

Silicon Carbide (SiC) MOSFET – EliteSiC, 12 mohm, 650 V, M2, D2PAK-7L

NTBG015N065SC1

Features

- Typ. $R_{DS(on)} = 12\text{ m}\Omega$ @ $V_{GS} = 18\text{ V}$
Typ. $R_{DS(on)} = 15\text{ m}\Omega$ @ $V_{GS} = 15\text{ V}$
- Ultra Low Gate Charge ($Q_{G(tot)} = 283\text{ nC}$)
- Low Effective Output Capacitance ($C_{oss} = 424\text{ pF}$)
- 100% Avalanche Tested
- $T_J = 175^\circ\text{C}$
- This Device is Halide Free and RoHS Compliant with exemption 7a, Pb-Free 2L1 (on second level interconnection)

Typical Applications

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

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	650	V
Gate-to-Source Voltage			V_{GS}	-8/+22	V
Recommended Operation Values of Gate - Source Voltage		$T_C < 175^\circ\text{C}$	V_{GSop}	-5/+18	V
Continuous Drain Current $R_{\theta JC}$ (Note 2)	Steady State	$T_C = 25^\circ\text{C}$	I_D	145	A
			P_D	500	W
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2)	Steady State	$T_C = 100^\circ\text{C}$	I_D	103	A
			P_D	250	W
Pulsed Drain Current (Note 3)		$T_C = 25^\circ\text{C}$	I_{DM}	422	A
Operating Junction and Storage Temperature Range			T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
Source Current (Body Diode)			I_S	111	A
Single Pulse Drain-to-Source Avalanche Energy ($I_L = 13\text{ A}_{pk}$, $L = 1\text{ mH}$) (Note 4)			E_{AS}	84	mJ
Maximum Lead Temperature for Soldering, 1/8" from Case for 10 Seconds			T_L	245	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface mounted on a FR-4 board using 1 in² pad of 2 oz copper.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
3. Repetitive rating, limited by max junction temperature.
4. E_{AS} of 84 mJ is based on starting $T_J = 25^\circ\text{C}$; $L = 1\text{ mH}$, $I_{AS} = 13\text{ A}$, $V_{DD} = 50\text{ V}$, $V_{GS} = 18\text{ V}$.



Drain (TAB)

Power Source (Pins 3, 4, 5, 6, 7)



D2PAK-7L
CASE 418BJ

MARKING DIAGRAM

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THERMAL CHARACTERISTICS

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-to-Case (Note 2)	$R_{\theta JC}$	0.3	°C/W

Thermal Resistance Junction

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ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise stated)(continued)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Reverse Recovery Time	t_{RR}	$V_{GS} = -5/18\text{ V}$, $I_{SD} = 75\text{ A}$, $dI_S/dt = 1000\text{ A}/\mu\text{s}$		28		ns
Reverse Recovery Charge	Q_{RR}			234		nC
Reverse Recovery Energy	E_{REC}			23		μJ
Peak Reverse Recovery Current	I_{RRM}			16		A
Charge Time	T_a			17		ns
Discharge Time	T_b			11		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.

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TYPICAL CHARACTERISTICS (continued)

