110A
	180	6.3	11	200	410	FF181M025E110A
	220	6.3	11	180	445	FF221M025E110A
	270	8	11.5	150	580	FF271M025F115A
	330	8	11.5	120	650	FF331M025F115A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
25	390	8	11.5	100	740	FF391M025F115A
	470	8	11.5	86	840	FF471M025F115A
	560	10	12.5	72	980	FF561M025G125A
	680	10	12.5	65	1180	FF681M025G125A
	820	10	16	60	1340	FF821M025G160A
	1000	10	16	55	1440	FF102M025G160A
	1200	10	20	50	1580	FF122M025G200A
	1500	13	20	48	1860	FF152M025I200A
	1800	13	20	45	2200	FF182M025I200A
	2200	13	20	40	2280	FF222M025I200A
	2700	13	25	38	2600	FF272M025I250A
	3300	13	25	35	2850	FF332M025I250A
	3900	16	25	32	2890	FF392M025J250A
	4700	16	25	30	3080	FF472M025J250A
	5600	16	31.5	26	3300	FF562M025J315A
	6800	18	31.5	24	3500	FF682M025K315A
	8200	18	35.5	22	3700	FF822M025K355A
35	4.7	5	11	3000	74	FF4R7M035C110A
	5.6	5	11	2950	84	FF5R6M035C110A
	6.8	5	11	2920	94	FF6R8M035C110A
	8.2	5	11	2900	104	FF8R2M035C110A
	10	5	11	2880	114	FF100M035C110A
	12	5	11	2850	128	FF120M035C110A
	15	5	11	1900	140	FF150M035C110A
	18	5	11	1700	153	FF180M035C110A
	22	5	11	750	168	FF220M035C110A
	27	5	11	600	188	FF270M035C110A
	33	5	11	550	220	FF330M035C110A
	39	5	11	500	232	FF390M035C110A
	47	5	11	450	243	FF470M035C110A
	56	5	11	300	265	FF560M035C110A
	68	6.3	11	250	320	FF680M035E110A
	82	6.3	11	240	350	FF820M035E110A
	100	6.3	11	230	380	FF101M035E110A
	120	6.3	12	210	440	FF121M035E120A
	150	8	9	200	540	FF151M035F090A
	180	8	11.5	180	590	FF181M035F115A
	220	8	11.5	130	650	FF221M035F115A
	270	8	16	100	840	FF271M035F160A
	330	8	16	97	980	FF331M035F160A
	390	8	16	95	1040	FF391M035F160A
	470	10	12.5	90	1140	FF471M035G125A
	560	10	16	74	1280	FF561M035G160A
	680	10	16	72	1380	FF681M035G160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
35	820	10	20	71	1480	FF821M035G200A
	1000	10	20	60	1580	FF102M035G200A
	1200	13	20	50	2080	FF122M035I200A
	1500	13	20	44	2180	FF152M035I200A
	1800	13	25	43	2280	FF182M035I250A
	2200	13	25	42	2380	FF222M035I250A
	2700	16	25	38	2700	FF272M035J250A
	3300	18	25	30	3100	FF332M035K250A
	3900	18	31.5	28	3500	FF392M035K315A
	4700	18	35.5	26	3750	FF472M035K355A
50	1	5	11	4600	32	FF010M050C110A
	2.2	5	11	3500	44	FF2R2M050C110A
	3.3	5	11	3020	58	FF3R3M050C110A
	4.7	5	11	2720	84	FF4R7M050C110A
	5.6	5	11	3700	94	FF5R6M050C110A
	6.8	5	11	3600	104	FF6R8M050C110A
	8.2	5	11	2600	114	FF8R2M050C110A
	10	5	11	2550	128	FF100M050C110A
	12	5	11	2400	140	FF120M050C110A
	15	5	11	2300	153	FF150M050C110A
	18	5	11	1900	168	FF180M050C110A
	22	5	11	1683	188	FF220M050C110A
	27	5	11	1620	220	FF270M050C110A
	33	5	11	1410	232	FF330M050C110A
	39	6.3	11	900	243	FF390M050E110A
	47	6.3	11	710	265	FF470M050E110A
	56	6.3	11	680	290	FF560M050E110A
	68	6.3	11	650	340	FF680M050E110A
	82	8	11.5	440	420	FF820M050F115A
	100	8	11.5	380	460	FF101M050F115A
	120	8	11.5	350	540	FF121M050F115A
	150	8	11.5	320	580	FF151M050F115A
	180	10	12.5	300	690	FF181M050G125A
	220	10	12.5	260	890	FF221M050G125A
	270	10	16	240	1040	FF271M050G160A
	330	10	16	400	1140	FF331M050G160A
	390	10	20	210	1240	FF391M050G200A
	470	10	20	150	1290	FF471M050G200A
	560	10	20	171	1390	FF561M050G200A
	680	10	25	300	1700	FF681M050G250A
	820	13	20	93	2000	FF821M050I200A
	1000	13	25	105	2180	FF102M050I250A
	1200	16	25	75	2480	FF122M050J250A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
50	1500	16	25	73	2580	FF152M050J250A
	1800	18	25	71	2680	FF182M050K250A
	2200	16	31.5	120	2780	FF222M050J315A
	2700	18	31.5	110	2980	FF272M050K315A
	3300	18	35.5	39	3350	FF332M050K355A
63	1	5	11	5400	41	FF010M063C110A
	2.2	5	11	4200	52	FF2R2M063C110A
	3.3	5	11	2000	68	FF3R3M063C110A
	4.7	5	11	3900	98	FF4R7M063C110A
	5.6	5	11	3200	104	FF5R6M063C110A
	6.8	5	11	3000	114	FF6R8M063C110A
	8.2	5	11	2700	128	FF8R2M063C110A
	10	5	11	2570	140	FF100M063C110A
	12	5	11	2300	153	FF120M063C110A
	15	5	11	2200	168	FF150M063C110A
	18	5	11	2000	198	FF180M063C110A
	22	5	11	1770	208	FF220M063C110A
	27	5	11	1600	225	FF270M063C110A
	33	6.3	11	1200	245	FF330M063E110A
	39	6.3	11	1100	260	FF390M063E110A
	47	6.3	11	1000	275	FF470M063E110A
	56	8	9	750	340	FF560M063F090A
	68	8	9	650	400	FF680M063F090A
	82	8	11.5	590	450	FF820M063F115A
	100	8	11.5	500	540	FF101M063F115A
	120	10	12.5	450	640	FF121M063G125A
	150	8	16	690	710	FF151M063F160A
	180	10	16	300	890	FF181M063G160A
	220	10	16	270	1040	FF221M063G160A
	270	10	16	260	1140	FF271M063G160A
	330	10	20	220	1240	FF331M063G200A
	390	10	20	180	1340	FF391M063G200A
	470	13	20	150	1390	FF471M063I200A
	560	13	20	130	1700	FF561M063I200A
	680	13	25	87	2000	FF681M063I250A
	820	16	21	75	2180	FF821M063J210A
	1000	16	25	71	2650	FF102M063J250A
	1200	18	25	65	2950	FF122M063K250A
	1500	16	31.5	110	2990	FF152M063J315A
	1800	16	35.5	63	3080	FF182M063J355A
	2200	18	35.5	60	3300	FF222M063K355A
	2700	18	41	51	3550	FF272M063K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
80	1	5	11	5800	43	FF010M080C110A
	2.2	5	11	4500	57	FF2R2M080C110A
	3.3	5	11	4200	78	FF3R3M080C110A
	4.7	5	11	3900	104	FF4R7M080C110A
	5.6	5	11	3800	109	FF5R6M080C110A
	6.8	5	11	3700	119	FF6R8M080C110A
	8.2	5	11	2800	133	FF8R2M080C110A
	10	5	11	2630	153	FF100M080C110A
	12	5	11	2520	168	FF120M080C110A
	15	5	11	4200	198	FF150M080C110A
	18	6.3	11	2200	208	FF180M080E110A
	22	6.3	11	1950	225	FF220M080E110A
	27	6.3	11	1800	245	FF270M080E110A
	33	6.3	11	795	260	FF330M080E110A
	39	8	9	750	275	FF390M080F090A
	47	8	11.5	650	340	FF470M080F115A
	56	8	11.5	450	400	FF560M080F115A
	68	8	11.5	730	420	FF680M080F115A
	82	10	12.5	400	500	FF820M080G125A
	100	10	12.5	350	590	FF101M080G125A
	120	8	20	280	660	FF121M080F200A
	150	10	16	260	740	FF151M080G160A
	180	10	20	200	910	FF181M080G200A
	220	10	20	230	1060	FF221M080G200A
	270	10	25	350	1160	FF271M080G250A
	330	13	20	150	1260	FF331M080I200A
	390	13	25	140	1360	FF391M080I250A
	470	13	25	240	1600	FF471M080I250A
	560	16	25	90	1760	FF561M080J250A
	680	16	25	78	1890	FF681M080J250A
	820	18	25	75	2200	FF821M080K250A
	1000	16	31.5	70	2700	FF102M080J315A
	1200	18	31.5	55	3000	FF122M080K315A
	1500	18	35.5	42	3090	FF152M080K355A
	1800	18	41	39	3190	FF182M080K410A
100	1	5	11	3200	59	FF010M100C110A
	2.2	5	11	3000	69	FF2R2M100C110A
	3.3	5	11	2800	89	FF3R3M100C110A
	4.7	5	11	3300	114	FF4R7M100C110A
	5.6	5	11	2600	119	FF5R6M100C110A
	6.8	5	11	2500	133	FF6R8M100C110A
	8.2	5	11	2300	139	FF8R2M100C110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
100	10	5	11	2100	168	FF100M100C110A
	12	6.3	11	1200	198	FF120M100E110A
	15	6.3	11	1100	208	FF150M100E110A
	18	6.3	11	1050	225	FF180M100E110A
	22	6.3	11	1000	245	FF220M100E110A
	27	8	11.5	750	320	FF270M100F115A
	33	8	11.5	720	360	FF330M100F115A
	39	8	11.5	680	400	FF390M100F115A
	47	8	11.5	500	420	FF470M100F115A
	56	10	12.5	450	460	FF560M100G125A
	68	10	12.5	440	530	FF680M100G125A
	82	10	16	260	660	FF820M100G160A
	100	10	16	240	740	FF101M100G160A
	120	10	16	3500	800	FF121M100G160A
	150	10	20	3400	890	FF151M100G200A
	180	13	20	170	1040	FF181M100I200A
	220	13	20	150	1180	FF221M100I200A
	270	13	25	140	1290	FF271M100I250A
	330	13	25	130	1600	FF331M100I250A
	390	16	25	90	1760	FF391M100J250A
	470	16	25	84	1890	FF471M100J250A
	560	18	25	72	2000	FF561M100K250A
	680	16	31.5	75	2090	FF681M100J315A
	820	18	31.5	68	2500	FF821M100K315A
	1000	18	35.5	63	2800	FF102M100K355A
120	1	5	11	8600	64	FF010M120C110A
	2.2	5	11	6400	78	FF2R2M120C110A
	3.3	5	11	6000	98	FF3R3M120C110A
	4.7	5	11	5600	119	FF4R7M120C110A
	5.6	5	11	4500	129	FF5R6M120C110A
	6.8	5	11	4200	138	FF6R8M120C110A
	8.2	5	11	3800	148	FF8R2M120C110A
	10	6.3	11	2250	183	FF100M120E110A
	12	6.3	11	2100	203	FF120M120E110A
	15	6.3	11	1900	213	FF150M120E110A
	18	8	11.5	1200	275	FF180M120F115A
	22	8	11.5	800	300	FF220M120F115A
	27	8	11.5	750	350	FF270M120F115A
	33	8	11.5	530	390	FF330M120F115A
	39	10	12.5	430	420	FF390M120G125A
	47	10	12.5	410	470	FF470M120G125A
	56	10	16	350	540	FF560M120G160A
	68	10	16	280	590	FF680M120G160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

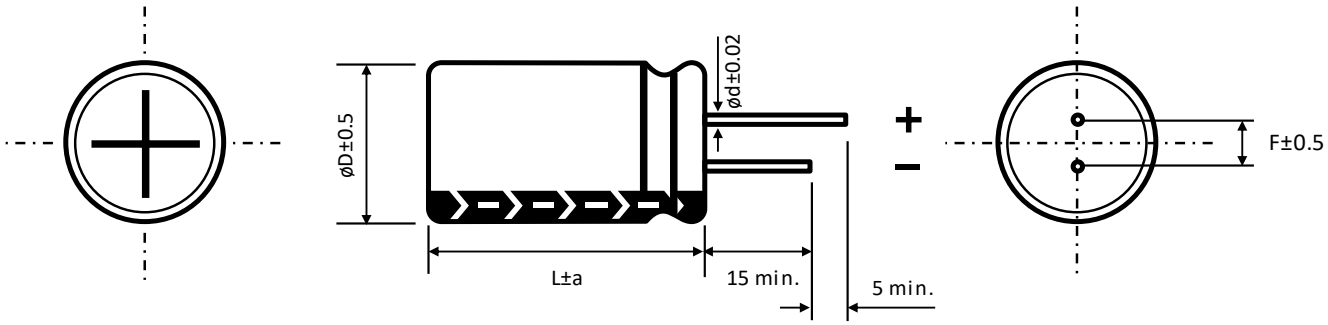
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
120	82	10	16	250	690	FF820M120G160A
	100	10	20	230	790	FF101M120G200A
	120	10	25	180	890	FF121M120G250A
	150	13	20	120	1080	FF151M120I200A
	180	13	25	110	1180	FF181M120I250A
	220	16	21	280	1280	FF221M120J210A
	270	16	21	320	1380	FF271M120J210A
	330	16	25	300	1800	FF331M120J250A
	390	18	25	100	1930	FF391M120K250A
	470	18	25	90	2080	FF471M120K250A
	560	18	31.5	85	2180	FF561M120K315A
	680	18	35.5	77	2350	FF681M120K355A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
$C_R \leq 47$	0.42	0.7	0.9	1
$47 < C_R \leq 330$	0.5	0.73	0.92	1
$330 < C_R \leq 820$	0.55	0.77	0.94	1
$820 < C_R \leq 2200$	0.6	0.8	0.96	1
$2200 < C_R$	0.7	0.85	0.98	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

FG SERIES ▪ HIGH TEMPERATURE 130°C TYPE

KEY FEATURES

HIGH TEMPERATURE · LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 130°C ▪ 2 000 hours up to 5 000 hours
- Low voltage version
- Miniaturized for space critical designs
- Ideal for lighting applications with high ambient temperatures

HF Halogen Free · RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics								
Operating Temperature Range		-40 ~ +130°C								
Rated Voltage Range	V_R	6.3 ~ 100V DC								
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$								
Capacitance Range	C_R	1 ~ 22000µF								
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)								
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.01 \cdot C_R \cdot V_R$ or 3µA, whichever is greater ▪ After 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]								
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	6.3	10	16	25	35	50	63	80	100
		tanδ (%)	22	17	16	14	12	10	10	10	10
		For C_R ≥ 1000µF, add 2% per every multiple 1000µF of rated capacitance value									
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	6.3	10	16	25	35	50	63	80	100
		Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	3	3	3	3	3	3
		For capacitance > 1000µF									
		Z-25°C/Z+20°C	Add 0.5 for every multiple 1000µF of rated capacitance value								
		Z-40°C/Z+20°C	Add 1 for every multiple 1000µF of rated capacitance value								

Lifetime Test			
Endurance 130°C (V_R & I_R applied)	Test	**2 000 hours**	ø D ≤ 6.3 mm
		3 000 hours	ø D = 8 and 10 mm
		5 000 hours	ø D ≥ 12.5 mm
	△C/C_R	≤ ±30% of initial measured value	
	tanδ	≤ 300% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 130°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±30% of initial measured value	
	tanδ	≤ 300% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
6.3	33	5	11	2500	90	FG330M6R3C110A
	39	5	11	2200	95	FG390M6R3C110A
	47	5	11	2000	100	FG470M6R3C110A
	56	5	11	1900	110	FG560M6R3C110A
	68	5	11	1800	120	FG680M6R3C110A
	82	5	11	1630	130	FG820M6R3C110A
	100	5	11	1450	160	FG101M6R3C110A
	120	5	11	1280	170	FG121M6R3C110A
	150	5	11	1160	185	FG151M6R3C110A
	180	5	11	1040	210	FG181M6R3C110A
	220	5	11	1200	250	FG221M6R3C110A
	270	5	11	890	295	FG271M6R3C110A
	330	6.3	11	770	340	FG331M6R3E110A
	390	6.3	11	670	400	FG391M6R3E110A
	470	6.3	11	600	460	FG471M6R3E110A
	560	6.3	11	550	495	FG561M6R3E110A
	680	6.3	11	500	540	FG681M6R3E110A
	820	8	11.5	450	600	FG821M6R3F115A
	1000	8	11.5	400	670	FG102M6R3F115A
	1200	8	14	350	750	FG122M6R3F140A
	1500	10	12.5	300	1170	FG152M6R3G125A
	1800	10	16	250	1300	FG182M6R3G160A
	2200	8	20	200	1420	FG222M6R3F200A
	2700	10	20	150	1540	FG272M6R3G200A
	3300	10	20	100	1660	FG332M6R3G200A
	3900	12.5	20	95	1900	FG392M6R3Z200A
	4700	12.5	20	90	2120	FG472M6R3Z200A
	5600	12.5	25	85	2250	FG562M6R3Z250A
	6800	12.5	25	80	2380	FG682M6R3Z250A
	8200	16	25	75	2880	FG822M6R3J250A
	10000	16	25	70	2980	FG103M6R3J250A
	12000	16	31.5	65	3500	FG123M6R3J315A
	15000	16	35.5	60	3650	FG153M6R3J355A
	18000	18	35.5	55	3850	FG183M6R3K355A
	22000	18	41	50	4000	FG223M6R3K410A
10	22	5	11	3080	90	FG220M010C110A
	27	5	11	2670	100	FG270M010C110A
	33	5	11	2330	115	FG330M010C110A
	39	5	11	2020	126	FG390M010C110A
	47	5	11	1710	140	FG470M010C110A
	56	5	11	1470	160	FG560M010C110A
	68	5	11	1300	172	FG680M010C110A
	82	5	11	1150	186	FG820M010C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
10	100	5	11	1110	200	FG101M010C110A
	120	5	11	1020	220	FG121M010C110A
	150	5	11	1000	255	FG151M010C110A
	180	5	11	850	285	FG181M010C110A
	220	5	11	750	310	FG221M010C110A
	270	6.3	11	650	328	FG271M010E110A
	330	6.3	11	560	355	FG331M010E110A
	390	6.3	11	510	410	FG391M010E110A
	470	6.3	11	460	470	FG471M010E110A
	560	8	9	420	545	FG561M010F090A
	680	8	9	370	580	FG681M010F090A
	820	8	11.5	320	700	FG821M010F115A
	1000	8	11.5	250	750	FG102M010F115A
	1200	8	16	220	1050	FG122M010F160A
	1500	10	12.5	180	1200	FG152M010G125A
	1800	10	16	150	1360	FG182M010G160A
	2200	10	20	100	1550	FG222M010G200A
	2700	10	20	95	1680	FG272M010G200A
	3300	10	20	90	1720	FG332M010G200A
	3900	13	20	85	2200	FG392M010I200A
	4700	13	20	80	2300	FG472M010I200A
	5600	13	25	75	2450	FG562M010I250A
	6800	13	25	70	2600	FG682M010I250A
	8200	16	25	65	2900	FG822M010J250A
	10000	16	31.5	60	3100	FG103M010J315A
	12000	16	35.5	55	3550	FG123M010J355A
	15000	18	35.5	50	3680	FG153M010K355A
16	6.8	5	11	5200	72	FG6R8M016C110A
	8.2	5	11	4500	80	FG8R2M016C110A
	10	5	11	3900	85	FG100M016C110A
	12	5	11	3610	90	FG120M016C110A
	15	5	11	3320	100	FG150M016C110A
	18	5	11	2800	110	FG180M016C110A
	22	5	11	2640	120	FG220M016C110A
	27	5	11	2370	132	FG270M016C110A
	33	5	11	2000	140	FG330M016C110A
	39	5	11	1610	150	FG390M016C110A
	47	5	11	1350	170	FG470M016C110A
	56	5	11	1240	192	FG560M016C110A
	68	5	11	1180	220	FG680M016C110A
	82	5	11	1150	235	FG820M016C110A
	100	5	11	1100	255	FG101M016C110A
	120	5	11	950	280	FG121M016C110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
16	150	5	11	880	310	FG151M016C110A
	180	6.3	11	770	340	FG181M016E110A
	220	6.3	11	680	380	FG221M016E110A
	270	6.3	11	550	410	FG271M016E110A
	330	6.3	11	480	440	FG331M016E110A
	390	8	11.5	400	600	FG391M016F115A
	470	8	11.5	350	635	FG471M016F115A
	560	8	11.5	300	675	FG561M016F115A
	680	8	11.5	270	850	FG681M016F115A
	820	10	12.5	220	1050	FG821M016G125A
	1000	10	16	200	1150	FG102M016G160A
	1200	10	16	170	1250	FG122M016G160A
	1500	10	16	120	1300	FG152M016G160A
	1800	10	20	98	1550	FG182M016G200A
	2200	10	20	150	1750	FG222M016G200A
	2700	13	20	88	1950	FG272M016I200A
	3300	13	20	82	2050	FG332M016I200A
	3900	13	25	77	2250	FG392M016I250A
	4700	13	25	72	2500	FG472M016I250A
	5600	16	25	65	2800	FG562M016J250A
	6800	16	31.5	60	3100	FG682M016J315A
	8200	16	35.5	55	3400	FG822M016J355A
	10000	18	35.5	50	3600	FG103M016K355A
25	4.7	5	11	5000	72	FG4R7M025C110A
	5.6	5	11	4500	77	FG5R6M025C110A
	6.8	5	11	4000	85	FG6R8M025C110A
	8.2	5	11	3500	90	FG8R2M025C110A
	10	5	11	3010	95	FG100M025C110A
	12	5	11	2850	108	FG120M025C110A
	15	5	11	2640	118	FG150M025C110A
	18	5	11	2500	128	FG180M025C110A
	22	5	11	2300	140	FG220M025C110A
	27	5	11	2030	150	FG270M025C110A
	33	5	11	1720	160	FG330M025C110A
	39	5	11	1500	175	FG390M025C110A
	47	5	11	1370	205	FG470M025C110A
	56	5	11	1250	230	FG560M025C110A
	68	5	11	1150	260	FG680M025C110A
	82	5	11	1100	285	FG820M025C110A
	100	5	11	1000	315	FG101M025C110A
	120	6.3	11	700	345	FG121M025E110A
	150	6.3	11	650	375	FG151M025E110A
	180	6.3	11	600	415	FG181M025E110A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
25	220	6.3	11	550	450	FG221M025E110A
	270	8	11.5	450	600	FG271M025F115A
	330	8	11.5	400	660	FG331M025F115A
	390	8	11.5	350	750	FG391M025F115A
	470	8	11.5	300	850	FG471M025F115A
	560	10	12.5	280	1000	FG561M025G125A
	680	10	12.5	250	1180	FG681M025G125A
	820	10	16	200	1350	FG821M025G160A
	1000	10	16	150	1450	FG102M025G160A
	1200	10	20	100	1600	FG122M025G200A
	1500	13	20	95	1880	FG152M025I200A
	1800	13	20	90	2200	FG182M025I200A
	2200	13	20	85	2300	FG222M025I200A
	2700	13	25	80	2600	FG272M025I250A
	3300	13	25	75	2850	FG332M025I250A
	3900	16	25	70	2900	FG392M025J250A
	4700	16	25	65	3100	FG472M025J250A
	5600	16	31.5	60	3300	FG562M025J315A
	6800	18	31.5	55	3500	FG682M025K315A
	8200	18	35.5	50	3700	FG822M025K355A
35	4.7	5	11	4500	75	FG4R7M035C110A
	5.6	5	11	4000	85	FG5R6M035C110A
	6.8	5	11	3500	95	FG6R8M035C110A
	8.2	5	11	3000	105	FG8R2M035C110A
	10	5	11	2650	115	FG100M035C110A
	12	5	11	2470	130	FG120M035C110A
	15	5	11	2290	140	FG150M035C110A
	18	5	11	2140	155	FG180M035C110A
	22	5	11	1900	170	FG220M035C110A
	27	5	11	1580	190	FG270M035C110A
	33	5	11	1250	220	FG330M035C110A
	39	5	11	1200	234	FG390M035C110A
	47	5	11	960	245	FG470M035C110A
	56	5	11	850	265	FG560M035C110A
	68	6.3	11	620	325	FG680M035E110A
	82	6.3	11	600	355	FG820M035E110A
	100	6.3	11	490	385	FG101M035E110A
	120	6.3	12	470	450	FG121M035E120A
	150	8	9	450	550	FG151M035F090A
	180	8	11.5	400	600	FG181M035F115A
	220	8	11.5	370	660	FG221M035F115A
	270	8	16	320	850	FG271M035F160A
	330	8	16	300	980	FG331M035F160A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
35	390	8	16	250	1050	FG391M035F160A
	470	10	12.5	220	1150	FG471M035G125A
	560	10	16	210	1280	FG561M035G160A
	680	10	16	200	1380	FG681M035G160A
	820	10	20	180	1480	FG821M035G200A
	1000	10	20	150	1600	FG102M035G200A
	1200	13	20	130	2100	FG122M035I200A
	1500	13	20	100	2200	FG152M035I200A
	1800	13	25	95	2300	FG182M035I250A
	2200	13	25	92	2400	FG222M035I250A
	2700	16	25	87	2700	FG272M035J250A
	3300	18	25	85	3100	FG332M035K250A
	3900	18	31.5	76	3500	FG392M035K315A
	4700	18	35.5	72	3750	FG472M035K355A
50	1	5	11	4310	32	FG010M050C110A
	2.2	5	11	3600	44	FG2R2M050C110A
	3.3	5	11	3500	58	FG3R3M050C110A
	4.7	5	11	3300	85	FG4R7M050C110A
	5.6	5	11	3200	95	FG5R6M050C110A
	6.8	5	11	3000	105	FG6R8M050C110A
	8.2	5	11	2800	115	FG8R2M050C110A
	10	5	11	2600	130	FG100M050C110A
	12	5	11	2450	140	FG120M050C110A
	15	5	11	1870	155	FG150M050C110A
	18	5	11	1760	170	FG180M050C110A
	22	5	11	1600	190	FG220M050C110A
	27	5	11	1110	220	FG270M050C110A
	33	5	11	960	234	FG330M050C110A
	39	6.3	11	720	245	FG390M050E110A
	47	6.3	11	590	265	FG470M050E110A
	56	6.3	11	490	290	FG560M050E110A
	68	6.3	11	450	340	FG680M050E110A
	82	8	11.5	320	420	FG820M050F115A
	100	8	11.5	280	460	FG101M050F115A
	120	8	11.5	270	540	FG121M050F115A
	150	8	11.5	260	580	FG151M050F115A
	180	10	12.5	250	690	FG181M050G125A
	220	10	12.5	240	890	FG221M050G125A
	270	10	16	230	1050	FG271M050G160A
	330	10	16	220	1150	FG331M050G160A
	390	10	20	200	1250	FG391M050G200A
	470	10	20	180	1300	FG471M050G200A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
50	560	10	20	160	1400	FG561M050G200A
	680	10	25	130	1700	FG681M050G250A
	820	13	20	110	2000	FG821M050I200A
	1000	13	25	95	2200	FG102M050I250A
	1200	16	25	84	2480	FG122M050J250A
	1500	16	25	72	2580	FG152M050J250A
	1800	18	25	66	2680	FG182M050K250A
	2200	16	31.5	62	2780	FG222M050J315A
	2700	18	31.5	59	2980	FG272M050K315A
	3300	18	35.5	55	3350	FG332M050K355A
63	1	5	11	7100	41	FG010M063C110A
	2.2	5	11	6400	52	FG2R2M063C110A
	3.3	5	11	5600	70	FG3R3M063C110A
	4.7	5	11	4560	100	FG4R7M063C110A
	5.6	5	11	4300	105	FG5R6M063C110A
	6.8	5	11	3850	115	FG6R8M063C110A
	8.2	5	11	3500	130	FG8R2M063C110A
	10	5	11	3020	140	FG100M063C110A
	12	5	11	2750	155	FG120M063C110A
	15	5	11	2370	170	FG150M063C110A
	18	5	11	2080	198	FG180M063C110A
	22	5	11	1770	210	FG220M063C110A
	27	5	11	1420	230	FG270M063C110A
	33	6.3	11	1020	245	FG330M063E110A
	39	6.3	11	890	260	FG390M063E110A
	47	6.3	11	850	280	FG470M063E110A
	56	8	9	790	340	FG560M063F090A
	68	8	9	680	400	FG680M063F090A
	82	8	11.5	470	455	FG820M063F115A
	100	8	11.5	450	550	FG101M063F115A
	120	10	12.5	410	640	FG121M063G125A
	150	8	16	380	720	FG151M063F160A
	180	10	16	280	890	FG181M063G160A
	220	10	16	230	1050	FG221M063G160A
	270	10	16	210	1150	FG271M063G160A
	330	10	20	180	1250	FG331M063G200A
	390	13	20	160	1350	FG391M063I200A
	470	13	20	130	1400	FG471M063I200A
	560	13	20	110	1700	FG561M063I200A
	680	13	25	90	2000	FG681M063I250A
	820	16	21	86	2200	FG821M063J210A
	1000	16	25	80	2700	FG102M063J250A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
63	1200	18	25	75	2950	FG122M063K250A
	1500	16	31.5	72	3000	FG152M063J315A
	1800	16	35.5	68	3100	FG182M063J355A
	2200	18	35.5	60	3350	FG222M063K355A
	2700	18	41	53	3550	FG272M063K410A
80	1	5	11	7600	43	FG010M080C110A
	2.2	5	11	6800	57	FG2R2M080C110A
	3.3	5	11	6200	80	FG3R3M080C110A
	4.7	5	11	5200	105	FG4R7M080C110A
	5.6	5	11	4700	110	FG5R6M080C110A
	6.8	5	11	4200	120	FG6R8M080C110A
	8.2	5	11	3000	135	FG8R2M080C110A
	10	5	11	4070	155	FG100M080C110A
	12	5	11	3650	170	FG120M080C110A
	15	5	11	3200	198	FG150M080C110A
	18	6.3	11	2540	210	FG180M080E110A
	22	6.3	11	1880	230	FG220M080E110A
	27	6.3	11	1750	245	FG270M080E110A
	33	6.3	11	1370	260	FG330M080E110A
	39	8	9	1210	280	FG390M080F090A
	47	8	11.5	1020	340	FG470M080F115A
	56	8	11.5	950	400	FG560M080F115A
	68	8	11.5	850	425	FG680M080F115A
	82	10	12.5	660	505	FG820M080G125A
	100	10	12.5	540	590	FG101M080G125A
	120	8	20	480	670	FG121M080F200A
	150	10	16	450	750	FG151M080G160A
	180	10	20	420	920	FG181M080G200A
	220	10	20	400	1070	FG221M080G200A
	270	10	25	330	1170	FG271M080G250A
	330	13	20	280	1270	FG331M080I200A
	390	13	25	250	1370	FG391M080I250A
	470	13	25	220	1600	FG471M080I250A
	560	16	25	210	1760	FG561M080J250A
	680	16	25	200	1900	FG681M080J250A
	820	18	25	180	2220	FG821M080K250A
	1000	16	31.5	150	2750	FG102M080J315A
	1200	18	31.5	130	3000	FG122M080K315A
	1500	18	35.5	88	3100	FG152M080K355A
	1800	18	41	82	3200	FG182M080K410A

