Silicon Carbide (SiC) MOSFET – EliteSiC, 33 mohm, 650 V, M2, TOLL

NTBL045N065SC1

Features

- Typ. $R_{DS(on)}$ = 33 mΩ @ V_{GS} = 18 V
  Typ. $R_{DS(on)}$ = 45 mΩ @ V_{GS} = 15 V
- Ultra Low Gate Charge ($Q_{G(tot)}$ = 105 nC)
- Low Effective Output Capacitance (C_{oss} = 162 pF)
- 100% Avalanche Tested
- T_J = 175°C
- RoHS Compliant

Typical Applications

- SMPS (Switching Mode Power Supplies)
- Solar Inverters
- UPS (Uninterruptable Power Supplies)
- Energy Storage

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	650	V
Gate to Source Voltage	V_{GS}	8/+22.6	V

THERMAL CHARACTERISTICS

Parameter	Symbol	Max	Units
Junction to Case Steady State (Note 2)	$R_{\theta JC}$	0.43	°C/W
Junction to Ambient Steady State (Notes 1, 2)	$R_{\theta JA}$	43	°C/W

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA		650			V
Drain to Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	I_D = 20 mA, refer to 25°C			0.15		V/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 650 V	T_J = 25°C			10	μA
			T_J = 175°C			1	mA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = +18/ 5 V, V_{DS} = 0 V				250	nA
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_D = 8 mA		1.8	2.8	4.3	V
Recommended Gate Voltage	V_{GOP}			5		+18	V
Drain to Source On Resistance	$R_{DS(on)}$	V_{GS} = 15 V, I_D = 25 A, T_J = 25°C			45		mΩ
		V_{GS} = 18 V, I_D = 25 A, T_J = 25°C			33	50	
		V_{GS} = 18 V, I_D = 25 A, T_J = 175°C			40		
Forward Transconductance	g_{FS}	V_{DS} = 10 V, I_D = 25 A			16		S
CHARGES, CAPACITANCES & GATE RESISTANCE							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 325 V			1870		pF
Output Capacitance	C_{OSS}				162		
Reverse Transfer Capacitance	C_{RSS}				14		

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
SOURCE−DRAIN DIODE CHARACTERISTICS						
Reverse Recovery Time	t_{RR}	V_{GS} = 5/18 V, I_{SD} = 25 A, dI_S/dt = 1000 A/μs		20		ns
Reverse Recovery Charge	Q_{RR}			108		nC
Reverse Recovery Energy	E_{REC}			4.5		μJ
Peak Reverse Recovery Current	I_{RRM}			11		A
Charge time	Ta			11		ns
Discharge time	Tb			8.5		ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

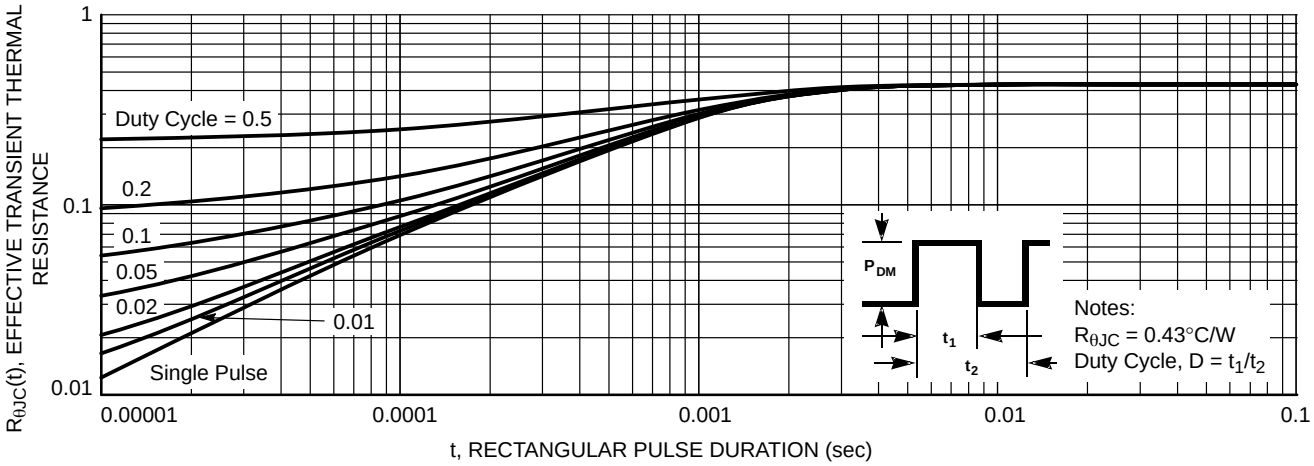
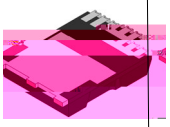


Figure 13. Transient Thermal Impedance

DEVICE ORDERING INFORMATION

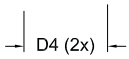
Device	Package	Shipping†
NTBL045N065SC1	H PSOF8L	2000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



H−PSOF8L 9.90x10.38x2.30, 1.20P
CASE 100DC
ISSUE D

DATE 30 JUL 2024



LAND PATTERN
RECOMMENDATION

GENERIC
MARKING DIAGRAM*

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.