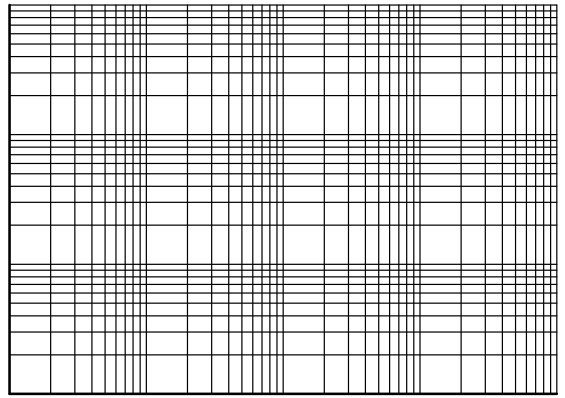
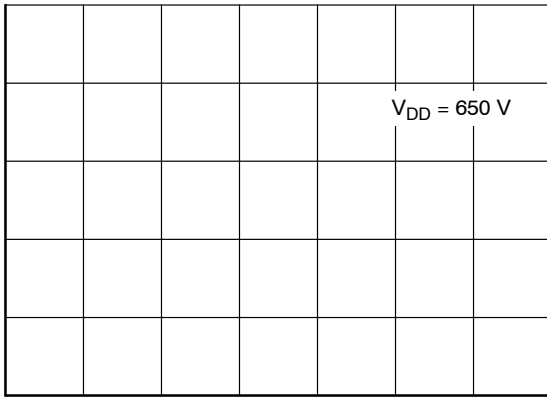
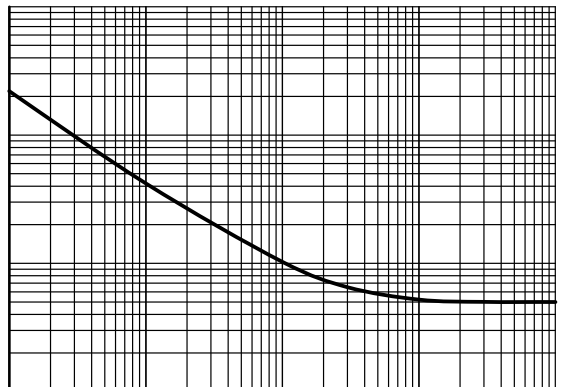
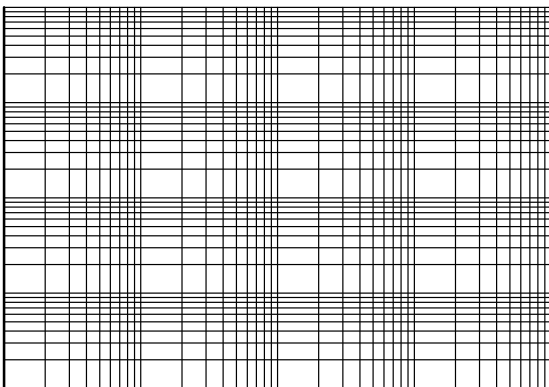
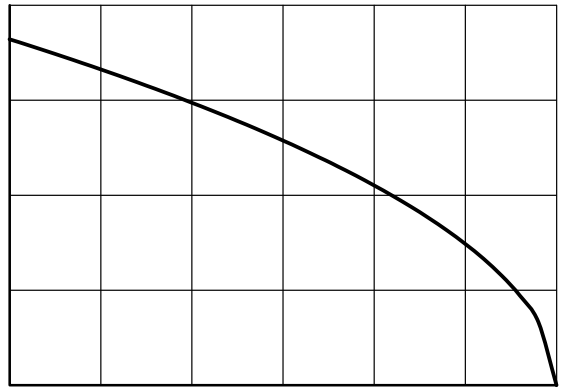
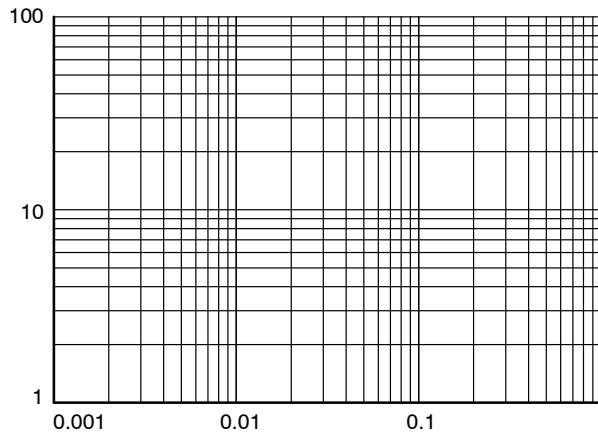


Figure 7. Gate-to-Source Voltage vs. Total Charge



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TYPICAL CHARACTERISTICS (continued)

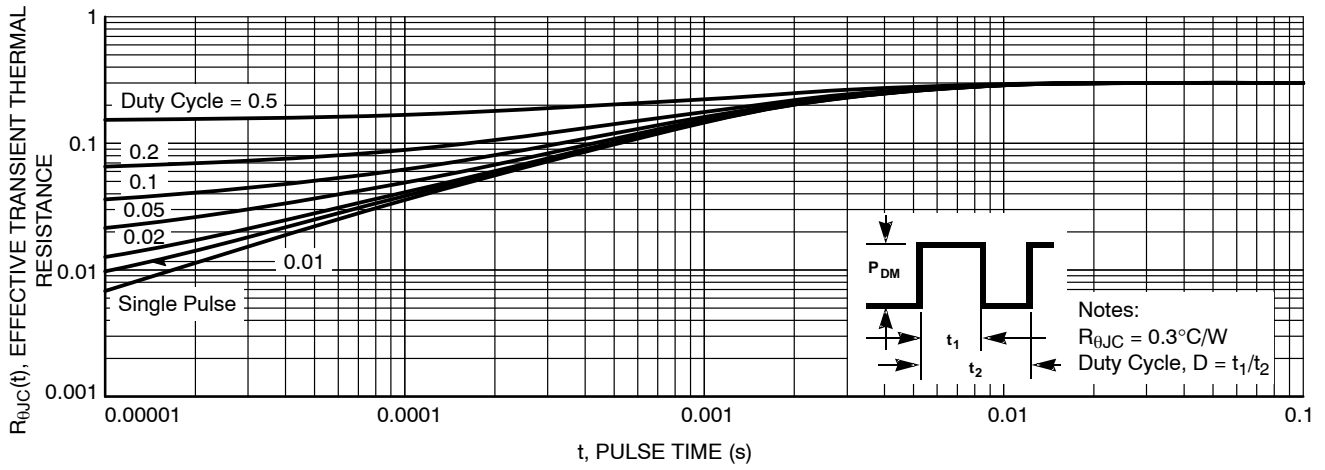


Figure 13. Junction-to-Case Transient Thermal Response Curve

D²PAK7 (TO-263-7L HV)
CASE 418BJ
ISSUE B

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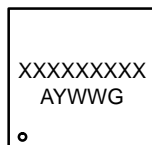
A

c2

H

C

**GENERIC
MARKING DIAGRAM***



XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package

*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.

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