See "PACKAGING INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

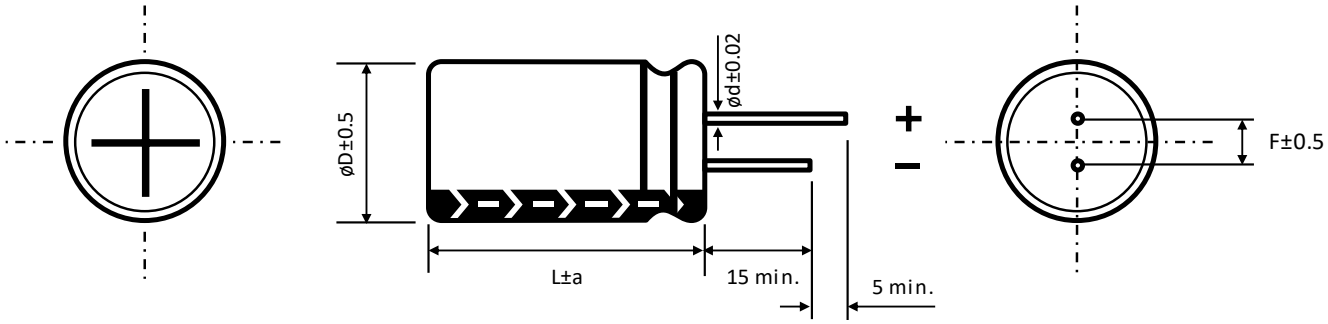
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	Z ▪ Max. Impedance +20°C ▪ 100kHz (mΩ)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
100	1	5	11	7800	60	FG010M100C110A
	2.2	5	11	6950	70	FG2R2M100C110A
	3.3	5	11	6400	90	FG3R3M100C110A
	4.7	5	11	5750	115	FG4R7M100C110A
	5.6	5	11	5000	120	FG5R6M100C110A
	6.8	5	11	4360	135	FG6R8M100C110A
	8.2	5	11	3680	140	FG8R2M100C110A
	10	5	11	2630	170	FG100M100C110A
	12	6.3	11	2470	198	FG120M100E110A
	15	6.3	11	2310	210	FG150M100E110A
	18	6.3	11	2080	230	FG180M100E110A
	22	6.3	11	1850	245	FG220M100E110A
	27	8	11.5	1310	325	FG270M100F115A
	33	8	11.5	1240	365	FG330M100F115A
	39	8	11.5	940	400	FG390M100F115A
	47	8	11.5	850	425	FG470M100F115A
	56	10	12.5	750	465	FG560M100G125A
	68	10	12.5	740	535	FG680M100G125A
	82	10	16	520	670	FG820M100G160A
	100	10	16	450	750	FG101M100G160A
	120	10	20	400	800	FG121M100G200A
	150	10	20	420	900	FG151M100G200A
	180	13	20	290	1050	FG181M100I200A
	220	13	20	270	1200	FG221M100I200A
	270	13	25	250	1300	FG271M100I250A
	330	13	25	230	1600	FG331M100I250A
	390	16	25	180	1780	FG391M100J250A
	470	16	25	150	1900	FG471M100J250A
	560	18	25	140	2000	FG561M100K250A
	680	16	31.5	130	2100	FG681M100J315A
	820	18	31.5	120	2500	FG821M100K315A
	1000	18	35.5	110	2850	FG102M100K355A

See "PACKAGING INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (µF) / Frequency (Hz)	50/60	100/120	1k	10k	100k
$C_R < 10$	0.35	0.42	0.6	0.8	1
$10 \le C_R < 47$	0.45	0.55	0.75	0.9	1
$47 \le C_R < 470$	0.6	0.7	0.85	0.95	1
$470 \le C_R < 2200$	0.65	0.75	0.9	0.98	1
$2200 \le C_R$	0.75	0.8	0.95	1	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FR SERIES ▪ STANDARD 105°C TYPE

KEY FEATURES

HIGH VOLTAGE LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 2 000 hours
- High voltage up to 550V
- Miniaturized for space critical designs
- Ideal for lighting applications from an economic point of view

HF Halogen Free

RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics					
Operating Temperature Range		-40 ~ +105°C			-25 ~ +105°C		
Rated Voltage Range	V_R	160 ~ 500V DC			550V DC		
Surge Voltage	V_S	($V_R \leq 315V$): $V_S = 1.15 \cdot V_R$			($V_R > 315V$): $V_S = 1.10 \cdot V_R$		
Capacitance Range	C_R	1 ~ 560µF			10 ~ 68µF		
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)					
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ $0.03 \cdot C_R \cdot V_R$ + 10µA ▪ after 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]					
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500 ~ 550	
		tanδ (%)	12	15	17	20	
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500	550
		Z-25°C/Z+20°C	2	5	6	7	10
		Z-40°C/Z+20°C	5	6	7	9	-

Lifetime Test		
Endurance 105°C (V_R & I_R applied)	Test	**2 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4	

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	60	FR010M160C110A
	1.2	5	11	64	FR1R2M160C110A
	1.5	5	11	66	FR1R5M160C110A
	1.8	5	11	68	FR1R8M160C110A
	2.2	5	11	70	FR2R2M160C110A
	2.7	5	11	80	FR2R7M160C110A
	3.3	5	11	90	FR3R3M160C110A
	3.9	5	11	100	FR3R9M160C110A
	4.7	6.3	11	115	FR4R7M160E110A
	5.6	6.3	11	125	FR5R6M160E110A
	6.8	6.3	11	130	FR6R8M160E110A
	8.2	6.3	11	140	FR8R2M160E110A
	10	8	9	175	FR100M160F090A
	12	8	9	195	FR120M160F090A
	15	8	11.5	210	FR150M160F115A
	18	8	11.5	255	FR180M160F115A
	22	8	11.5	280	FR220M160F115A
	27	10	12.5	330	FR270M160G125A
	33	10	12.5	370	FR330M160G125A
	39	10	16	450	FR390M160G160A
	47	10	16	480	FR470M160G160A
	56	10	16	530	FR560M160G160A
	68	10	20	560	FR680M160G200A
	82	10	20	650	FR820M160G200A
	100	13	20	830	FR101M160I200A
	120	13	20	880	FR121M160I200A
	150	13	25	1050	FR151M160I250A
	180	16	21	1150	FR181M160J210A
	220	18	21	1250	FR221M160K210A
	270	18	25	1350	FR271M160K250A
	330	18	25	1750	FR331M160K250A
	390	18	31.5	1920	FR391M160K315A
	470	18	35.5	2050	FR471M160K355A
	560	18	41	2200	FR561M160K410A
200	1	5	11	61	FR010M200C110A
	1.2	5	11	66	FR1R2M200C110A
	1.5	5	11	69	FR1R5M200C110A
	1.8	5	11	72	FR1R8M200C110A
	2.2	5	11	75	FR2R2M200C110A
	2.7	5	11	82	FR2R7M200C110A
	3.3	6.3	11	92	FR3R3M200E110A
	3.9	6.3	11	102	FR3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	117	FR4R7M200E110A
	5.6	6.3	11	127	FR5R6M200E110A
	6.8	8	9	140	FR6R8M200F090A
	8.2	8	9	152	FR8R2M200F090A
	10	8	9	180	FR100M200F090A
	12	8	11.5	230	FR120M200F115A
	15	8	11.5	260	FR150M200F115A
	18	10	12.5	290	FR180M200G125A
	22	10	12.5	340	FR220M200G125A
	27	10	16	370	FR270M200G160A
	33	10	16	450	FR330M200G160A
	39	10	20	520	FR390M200G200A
	47	10	20	580	FR470M200G200A
	56	10	20	640	FR560M200G200A
	68	13	20	720	FR680M200I200A
	82	13	20	780	FR820M200I200A
	100	13	20	850	FR101M200I200A
	120	13	25	900	FR121M200I250A
	150	16	21	1100	FR151M200J210A
	180	18	21	1200	FR181M200K210A
	220	18	25	1300	FR221M200K250A
	270	18	31.5	1400	FR271M200K315A
	330	18	35.5	1800	FR331M200K355A
	390	18	41	1950	FR391M200K410A
220	1	5	11	62	FR010M220C110A
	1.2	5	11	68	FR1R2M220C110A
	1.5	5	11	71	FR1R5M220C110A
	1.8	5	11	73	FR1R8M220C110A
	2.2	6.3	11	76	FR2R2M220E110A
	2.7	6.3	11	84	FR2R7M220E110A
	3.3	6.3	11	94	FR3R3M220E110A
	3.9	6.3	11	105	FR3R9M220E110A
	4.7	6.3	11	120	FR4R7M220E110A
	5.6	8	9	130	FR5R6M220F090A
	6.8	8	9	142	FR6R8M220F090A
	8.2	8	11.5	155	FR8R2M220F115A
	10	10	9	185	FR100M220G090A
	12	10	12.5	240	FR120M220G125A
	15	10	12.5	270	FR150M220G125A
	18	10	16	300	FR180M220G160A
	22	10	16	350	FR220M220G160A
	27	10	20	400	FR270M220G200A
	33	10	20	500	FR330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	560	FR390M220I200A
	47	13	20	620	FR470M220I200A
	56	13	20	680	FR560M220I200A
	68	13	25	750	FR680M220I250A
	82	13	25	800	FR820M220I250A
	100	16	21	860	FR101M220J210A
	120	16	25	920	FR121M220J250A
	150	16	25	1120	FR151M220J250A
	180	18	25	1220	FR181M220K250A
	220	18	31.5	1320	FR221M220K315A
	270	18	35.5	1420	FR271M220K355A
	330	18	41	1820	FR331M220K410A
250	1	5	11	63	FR010M250C110A
	1.2	5	11	69	FR1R2M250C110A
	1.5	5	11	72	FR1R5M250C110A
	1.8	5	11	75	FR1R8M250C110A
	2.2	6.3	11	80	FR2R2M250E110A
	2.7	6.3	11	90	FR2R7M250E110A
	3.3	6.3	11	100	FR3R3M250E110A
	3.9	6.3	11	110	FR3R9M250E110A
	4.7	6.3	11	125	FR4R7M250E110A
	5.6	8	9	135	FR5R6M250F090A
	6.8	8	9	150	FR6R8M250F090A
	8.2	8	11.5	170	FR8R2M250F115A
	10	10	9	190	FR100M250G090A
	12	10	12.5	245	FR120M250G125A
	15	10	12.5	275	FR150M250G125A
	18	10	16	320	FR180M250G160A
	22	10	16	370	FR220M250G160A
	27	10	20	420	FR270M250G200A
	33	10	20	520	FR330M250G200A
	39	13	20	570	FR390M250I200A
	47	13	20	640	FR470M250I200A
	56	13	20	700	FR560M250I200A
	68	13	25	770	FR680M250I250A
	82	13	25	830	FR820M250I250A
	100	16	21	900	FR101M250J210A
	120	16	25	1000	FR121M250J250A
	150	16	25	1140	FR151M250J250A
	180	18	25	1240	FR181M250K250A
	220	18	31.5	1340	FR221M250K315A
	270	18	35.5	1440	FR271M250K355A
	330	18	41	1840	FR331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	65	FR010M350E110A
	1.2	6.3	11	71	FR1R2M350E110A
	1.5	6.3	11	76	FR1R5M350E110A
	1.8	6.3	11	80	FR1R8M350E110A
	2.2	6.3	11	85	FR2R2M350E110A
	2.7	6.3	11	93	FR2R7M350E110A
	3.3	8	11.5	102	FR3R3M350F115A
	3.9	8	11.5	120	FR3R9M350F115A
	4.7	8	11.5	130	FR4R7M350F115A
	5.6	8	11.5	140	FR5R6M350F115A
	6.8	8	11.5	160	FR6R8M350F115A
	8.2	10	9	190	FR8R2M350G090A
	10	10	12.5	210	FR100M350G125A
	12	10	16	260	FR120M350G160A
	15	10	16	310	FR150M350G160A
	18	10	16	360	FR180M350G160A
	22	10	20	400	FR220M350G200A
	27	13	20	470	FR270M350I200A
	33	13	20	530	FR330M350I200A
	39	13	20	590	FR390M350I200A
	47	13	20	650	FR470M350I200A
	56	13	25	740	FR560M350I250A
	68	16	21	800	FR680M350J210A
	82	16	25	900	FR820M350J250A
	100	16	25	1000	FR101M350J250A
	120	18	25	1200	FR121M350K250A
	150	18	31.5	1400	FR151M350K315A
	180	18	35.5	1600	FR181M350K355A
	220	18	41	1800	FR221M350K410A
400	1	6.3	11	70	FR010M400E110A
	1.2	6.3	11	75	FR1R2M400E110A
	1.5	6.3	11	80	FR1R5M400E110A
	1.8	6.3	11	85	FR1R8M400E110A
	2.2	6.3	11	90	FR2R2M400E110A
	2.7	6.3	11	100	FR2R7M400E110A
	3.3	6.3	11	110	FR3R3M400E110A
	3.9	8	11.5	125	FR3R9M400F115A
	4.7	8	11.5	140	FR4R7M400F115A
	5.6	8	11.5	150	FR5R6M400F115A
	6.8	8	14	170	FR6R8M400F140A
	8.2	8	14	200	FR8R2M400F140A
	10	8	16	220	FR100M400F160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	280	FR120M400G160A
	15	10	16	330	FR150M400G160A
	18	10	16	380	FR180M400G160A
	22	10	20	420	FR220M400G200A
	27	13	20	490	FR270M400I200A
	33	13	20	550	FR330M400I200A
	39	13	25	620	FR390M400I250A
	47	13	25	700	FR470M400I250A
	56	16	21	760	FR560M400J210A
	68	16	25	820	FR680M400J250A
	82	18	25	920	FR820M400K250A
	100	18	31.5	1050	FR101M400K315A
	120	18	35.5	1350	FR121M400K355A
	150	18	41	1600	FR151M400K410A
450	1	6.3	11	75	FR010M450E110A
	1.2	6.3	11	80	FR1R2M450E110A
	1.5	8	9	85	FR1R5M450F090A
	1.8	8	11.5	90	FR1R8M450F115A
	2.2	8	11.5	95	FR2R2M450F115A
	2.7	8	11.5	110	FR2R7M450F115A
	3.3	8	11.5	120	FR3R3M450F115A
	3.9	8	11.5	130	FR3R9M450F115A
	4.7	8	11.5	145	FR4R7M450F115A
	5.6	8	16	160	FR5R6M450F160A
	6.8	10	12.5	180	FR6R8M450G125A
	8.2	10	14	205	FR8R2M450G140A
	10	10	16	230	FR100M450G160A
	12	10	16	300	FR120M450G160A
	15	10	20	350	FR150M450G200A
	18	12.5	16	400	FR180M450Z160A
	22	13	20	460	FR220M450I200A
	27	13	25	520	FR270M450I250A
	33	13	25	580	FR330M450I250A
	39	16	21	650	FR390M450J210A
	47	16	21	730	FR470M450J210A
	56	16	25	790	FR560M450J250A
	68	18	25	850	FR680M450K250A
	82	18	31.5	950	FR820M450K315A
	100	18	35.5	1100	FR101M450K355A
	120	18	41	1400	FR121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

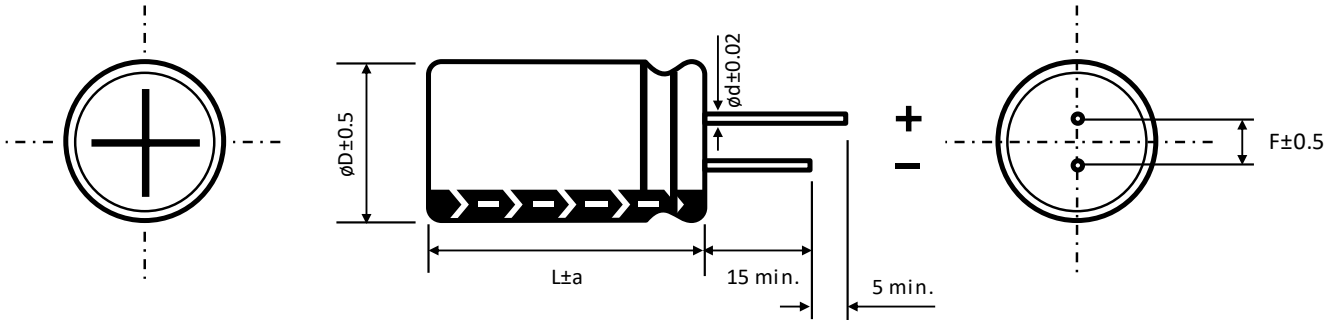
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
500	1	8	11.5	85	FR010M500F115A
	1.2	8	11.5	90	FR1R2M500F115A
	1.5	8	11.5	95	FR1R5M500F115A
	1.8	8	11.5	100	FR1R8M500F115A
	2.2	8	11.5	108	FR2R2M500F115A
	2.7	8	14	116	FR2R7M500F140A
	3.3	8	14	130	FR3R3M500F140A
	3.9	8	16	140	FR3R9M500F160A
	4.7	10	12.5	150	FR4R7M500G125A
	5.6	10	14	165	FR5R6M500G140A
	6.8	10	16	185	FR6R8M500G160A
	8.2	10	16	210	FR8R2M500G160A
	10	13	16	240	FR100M500I160A
	12	13	20	330	FR120M500I200A
	15	13	20	370	FR150M500I200A
	18	13	25	420	FR180M500I250A
	22	16	21	470	FR220M500J210A
	27	16	21	570	FR270M500J210A
	33	16	25	640	FR330M500J250A
	39	18	25	750	FR390M500K250A
	47	18	31.5	800	FR470M500K315A
	56	18	31.5	960	FR560M500K315A
	68	18	35.5	1000	FR680M500K355A
	82	18	41	1200	FR820M500K410A
550	10	13	16	210	FR100M550I160A
	12	13	20	250	FR120M550I200A
	15	13	20	280	FR150M550I200A
	18	13	25	340	FR180M550I250A
	22	16	21	400	FR220M550J210A
	27	16	25	460	FR270M550J250A
	33	18	21	520	FR330M550K210A
	39	18	25	600	FR390M550K250A
	47	18	31.5	720	FR470M550K315A
	56	18	31.5	800	FR560M550K315A
	68	18	35.5	900	FR680M550K355A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 550	0.5	0.8	0.9	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

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Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FS SERIES ▪ STANDARD 105°C TYPE

KEY FEATURES

HIGH VOLTAGE LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 3 000 hours
- High voltage up to 500V
- Miniaturized for space critical designs
- Ideal for lighting applications from an economic point of view

HF Halogen Free RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-40 ~ +105°C				
Rated Voltage Range	V_R	160 ~ 500V DC				
Surge Voltage	V_S	($V_R \le 315V$): $V_S = 1.15 \cdot V_R$ ($V_R > 315V$): $V_S = 1.10 \cdot V_R$				
Capacitance Range	C_R	1 ~ 560µF				
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)				
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 0.03·C_R·V_R + 10µA ▪ after 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]				
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		tanδ (%)	12	15	17	20
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		Z-25°C/Z+20°C	2	5	5	6
		Z-40°C/Z+20°C	5	6	6	7

Lifetime Test		
Endurance 105°C (V_R & I_R applied)	Test	**3 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4	

