

NCD3T400MP330S 3300 V Silicon Carbide Bi-Directional MOSFET (CD-BiFET)

Features

- State-of-the-art SiC MOSFET technology
- Reliable gate oxide process
- 100% avalanche tested
- Dual gate control
- Electrically isolated baseplate

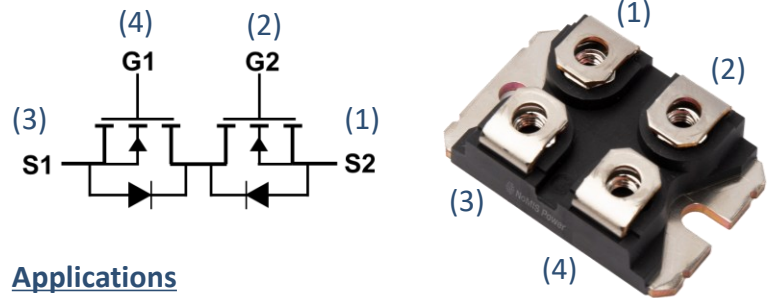
Benefits

- Higher system efficiency
- Reduced cooling requirements
- Increased power density
- Increased system switching frequency
- Enhanced system reliability
- Reduced total harmonic distortion

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	Note
Source-Source Voltage	$V_{(BR)SS}$	$T_C = 25\text{ }^\circ\text{C}$	3300	-	-	V	
Source-Source Leakage Current	I_{SSS}	$V_{S2S1} = 3300\text{ V}, V_{G1S1} = 0\text{ V}$	-	1	100	μA	
Gate-Source Voltage	$V_{GS(max)}$		-10	-	25	V	
	$V_{GS,op}$	Recommended Operation	-	-5/+20	-		
Gate Threshold Voltage	$V_{G1S1(th)}$	$V_{G1S1} = V_{S2S1}, V_{G1S1} = 20\text{ V}, I_{S2} = 2.5\text{ mA}$	2	2.64	3	V	Fig. 4
Source-Source On-State Resistance	$R_{SS(on)}$	$T_C = 25\text{ }^\circ\text{C}$	-	400	-	mΩ	Fig. 1
Continuous Current	I_{SS}	$V_{G1S1} = 20\text{ V}, T_C = 25\text{ }^\circ\text{C}$	-	20	-	A	
Turn-On Switching Energy	E_{ON}	$V_{S2} = 2000\text{ V}, I_{S2} = 15\text{ A}, V_{G1S1} = -5 / +20\text{ V}, R_{G(ext)} = 10\text{ }\Omega, L = 1.7\text{ mH}$	-	1550	-	μJ	Fig. 3
Turn-Off Switching Energy	E_{OFF}		-	155	-		
Total Switching Energy	E_{TOT}		-	1705	-		

$V_{(BR)SS}$	I_{SS}	$R_{SS(on)}$	Package
3300 V	20 A	400 mΩ	SOT-227



Applications

- Solid-state circuit breakers
- Matrix (AC/AC) converters
- Current source converters
- Energy storage systems
- Solid-state power controllers
- Uninterruptible power supplies

Typical Performance

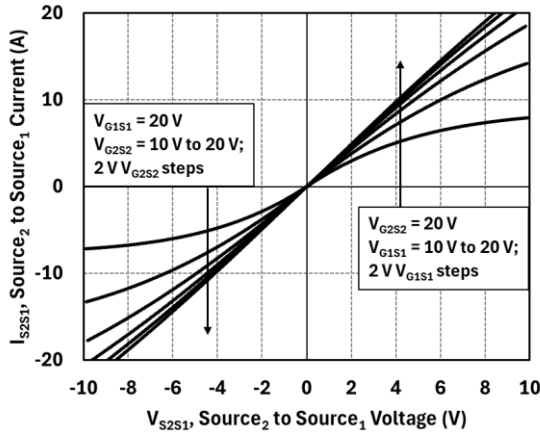


Figure 1: Forward and Reverse Output Characteristics: $t_p < 200 \mu s$, $T_c = 25 \text{ }^\circ\text{C}$