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 500	0.5	0.8	0.9	1

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	61	FS010M160C110A
	1.2	5	11	64	FS1R2M160C110A
	1.5	5	11	66	FS1R5M160C110A
	1.8	5	11	68	FS1R8M160C110A
	2.2	5	11	72	FS2R2M160C110A
	2.7	5	11	81	FS2R7M160C110A
	3.3	5	11	92	FS3R3M160C110A
	3.9	5	11	102	FS3R9M160C110A
	4.7	6.3	11	116	FS4R7M160E110A
	5.6	6.3	11	126	FS5R6M160E110A
	6.8	6.3	11	132	FS6R8M160E110A
	8.2	6.3	11	142	FS8R2M160E110A
	10	8	9	177	FS100M160F090A
	12	8	9	197	FS120M160F090A
	15	8	11.5	215	FS150M160F115A
	18	8	11.5	260	FS180M160F115A
	22	8	11.5	285	FS220M160F115A
	27	10	12.5	335	FS270M160G125A
	33	10	12.5	375	FS330M160G125A
	39	10	16	455	FS390M160G160A
	47	10	16	485	FS470M160G160A
	56	10	16	535	FS560M160G160A
	68	10	20	570	FS680M160G200A
	82	10	20	660	FS820M160G200A
	100	13	20	840	FS101M160I200A
	120	13	20	890	FS121M160I200A
	150	13	25	1060	FS151M160I250A
	180	16	21	1160	FS181M160J210A
	220	18	21	1260	FS221M160K210A
	270	18	25	1360	FS271M160K250A
	330	18	25	1780	FS331M160K250A
	390	18	31.5	1940	FS391M160K315A
	470	18	35.5	2070	FS471M160K355A
	560	18	41	2220	FS561M160K410A
200	1	5	11	62	FS010M200C110A
	1.2	5	11	67	FS1R2M200C110A
	1.5	5	11	69	FS1R5M200C110A
	1.8	5	11	72	FS1R8M200C110A
	2.2	5	11	76	FS2R2M200C110A
	2.7	5	11	83	FS2R7M200C110A
	3.3	6.3	11	94	FS3R3M200E110A
	3.9	6.3	11	104	FS3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	118	FS4R7M200E110A
	5.6	6.3	11	128	FS5R6M200E110A
	6.8	8	9	142	FS6R8M200F090A
	8.2	8	9	154	FS8R2M200F090A
	10	8	9	185	FS100M200F090A
	12	8	11.5	235	FS120M200F115A
	15	8	11.5	265	FS150M200F115A
	18	10	12.5	295	FS180M200G125A
	22	10	12.5	345	FS220M200G125A
	27	10	16	380	FS270M200G160A
	33	10	16	460	FS330M200G160A
	39	10	20	530	FS390M200G200A
	47	10	20	590	FS470M200G200A
	56	10	20	650	FS560M200G200A
	68	13	20	730	FS680M200I200A
	82	13	20	785	FS820M200I200A
	100	13	20	860	FS101M200I200A
	120	13	25	910	FS121M200I250A
	150	16	21	1110	FS151M200J210A
	180	18	21	1210	FS181M200K210A
	220	18	25	1310	FS221M200K250A
	270	18	31.5	1410	FS271M200K315A
	330	18	35.5	1820	FS331M200K355A
	390	18	41	1970	FS391M200K410A
220	1	5	11	63	FS010M220C110A
	1.2	5	11	68	FS1R2M220C110A
	1.5	5	11	71	FS1R5M220C110A
	1.8	5	11	73	FS1R8M220C110A
	2.2	6.3	11	77	FS2R2M220E110A
	2.7	6.3	11	85	FS2R7M220E110A
	3.3	6.3	11	96	FS3R3M220E110A
	3.9	6.3	11	107	FS3R9M220E110A
	4.7	6.3	11	122	FS4R7M220E110A
	5.6	8	9	132	FS5R6M220F090A
	6.8	8	9	144	FS6R8M220F090A
	8.2	8	11.5	160	FS8R2M220F115A
	10	10	9	190	FS100M220G090A
	12	10	12.5	245	FS120M220G125A
	15	10	12.5	275	FS150M220G125A
	18	10	16	305	FS180M220G160A
	22	10	16	355	FS220M220G160A
	27	10	20	410	FS270M220G200A
	33	10	20	510	FS330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	570	FS390M220I200A
	47	13	20	630	FS470M220I200A
	56	13	20	690	FS560M220I200A
	68	13	25	760	FS680M220I250A
	82	13	25	810	FS820M220I250A
	100	16	21	870	FS101M220J210A
	120	16	25	930	FS121M220J250A
	150	16	25	1130	FS151M220J250A
	180	18	25	1230	FS181M220K250A
	220	18	31.5	1330	FS221M220K315A
	270	18	35.5	1430	FS271M220K355A
	330	18	41	1850	FS331M220K410A
250	1	5	11	64	FS010M250C110A
	1.2	5	11	69	FS1R2M250C110A
	1.5	5	11	72	FS1R5M250C110A
	1.8	5	11	75	FS1R8M250C110A
	2.2	6.3	11	81	FS2R2M250E110A
	2.7	6.3	11	91	FS2R7M250E110A
	3.3	6.3	11	101	FS3R3M250E110A
	3.9	6.3	11	111	FS3R9M250E110A
	4.7	6.3	11	127	FS4R7M250E110A
	5.6	8	9	137	FS5R6M250F090A
	6.8	8	9	152	FS6R8M250F090A
	8.2	8	11.5	172	FS8R2M250F115A
	10	10	9	194	FS100M250G090A
	12	10	12.5	250	FS120M250G125A
	15	10	12.5	280	FS150M250G125A
	18	10	16	325	FS180M250G160A
	22	10	16	380	FS220M250G160A
	27	10	20	430	FS270M250G200A
	33	10	20	530	FS330M250G200A
	39	13	20	580	FS390M250I200A
	47	13	20	650	FS470M250I200A
	56	13	20	710	FS560M250I200A
	68	13	25	780	FS680M250I250A
	82	13	25	840	FS820M250I250A
	100	16	21	910	FS101M250J210A
	120	16	25	1020	FS121M250J250A
	150	16	25	1160	FS151M250J250A
	180	18	25	1250	FS181M250K250A
	220	18	31.5	1360	FS221M250K315A
	270	18	35.5	1460	FS271M250K355A
	330	18	41	1860	FS331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	66	FS010M350E110A
	1.2	6.3	11	72	FS1R2M350E110A
	1.5	6.3	11	76	FS1R5M350E110A
	1.8	6.3	11	81	FS1R8M350E110A
	2.2	6.3	11	86	FS2R2M350E110A
	2.7	6.3	11	94	FS2R7M350E110A
	3.3	8	11.5	104	FS3R3M350F115A
	3.9	8	11.5	121	FS3R9M350F115A
	4.7	8	11.5	132	FS4R7M350F115A
	5.6	8	11.5	142	FS5R6M350F115A
	6.8	8	11.5	162	FS6R8M350F115A
	8.2	10	9	192	FS8R2M350G090A
	10	10	12.5	220	FS100M350G125A
	12	10	16	270	FS120M350G160A
	15	10	16	320	FS150M350G160A
	18	10	16	365	FS180M350G160A
	22	10	20	410	FS220M350G200A
	27	13	20	480	FS270M350I200A
	33	13	20	540	FS330M350I200A
	39	13	20	600	FS390M350I200A
	47	13	20	660	FS470M350I200A
	56	13	25	750	FS560M350I250A
	68	16	21	810	FS680M350J210A
	82	16	25	910	FS820M350J250A
	100	16	25	1020	FS101M350J250A
	120	18	25	1220	FS121M350K250A
	150	18	31.5	1420	FS151M350K315A
	180	18	35.5	1620	FS181M350K355A
	220	18	41	1820	FS221M350K410A
400	1	6.3	11	71	FS010M400E110A
	1.2	6.3	11	76	FS1R2M400E110A
	1.5	6.3	11	81	FS1R5M400E110A
	1.8	6.3	11	86	FS1R8M400E110A
	2.2	6.3	11	91	FS2R2M400E110A
	2.7	6.3	11	102	FS2R7M400E110A
	3.3	6.3	11	112	FS3R3M400E110A
	3.9	8	11.5	126	FS3R9M400F115A
	4.7	8	11.5	142	FS4R7M400F115A
	5.6	8	11.5	152	FS5R6M400F115A
	6.8	8	14	172	FS6R8M400F140A
	8.2	8	14	202	FS8R2M400F140A
	10	8	16	230	FS100M400F160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	290	FS120M400G160A
	15	10	16	340	FS150M400G160A
	18	10	16	385	FS180M400G160A
	22	10	20	430	FS220M400G200A
	27	13	20	500	FS270M400I200A
	33	13	20	560	FS330M400I200A
	39	13	25	630	FS390M400I250A
	47	13	25	710	FS470M400I250A
	56	16	21	770	FS560M400J210A
	68	16	25	830	FS680M400J250A
	82	18	25	930	FS820M400K250A
	100	18	31.5	1100	FS101M400K315A
	120	18	35.5	1400	FS121M400K355A
	150	18	41	1620	FS151M400K410A
450	1	6.3	11	76	FS010M450E110A
	1.2	6.3	11	81	FS1R2M450E110A
	1.5	8	9	86	FS1R5M450F090A
	1.8	8	11.5	91	FS1R8M450F115A
	2.2	8	11.5	96	FS2R2M450F115A
	2.7	8	11.5	111	FS2R7M450F115A
	3.3	8	11.5	121	FS3R3M450F115A
	3.9	8	11.5	132	FS3R9M450F115A
	4.7	8	11.5	147	FS4R7M450F115A
	5.6	8	16	162	FS5R6M450F160A
	6.8	10	12.5	182	FS6R8M450G125A
	8.2	10	14	210	FS8R2M450G140A
	10	10	16	240	FS100M450G160A
	12	10	16	310	FS120M450G160A
	15	10	20	360	FS150M450G200A
	18	12.5	16	410	FS180M450Z160A
	22	13	20	470	FS220M450I200A
	27	13	25	530	FS270M450I250A
	33	13	25	590	FS330M450I250A
	39	16	21	660	FS390M450J210A
	47	16	21	740	FS470M450J210A
	56	16	25	800	FS560M450J250A
	68	18	25	860	FS680M450K250A
	82	18	31.5	960	FS820M450K315A
	100	18	35.5	1150	FS101M450K355A
	120	18	41	1450	FS121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

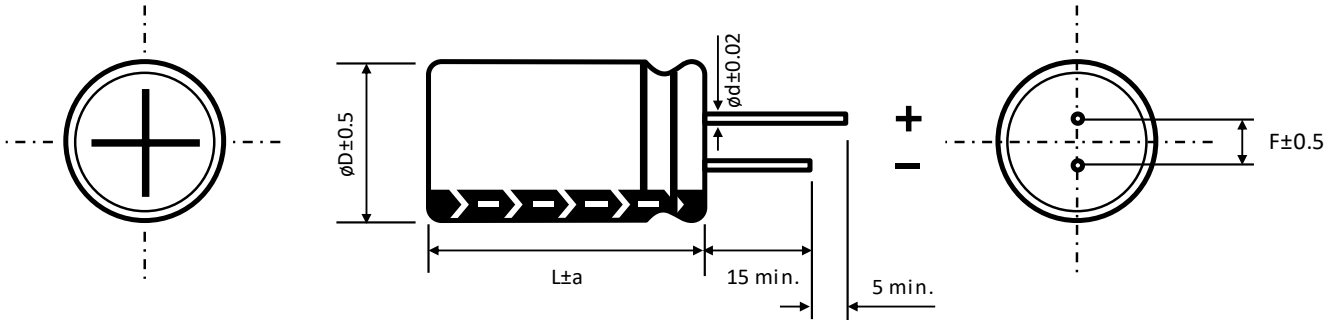
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
500	1	8	11.5	85	FS010M500F115A
	1.2	8	11.5	91	FS1R2M500F115A
	1.5	8	11.5	96	FS1R5M500F115A
	1.8	8	11.5	102	FS1R8M500F115A
	2.2	8	11.5	110	FS2R2M500F115A
	2.7	8	14	118	FS2R7M500F140A
	3.3	8	14	132	FS3R3M500F140A
	3.9	8	16	142	FS3R9M500F160A
	4.7	10	12.5	152	FS4R7M500G125A
	5.6	10	14	165	FS5R6M500G140A
	6.8	10	16	185	FS6R8M500G160A
	8.2	10	16	215	FS8R2M500G160A
	10	13	16	250	FS100M500I160A
	12	13	20	340	FS120M500I200A
	15	13	20	380	FS150M500I200A
	18	13	25	430	FS180M500I250A
	22	16	21	480	FS220M500J210A
	27	16	21	580	FS270M500J210A
	33	16	25	650	FS330M500J250A
	39	18	25	760	FS390M500K250A
	47	18	31.5	850	FS470M500K315A
	56	18	31.5	970	FS560M500K315A
	68	18	35.5	1050	FS680M500K355A
	82	18	41	1250	FS820M500K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 500	0.5	0.8	0.9	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

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Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FT SERIES ▪ LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE · HIGH VOLTAGE · LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 6 000 hours
- High voltage up to 500V
- Miniaturized for space critical designs
- Ideal for lighting applications with longer life expectancies

HF Halogen Free · RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-40 ~ +105°C				
Rated Voltage Range	V_R	160 ~ 500V DC				
Surge Voltage	V_S	($V_R \le 315V$): $V_S = 1.15 \cdot V_R$ ($V_R > 315V$): $V_S = 1.10 \cdot V_R$				
Capacitance Range	C_R	1 ~ 560µF				
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)				
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 0.03·C_R·V_R + 10µA ▪ after 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]				
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		tanδ (%)	12	15	17	20
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		Z-25°C/Z+20°C	3	5	5	6
		Z-40°C/Z+20°C	6	6	6	10

Lifetime Test		
Endurance 105°C (V_R & I_R applied)	Test	**6 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4	

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 500	0.5	0.8	0.9	1

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	62	FT010M160C110A
	1.2	5	11	65	FT1R2M160C110A
	1.5	5	11	67	FT1R5M160C110A
	1.8	5	11	69	FT1R8M160C110A
	2.2	5	11	74	FT2R2M160C110A
	2.7	5	11	82	FT2R7M160C110A
	3.3	5	11	94	FT3R3M160C110A
	3.9	5	11	104	FT3R9M160C110A
	4.7	6.3	11	117	FT4R7M160E110A
	5.6	6.3	11	127	FT5R6M160E110A
	6.8	6.3	11	134	FT6R8M160E110A
	8.2	6.3	11	144	FT8R2M160E110A
	10	8	9	179	FT100M160F090A
	12	8	9	199	FT120M160F090A
	15	8	11.5	220	FT150M160F115A
	18	8	11.5	265	FT180M160F115A
	22	8	11.5	290	FT220M160F115A
	27	10	12.5	340	FT270M160G125A
	33	10	12.5	380	FT330M160G125A
	39	10	16	460	FT390M160G160A
	47	10	16	490	FT470M160G160A
	56	10	16	540	FT560M160G160A
	68	10	20	580	FT680M160G200A
	82	10	20	670	FT820M160G200A
	100	13	20	850	FT101M160I200A
	120	13	20	900	FT121M160I200A
	150	13	25	1070	FT151M160I250A
	180	16	21	1170	FT181M160J210A
	220	18	21	1270	FT221M160K210A
	270	18	25	1370	FT271M160K250A
	330	18	25	1800	FT331M160K250A
	390	18	31.5	1960	FT391M160K315A
	470	18	35.5	2100	FT471M160K355A
	560	18	41	2240	FT561M160K410A
200	1	5	11	63	FT010M200C110A
	1.2	5	11	67	FT1R2M200C110A
	1.5	5	11	70	FT1R5M200C110A
	1.8	5	11	73	FT1R8M200C110A
	2.2	5	11	77	FT2R2M200C110A
	2.7	5	11	84	FT2R7M200C110A
	3.3	6.3	11	96	FT3R3M200E110A
	3.9	6.3	11	106	FT3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	119	FT4R7M200E110A
	5.6	6.3	11	129	FT5R6M200E110A
	6.8	8	9	144	FT6R8M200F090A
	8.2	8	9	156	FT8R2M200F090A
	10	8	9	190	FT100M200F090A
	12	8	11.5	240	FT120M200F115A
	15	8	11.5	270	FT150M200F115A
	18	10	12.5	300	FT180M200G125A
	22	10	12.5	350	FT220M200G125A
	27	10	16	390	FT270M200G160A
	33	10	16	470	FT330M200G160A
	39	10	20	540	FT390M200G200A
	47	10	20	600	FT470M200G200A
	56	10	20	660	FT560M200G200A
	68	13	20	740	FT680M200I200A
	82	13	20	790	FT820M200I200A
	100	13	20	870	FT101M200I200A
	120	13	25	920	FT121M200I250A
	150	16	21	1120	FT151M200J210A
	180	18	21	1220	FT181M200K210A
	220	18	25	1320	FT221M200K250A
	270	18	31.5	1420	FT271M200K315A
	330	18	35.5	1850	FT331M200K355A
	390	18	41	1990	FT391M200K410A
220	1	5	11	64	FT010M220C110A
	1.2	5	11	69	FT1R2M220C110A
	1.5	5	11	72	FT1R5M220C110A
	1.8	5	11	74	FT1R8M220C110A
	2.2	6.3	11	78	FT2R2M220E110A
	2.7	6.3	11	86	FT2R7M220E110A
	3.3	6.3	11	98	FT3R3M220E110A
	3.9	6.3	11	109	FT3R9M220E110A
	4.7	6.3	11	124	FT4R7M220E110A
	5.6	8	9	134	FT5R6M220F090A
	6.8	8	9	146	FT6R8M220F090A
	8.2	8	11.5	165	FT8R2M220F115A
	10	10	9	195	FT100M220G090A
	12	10	12.5	250	FT120M220G125A
	15	10	12.5	280	FT150M220G125A
	18	10	16	310	FT180M220G160A
	22	10	16	360	FT220M220G160A
	27	10	20	420	FT270M220G200A
	33	10	20	520	FT330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	580	FT390M220I200A
	47	13	20	640	FT470M220I200A
	56	13	20	700	FT560M220I200A
	68	13	25	770	FT680M220I250A
	82	13	25	820	FT820M220I250A
	100	16	21	880	FT101M220J210A
	120	16	25	940	FT121M220J250A
	150	16	25	1140	FT151M220J250A
	180	18	25	1240	FT181M220K250A
	220	18	31.5	1340	FT221M220K315A
	270	18	35.5	1440	FT271M220K355A
	330	18	41	1870	FT331M220K410A
250	1	5	11	65	FT010M250C110A
	1.2	5	11	70	FT1R2M250C110A
	1.5	5	11	73	FT1R5M250C110A
	1.8	5	11	76	FT1R8M250C110A
	2.2	6.3	11	82	FT2R2M250E110A
	2.7	6.3	11	92	FT2R7M250E110A
	3.3	6.3	11	102	FT3R3M250E110A
	3.9	6.3	11	112	FT3R9M250E110A
	4.7	6.3	11	129	FT4R7M250E110A
	5.6	8	9	139	FT5R6M250F090A
	6.8	8	9	154	FT6R8M250F090A
	8.2	8	11.5	174	FT8R2M250F115A
	10	10	9	198	FT100M250G090A
	12	10	12.5	255	FT120M250G125A
	15	10	12.5	285	FT150M250G125A
	18	10	16	330	FT180M250G160A
	22	10	16	390	FT220M250G160A
	27	10	20	440	FT270M250G200A
	33	10	20	540	FT330M250G200A
	39	13	20	590	FT390M250I200A
	47	13	20	660	FT470M250I200A
	56	13	20	720	FT560M250I200A
	68	13	25	790	FT680M250I250A
	82	13	25	850	FT820M250I250A
	100	16	21	920	FT101M250J210A
	120	16	25	1040	FT121M250J250A
	150	16	25	1180	FT151M250J250A
	180	18	25	1260	FT181M250K250A
	220	18	31.5	1380	FT221M250K315A
	270	18	35.5	1480	FT271M250K355A
	330	18	41	1880	FT331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	67	FT010M350E110A
	1.2	6.3	11	73	FT1R2M350E110A
	1.5	6.3	11	77	FT1R5M350E110A
	1.8	6.3	11	82	FT1R8M350E110A
	2.2	6.3	11	87	FT2R2M350E110A
	2.7	6.3	11	95	FT2R7M350E110A
	3.3	8	11.5	106	FT3R3M350F115A
	3.9	8	11.5	122	FT3R9M350F115A
	4.7	8	11.5	134	FT4R7M350F115A
	5.6	8	11.5	144	FT5R6M350F115A
	6.8	8	11.5	164	FT6R8M350F115A
	8.2	10	9	194	FT8R2M350G090A
	10	10	12.5	230	FT100M350G125A
	12	10	16	280	FT120M350G160A
	15	10	16	330	FT150M350G160A
	18	10	16	370	FT180M350G160A
	22	10	20	420	FT220M350G200A
	27	13	20	490	FT270M350I200A
	33	13	20	550	FT330M350I200A
	39	13	20	610	FT390M350I200A
	47	13	20	670	FT470M350I200A
	56	13	25	760	FT560M350I250A
	68	16	21	820	FT680M350J210A
	82	16	25	920	FT820M350J250A
	100	16	25	1040	FT101M350J250A
	120	18	25	1240	FT121M350K250A
	150	18	31.5	1440	FT151M350K315A
	180	18	35.5	1640	FT181M350K355A
	220	18	41	1840	FT221M350K410A
400	1	6.3	11	72	FT010M400E110A
	1.2	6.3	11	77	FT1R2M400E110A
	1.5	6.3	11	82	FT1R5M400E110A
	1.8	6.3	11	87	FT1R8M400E110A
	2.2	6.3	11	92	FT2R2M400E110A
	2.7	6.3	11	104	FT2R7M400E110A
	3.3	6.3	11	114	FT3R3M400E110A
	3.9	8	11.5	127	FT3R9M400F115A
	4.7	8	11.5	144	FT4R7M400F115A
	5.6	8	11.5	154	FT5R6M400F115A
	6.8	8	14	174	FT6R8M400F140A
	8.2	8	14	204	FT8R2M400F140A
	10	8	16	240	FT100M400F160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	300	FT120M400G160A
	15	10	16	350	FT150M400G160A
	18	10	16	390	FT180M400G160A
	22	10	20	440	FT220M400G200A
	27	13	20	510	FT270M400I200A
	33	13	20	570	FT330M400I200A
	39	13	25	640	FT390M400I250A
	47	13	25	720	FT470M400I250A
	56	16	21	780	FT560M400J210A
	68	16	25	840	FT680M400J250A
	82	18	25	940	FT820M400K250A
	100	18	31.5	1150	FT101M400K315A
	120	18	35.5	1450	FT121M400K355A
	150	18	41	1640	FT151M400K410A
450	1	6.3	11	77	FT010M450E110A
	1.2	6.3	11	82	FT1R2M450E110A
	1.5	8	9	87	FT1R5M450F090A
	1.8	8	11.5	92	FT1R8M450F115A
	2.2	8	11.5	97	FT2R2M450F115A
	2.7	8	11.5	112	FT2R7M450F115A
	3.3	8	11.5	122	FT3R3M450F115A
	3.9	8	11.5	134	FT3R9M450F115A
	4.7	8	14	149	FT4R7M450F140A
	5.6	8	16	164	FT5R6M450F160A
	6.8	10	12.5	184	FT6R8M450G125A
	8.2	10	14	215	FT8R2M450G140A
	10	10	16	250	FT100M450G160A
	12	10	16	320	FT120M450G160A
	15	10	20	370	FT150M450G200A
	18	12.5	16	420	FT180M450Z160A
	22	13	20	480	FT220M450I200A
	27	13	25	540	FT270M450I250A
	33	13	25	600	FT330M450I250A
	39	16	21	670	FT390M450J210A
	47	16	21	750	FT470M450J210A
	56	16	25	810	FT560M450J250A
	68	18	25	870	FT680M450K250A
	82	18	31.5	970	FT820M450K315A
	100	18	35.5	1200	FT101M450K355A
	120	18	41	1500	FT121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

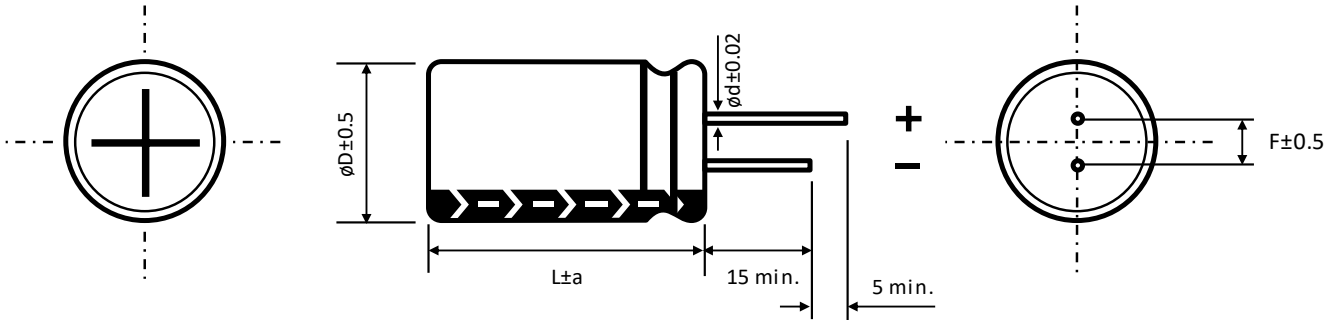
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
500	1	8	11.5	87	FT010M500F115A
	1.2	8	11.5	92	FT1R2M500F115A
	1.5	8	11.5	97	FT1R5M500F115A
	1.8	8	11.5	104	FT1R8M500F115A
	2.2	8	11.5	112	FT2R2M500F115A
	2.7	8	14	120	FT2R7M500F140A
	3.3	8	14	134	FT3R3M500F140A
	3.9	8	16	144	FT3R9M500F160A
	4.7	10	12.5	154	FT4R7M500G125A
	5.6	10	14	170	FT5R6M500G140A
	6.8	10	16	190	FT6R8M500G160A
	8.2	10	16	220	FT8R2M500G160A
	10	13	16	260	FT100M500I160A
	12	13	20	350	FT120M500I200A
	15	13	20	390	FT150M500I200A
	18	13	25	440	FT180M500I250A
	22	16	21	490	FT220M500J210A
	27	16	21	590	FT270M500J210A
	33	16	25	660	FT330M500J250A
	39	18	25	770	FT390M500K250A
	47	18	31.5	900	FT470M500K315A
	56	18	31.5	980	FT560M500K315A
	68	18	35.5	1100	FT680M500K355A
	82	18	41	1300	FT820M500K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 500	0.5	0.8	0.9	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FU SERIES ▪ ULTRA LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE · HIGH VOLTAGE · LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 10 000 hours
- High voltage up to 500V
- Miniaturized for space critical designs
- Ideal for lighting applications with ultra-long life expectancies

HF Halogen Free · RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-40 ~ +105°C				
Rated Voltage Range	V_R	160 ~ 500V DC				
Surge Voltage	V_S	($V_R \le 315V$): $V_S = 1.15 \cdot V_R$ ($V_R > 315V$): $V_S = 1.10 \cdot V_R$				
Capacitance Range	C_R	1 ~ 560µF				
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)				
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 0.03·C_R·V_R + 10µA ▪ after 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]				
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		tanδ (%)	12	15	17	20
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450	500
		Z-25°C/Z+20°C	3	5	5	6
		Z-40°C/Z+20°C	6	6	6	10

Lifetime Test		
Endurance 105°C (V_R & I_R applied)	Test	**10 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**
	△C/C_R	≤ ±20% of initial measured value
	tanδ	≤ 200% of initial specified value
	I_{Leak}	≤ the initial specified value
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4	

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	63	FU010M160C110A
	1.2	5	11	65	FU1R2M160C110A
	1.5	5	11	67	FU1R5M160C110A
	1.8	5	11	69	FU1R8M160C110A
	2.2	5	11	76	FU2R2M160C110A
	2.7	5	11	83	FU2R7M160C110A
	3.3	5	11	96	FU3R3M160C110A
	3.9	5	11	106	FU3R9M160C110A
	4.7	6.3	11	118	FU4R7M160E110A
	5.6	6.3	11	128	FU5R6M160E110A
	6.8	6.3	11	136	FU6R8M160E110A
	8.2	6.3	11	146	FU8R2M160E110A
	10	8	9	181	FU100M160F090A
	12	8	9	201	FU120M160F090A
	15	8	11.5	225	FU150M160F115A
	18	8	11.5	270	FU180M160F115A
	22	8	11.5	295	FU220M160F115A
	27	10	12.5	345	FU270M160G125A
	33	10	12.5	385	FU330M160G125A
	39	10	16	465	FU390M160G160A
	47	10	16	495	FU470M160G160A
	56	10	16	545	FU560M160G160A
	68	10	20	590	FU680M160G200A
	82	10	20	680	FU820M160G200A
	100	13	20	860	FU101M160I200A
	120	13	20	910	FU121M160I200A
	150	13	25	1080	FU151M160I250A
	180	16	21	1180	FU181M160J210A
	220	18	21	1280	FU221M160K210A
	270	18	25	1380	FU271M160K250A
	330	18	25	1850	FU331M160K250A
	390	18	31.5	1980	FU391M160K315A
	470	18	35.5	2120	FU471M160K355A
	560	18	41	2260	FU561M160K410A
200	1	5	11	64	FU010M200C110A
	1.2	5	11	68	FU1R2M200C110A
	1.5	5	11	70	FU1R5M200C110A
	1.8	5	11	73	FU1R8M200C110A
	2.2	5	11	78	FU2R2M200C110A
	2.7	5	11	85	FU2R7M200C110A
	3.3	6.3	11	98	FU3R3M200E110A
	3.9	6.3	11	108	FU3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	120	FU4R7M200E110A
	5.6	6.3	11	130	FU5R6M200E110A
	6.8	8	9	146	FU6R8M200F090A
	8.2	8	9	158	FU8R2M200F090A
	10	8	9	195	FU100M200F090A
	12	8	11.5	245	FU120M200F115A
	15	8	11.5	275	FU150M200F115A
	18	10	12.5	305	FU180M200G125A
	22	10	12.5	355	FU220M200G125A
	27	10	16	400	FU270M200G160A
	33	10	16	480	FU330M200G160A
	39	10	20	550	FU390M200G200A
	47	10	20	610	FU470M200G200A
	56	10	20	670	FU560M200G200A
	68	13	20	750	FU680M200I200A
	82	13	20	795	FU820M200I200A
	100	13	20	880	FU101M200I200A
	120	13	25	930	FU121M200I250A
	150	16	21	1130	FU151M200J210A
	180	18	21	1230	FU181M200K210A
	220	18	25	1330	FU221M200K250A
	270	18	31.5	1430	FU271M200K315A
	330	18	35.5	1870	FU331M200K355A
	390	18	41	2110	FU391M200K410A
220	1	5	11	65	FU010M220C110A
	1.2	5	11	69	FU1R2M220C110A
	1.5	5	11	72	FU1R5M220C110A
	1.8	5	11	74	FU1R8M220C110A
	2.2	6.3	11	79	FU2R2M220E110A
	2.7	6.3	11	87	FU2R7M220E110A
	3.3	6.3	11	100	FU3R3M220E110A
	3.9	6.3	11	111	FU3R9M220E110A
	4.7	6.3	11	126	FU4R7M220E110A
	5.6	8	9	136	FU5R6M220F090A
	6.8	8	9	148	FU6R8M220F090A
	8.2	8	11.5	165	FU8R2M220F115A
	10	10	9	200	FU100M220G090A
	12	10	12.5	255	FU120M220G125A
	15	10	12.5	285	FU150M220G125A
	18	10	16	315	FU180M220G160A
	22	10	16	365	FU220M220G160A
	27	10	20	430	FU270M220G200A
	33	10	20	530	FU330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	590	FU390M220I200A
	47	13	20	650	FU470M220I200A
	56	13	20	710	FU560M220I200A
	68	13	25	780	FU680M220I250A
	82	13	25	830	FU820M220I250A
	100	16	21	890	FU101M220J210A
	120	16	25	950	FU121M220J250A
	150	16	25	1150	FU151M220J250A
	180	18	25	1250	FU181M220K250A
	220	18	31.5	1350	FU221M220K315A
	270	18	35.5	1450	FU271M220K355A
	330	18	41	1890	FU331M220K410A
250	1	5	11	66	FU010M250C110A
	1.2	5	11	70	FU1R2M250C110A
	1.5	5	11	73	FU1R5M250C110A
	1.8	5	11	76	FU1R8M250C110A
	2.2	6.3	11	83	FU2R2M250E110A
	2.7	6.3	11	93	FU2R7M250E110A
	3.3	6.3	11	103	FU3R3M250E110A
	3.9	6.3	11	113	FU3R9M250E110A
	4.7	6.3	11	131	FU4R7M250E110A
	5.6	8	9	141	FU5R6M250F090A
	6.8	8	9	156	FU6R8M250F090A
	8.2	8	11.5	176	FU8R2M250F115A
	10	10	9	202	FU100M250G090A
	12	10	12.5	260	FU120M250G125A
	15	10	12.5	290	FU150M250G125A
	18	10	16	335	FU180M250G160A
	22	10	16	395	FU220M250G160A
	27	10	20	450	FU270M250G200A
	33	10	20	550	FU330M250G200A
	39	13	20	600	FU390M250I200A
	47	13	20	670	FU470M250I200A
	56	13	20	730	FU560M250I200A
	68	13	25	800	FU680M250I250A
	82	13	25	860	FU820M250I250A
	100	16	21	930	FU101M250J210A
	120	16	25	1060	FU121M250J250A
	150	16	25	1200	FU151M250J250A
	180	18	25	1270	FU181M250K250A
	220	18	31.5	1400	FU221M250K315A
	270	18	35.5	1500	FU271M250K355A
	330	18	41	1900	FU331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	68	FU010M350E110A
	1.2	6.3	11	74	FU1R2M350E110A
	1.5	6.3	11	78	FU1R5M350E110A
	1.8	6.3	11	83	FU1R8M350E110A
	2.2	6.3	11	88	FU2R2M350E110A
	2.7	6.3	11	96	FU2R7M350E110A
	3.3	8	11.5	108	FU3R3M350F115A
	3.9	8	11.5	123	FU3R9M350F115A
	4.7	8	11.5	136	FU4R7M350F115A
	5.6	8	11.5	146	FU5R6M350F115A
	6.8	8	11.5	166	FU6R8M350F115A
	8.2	10	9	196	FU8R2M350G090A
	10	10	12.5	240	FU100M350G125A
	12	10	16	290	FU120M350G160A
	15	10	16	340	FU150M350G160A
	18	10	16	375	FU180M350G160A
	22	10	20	430	FU220M350G200A
	27	13	20	500	FU270M350I200A
	33	13	20	560	FU330M350I200A
	39	13	20	620	FU390M350I200A
	47	13	20	680	FU470M350I200A
	56	13	25	770	FU560M350I250A
	68	16	21	830	FU680M350J210A
	82	16	25	930	FU820M350J250A
	100	16	25	1060	FU101M350J250A
	120	18	25	1260	FU121M350K250A
	150	18	31.5	1460	FU151M350K315A
	180	18	35.5	1660	FU181M350K355A
	220	18	41	1860	FU221M350K410A
400	1	6.3	11	73	FU010M400E110A
	1.2	6.3	11	78	FU1R2M400E110A
	1.5	6.3	11	83	FU1R5M400E110A
	1.8	6.3	11	88	FU1R8M400E110A
	2.2	6.3	11	93	FU2R2M400E110A
	2.7	8	11.5	106	FU2R7M400F115A
	3.3	8	11.5	116	FU3R3M400F115A
	3.9	8	11.5	128	FU3R9M400F115A
	4.7	8	11.5	146	FU4R7M400F115A
	5.6	8	14	156	FU5R6M400F140A
	6.8	8	14	176	FU6R8M400F140A
	8.2	8	14	206	FU8R2M400F140A
	10	8	16	250	FU100M400F160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	310	FU120M400G160A
	15	10	16	360	FU150M400G160A
	18	10	16	395	FU180M400G160A
	22	10	20	450	FU220M400G200A
	27	13	20	520	FU270M400I200A
	33	13	20	580	FU330M400I200A
	39	13	25	650	FU390M400I250A
	47	13	25	730	FU470M400I250A
	56	16	21	790	FU560M400J210A
	68	16	25	850	FU680M400J250A
	82	18	25	950	FU820M400K250A
	100	18	31.5	1200	FU101M400K315A
	120	18	35.5	1500	FU121M400K355A
	150	18	41	1660	FU151M400K410A
450	1	6.3	11	78	FU010M450E110A
	1.2	6.3	11	83	FU1R2M450E110A
	1.5	8	9	88	FU1R5M450F090A
	1.8	8	11.5	93	FU1R8M450F115A
	2.2	8	11.5	98	FU2R2M450F115A
	2.7	8	11.5	113	FU2R7M450F115A
	3.3	8	11.5	123	FU3R3M450F115A
	3.9	8	11.5	136	FU3R9M450F115A
	4.7	8	14	151	FU4R7M450F140A
	5.6	8	16	166	FU5R6M450F160A
	6.8	10	12.5	186	FU6R8M450G125A
	8.2	10	14	220	FU8R2M450G140A
	10	10	16	260	FU100M450G160A
	12	10	16	330	FU120M450G160A
	15	10	20	380	FU150M450G200A
	18	12.5	16	430	FU180M450Z160A
	22	13	20	490	FU220M450I200A
	27	13	25	550	FU270M450I250A
	33	13	25	610	FU330M450I250A
	39	16	21	680	FU390M450J210A
	47	16	21	760	FU470M450J210A
	56	16	25	820	FU560M450J250A
	68	18	25	880	FU680M450K250A
	82	18	31.5	980	FU820M450K315A
	100	18	35.5	1250	FU101M450K355A
	120	18	41	1550	FU121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
500	1	8	11.5	88	FU010M500F115A
	1.2	8	11.5	93	FU1R2M500F115A
	1.5	8	11.5	98	FU1R5M500F115A
	1.8	8	11.5	106	FU1R8M500F115A
	2.2	8	11.5	114	FU2R2M500F115A
	2.7	8	14	122	FU2R7M500F140A
	3.3	8	14	136	FU3R3M500F140A
	3.9	8	16	146	FU3R9M500F160A
	4.7	10	12.5	156	FU4R7M500G125A
	5.6	10	14	170	FU5R6M500G140A
	6.8	10	16	190	FU6R8M500G160A
	8.2	10	16	225	FU8R2M500G160A
	10	13	16	270	FU100M500I160A
	12	13	20	360	FU120M500I200A
	15	13	20	400	FU150M500I200A
	18	13	25	450	FU180M500I250A
	22	16	21	500	FU220M500J210A
	27	16	21	600	FU270M500J210A
	33	16	25	670	FU330M500J250A
	39	18	25	780	FU390M500K250A
	47	18	31.5	950	FU470M500K315A
	56	18	31.5	990	FU560M500K315A
	68	18	35.5	1150	FU680M500K355A
	82	18	41	1350	FU820M500K410A

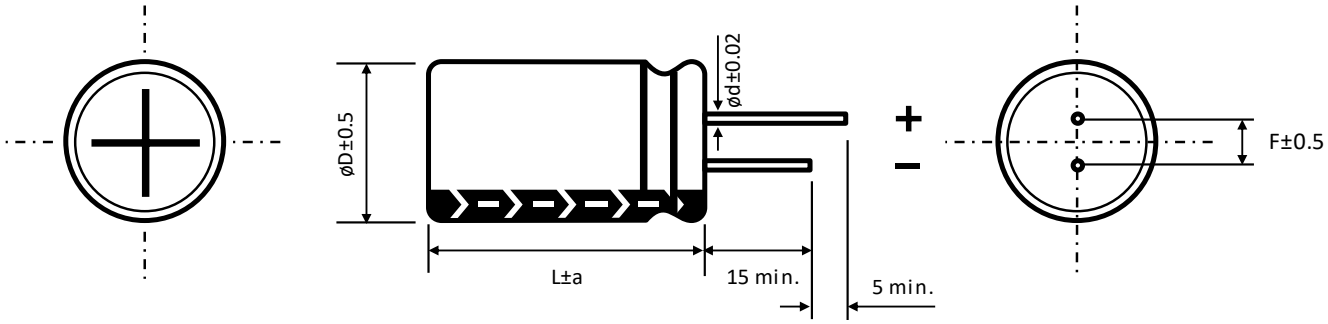
See "ADDITIONAL INFORMATION" to taped or formed products

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 500	0.5	0.8	0.9	1

.

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FW SERIES ▪ ULTRA-LONG LIFE 105°C TYPE

KEY FEATURES

LONG LIFE · HIGH VOLTAGE · LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 105°C ▪ 12 000 hours up to 20 000 hours
- High voltage up to 450V
- Miniaturized for space critical designs
- Ideal for lighting applications with ultra-long life expectancies

HF Halogen Free · RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +105°C			
Rated Voltage Range	V_R	160 ~ 450V DC			
Surge Voltage	V_S	($V_R \le 315V$): $V_S = 1.15 \cdot V_R$	($V_R > 315V$): $V_S = 1.10 \cdot V_R$		
Capacitance Range	C_R	1 ~ 560µF			
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 0.01·C_R·V_R + 40µA ▪ after 1 minute [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450
		tanδ (%)	12	15	17
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450
		Z-25°C/Z+20°C	3	3	3
		Z-40°C/Z+20°C	4	4	4

Lifetime Test			
Endurance 105°C (V_R & I_R applied)	Test	**12 000 hours**	ø D ≤ 6.3 mm
		15 000 hours	ø D = 8 mm
		15 000 hours	ø D = 10 mm
		20 000 hours	ø D ≥ 12.5 mm
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 105°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	64	FW010M160C110A
	1.2	5	11	66	FW1R2M160C110A
	1.5	5	11	68	FW1R5M160C110A
	1.8	5	11	70	FW1R8M160C110A
	2.2	5	11	78	FW2R2M160C110A
	2.7	5	11	84	FW2R7M160C110A
	3.3	5	11	98	FW3R3M160C110A
	3.9	5	11	108	FW3R9M160C110A
	4.7	6.3	11	119	FW4R7M160E110A
	5.6	6.3	11	129	FW5R6M160E110A
	6.8	6.3	11	138	FW6R8M160E110A
	8.2	6.3	11	148	FW8R2M160E110A
	10	8	9	183	FW100M160F090A
	12	8	9	203	FW120M160F090A
	15	8	11.5	230	FW150M160F115A
	18	8	11.5	275	FW180M160F115A
	22	8	11.5	300	FW220M160F115A
	27	10	12.5	350	FW270M160G125A
	33	10	12.5	390	FW330M160G125A
	39	10	16	470	FW390M160G160A
	47	10	16	500	FW470M160G160A
	56	10	16	550	FW560M160G160A
	68	10	20	600	FW680M160G200A
	82	10	20	690	FW820M160G200A
	100	13	20	870	FW101M160I200A
	120	13	20	920	FW121M160I200A
	150	13	25	1090	FW151M160I250A
	180	16	21	1190	FW181M160J210A
	220	18	21	1290	FW221M160K210A
	270	18	25	1390	FW271M160K250A
	330	18	25	1880	FW331M160K250A
	390	18	31.5	2000	FW391M160K315A
	470	18	35.5	2150	FW471M160K355A
	560	18	41	2280	FW561M160K410A
200	1	5	11	65	FW010M200C110A
	1.2	5	11	68	FW1R2M200C110A
	1.5	5	11	71	FW1R5M200C110A
	1.8	5	11	74	FW1R8M200C110A
	2.2	5	11	79	FW2R2M200C110A
	2.7	5	11	86	FW2R7M200C110A
	3.3	6.3	11	100	FW3R3M200E110A
	3.9	6.3	11	110	FW3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	121	FW4R7M200E110A
	5.6	6.3	11	131	FW5R6M200E110A
	6.8	8	9	148	FW6R8M200F090A
	8.2	8	9	160	FW8R2M200F090A
	10	8	9	200	FW100M200F090A
	12	8	11.5	250	FW120M200F115A
	15	8	11.5	280	FW150M200F115A
	18	10	12.5	310	FW180M200G125A
	22	10	12.5	360	FW220M200G125A
	27	10	16	410	FW270M200G160A
	33	10	16	490	FW330M200G160A
	39	10	20	560	FW390M200G200A
	47	10	20	620	FW470M200G200A
	56	10	20	680	FW560M200G200A
	68	13	20	760	FW680M200I200A
	82	13	20	800	FW820M200I200A
	100	13	20	890	FW101M200I200A
	120	13	25	940	FW121M200I250A
	150	16	21	1140	FW151M200J210A
	180	18	21	1240	FW181M200K210A
	220	18	25	1340	FW221M200K250A
	270	18	31.5	1440	FW271M200K315A
	330	18	35.5	1900	FW331M200K355A
	390	18	41	2130	FW391M200K410A
220	1	5	11	66	FW010M220C110A
	1.2	5	11	70	FW1R2M220C110A
	1.5	5	11	73	FW1R5M220C110A
	1.8	5	11	75	FW1R8M220C110A
	2.2	6.3	11	80	FW2R2M220E110A
	2.7	6.3	11	88	FW2R7M220E110A
	3.3	6.3	11	102	FW3R3M220E110A
	3.9	6.3	11	113	FW3R9M220E110A
	4.7	6.3	11	128	FW4R7M220E110A
	5.6	8	9	138	FW5R6M220F090A
	6.8	8	9	150	FW6R8M220F090A
	8.2	8	11.5	170	FW8R2M220F115A
	10	10	9	205	FW100M220G090A
	12	10	12.5	260	FW120M220G125A
	15	10	12.5	290	FW150M220G125A
	18	10	16	320	FW180M220G160A
	22	10	16	370	FW220M220G160A
	27	10	20	440	FW270M220G200A
	33	10	20	540	FW330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	600	FW390M220I200A
	47	13	20	660	FW470M220I200A
	56	13	20	720	FW560M220I200A
	68	13	25	790	FW680M220I250A
	82	13	25	840	FW820M220I250A
	100	16	21	900	FW101M220J210A
	120	16	25	960	FW121M220J250A
	150	16	25	1160	FW151M220J250A
	180	18	25	1260	FW181M220K250A
	220	18	31.5	1360	FW221M220K315A
	270	18	35.5	1460	FW271M220K355A
	330	18	41	1920	FW331M220K410A
250	1	5	11	67	FW010M250C110A
	1.2	5	11	71	FW1R2M250C110A
	1.5	5	11	74	FW1R5M250C110A
	1.8	5	11	77	FW1R8M250C110A
	2.2	6.3	11	84	FW2R2M250E110A
	2.7	6.3	11	94	FW2R7M250E110A
	3.3	6.3	11	104	FW3R3M250E110A
	3.9	6.3	11	114	FW3R9M250E110A
	4.7	6.3	11	132	FW4R7M250E110A
	5.6	8	9	143	FW5R6M250F090A
	6.8	8	9	158	FW6R8M250F090A
	8.2	8	11.5	178	FW8R2M250F115A
	10	10	9	206	FW100M250G090A
	12	10	12.5	265	FW120M250G125A
	15	10	12.5	295	FW150M250G125A
	18	10	16	340	FW180M250G160A
	22	10	16	400	FW220M250G160A
	27	10	20	460	FW270M250G200A
	33	10	20	560	FW330M250G200A
	39	13	20	610	FW390M250I200A
	47	13	20	680	FW470M250I200A
	56	13	20	740	FW560M250I200A
	68	13	25	810	FW680M250I250A
	82	13	25	870	FW820M250I250A
	100	16	21	940	FW101M250J210A
	120	16	25	1080	FW121M250J250A
	150	16	25	1220	FW151M250J250A
	180	18	25	1280	FW181M250K250A
	220	18	31.5	1420	FW221M250K315A
	270	18	35.5	1520	FW271M250K355A
	330	18	41	1930	FW331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	69	FW010M350E110A
	1.2	6.3	11	75	FW1R2M350E110A
	1.5	6.3	11	79	FW1R5M350E110A
	1.8	6.3	11	84	FW1R8M350E110A
	2.2	6.3	11	89	FW2R2M350E110A
	2.7	6.3	11	97	FW2R7M350E110A
	3.3	8	11.5	110	FW3R3M350F115A
	3.9	8	11.5	124	FW3R9M350F115A
	4.7	8	11.5	138	FW4R7M350F115A
	5.6	8	11.5	148	FW5R6M350F115A
	6.8	8	11.5	168	FW6R8M350F115A
	8.2	10	9	198	FW8R2M350G090A
	10	10	12.5	250	FW100M350G125A
	12	10	16	295	FW120M350G160A
	15	10	16	350	FW150M350G160A
	18	10	16	380	FW180M350G160A
	22	10	20	440	FW220M350G200A
	27	13	20	510	FW270M350I200A
	33	13	20	570	FW330M350I200A
	39	13	20	630	FW390M350I200A
	47	13	20	690	FW470M350I200A
	56	13	25	780	FW560M350I250A
	68	16	21	840	FW680M350J210A
	82	16	25	940	FW820M350J250A
	100	16	25	1080	FW101M350J250A
	120	18	25	1280	FW121M350K250A
	150	18	31.5	1480	FW151M350K315A
	180	18	35.5	1680	FW181M350K355A
	220	18	41	1880	FW221M350K410A
400	1	6.3	11	74	FW010M400E110A
	1.2	6.3	11	79	FW1R2M400E110A
	1.5	6.3	11	84	FW1R5M400E110A
	1.8	6.3	11	89	FW1R8M400E110A
	2.2	6.3	11	94	FW2R2M400E110A
	2.7	8	11.5	108	FW2R7M400F115A
	3.3	8	11.5	118	FW3R3M400F115A
	3.9	8	11.5	129	FW3R9M400F115A
	4.7	8	11.5	148	FW4R7M400F115A
	5.6	8	14	158	FW5R6M400140A
	6.8	8	14	178	FW6R8M400140A
	8.2	8	14	208	FW8R2M400140A
	10	8	16	260	FW100M400160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