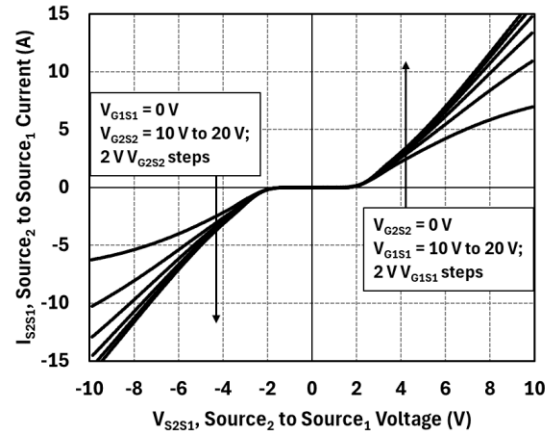


Figure 2: Forward and Reverse Output Characteristics: $t_p < 200 \mu s$, $T_c = 25 \text{ }^\circ\text{C}$

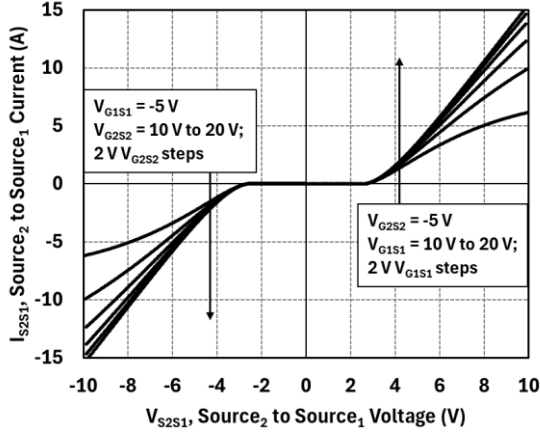


Figure 3: Forward and Reverse Output Characteristics: $t_p < 200 \mu s$, $T_c = 25 \text{ }^\circ\text{C}$

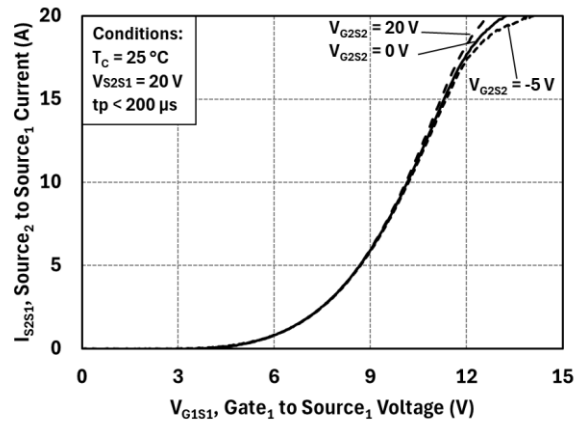


Figure 4: Transfer Characteristics

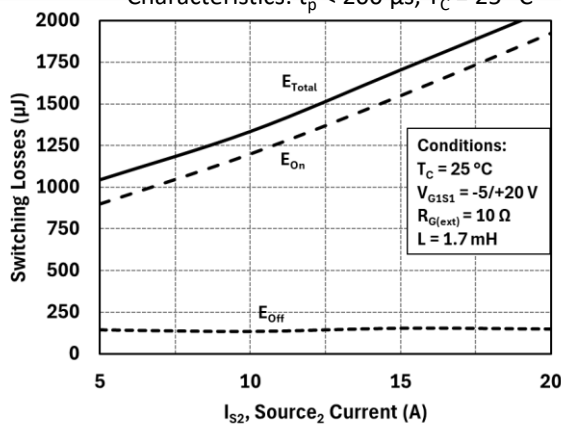


Figure 5: Switching Energy vs. Current

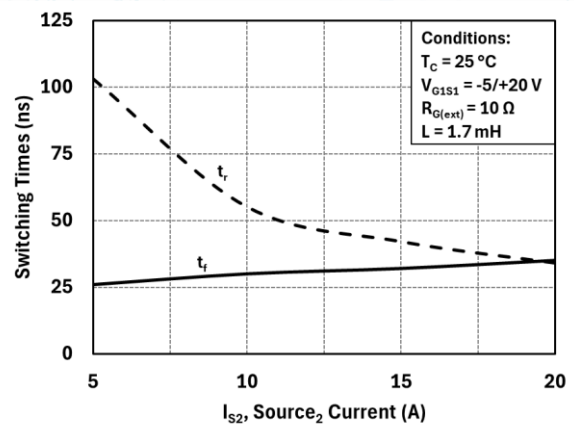



Figure 6: Switching Times Vs. Current

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