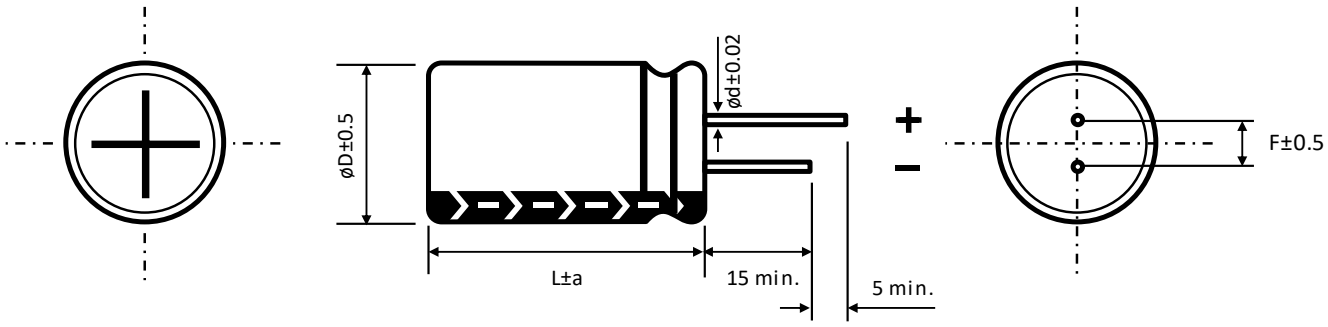
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +105°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	320	FW120M400G160A
	15	10	16	365	FW150M400G160A
	18	10	16	400	FW180M400G160A
	22	10	20	460	FW220M400G200A
	27	13	20	530	FW270M400I200A
	33	13	20	590	FW330M400I200A
	39	13	25	660	FW390M400I250A
	47	13	25	740	FW470M400I250A
	56	16	21	800	FW560M400J210A
	68	16	25	860	FW680M400J250A
	82	18	25	960	FW820M400K250A
	100	18	31.5	1250	FW101M400K315A
	120	18	35.5	1550	FW121M400K355A
	150	18	41	1680	FW151M400K410A
450	1	6.3	11	79	FW010M450E110A
	1.2	6.3	11	84	FW1R2M450E110A
	1.5	8	9	89	FW1R5M450F090A
	1.8	8	11.5	94	FW1R8M450F115A
	2.2	8	11.5	99	FW2R2M450F115A
	2.7	8	11.5	114	FW2R7M450F115A
	3.3	8	11.5	124	FW3R3M450F115A
	3.9	8	14	138	FW3R9M450F140A
	4.7	8	16	153	FW4R7M450F160A
	5.6	8	16	168	FW5R6M450F160A
	6.8	10	12.5	188	FW6R8M450G125A
	8.2	10	14	225	FW8R2M450G140A
	10	10	16	270	FW100M450G160A
	12	10	16	340	FW120M450G160A
	15	10	20	390	FW150M450G200A
	18	12.5	16	440	FW180M450Z160A
	22	13	20	500	FW220M450I200A
	27	13	25	560	FW270M450I250A
	33	13	25	620	FW330M450I250A
	39	16	21	690	FW390M450J210A
	47	16	21	770	FW470M450J210A
	56	16	25	830	FW560M450J250A
	68	18	25	890	FW680M450K250A
	82	18	31.5	990	FW820M450K315A
	100	18	35.5	1300	FW101M450K355A
	120	18	41	1600	FW121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER for RIPPLE CURRENT vs. FREQUENCY

V_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 450	0.5	0.8	0.9	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

FX SERIES ▪ HIGH TEMPERATURE 130°C TYPE

KEY FEATURES

LONG LIFE · HIGH VOLTAGE · HIGH TEMPERATURE · LIGHTING

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Endurance: 130°C ▪ 2 000 hours up to 5 000 hours
- High voltage up to 450V
- Miniaturized for space critical designs
- Ideal for lighting applications with high ambient temperatures

HF Halogen Free · RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +130°C			
Rated Voltage Range	V_R	160 ~ 450V DC			
Surge Voltage	V_S	($V_R \le 315V$): $V_S = 1.15 \cdot V_R$ ($V_R > 315V$): $V_S = 1.10 \cdot V_R$			
Capacitance Range	C_R	1 ~ 560µF			
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 0.03·C_R·V_R + 10µA ▪ after 2 minutes [I_{LEAK} (µA) ▪ C_R (µF) ▪ V_R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450
		tanδ (%)	12	15	17
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	160 ~ 250	300 ~ 350	400 ~ 450
		Z-25°C/Z+20°C	3	5	5
		Z-40°C/Z+20°C	6	6	6

Lifetime Test			
Endurance 130°C (V_R & I_R applied)	Test	**2 000 hours**	ø D ≤ 6.3 mm
		3 000 hours	ø D = 8 mm
		5 000 hours	ø D ≥ 10 mm
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
Shelf Life 130°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
	I_{Leak}	≤ the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

MULTIPLIER for RIPPLE CURRENT vs. FREQUENCY

V_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 450	0.5	0.8	0.9	1

For further information please contact sales@capxon.org

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
160	1	5	11	64	FX010M160C110A
	1.2	5	11	66	FX1R2M160C110A
	1.5	5	11	68	FX1R5M160C110A
	1.8	5	11	70	FX1R8M160C110A
	2.2	5	11	78	FX2R2M160C110A
	2.7	5	11	85	FX2R7M160C110A
	3.3	5	11	100	FX3R3M160C110A
	3.9	5	11	110	FX3R9M160C110A
	4.7	6.3	11	120	FX4R7M160E110A
	5.6	6.3	11	130	FX5R6M160E110A
	6.8	6.3	11	140	FX6R8M160E110A
	8.2	6.3	11	150	FX8R2M160E110A
	10	8	9	185	FX100M160F090A
	12	8	9	205	FX120M160F090A
	15	8	11.5	235	FX150M160F115A
	18	8	11.5	280	FX180M160F115A
	22	8	11.5	305	FX220M160F115A
	27	10	12.5	355	FX270M160G125A
	33	10	12.5	400	FX330M160G125A
	39	10	16	475	FX390M160G160A
	47	10	16	505	FX470M160G160A
	56	10	16	555	FX560M160G160A
	68	10	20	610	FX680M160G200A
	82	10	20	700	FX820M160G200A
	100	13	20	880	FX101M160I200A
	120	13	20	930	FX121M160I200A
	150	13	25	1100	FX151M160I250A
	180	16	21	1200	FX181M160J210A
	220	18	21	1300	FX221M160K210A
	270	18	25	1400	FX271M160K250A
	330	18	25	1900	FX331M160K250A
	390	18	31.5	2000	FX391M160K315A
	470	18	35.5	2160	FX471M160K355A
	560	18	41	2300	FX561M160K410A
200	1	5	11	66	FX010M200C110A
	1.2	5	11	68	FX1R2M200C110A
	1.5	5	11	71	FX1R5M200C110A
	1.8	5	11	74	FX1R8M200C110A
	2.2	5	11	80	FX2R2M200C110A
	2.7	5	11	87	FX2R7M200C110A
	3.3	6.3	11	100	FX3R3M200E110A
	3.9	6.3	11	110	FX3R9M200E110A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
200	4.7	6.3	11	122	FX4R7M200E110A
	5.6	6.3	11	132	FX5R6M200E110A
	6.8	8	9	150	FX6R8M200F090A
	8.2	8	9	162	FX8R2M200F090A
	10	8	9	205	FX100M200F090A
	12	8	11.5	255	FX120M200F115A
	15	8	11.5	285	FX150M200F115A
	18	10	12.5	315	FX180M200G125A
	22	10	12.5	365	FX220M200G125A
	27	10	16	420	FX270M200G160A
	33	10	16	500	FX330M200G160A
	39	10	20	570	FX390M200G200A
	47	10	20	630	FX470M200G200A
	56	10	20	690	FX560M200G200A
	68	13	20	770	FX680M200I200A
	82	13	20	805	FX820M200I200A
	100	13	20	900	FX101M200I200A
	120	13	25	950	FX121M200I250A
	150	16	21	1150	FX151M200J210A
	180	18	21	1250	FX181M200K210A
	220	18	25	1350	FX221M200K250A
	270	18	31.5	1450	FX271M200K315A
	330	18	35.5	1920	FX331M200K355A
	390	18	41	2150	FX391M200K410A
220	1	5	11	67	FX010M220C110A
	1.2	5	11	70	FX1R2M220C110A
	1.5	5	11	73	FX1R5M220C110A
	1.8	5	11	75	FX1R8M220C110A
	2.2	6.3	11	80	FX2R2M220E110A
	2.7	6.3	11	89	FX2R7M220E110A
	3.3	6.3	11	104	FX3R3M220E110A
	3.9	6.3	11	115	FX3R9M220E110A
	4.7	6.3	11	130	FX4R7M220E110A
	5.6	8	9	140	FX5R6M220F090A
	6.8	8	9	152	FX6R8M220F090A
	8.2	8	11.5	170	FX8R2M220F115A
	10	10	9	210	FX100M220G090A
	12	10	12.5	265	FX120M220G125A
	15	10	12.5	295	FX150M220G125A
	18	10	16	325	FX180M220G160A
	22	10	16	375	FX220M220G160A
	27	10	20	450	FX270M220G200A
	33	10	20	550	FX330M220G200A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
220	39	13	20	610	FX390M220I200A
	47	13	20	670	FX470M220I200A
	56	13	20	730	FX560M220I200A
	68	13	25	800	FX680M220I250A
	82	13	25	850	FX820M220I250A
	100	16	21	910	FX101M220J210A
	120	16	25	970	FX121M220J250A
	150	16	25	1170	FX151M220J250A
	180	18	25	1270	FX181M220K250A
	220	18	31.5	1370	FX221M220K315A
	270	18	35.5	1470	FX271M220K355A
	330	18	41	1940	FX331M220K410A
250	1	5	11	68	FX010M250C110A
	1.2	5	11	71	FX1R2M250C110A
	1.5	5	11	74	FX1R5M250C110A
	1.8	5	11	77	FX1R8M250C110A
	2.2	6.3	11	85	FX2R2M250E110A
	2.7	6.3	11	95	FX2R7M250E110A
	3.3	6.3	11	105	FX3R3M250E110A
	3.9	6.3	11	115	FX3R9M250E110A
	4.7	6.3	11	132	FX4R7M250E110A
	5.6	8	9	145	FX5R6M250F090A
	6.8	8	9	160	FX6R8M250F090A
	8.2	8	11.5	180	FX8R2M250F115A
	10	10	9	210	FX100M250G090A
	12	10	12.5	270	FX120M250G125A
	15	10	12.5	300	FX150M250G125A
	18	10	16	345	FX180M250G160A
	22	10	16	410	FX220M250G160A
	27	10	20	470	FX270M250G200A
	33	10	20	570	FX330M250G200A
	39	13	20	620	FX390M250I200A
	47	13	20	690	FX470M250I200A
	56	13	20	750	FX560M250I200A
	68	13	25	820	FX680M250I250A
	82	13	25	880	FX820M250I250A
	100	16	21	950	FX101M250J210A
	120	16	25	1100	FX121M250J250A
	150	16	25	1240	FX151M250J250A
	180	18	25	1290	FX181M250K250A
	220	18	31.5	1440	FX221M250K315A
	270	18	35.5	1540	FX271M250K355A
	330	18	41	1950	FX331M250K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
350	1	6.3	11	70	FX010M350E110A
	1.2	6.3	11	76	FX1R2M350E110A
	1.5	6.3	11	80	FX1R5M350E110A
	1.8	6.3	11	85	FX1R8M350E110A
	2.2	6.3	11	90	FX2R2M350E110A
	2.7	6.3	11	98	FX2R7M350E110A
	3.3	8	11.5	112	FX3R3M350F115A
	3.9	8	11.5	125	FX3R9M350F115A
	4.7	8	11.5	140	FX4R7M350F115A
	5.6	8	11.5	150	FX5R6M350F115A
	6.8	8	11.5	170	FX6R8M350F115A
	8.2	10	9	200	FX8R2M350G090A
	10	10	12.5	255	FX100M350G125A
	12	10	16	300	FX120M350G160A
	15	10	16	360	FX150M350G160A
	18	10	16	385	FX180M350G160A
	22	10	20	450	FX220M350G200A
	27	13	20	520	FX270M350I200A
	33	13	20	580	FX330M350I200A
	39	13	20	640	FX390M350I200A
	47	13	20	700	FX470M350I200A
	56	13	25	790	FX560M350I250A
	68	16	21	850	FX680M350J210A
	82	16	25	950	FX820M350J250A
	100	16	25	1100	FX101M350J250A
	120	18	25	1300	FX121M350K250A
	150	18	31.5	1500	FX151M350K315A
	180	18	35.5	1700	FX181M350K355A
	220	18	41	1900	FX221M350K410A
400	1	6.3	11	75	FX010M400E110A
	1.2	6.3	11	80	FX1R2M400E110A
	1.5	6.3	11	85	FX1R5M400E110A
	1.8	6.3	11	90	FX1R8M400E110A
	2.2	6.3	11	95	FX2R2M400E110A
	2.7	8	11.5	110	FX2R7M400F115A
	3.3	8	11.5	120	FX3R3M400F115A
	3.9	8	11.5	130	FX3R9M400F115A
	4.7	8	11.5	150	FX4R7M400F115A
	5.6	8	14	160	FX5R6M400F140A
	6.8	8	14	180	FX6R8M400F140A
	8.2	8	14	210	FX8R2M400F140A
	10	8	16	270	FX100M400F160A

See "ADDITIONAL INFORMATION" to taped or formed products.

STANDARD RATINGS

Part number shows bulk version with straight leads

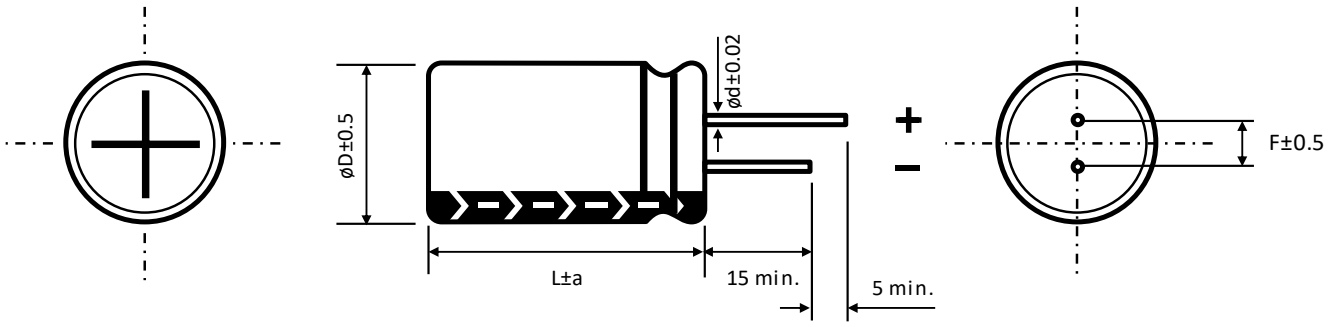
V_R (V)	C_R (µF)	ø D (mm)	L (mm)	I_R ▪ Max. Ripple Current +130°C ▪ 100kHz (mA rms)	CapXon Part Number
400	12	10	16	330	FX120M400G160A
	15	10	16	370	FX150M400G160A
	18	10	16	405	FX180M400G160A
	22	10	20	470	FX220M400G200A
	27	13	20	540	FX270M400I200A
	33	13	20	600	FX330M400I200A
	39	13	25	670	FX390M400I250A
	47	13	25	750	FX470M400I250A
	56	16	21	810	FX560M400J210A
	68	16	25	870	FX680M400J250A
	82	18	25	970	FX820M400K250A
	100	18	31.5	1300	FX101M400K315A
	120	18	35.5	1600	FX121M400K355A
	150	18	41	1700	FX151M400K410A
450	1	6.3	11	80	FX010M450E110A
	1.2	6.3	11	85	FX1R2M450E110A
	1.5	8	9	90	FX1R5M450F090A
	1.8	8	11.5	95	FX1R8M450F115A
	2.2	8	11.5	100	FX2R2M450F115A
	2.7	8	11.5	115	FX2R7M450F115A
	3.3	8	11.5	125	FX3R3M450F115A
	3.9	8	14	140	FX3R9M450F140A
	4.7	8	16	155	FX4R7M450F160A
	5.6	8	16	170	FX5R6M450F160A
	6.8	10	12.5	190	FX6R8M450G125A
	8.2	10	14	230	FX8R2M450G140A
	10	10	16	280	FX100M450G160A
	12	10	16	350	FX120M450G160A
	15	10	20	400	FX150M450G200A
	18	13	16	450	FX180M450I160A
	22	13	20	510	FX220M450I200A
	27	13	25	570	FX270M450I250A
	33	13	25	630	FX330M450I250A
	39	16	21	700	FX390M450J210A
	47	16	21	780	FX470M450J210A
	56	16	25	840	FX560M450J250A
	68	18	25	900	FX680M450K250A
	82	18	31.5	1000	FX820M450K315A
	100	18	35.5	1350	FX101M450K355A
	120	18	41	1650	FX121M450K410A

See "ADDITIONAL INFORMATION" to taped or formed products.

MULTIPLIER for RIPPLE CURRENT vs. FREQUENCY

V_R (µF) / Frequency (Hz)	100/120	1k	10k	100k
160 ~ 450	0.5	0.8	0.9	1

DIMENSIONS ▪ All dimensions in mm



ø D	5	6.3	8		10	13	16	18	22
F	2	2.5	3.5		5	5	7.5	7.5	10
ø d	0.5		L < 20	L ≥ 20	0.6		0.8		
			0.5	0.6					

a	ø D < 16	ø D = 16		ø D = 18		ø D > 18
	1.5	L = 25 to 35.5	L < 25 and L ≥ 40	L = 25 to 31.5	L < 25 and L ≥ 35.5	2
		1.5	2	1.5	2	

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information
Page 142	Page 121

DISCLAIMER

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Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

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RF SERIES ▪ PULSE & PHOTO-FLASH TYPE

KEY FEATURES

PHOTO FLASH

- **ALUMINUM ELECTROLYTIC CAPACITOR** ▪ THT type
- Small dimensions and low leakage current
- Optimized material combination to achieve low ESR and low dissipation factor
- Especially for impulse applications as photo flash generators, intense pulse light hair removers, laser power supplies and warning beacons

HF Halogen Free

RoHS & REACH COMPLIANT

SPECIFICATIONS

Items		Performance Characteristics
Operating Temperature Range		-20 ~ +55°C
Rated Voltage Range	V_R	330 ~ 350V DC
Capacitance Range	C_R	100 ~ 450µF
Cap. Tolerance	ΔC	-10 ~ +20% (120Hz ▪ 25°C)
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	≤ 1·C_R (µA) ▪ After 5 minutes [I_{LEAK} (µA) ; C_R (µF)]
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	8% max.

Lifetime Test			
Charge and Discharge 5 ~ 35°C (V_R applied)	Test	**5 000 times**	Duration time
	Cycles	30 sec	Charge and discharge cycles
	R_D	0.7 ~ 1Ω	Discharge resistance
	△C/C_R	≤ ±10% of initial measured value	
	tanδ	≤ 150% of initial specified value	
	I_{Leak}	≤ 150% of initial specified value	
Shelf Life 55°C (V_R = 0)	Test	**1 000 hours**	
	△C/C_R	≤ ±10% of initial measured value	
	tanδ	≤ 150% of initial specified value	
	I_{Leak}	≤ 150% of initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		

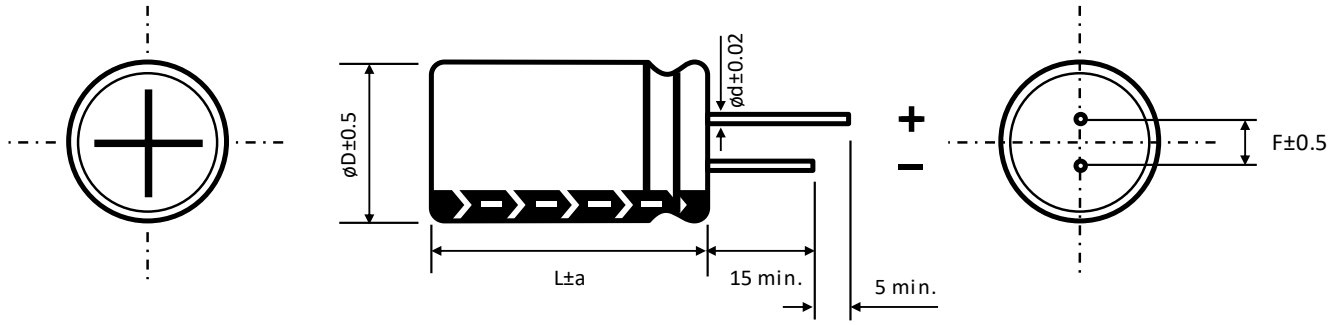
Pulse and flash-light capacitors are specially adapted to the application.

PHOTO FLASH HAIR REMOVER LASER BEACONS

The data listed in the upper table and the following page are therefore **only a guide** for possible designs of the capacitance, voltage, dimensions, pulse frequency.

Please contact our CapXon product specialists for further details.

DIMENSIONS ▪ All dimensions in mm



ø D	8	10	12	13	14	16	18	20
F	3.5	5	5	5	5	7.5	7.5	7.5
ø d	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8
a	1.5							

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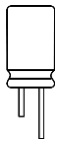
For further information, please visit our website www.capxongroup.com or contact CapXon directly.

PRODUCT CODE ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS



THT type example:
FB series ▪ 100µF ▪ 16V ▪ ±20% ▪ Ø 5mm ▪ H 11mm ▪ P 2mm ▪ Tape Ammo

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	B	1	0	1	M	0	1	6	C	1	1	0	E	T	B	-	-	-	-
Series		Capacitance			Capacitance tolerance	Voltage			Case Ø (mm)	Height (mm)			Type code	Taping / lead treatment *		Special requirement			

Code	µF
R47	0.47
010	1
4R7	4.7
100	10
220	22
101	100
561	560
102	1000
472	4700
103	10000
223	22000

Code	%
H	±5
K	±10
S	±15
M	±20
N	±30
D	±40
I	+5 to +20
B	0 to -20
G	0 to +10
Z	0 to +20
Y	0 to +30
X	0 to +40
A	0 to +50
J	-5 to +20
C	-5 to +30
E	-8 to +5
V	-10 to +20
Q	-10 to +30
T	-10 to +50
W	-20 to +10
P	-15 to +20
L	-25 to +20
U	-30 to 0
F	-35 to 0
O	-50 to 0

Code	Volt
6R3	6.3
010	10
016	16
025	25
035	35
050	50
063	63
080	80
100	100
160	160
200	200
220	220
250	250
350	350
400	400
420	420
450	450
500	500
550	550

Code	ØD
C	5
E	6.3
F	8
G	10
Z	12.5
I	13
J	16
K	18

Code	H
090	9
110	11
115	11.5
120	12
125	12.5
140	14
150	15
160	16
200	20
210	21
250	25
315	31.5
350	35
355	35.5
410	41

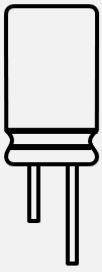
Code	Type
A	Without lead treatment
E	With lead treatment

See chapters taping or lead treatment

* See chapter taping or lead treatment for further information
Please consult CapXon for further assistance

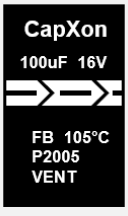
MARKING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Aluminum Electrolytic Capacitor ▪ Radial type



CapXon:	Manufacturer trademark
100µF:	Nominal capacitance
16V:	Rated voltage (V) ▪ Standard type
	(-) polarity (Cathode indicate)
FB:	Series
105°C:	Maximum operating temperature
P2005:	Production datacode year/week (ex. 2020/CW05)
VENT:	Safety vent

Standard type



Front side

Back side

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Possible tape versions in AMMO packaging with lead space F and taping ordering code.
All dimensions in mm.

D	Diameter	4	5	6.3	8	10	12.5	13	14.5	16	18	20	22	25	Code
F	Lead space Straight leads	1.5	2	2.5	3.5	5	5	5	7.5	7.5	7.5	10	10	10	
F	Ammo Tape	2	2	-	-	-	-	-	-	-	-	-	-	-	TB
	Ammo Tape	2.5	2.5	2.5	-	-	-	-	-	-	-	-	-	-	TC
	Ammo Tape	-	-	-	3.5	-	-	-	-	-	-	-	-	-	TD
	Ammo Tape	5	5	5	5	5	5	5	-	-	-	-	-	-	TA
	Ammo Tape	-	-	-	-	-	-	-	7.5	7.5	7.5	-	-	-	TE
	Ammo Tape	-	-	-	-	-	-	5	-	-	-	-	-	-	PA
	Ammo Tape	-	-	-	-	-	-	-	7.5	7.5	7.5	-	-	-	PE

Possible tape versions in REEL packaging with lead space F and taping ordering code.
All dimensions in mm.

D	Diameter	4	5	6.3	8	10	12.5	13	14.5	16	18	20	22	25	Code
F	Lead space Straight leads	1.5	2	2.5	3.5	5	5	5	7.5	7.5	7.5	10	10	10	
F	Reel Tape	2	2	-	-	-	-	-	-	-	-	-	-	-	RB
	Reel Tape	2.5	2.5	2.5	-	-	-	-	-	-	-	-	-	-	RC
	Reel Tape	-	-	-	3.5	-	-	-	-	-	-	-	-	-	RD
	Reel Tape	5	5	5	5	5	5	5	-	-	-	-	-	-	RA
	Reel Tape	-	-	-	-	-	-	-	7.5	7.5	7.5	-	-	-	RE
	Reel Tape	-	-	-	-	-	-	5	-	-	-	-	-	-	QA
	Reel Tape	-	-	-	-	-	-	-	7.5	7.5	7.5	-	-	-	QE

Details to the exact tape dimensions can be found in the following drawings on the next pages:

T1 taping ▪ ØD 5mm ▪ standard lead space

T2 taping ▪ ØD 4 and 5mm ▪ wide lead space

T3 taping ▪ ØD 6.3 to 13mm ▪ standard lead space

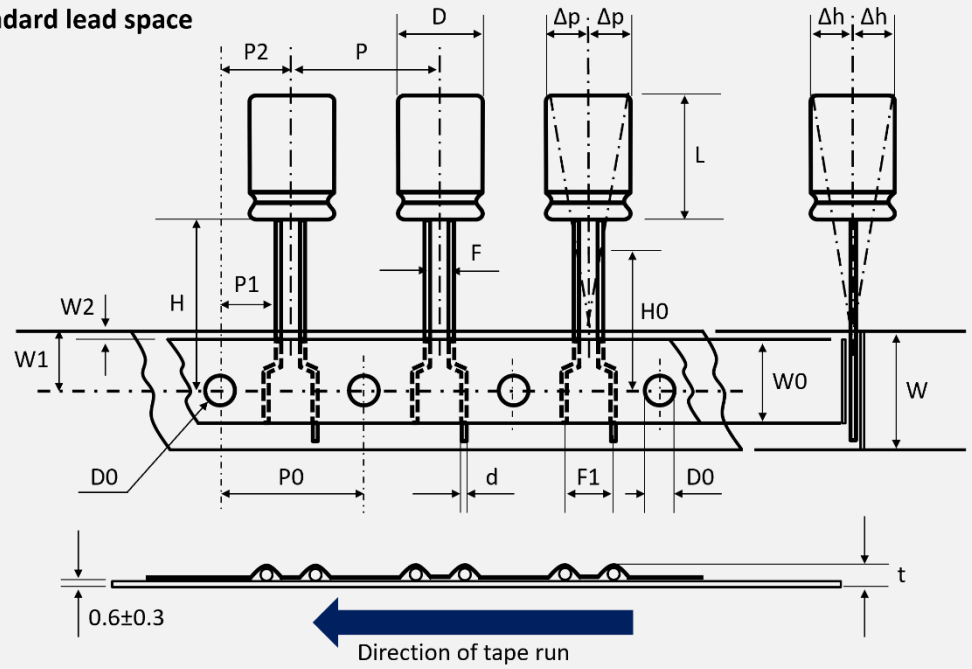
T4 taping ▪ ØD 4 to 8mm ▪ lead space F = 5mm

T5 taping ▪ ØD ≥ 12.5mm ▪ wide component space

T6 taping ▪ ØD ≥ 14.5mm ▪ standard component space

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T1 taping ▪ ØD 5mm ▪ standard lead space



Example

F B	1 0 1	M	0 1 6	C	1 1 0	E	T B	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

All dimensions in mm

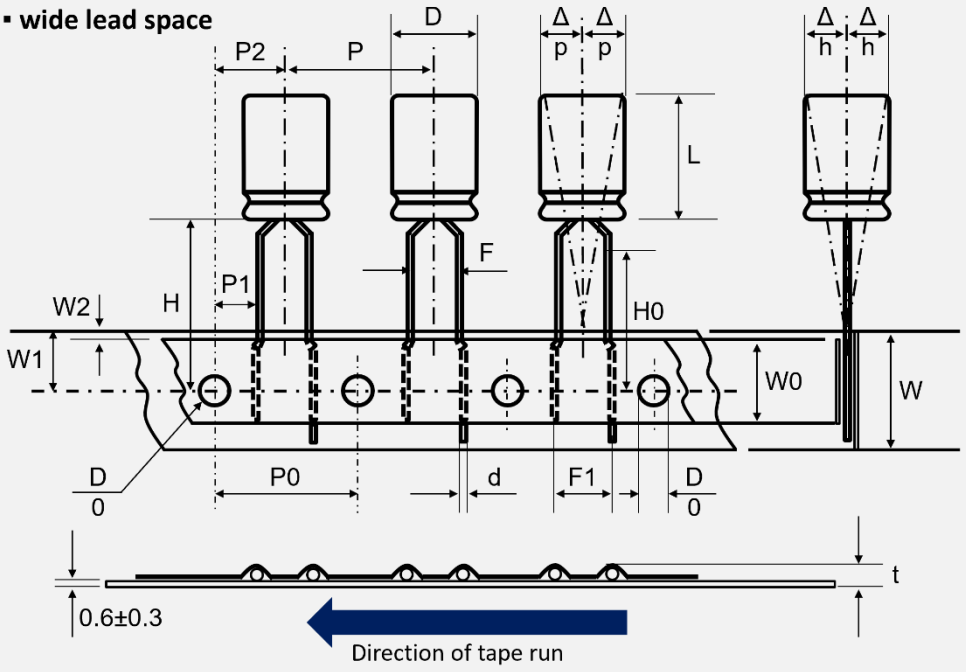
	D	L	d	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±1.3	±0.5	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.2	Max	Max	Max	
Item	5	5-7 (+1)	0.45	12.7	12.7	5.35	6.35	**2**	5	18	11	9	2	18.5	4	1	1	1.5	TB
		9 (±2)	0.5																
		11-15 (±1.5)	0.5																

Table and example show the ammo package version. Coding RB instead of TB means the reel package version.

In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T2 taping ▪ ØD 4 and 5mm ▪ wide lead space



Example

F U	R 4 7	M	2 0 0	C	1 1 0	E	T C	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

All dimensions in mm

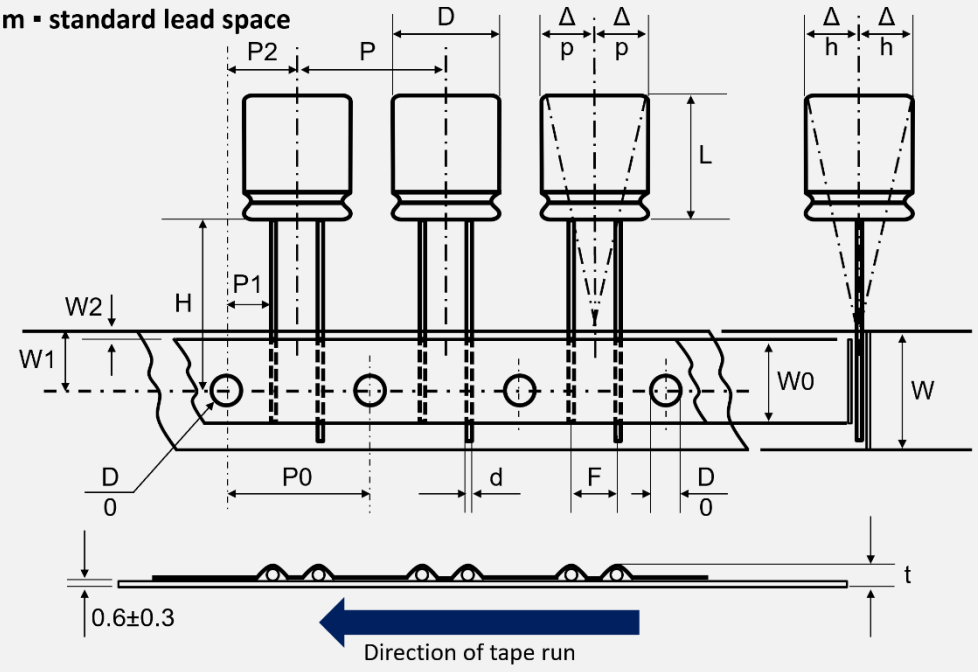
	D	L	d	P	P0	P1	P2	F	F1	W	W0	W1	W2	H	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±1.3	±0.5	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.2	Max	Max	Max	
Item	4	5-7 (+1)	0.45	12.7	12.7	5.35	6.35	**2**	5	18	11	9	2	18.5	4	1	1	1.5	TB
						5.1		**2.5**											TC
	5	5-7 (+1)	0.45	12.7	12.7	5.1	6.35	**2.5**	5	18	11	9	2	18.5	4	1	1	1.5	TC
		9 (±2)	0.5																
		11-15 (±1.5)	0.5																

Table and example show the ammo package version. Coding RB or RC instead of TB or TC means the reel package version.

In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T3 taping ▪ ØD 6.3 to 13mm ▪ standard lead space



Example

F T	6 R 8	M	1 6 0	E	1 1 0	E	T C	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

All dimensions in mm

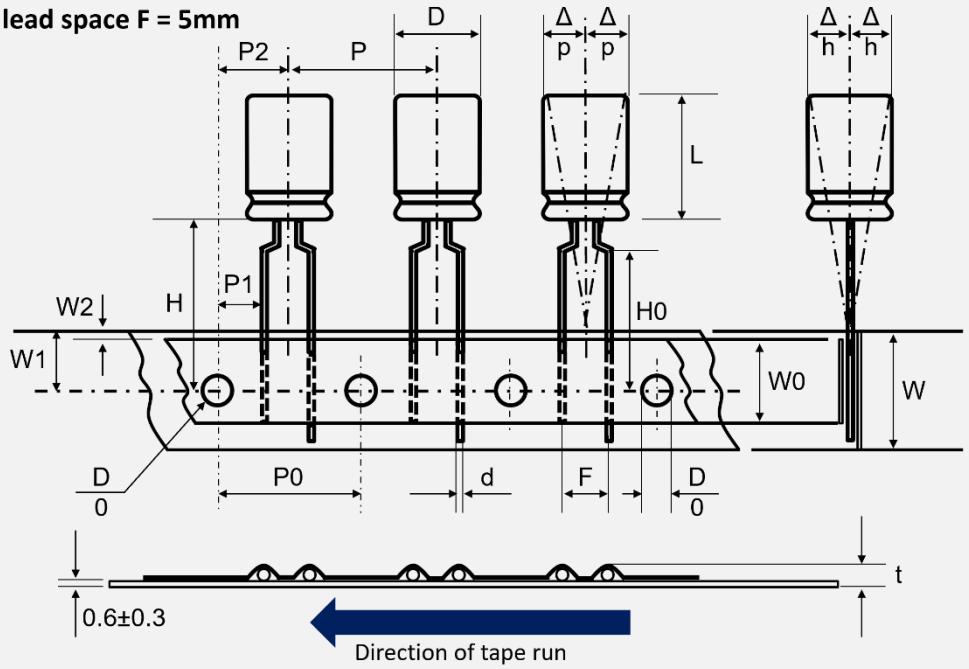
	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±1.3	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.2	Max	Max	Max	
Item	6.3	5 (+1)	0.45	12.7	12.7	5.1	6.35	**2.5**	18	11	9	2	18.5	4	1	1	1.5	TC
		7 (+1)	0.5															
		9 (±2)	0.5															
		11-25 (±1.5)	0.5															
	8	5 (+1)	0.45	12.7	12.7	4.6	6.35	**3.5**	18	11	9	2	18.5	4	1	1	1.5	TD
		7 (+1)	0.5															
		9 (±2)	0.5															
		11.5-16 (±1.5)	0.5															
		20-30 (±1.5)	0.6															
	10	7-9 (±2)	0.6	12.7	12.7	3.85	6.35	**5**	18	11	9	2	18.5	4	1	1	1.5	TA
		12.3-35 (±1.5)	0.6															
	(12.5) 13	13-16 (+2)	0.6	15	15	5	7.5	**5**	18	15	9	2	18.5	4	2	2	1.5	TA
		20-35 (±1.5)	0.6															

Table and example show the ammo package version. Coding RA, RC or RD instead of TA, TC or TD means the reel package version.

In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T4 taping ▪ ØD 4 to 8mm ▪ lead space F = 5mm



Example

F D	8 2 1	M	0 1 0	F	1 1 5	E	T A	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

All dimensions in mm

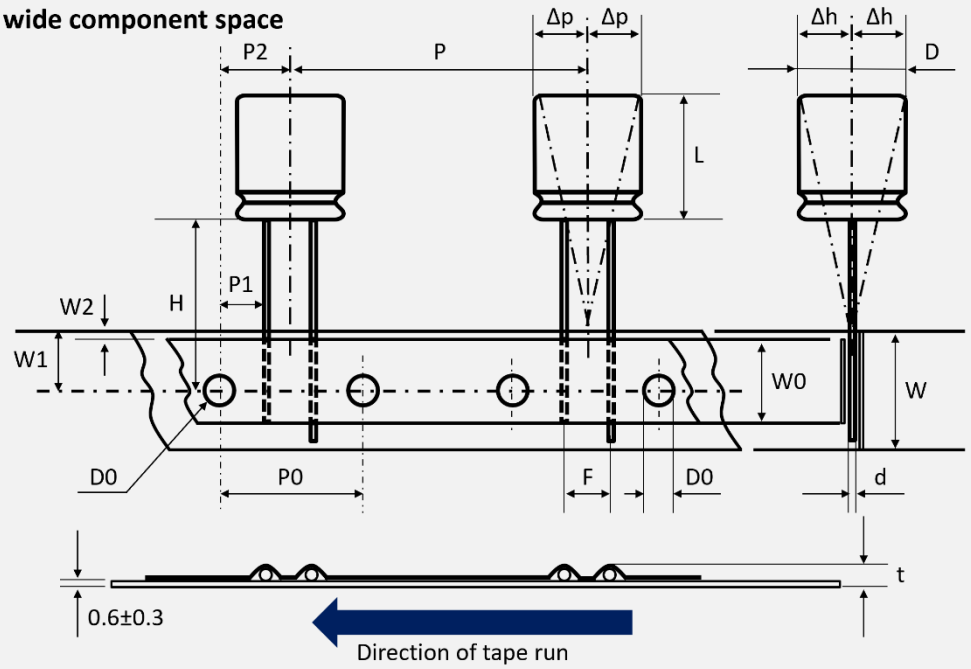
	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	H0	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±1.3	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.5	±0.2	Max	Max	Max	
Item	4	5-7 (+1)	0.45	12.7	12.7	3.85	6.35	**5**	18	11	9	2	18.5	16	4	1	1	1.5	TA
	5	5-7 (+1)	0.45	12.7	12.7	3.85	6.35	**5**	18	11	9	2	18.5	16	4	1	1	1.5	
		9 (±2)	0.5																
		11-15 (±1.5)	0.5																
	6.3	5 (+1)	0.45	12.7	12.7	3.85	6.35	**5**	18	11	9	2	18.5	16	4	1	1	1.5	
		7 (+1)	0.5																
		9 (±2)	0.5																
		11-25 (±1.5)	0.5																
	8	5 (+1)	0.45	12.7	12.7	3.85	6.35	**5**	18	11	9	2	18.5	16	4	1	1	1	
		7 (+1)	0.5																
		9 (±2)	0.5																
		11.5-16 (±1.5)	0.5																
		20-30 (±1.5)	0.6																

Table and example show the ammo package version. Coding RA instead of TA means the reel package version.

In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T5 taping ▪ ØD ≥12.5mm ▪ wide component space



Example

F X	4 7 0	M	4 5 0	J	2 1 0	E	T E	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

All dimensions in mm

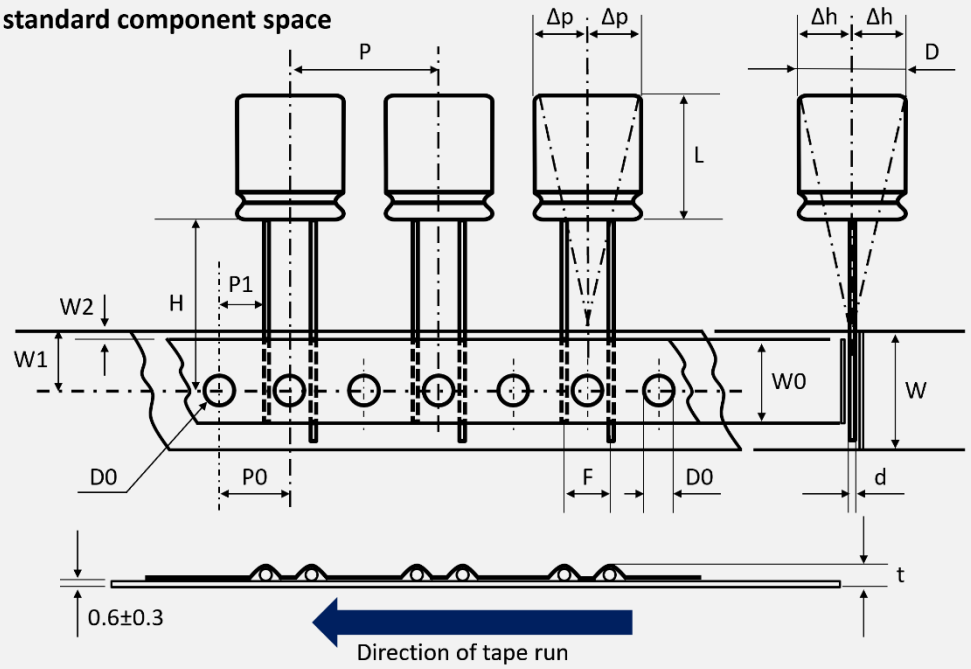
	D	L	d	P	P0	P1	P2	F	W	W0	W1	W2	H	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±1.3	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.2	Max	Max	Max	
Item	13 (12.5)	13-16 (+2)	0.6	25.4	12.7	3.85	6.35	**5**	18	15	9	2	18.5	4	2	2	1.5	PA
		20-35 (±1.5)																
	14.5	18-35 (±2)	0.8	30	15	3.75	7.5	**7.5**	18	15	9	2	18.5	4	2	2	1.5	TE
	16	16-21 (±2)	0.8	30	15	3.75	7.5	**7.5**	18	15	9	2	18.5	4	2	2	1.5	
		25-35.5 (±1.5)																
	18	16-21 (±2)	0.8	30	15	3.75	7.5	**7.5**	18	15	9	2	18.5	4	2	2	1.5	
		25-31.5 (±1.5)																
		35.5 (±2)																

Table and example show the ammo package version. Coding RE or QA instead of TE or PA means the reel package version.

In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

T6 taping ▪ ØD ≥14.5mm ▪ standard component space



Example

F U	1 0 1	M	4 0 0	K	3 1 5	E	P E	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

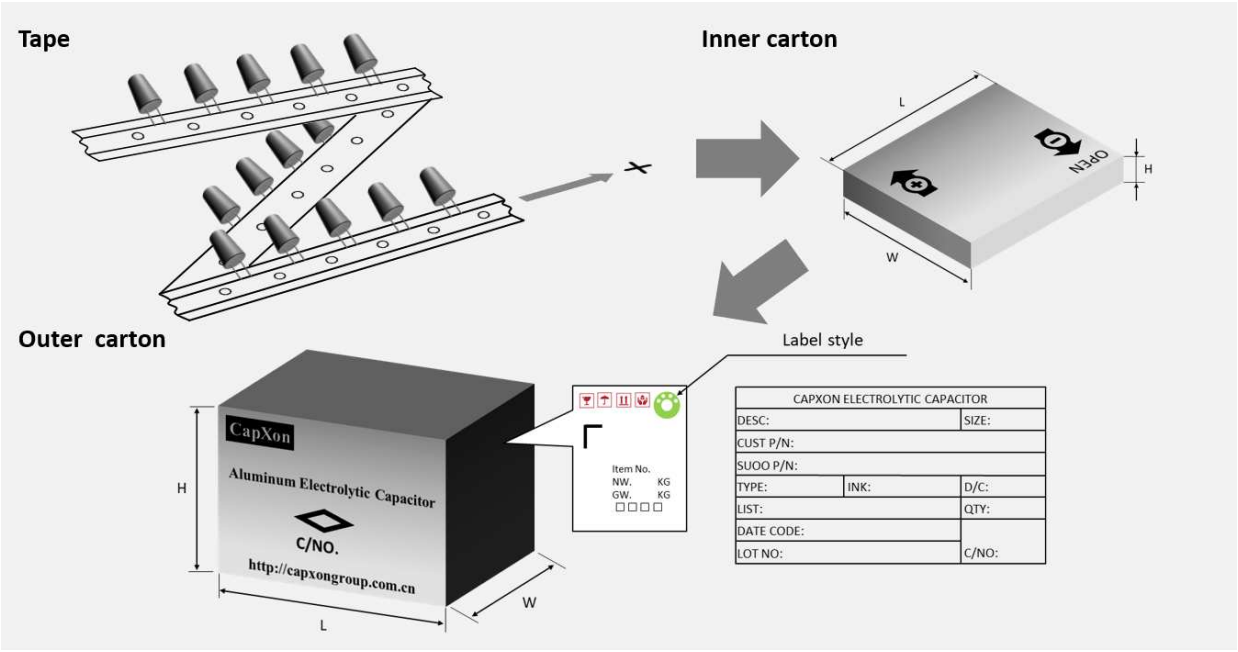
All dimensions in mm

	D	L	d	P	P0	P1	F	W	W0	W1	W2	H	D0	Δh	Δp	t	Code
Tol	±0.5	-	±0.02	±1.0	±0.2	±0.7	±0.5	±0.5	±0.5	±0.5	Max	+0.75 -0.5	±0.2	Max	Max	Max	
Item	14.5	18-35 (±2)	0.8	25.4	12.7	8.95	**7.5**	18	15	9	2	18.5	4	2	2	1.5	PE
	16	16-21 (±2)	0.8	25.4	12.7	8.95	**7.5**	18	15	9	2	18.5	4	2	2	1.5	
		25-35.5 (±1.5)															
	18	16-21 (±2)	0.8	25.4	12.7	8.95	**7.5**	18	15	9	2	18.5	4	2	2	1.5	
		25-31.5 (±1.5)															
		35.5 (±2)															

Table and example show the ammo package version. Coding QE instead of PE means the reel package version.

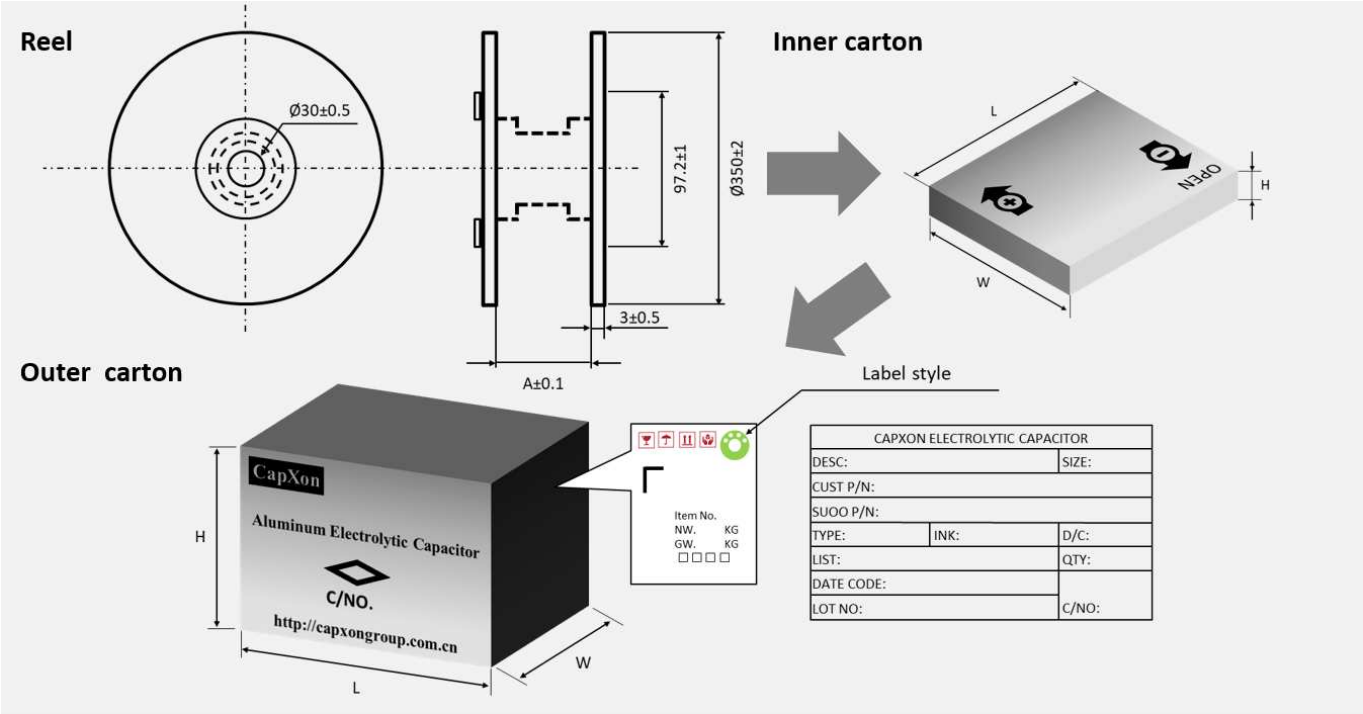
In the case of polarized capacitors, the negative lead (cathode) is in the front, i.e. in the direction of tape run.

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS ▪ AMMO PACK



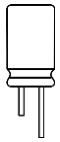
Ø D (mm)	Length L (mm)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
4	All	2500	331 x 227 x 51	25000	474 x 343 x 285	China	85322200
5	All	2000	331 x 227 x 51	20000	474 x 343 x 285	China	85322200
6.3	5 to 15	1500	331 x 227 x 51	15000	474 x 343 x 285	China	85322200
	17 to 20	1300	327 x 191 x 57	13000	403 x 343 x 312	China	85322200
8	5 to 20	800	327 x 191 x 57	8000	403 x 343 x 312	China	85322200
	25 to 30	800	332 x 216 x 64	6400	474 x 343 x 285	China	85322200
10	7 to 15	600	331 x 227 x 51	6000	474 x 343 x 285	China	85322200
	16 to 20	500	327 x 191 x 57	5000	403 x 343 x 312	China	85322200
	21 to 25	500	332 x 190 x 60	2500	351 x 208 x 334	China	85322200
	26 to 30	500	332 x 216 x 64	4000	474 x 343 x 285	China	85322200
	35	500	310 x 260 x 71	2500	330 x 278 x 380	China	85322200
12.5 (P0=15)	13 to 25	300	327 x 191 x 57	3000	403 x 343 x 312	China	85322200
	26 to 30	300	332 x 216 x 64	2400	474 x 343 x 285	China	85322200
	35	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
12.5 (P0=12.7)	13 to 25	300	327 x 191 x 57	3000	403 x 343 x 312	China	85322200
	26 to 30	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
	35	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
13 (P0=15)	13 to 25	300	327 x 191 x 57	3000	403 x 343 x 312	China	85322200
	26 to 30	300	332 x 216 x 64	2400	474 x 343 x 285	China	85322200
	35	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
13 (P0=12.7)	13 to 25	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
	26 to 30	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
	35	400	318 x 254 x 70	2000	330 x 278 x 380	China	85322200
16 (P0=15)	16 to 20	200	327 x 191 x 57	2000	403 x 343 x 312	China	85322200
	21 to 25	250	318 x 254 x 67	2000	528 x 331 x 281	China	85322200
	> 25	250	310 x 260 x 71	1250	330 x 278 x 380	China	85322200
16 (P0=12.7)	16 to 20	200	327 x 191 x 57	2000	403 x 343 x 312	China	85322200
	21 to 25	200	332 x 216 x 64	1600	474 x 343 x 285	China	85322200
	> 25	250	310 x 260 x 71	1250	330 x 278 x 380	China	85322200
18	16 to 25	200	310 x 260 x 61	1000	330 x 278 x 333	China	85322200
	> 25	200	310 x 260 x 71	1000	330 x 278 x 380	China	85322200

TAPING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS ▪ REEL PACK



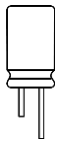
Ø D (mm)	Length L (mm)	A (mm)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
4	All	45	1800	350 x 350 x 105	10800	375 x 375 x 343	China	85322200
5	All	45	1300	350 x 350 x 105	7800	375 x 375 x 343	China	85322200
6.3	All	45	1000	350 x 350 x 105	6000	375 x 375 x 343	China	85322200
8	5 to 17	45	800	350 x 350 x 105	4800	375 x 375 x 343	China	85322200
	18 to 28	55	800	349 x 349 x 121	4800	375 x 375 x 385	China	85322200
10	7 to 17	45	600	350 x 350 x 105	3600	375 x 375 x 343	China	85322200
	18 to 28	55	600	349 x 349 x 121	3600	375 x 375 x 385	China	85322200
12.5	13 to17	45	400	350 x 350 x 105	1800	375 x 375 x 343	China	85322200
	18 to 28	55	400	349 x 349 x 121	1800	375 x 375 x 385	China	85322200
13	13 to 17	45	300	350 x 350 x 105	1800	375 x 375 x 343	China	85322200
	18 to 28	55	300	349 x 349 x 121	1800	375 x 375 x 385	China	85322200
16	13 to 17	45	200	350 x 350 x 105	1200	375 x 375 x 343	China	85322200
	18 to 28	55	200	349 x 349 x 121	1200	375 x 375 x 385	China	85322200

PACKAGING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS
STRAIGHT LEADS ▪ BULK PACK



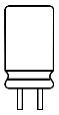
Ø D (mm)	Length L (mm)	Inner bag / Inner row (pcs)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
3	5	1000/bag	20000	293 x 181 x 223	60000	562 x 318 x 238	China	85322200
4	5 to 7	1000/bag	15000	293 x 181 x 223	45000	562 x 318 x 238	China	85322200
5	5 to 9	1000/bag	15000	293 x 181 x 223	45000	562 x 318 x 238	China	85322200
	11 to 12	1000/bag	10000	293 x 181 x 223	30000	562 x 318 x 238	China	85322200
6.3	5 to 9	1000/bag	10000	293 x 181 x 223	30000	562 x 318 x 238	China	85322200
	11 to 20	1000/bag	8000	293 x 181 x 223	24000	562 x 318 x 238	China	85322200
8	5 to 9	500/bag	6000	293 x 181 x 223	18000	562 x 318 x 238	China	85322200
	11 to 14	500/bag	5000	293 x 181 x 223	15000	562 x 318 x 238	China	85322200
	15 to 16	500/bag	4000	293 x 181 x 223	12000	562 x 318 x 238	China	85322200
	20	500/bag	3000	293 x 181 x 223	9000	562 x 318 x 238	China	85322200
	25 to 30	400/bag	2400	293 x 181 x 223	7200	562 x 318 x 238	China	85322200
	30 to 34	40/line	840	334 x 217 x 68	6720	448 x 354 x 295	China	85322200
	35 to 41	40/line	840	334 x 217 x 79.5	5040	448 x 354 x 260	China	85322200
	42 to 51	40/line	840	334 x 217 x 92	5040	448 x 354 x 295	China	85322200
	52 to 60	40/line	840	334 x 217 x 92	5040	448 x 354 x 295	China	85322200
10	≤ 13	500/bag	4000	293 x 181 x 223	12000	562 x 318 x 238	China	85322200
	14 to 17	500/bag	3000	293 x 181 x 223	9000	562 x 318 x 238	China	85322200
	20	500/bag	2500	293 x 181 x 223	7500	562 x 318 x 238	China	85322200
	24 to 25	400/bag	2000	293 x 181 x 223	6000	562 x 318 x 238	China	85322200
	30 to 34	32/line	544	334 x 217 x 68	4352	448 x 354 x 295	China	85322200
	35	32/line	544	334 x 217 x 79.5	3264	448 x 354 x 260	China	85322200
	40 to 51	32/line	544	334 x 217 x 92	3264	448 x 354 x 295	China	85322200
	55 to 60	32/line	544	334 x 217 x 92	3264	448 x 354 x 295	China	85322200
12.5	≤ 21	300/bag	1500	293 x 181 x 223	4500	562 x 318 x 238	China	85322200
	25	200/bag	1200	293 x 181 x 223	3600	562 x 318 x 238	China	85322200
	30	200/bag	1000	293 x 181 x 223	3000	562 x 318 x 238	China	85322200
	35	25/line	350	334 x 217 x 79.5	2100	448 x 354 x 260	China	85322200
	40 to 50	26/line	364	334 x 217 x 92	2184	448 x 354 x 295	China	85322200
13	≤ 21	300/bag	1500	293 x 181 x 223	4500	562 x 318 x 238	China	85322200
	25 to 31.5	25/line	350	334 x 217 x 68	2800	448 x 354 x 295	China	85322200
	35.5 to 41	25/line	350	334 x 217 x 79.5	2100	448 x 354 x 260	China	85322200
	42 to 51	25/line	350	334 x 217 x 92	2100	448 x 354 x 295	China	85322200
	55 to 60	25/line	350	334 x 217 x 92	2100	448 x 354 x 295	China	85322200
14.5	31.5 to 32	20/line	220	304 x 196 x 68	1760	415 x 320 x 295	China	85322200
	37	20/line	220	304 x 196 x 92	1320	415 x 320 x 295	China	85322200
16	15 to 21	18/line	180	304 x 196 x 55	1800	415 x 320 x 295	China	85322200
	25 to 31.5	18/line	180	304 x 196 x 68	1440	415 x 320 x 295	China	85322200
	35.5 to 41	18/line	180	305 x 197 x 79.5	1080	415 x 320 x 260	China	85322200
	45 to 50	18/line	180	304 x 196 x 92	1080	415 x 320 x 295	China	85322200
18	15 to 21	32 in all/2 lines	160	304 x 196 x 55	1600	415 x 320 x 295	China	85322200
	25 to 31.5	32 in all/2 lines	160	304 x 196 x 68	1280	415 x 320 x 295	China	85322200
	35.5 to 41	32 in all/2 lines	160	305 x 197 x 79.5	960	415 x 320 x 260	China	85322200
	45 to 51	32 in all/2 lines	160	304 x 196 x 92	960	415 x 320 x 295	China	85322200
20	21 to 31.5	32 in all/2 lines	160	334 x 217 x 68	1280	448 x 354 x 295	China	85322200
	35 to 36	32 in all/2 lines	160	334 x 217 x 79.5	960	448 x 354 x 248	China	85322200
	42 to 51	32 in all/2 lines	160	334 x 217 x 92	960	448 x 354 x 295	China	85322200
	40 to 51	32 in all/2 lines	160	334 x 217 x 92	960	448 x 354 x 295	China	85322200

PACKAGING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS
STRAIGHT LEADS ▪ BULK PACK



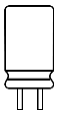
Ø D (mm)	Length L (mm)	Inner bag / Inner row (pcs)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
22	21 to 26	25 in all/2 lines	100	304 x 196 x 68	800	415 x 320 x 295	China	85322200
	30 to 41	25 in all/2 lines	100	305 x 197 x 79.5	600	415 x 320 x 260	China	85322200
	45 to 70	25 in all/2 lines	100	304 x 196 x 92	600	415 x 320 x 295	China	85322200
	21 to 26	25 in all/2 lines	100	334 x 217 x 68	800	448 x 354 x 295	China	85322200
25	30 to 41	25 in all/2 lines	100	334 x 217 x 79.5	600	448 x 354 x 260	China	85322200
	≥ 45	25 in all/2 lines	100	334 x 217 x 92	600	448 x 354 x 295	China	85322200
	21 to 26	25 in all/2 lines	100	304 x 196 x 68	800	415 x 320 x 295	China	85322200

PACKAGING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS
CUTTED LEADS ▪ BULK PACK



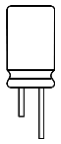
Ø D (mm)	Length L (mm)	Inner bag / Inner row (pcs)	Inner box quantity (pcs)	Cutting height (mm)	Outer box quantity (pcs)	Outer carton quantity (pcs)	Country of origin	Tariff number
3	All L	2500/bag	10000	N/A	6	60000	China	85322200
4	5 to 7	2000/bag	8000	N/A	5	40000	China	85322200
5	5 to 9	2000/bag	8000	N/A	5	40000	China	85322200
	11 to 12	1000/bag	6000	C < 7	5	30000	China	85322200
	11 to 12	1000/bag	4000	C ≥ 7	5	20000	China	85322200
6.3	5 to 7	1000/bag	6000	N/A	5	30000	China	85322200
	9 to 12	1000/bag	4000	N/A	5	20000	China	85322200
	15 to 20	1000/bag	4000	N/A	6	24000	China	85322200
8	≤ 9	500/bag	4000	N/A	6	24000	China	85322200
	11 to 13	500/bag	3000	C < 7	6	18000	China	85322200
	14	500/bag	2500	C < 7	6	15000	China	85322200
	15 to 16	500/bag	2000	C < 7	6	12000	China	85322200
	20	500/bag	1000	C < 7	12	12000	China	85322200
	30 to 35.5	500/bag	1000	C < 7	8	8000	China	85322200
	36 to 41	40/line	840	C < 7	10	8400	China	85322200
	42 to 51	40/line	840	C < 7	6	5040	China	85322200
	52 to 60	40/line	840	C < 7	6	5040	China	85322200
10	7 to 10	500/bag	1000	C < 7	12	12000	China	85322200
	12 to 17	500/bag	1000	C < 7	10	10000	China	85322200
	20	500/bag	1000	C < 7	8	8000	China	85322200
	24 to 25	500/bag	1000	C < 7	6	6000	China	85322200
	30 to 35.5	32/line	540	C < 7	12	6480	China	85322200
	36 to 41	32/line	540	C < 7	10	5400	China	85322200
	42 to 51	32/line	540	C < 7	8	4320	China	85322200
	52 to 60	32/line	540	C < 7	6	3240	China	85322200
13	31	25/line	350	C < 7	6	2100	China	85322200
	35 to 41	25/line	350	C < 7	5	1750	China	85322200
	42 to 51	25/line	350	C < 7	4	1400	China	85322200
	52 to 60	25/line	350	C < 7	4	1400	China	85322200
	35 to 40	25/line	350	C ≥ 12	4	1400	China	85322200
16	16 to 21	18/line	180	N/A	6	1080	China	85322200
	25 to 31.5	18/line	180	C < 7	6	1080	China	85322200
	25 to 31.5	18/line	180	C ≥ 7	5	900	China	85322200
	35.5 to 41	18/line	180	C < 7	5	900	China	85322200
	35.5 to 41	18/line	180	C ≥ 7	4	720	China	85322200
18	15 to 21	32 in all/2 lines	160	N/A	6	960	China	85322200
	25 to 31.5	32 in all/2 lines	160	C < 7	6	960	China	85322200
	25 to 31.5	32 in all/2 lines	160	C ≥ 7	5	800	China	85322200
	35.5 to 41	32 in all/2 lines	160	C < 7	5	800	China	85322200
	35.5 to 41	32 in all/2 lines	160	C ≥ 7	4	640	China	85322200
	≥ 45	32 in all/2 lines	160	N/A	4	640	China	85322200
20	25 to 40	30 in all/2 lines	120	C < 7	6	720	China	85322200
	25 to 40	30 in all/2 lines	150	C ≥ 7	4	600	China	85322200
	≥ 41	30 in all/2 lines	150	C < 7	4	600	China	85322200
	≥ 41	30 in all/2 lines	120	C ≥ 7	4	480	China	85322200

PACKAGING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS
CUTTED LEADS ▪ BULK PACK



Ø D (mm)	Length L (mm)	Inner bag / Inner row (pcs)	Inner box quantity (pcs)	Cutting height (mm)	Outer box quantity (pcs)	Outer carton quantity (pcs)	Country of origin	Tariff number
22	21 to 31	25 in all/2 lines	100	C < 7	6	600	China	85322200
	21 to 31	25 in all/2 lines	100	C ≥ 7	5	500	China	85322200
	36 to 41	25 in all/2 lines	100	C < 7	5	500	China	85322200
	36 to 41	25 in all/2 lines	100	C ≥ 7	6	600	China	85322200
	46 to 51	25 in all/2 lines	100	C < 7	4	400	China	85322200
	46 to 51	25 in all/2 lines	100	C ≥ 7	3	300	China	85322200
	≥ 56	25 in all/2 lines	100	C < 7	3	300	China	85322200
25	21 to 26	25 in all/2 lines	100	N/A	6	600	China	85322200
	30 to 37	25 in all/2 lines	100	N/A	5	500	China	85322200
	40 to 51	25 in all/2 lines	100	N/A	4	400	China	85322200
	≥ 52	25 in all/2 lines	100	N/A	3	300	China	85322200

PRODUCT CODE ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS



THT type example:
FB series ▪ 100µF ▪ 16V ▪ ±20% ▪ Ø 5mm ▪ H 11mm ▪ P 2mm ▪ Tape Ammo

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F	B	1	0	1	M	0	1	6	C	1	1	0	E	T	B	-	-	-	-
Series		Capacitance			Capacitance tolerance	Voltage			Case Ø (mm)	Height (mm)			Type code	Taping / lead treatment *		Special requirement			

Code	µF
R47	0.47
010	1
4R7	4.7
100	10
220	22
101	100
561	560
102	1000
472	4700
103	10000
223	22000

Code	%
H	±5
K	±10
S	±15
M	±20
N	±30
D	±40
I	+5 to +20
B	0 to -20
G	0 to +10
Z	0 to +20
Y	0 to +30
X	0 to +40
A	0 to +50
J	-5 to +20
C	-5 to +30
E	-8 to +5
V	-10 to +20
Q	-10 to +30
T	-10 to +50
W	-20 to +10
P	-15 to +20
L	-25 to +20
U	-30 to 0
F	-35 to 0
O	-50 to 0

Code	Volt
6R3	6.3
010	10
016	16
025	25
035	35
050	50
063	63
080	80
100	100
160	160
200	200
220	220
250	250
350	350
400	400
420	420
450	450
500	500
550	550

Code	ØD
C	5
E	6.3
F	8
G	10
Z	12.5
I	13
J	16
K	18

Code	H
090	9
110	11
115	11.5
120	12
125	12.5
140	14
150	15
160	16
200	20
210	21
250	25
315	31.5
350	35
355	35.5
410	41

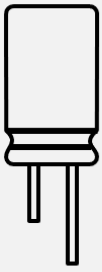
Code	Type
A	Without lead treatment
E	With lead treatment

See chapters taping or lead treatment

* See chapter taping or lead treatment for further information
Please consult CapXon for further assistance

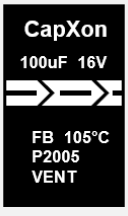
MARKING ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Aluminum Electrolytic Capacitor ▪ Radial type



CapXon:	Manufacturer trademark
100µF:	Nominal capacitance
16V:	Rated voltage (V) ▪ Standard type
	(-) polarity (Cathode indicate)
FB:	Series
105°C:	Maximum operating temperature
P2005:	Production datacode year/week (ex. 2020/CW05)
VENT:	Safety vent

Standard type

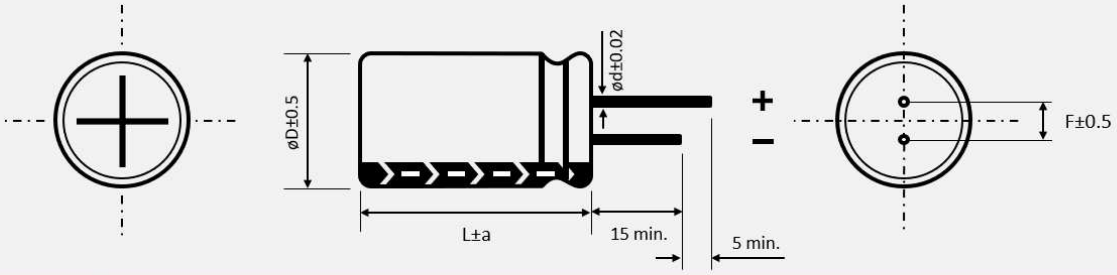


Front side

Back side

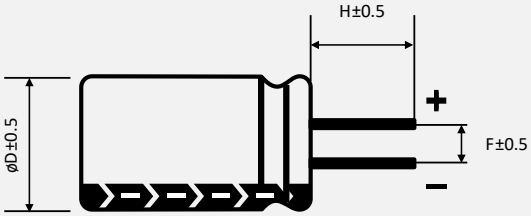
AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ standard version ▪ standard lead spacing (all dimension in mm)



Ø D (mm)	4	5		6.3		8				10	13	16		18		22	25
F (mm)	1.5	2		2.5		3.5				5		7.5		7.5		10	12.5
L (mm)	All	≤ 7	> 7	≤ 5	> 5	≤ 5	7	9 to < 20	≥ 20	All		25 to 35.5	< 25 & ≥ 40	25 to 31.5	< 25 & ≥ 35	All	All
Ø d (mm)	0.45	0.45	0.5	0.45	0.5	0.45	0.5		0.6	0.6		0.8		0.8		0.8	1
a (mm)	1	1		1		1	1	1.5	1.5	1.5		1.5	2	1.5	2	2	

Radial type ▪ CA version ▪ cutted leads ▪ standard lead spacing



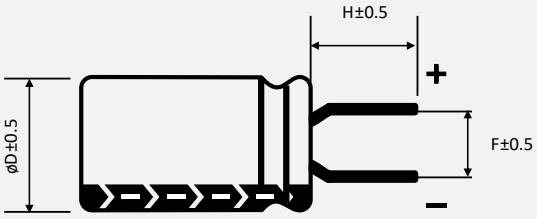
Example

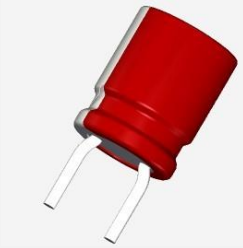
Length „H" customized. See product code table customized lead length for further reference.

Ø D (mm)	4	5	6.3	8	10	13	16	18	22	25
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5	10	12.5

F H	2 2 1	M	6 R 3	E	1 1 0	E	C A	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ CE version ▪ cutted leads ▪ wide lead spacing ≤ 2.5mm





Example

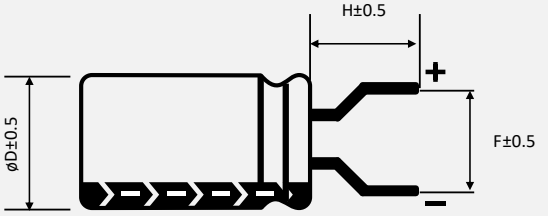
Length „H" customized. See product code table customized lead length for further reference.

Ø D (mm)	4	5
F (mm)	2	2.5

S A	2 R 2	M	0 5 0	B	0 5 0	E	C E	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ CF / CG / CH / CI version ▪ cutted leads ▪ wide lead spacing ≥ 2.5mm



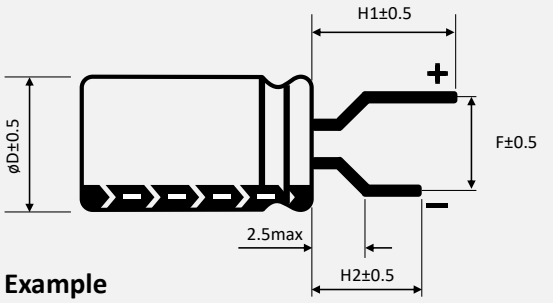
Ø D (mm)	4	4	4	5	5	6.3	6.3	8	10	13
F (mm)	2.5	3.5	5	3.5	5	3.5	5	5	7.5	7.5
Code	CF	CG	CH	CG	CH	CG	CH	CH	CI	CI

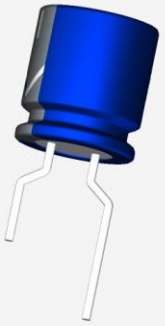
Example

Length „H" customized. See product code table customized lead length for further reference.

G H	1 2 1	M	0 1 6	E	1 1 0	E	C H	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ FA / FE version ▪ wide lead spacing ≥ 5mm ▪ long anode





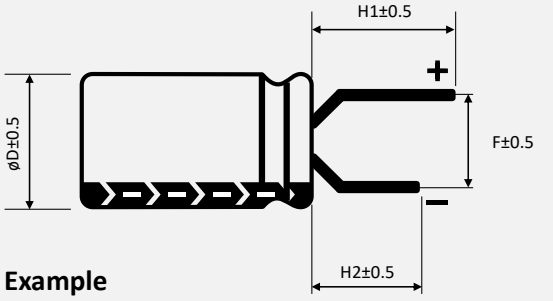
Length „H1" and „H2" customized.
Consult CapXon to specify the details.

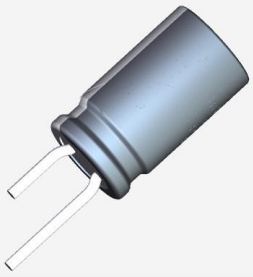
Ø D (mm)	4	5	6.3	8	10	13
F (mm)	5	5	5	5	7.5	7.5
Code	FA	FA	FA	FA	FE	FE

Example

S M	2 2 1	M	0 1 0	E	0 7 0	E	F A	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ FB / FC / FD version ▪ wide lead spacing ≤ 3.5mm ▪ long anode





Length „H1" and „H2" customized.
Consult CapXon to specify the details.

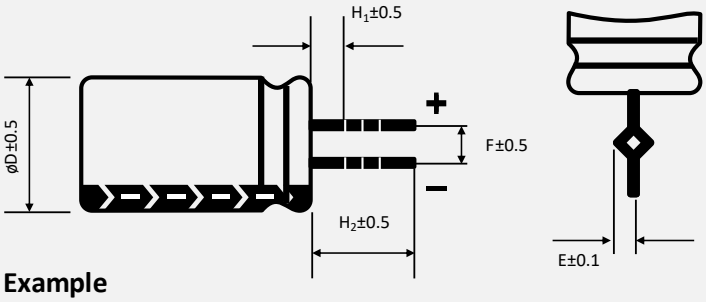
Ø D (mm)	4	5	6.3
F (mm)	2	2.5	3.5
Code	FB	FC	FD

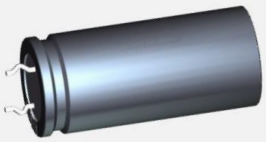
Example

S G	R 3 3	M	0 5 0	B	0 7 0	E	F B	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ KA version ▪ kinked anode and cathode ▪ standard lead spacing



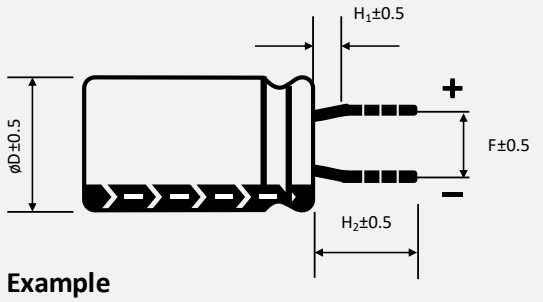


ØD (mm)	5	6.3	8	10	13	16	18	22
F (mm)	2	2.5	3.5	5	5	7.5	7.5	10
H_1 (mm)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
H_2 (mm)	4	4	4	4.5	4.5	4.5	4.5	4.5
E (mm)	1.12	1.12	1.32	1.32	1.32	1.32	1.32	1.82

Example

T E	2 2 2	M	0 2 5	J	3 5 5	E	K A	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ KE version ▪ kinked anode and cathode ▪ wide lead spacing ≤ 2.5mm

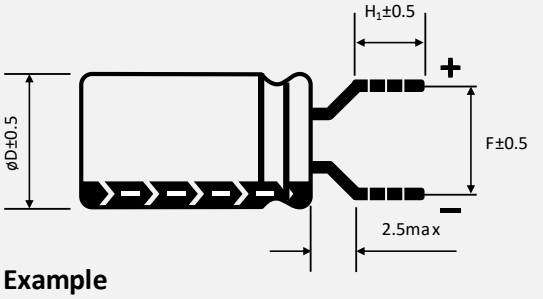


ØD (mm)	4	5
F (mm)	2	2.5
H_1 (mm)	1.8	1.8
H_2 (mm)	4	4
E (mm)	1.12	1.12

Example

G W	1 5 1	M	6 R 3	C	0 9 0	E	K E	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ KF version ▪ kinked anode and cathode ▪ wide lead spacing 5mm



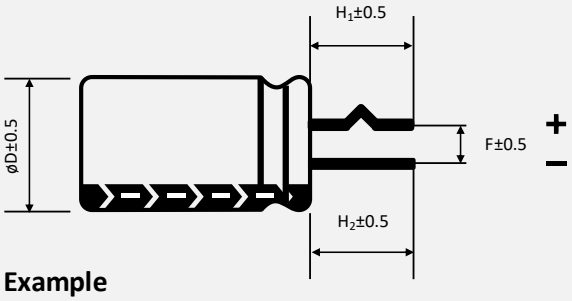
ØD (mm)	5	6.3	8
F (mm)	5	5	5
H_1 (mm)	4	4	4
E (mm)	1.12	1.12	1.32

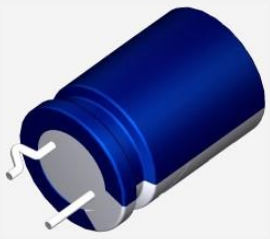
Example

T H	2 2 1	M	0 2 5	F	1 1 5	E	K F	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ CK version ▪ kinked anode



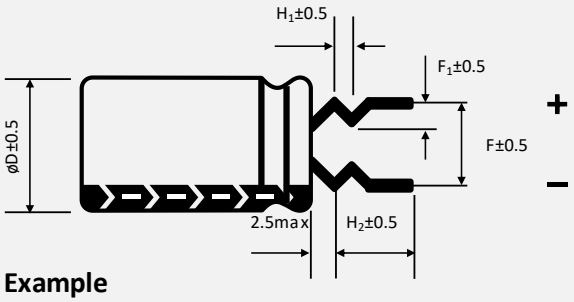


ØD (mm)	4	5	6.3	8	10	13	16	18
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5
H_1 (mm)	4	4	4	4	4.5	4.5	4.5	4.5
H_2 (mm)	4	4	4	4	4.5	4.5	4.5	4.5

Example

G S	4 7 1	M	0 2 5	F	1 1 5	E	C K	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ EF version ▪ double kinked anode and cathode ▪ lead spacing 5mm

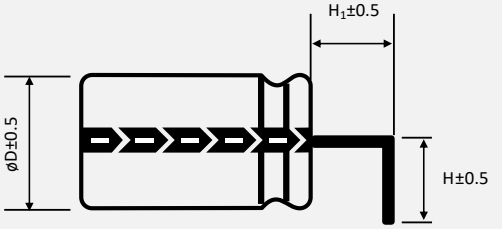


ØD (mm)	4	5	6.3	8
F (mm)	5	5	5	5
H_1 (mm)	1.8	1.8	1.8	1.8
H_2 (mm)	4	4	4	4
F_1 (mm)	1.2	1.2	1.2	1.2

Example

K W	1 0 0	M	0 6 3	C	0 9 0	E	E F	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ CR version ▪ L - bended leads ▪ cathode right



ØD (mm)	4	5	6.3	8	10	13	16	18	22	25
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5	10	12.5
H_1 (mm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

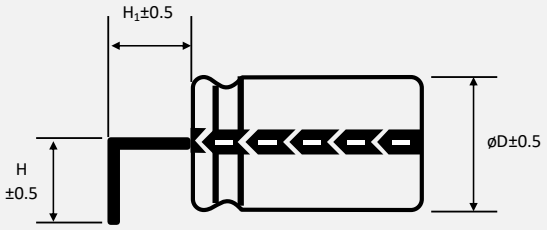
Example

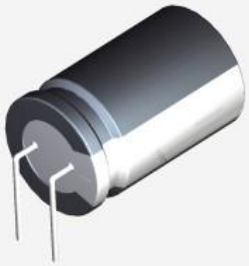
Length „H“ customized. See product code table customized lead length for further reference.

F K	1 0 1	M	4 5 0	K	3 5 5	E	C R	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ CL version ▪ L - bended leads ▪ cathode left





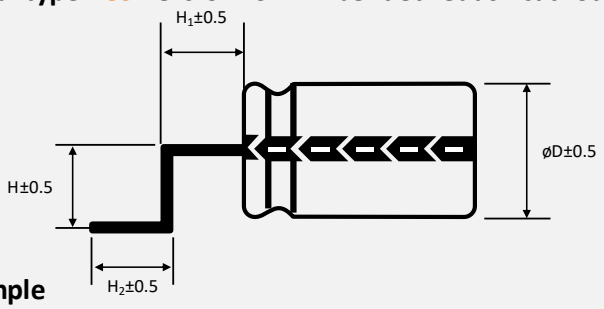
ØD (mm)	4	5	6.3	8	10	13	16	18	22	25
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5	10	12.5
H_1 (mm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Example

Length „H" customized. See product code table customized lead length for further reference.

K S	2 2 0	M	4 0 0	I	2 0 0	E	C L	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ CS version ▪ SMD - bended leads ▪ cathode left



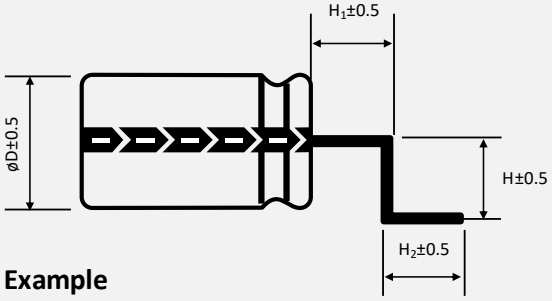
Length „H", „H_1" and „H_2" customized
Ask CapXon for further assistance

ØD (mm)	4	5	6.3	8	10	13	16	18	22	25
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5	10	12.5

Example

F K	3 R 3	M	4 5 0	G	0 9 0	E	C S	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ CZ version ▪ SMD - bended leads ▪ cathode right



Length „H", „H_1" and „H_2" customized
Ask CapXon for further assistance

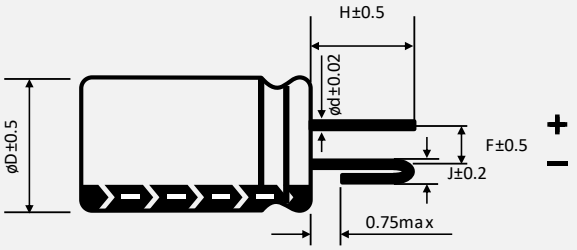
ØD (mm)	4	5	6.3	8	10	13	16	18	22	25
F (mm)	1.5	2	2.5	3.5	5	5	7.5	7.5	10	12.5

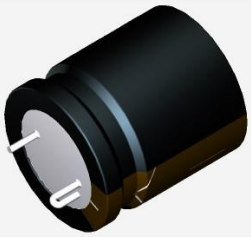
Example

R W	4 7 2	M	0 6 3	M	5 0 0	E	C Z	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

AVAILABLE LEAD TREATMENTS ▪ RADIAL ALUMINUM ELECTROLYTIC CAPACITORS

Radial type ▪ JI version ▪ polarity protected footprint ▪ cathode bended





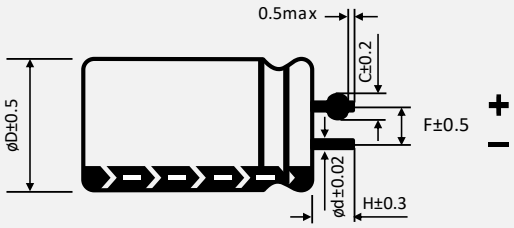
ØD (mm)	10	12.5	13	16	18	22
F (mm)	5	5	5	7.5	7.5	10
J (mm)	1.5	1.5	1.5	1.9	1.9	1.9
Ød (mm)	0.6	0.6	0.6	0.8	0.8	0.8

Example

Length „H“ customized. See product code table customized lead length for further reference.

F L	4 7 0	M	4 0 0	K	2 0 0	E	J I	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

Radial type ▪ CD version ▪ polarity protected footprint ▪ anode pressed



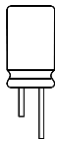
ØD (mm)	10	12.5	13	16	18	22
F (mm)	5	5	5	7.5	7.5	10
C (mm)	1.1	1.1	1.1	1.4	1.4	1.4
Ød (mm)	0.6	0.6	0.6	0.8	0.8	0.8

Example

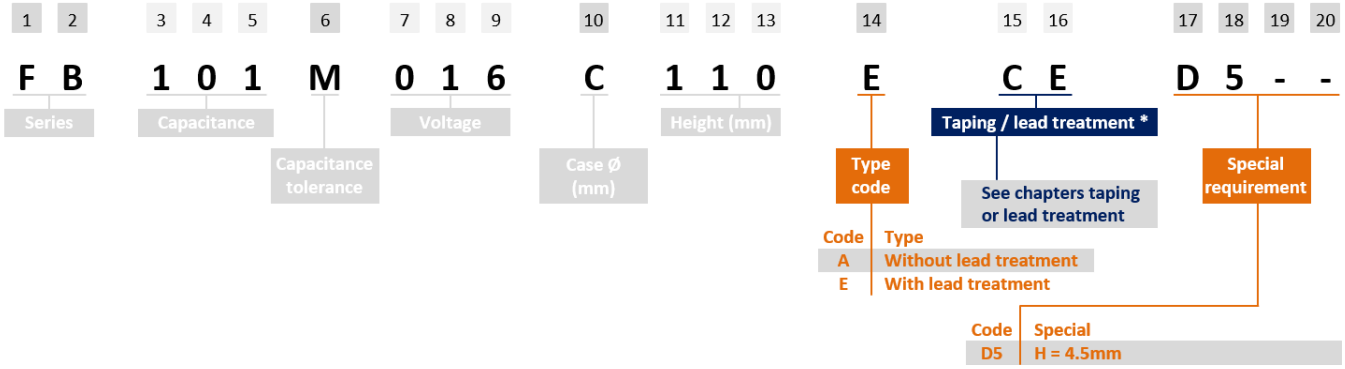
Length „H“ customized. See product code table customized lead length for further reference.

G L	2 2 1	M	0 5 0	G	1 6 0	E	C D	- - - -
Series	Capacitance	Tolerance	Voltage	ØD (mm)	Height (mm)	Type code	Lead treatment	Special requirement

PRODUCT CODE TABLE ▪ CUSTOMIZED LEAD LENGTH



THT type example:
FB series ▪ 100µF ▪ 16V ▪ ±20% ▪ Ø 5mm ▪ L 11mm ▪ CE version, wide lead spacing ▪ P 2.5mm ▪ H 4.5mm



Product code 17th digit	H (mm)
A	1
B	2
C	3
D	4
E	5
F	6
G	7
H	8
I	9
J	10
K	11
L	12
M	13
N	14
O	15
P	16
Q	17
R	18
S	19
T	20
U	21
V	22
W	23
X	24
Y	25
Z	26

Product code 18th digit	H (mm)
0	0.0
1	0.1
2	0.2
3	0.3
4	0.4
5	0.5
6	0.6
7	0.7
8	0.8
9	0.9

Example H (mm)	Product code Non-Automotive
4.5	**D5**
6.0	**F0**
10.7	**J7**
16.5	**P5**

The 17th digit is according basic ordering of the Latin alphabet and shows the measure "H" in front of the decimal separator. The 18th digit follows the numbering from 0 to 9 and shows the measure "H" after the decimal separator.

PRECAUTIONS & GUIDELINES ▪ CONTENT

1. PRECAUTIONS & GUIDELINES ▪ LIGHTING PRODUCTS

In the following Precautions and Guidelines, CapXon provides instructions and requirements to assure a proper handling and desired performance of capacitors. This version is an abbreviation of the full General Precautions and Guidelines, which is available on our webpage.

1.1. POLARITY

All conventional Electrolytic Capacitors have a polarity due to the internal construction. This polarity is marked on the component by printing on the top of component or on the sleeve of Aluminum Electrolytic Capacitors, including Radial, Snap-In and Screw types.

Any reverse voltage can cause short circuit breakdown of capacitor or leakage of electrolyte. Electrolytic Capacitors is not designed for AC-voltage supply and only meant for DC-voltage applications.

For an application where polarity in circuit can be reversed or unknown, specific bi-polar aluminium electrolytic capacitors shall be used. We offer such components within our product range.

1.2. OVERVOLTAGE

Overvoltage can damage the capacitor and can cause a drastic increase in leakage current, which possibly shortens the lifetime of the capacitor. In a worst case, short circuit failure mode can happen. As a result, do not apply any continuous or temporary overvoltage.

The applied operating voltage, which is applied to the capacitor, should not exceed the rated voltage of the capacitor.

1.3. OPERATING TEMPERATURE

Only operate the capacitor within the limits of allowed temperature range, which is specified by datasheet. Be aware that the sum of thermal stress by ambient condition plus electrical stress is the main driving factor for aging. As the thermal stress level gets higher, the expected capacitor lifetime would be lower.

A drop in applied temperature, ambient condition or cooling within application can enlarge the expected lifetime of the capacitor. For details, please see further documentation of lifetime estimation.

1.4. RIPPLE CURRENT

The applied ripple current shall not exceed the stated max. ripple current I_R on the datasheet at the specific frequency.

When capacitors are overstressed by ripple, it can generate massive heat inside the capacitor, which can result in deterioration, vent operation or capacitor breakage.

1.5. CHARGE AND DISCHARGING

Frequent and quick charge / discharge generates heat inside the capacitor and can cause possible increase of leakage current, reduction of the expected lifetime, decrease of capacitance, vent operation or breakage.

For such applications please see design rules or consult our technical support for assistance.

1.6. SLEEVE MATERIAL

The standard sleeve material for the majority of our Radial, Snap-In and Screw mounting capacitors is PET and for some series PVC is used as sleeve material. When sleeve is exposed to xylene, toluene or similar and afterwards exposed to high heat, the sleeve may be cracked or damaged.

The sleeve is not used as insulating material or layer and does not insulate capacitor to surroundings. For needed insulation, further actions need to be considered by customer and please follow our recommended design rules.

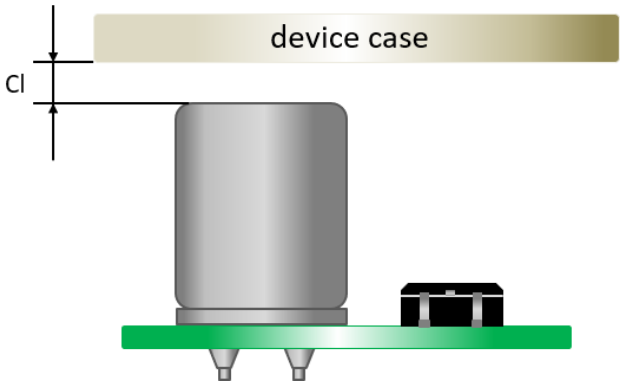
Sleeves are applied for all Aluminum Electrolytic Capacitors with Radial, Snap- In or Screw mounting and if desired for further customized solutions.

1.7. VENT & VENT OPERATION AT EMERGENCY

As a safety feature, most our regular electrolytic capacitors have a so-called vent, which is a pre-determined breaking point. In case of overstressed component, it can lead to internal gassing and due to this an internal overpressure will result in vent operation. So, the vent will open to release such pressure and gas can become visible. If user detects vent operation or gassing out of the capacitor when operating, disconnect the application immediately from power supply to turn it off directly. If it cannot be turned off, the capacitor or the conductive liquid / gas of electrolyte can result in short-circuits, which can dramatically damage the application.

Please notice to avoid being near with body or face above or in direction of capacitors vent when powered. When the running application is overstressed, gas leakage by vent is possible. By this gas with temperatures higher than 100°C can occur and can hurt human body and face. In such an event, if contact with skin, wash it immediately with plenty of water and soap. If contact with eyes, rinse immediately (e.g. eye shower) with plenty of water. If gas is inhaled, gargle right away with plenty of water. For all three cases, please consult a doctor for medical advices.

For proper operation of vent, consider space between the vent and covering surfaces (e.g. housing) as stated at the table below, it is strongly recommended for your mechanical construction / build-up of your product:



Minimum distance to be observed for the safe operation of the capacitor

Case diameter Ø	Clearance distance Cl
6.3mm to 16mm	Min. 2mm
18mm to 35mm	Min. 3mm
≥ 40mm	Min. 5mm

Recommended minimum clearance distance between topside capacitor and device case

If such a space is not provided, the vent will not operate completely or even cannot open in case of overpressure.

Case sizes which are smaller than 6.3mm in diameter have no vent on top, for these no space need to be considered.

1.8. PIN CUTTING & BENDING

Please take absolute care when cutting or bending pins, that the pin is fixed mechanically in direction of rubber sealant. It is necessary that the mechanical force while cutting and bending, which results in pulling or pressing force on pin, does not stress the inner construction of capacitor element or to damage the rubber sealant. Excessive pulling or pressing force on the pin with missing fixation can result in damage of internal pin to capacitor element connection

and also the sealing can be weakened. So, please take care to assure appropriate cutting and bending. Do not predamage the capacitors and shorten their lifetime performance by incorrect handling.

1.9. SOLDERING CONDITIONS

For recommended wave solder profile, please see additional solder instruction at section 2.1.

Improper soldering conditions may shrink or break the sleeve. Additionally, excessive heat can damage the internal capacitor element as terminals and lead wires conduct heat into the capacitor.

Any hand soldering is not recommended. No permission is released by CapXon side either. In case of such a usage, customer need to validate solder result and applied component stress within their own manufacturing process.

1.10. RESISTANCE TO CHEMICALS AND SOLVENTS FOR WASHING, GLUING, FILLING AND COATING

Due to the wide variety of suppliers and different chemical formulas of washing, gluing, filling and coating materials, the individually used material and appliance process need to be validated by customer itself. It is not possible to provide any global material usage approval from our side. CapXon can provide additional information, including combination of chemicals which could be critical to the component behavior and can support measurements of component performance after appliance of washing, gluing, filling or coating martials. For specific support, please kindly contact our technical support for further advices.

1.11. CLEANING AND WASHING

Do not wash the assembled capacitors with the following cleaning agents:

- **Xylene**
  - can cause deterioration of the rubber seal material
- **Halogenated solvents**
  - can cause corrosion and electrical failure modes
- **Petroleum based solvents**
  - can cause degeneration of the rubber seal material
- **Alkali based solvents**
  - can cause corrosion and dissolving of aluminum can
- **Acetone**
  - component marking possibly dissolve

After finishing cleaning and washing, the below points need to be verified by customer:

Dry all solvents properly from PCB as well as capacitor surface sufficiently and apply air blower or air knife, with temperatures within the temperature range of the product specification, if needed.

Monitor pH value, conductivity, specific gravity and water content of cleaning solvents to be sure of possible contaminations and pollution. Contaminations can negatively affect the performance of the capacitor.

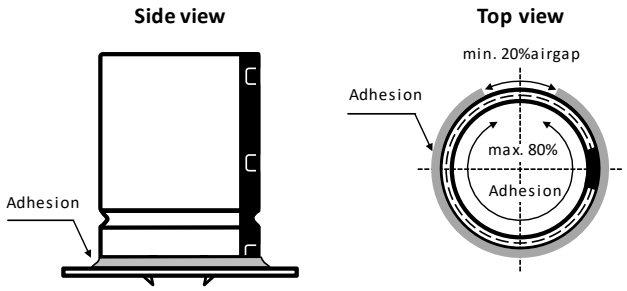
1.12. GLUING, FILLING OR COATING

It is not allowed to use any gluing (adhesives), filling or coating materials, which contains halogenated solvents. Halogen ions are critical, because they can diffuse or creep in the capacitor through rubber sealing and can possibly damage the internal capacitor element /structure result in serious failure modes for the capacitor.

Additionally, please pay attention to the following points:

- Make sure that the surface of capacitor and the area between component bottom / rubber sealant is dry and clean before appliance of gluing, filling or coating material. It is important to avoid any contamination with chemical residues (e.g. flux residues, cleaning).
- Please follow and meet the stated gluing, coating, filling, heating and curing instructions from manufacturer or supplier of such materials. Be aware of possible shrinkage of such materials. Verify that the hardening was properly done and that no solvents / agents do remain.
- There should be no excessive heat nor mechanical pressure /stress at any stages from the production on customer side. Be aware of the possible material shrinkage of used material. High material shrinkage which leads to damage on capacitor is not CapXon's responsibility.
- The used materials of gluing, coating or filling can possibly react with the marking of component and this can change optical appearance such as the appearance and legibility.
- If the rubber seal surface is fully covered by gluing, filling or coating material, it is no longer possible to have a natural diffusion of gas between the inside of the capacitor and the ambient. So, to avoid such situation, it is strongly recommended to block maximum 80% of the sealed section on the bottom side of the capacitor.

Please find the example below of how gluing could be applied on Radial and Snap-In types.



Gluing reference example of a Snap-In capacitor

1.13. OPERATION AND ENVIRONMENT

As long as the application is powered, in operation and cap is not discharged, the user is never permitted to touch the electric terminals of the capacitor directly or to bridge the terminals by hand or any other conductive liquid or solid material. Otherwise, a short circuit of terminals can happen, and a hard discharge can damage capacitor / application as well as it can harm the operator.

Within operation, please avoid the following environmental conditions to assure proper capacitor operation:

- high vibration, shocks or mechanical stress. For tested and allowed conditions, please see available references or contact us for details
- avoid direct sunlight, ozone and any kind of radiation or ultraviolet rays
- corrosive or toxic gases (e.g. ammonium, chlorine and compounds, bromine and compounds, hydrogen sulfide, sulfuric acid)
- ambient with high amount of damp condensation, water or types of oil

1.14. MECHANICAL STRESS

Best possible, avoid mechanical stress for the capacitor and do not apply any excessive mechanical stress to the lead wire pins or terminal.

After mounting, do not lift nor carry the PCB assembly by just grabbing the capacitor to pick up the board.

1.15. STORAGE

In case of long-term storage without applying voltage to the capacitor, leakage current tends to increase.

By applying the rated voltage before usage, the dielectric layer of aluminium oxide and leakage current can be stabilized.

If the capacitor is for more than 12 months, it is recommended to apply the DC rated voltage V_R for 30 minutes through 1kΩ protective series resistor.

The storage conditions for storage on customer side should be monitored and controlled to a temperature of 5°C up to 35°C and less than 75% rel. humidity.

1.16. DISPOSAL

Please follow your local governmental and organizational restrictions for disposal and if needed, contact your local responsible for correct handling.

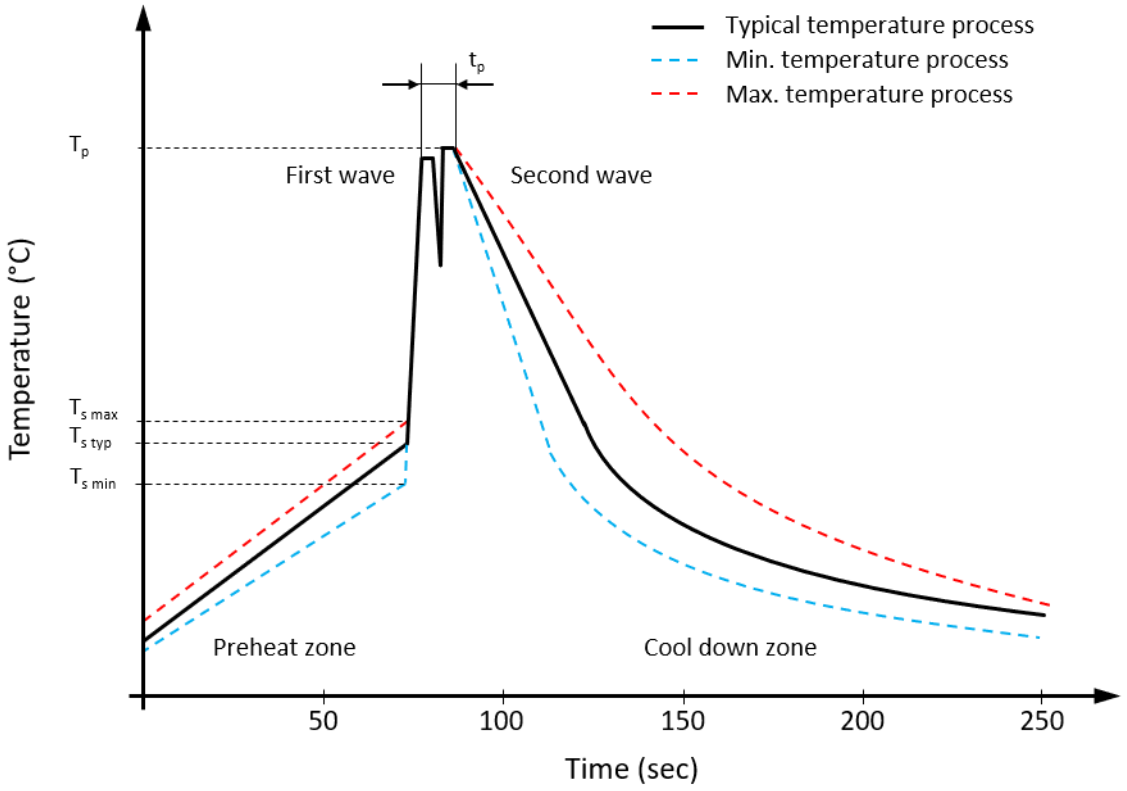
In case of incineration, punch holes in the aluminum can in advanced to avoid explosion of capacitor and then burn with at least 800°C, otherwise it can result toxic gas.

2. SOLDERING INSTRUCTIONS

In the following section CapXon's leadfree solder profile are stated in detail.

2.1. WAVE SOLDERING ▪ RADIAL CAPACITORS

Recommended wave soldering conditions



Classification wave soldering profile ▪ Refer to EN 61760-1: 2006

Profile Features		Value ▪ Pb-free Assembly	Value ▪ Sn-Pb Assembly
Preheat temperature min.	$T_{s\,min}$	100 °C	100 °C
Preheat temperature typical	$T_{s\,typ}$	120 °C	120 °C
Preheat temperature max.	$T_{s\,max}$	130 °C	130 °C
Preheat time t_s from $T_{s\,min}$ to $T_{s\,max}$	t_s	70 seconds	70 seconds
Peak temperature	T_p	245 °C ~ 260 °C	235 °C ~ 260 °C
Time of actual peak temperature	t_p	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down date min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second
Time 25°C to 25°C		4 minutes	4 minutes

CapXon

IATF 16949

AEC-Q200

ISO 9001

ISO 14001

QC 080000

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