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Silicon Carbide (SiC) MOSFET - EliteSiC, 23 mohm, 650 V, M3S, D2PAK-7L

NVBG023N065M3S

Features

- Typical $R_{DS(ON)}$ = 23 mΩ @ V_{GS} = 18 V
- Ultra Low Gate Charge ($Q_{G(tot)}$ = 69 nC)
- High Speed Switching with Low Capacitance (Coss = 153 pF)
- 100% Avalanche Tested
- AEC−Q101 Qualified and PPAP Capable
- This Device is Halide Free and RoHS Compliant with Exemption 7a, Pb−Free 2LI (on Second Level Interconnection)

Applications

- Automotive On Board Charger
- Automotive DC−DC Converter for EV/HEV

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	
Continuous Drain Current	T_C = 25 C	I_D	70	A

ELECTRICAL CHARACTERISTICS (T_J = 25 C unless otherwise specified) (continued)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
SWITCHING CHARACTERISTICS						
Turn−On Delay Time	$t_{d(ON)}$	V_{GS} = −3/18 V, I_D = 20 A, V_{DD} = 400 V, R_G = 4.7 Ω, T_J = 175 C (Note 4, 5)	–	9.6	–	ns
Turn−Off Delay Time	$t_{d(OFF)}$		–	41	–	
Rise Time	t_r		–	14	–	
Fall Time	t_f		–	12	–	
Turn−On Switching Loss	E_{ON}		–	51	–	μJ
Turn−Off Switching Loss	E_{OFF}		–	45	–	
Total Switching Loss	E_{TOT}		–	96	–	
SOURCE−TO−DRAIN DIODE CHARACTERISTICS						
Forward Diode Voltage	V_{SD}	I_{SD} = 20 A, V_{GS} = −3 V, T_J = 25 C	–	4.5	6.0	V
		I_{SD} = 20 A, V_{GS} = −3 V, T_J = 175 C (Note 5)	–	4.2	–	
Reverse Recovery Time	t_{RR}	V_{GS} = −3 V, I_S = 20 A, dI/dt = 1000 A/μs, V_{DS} = 400 V, T_J = 25 C (Note 5)	–	19	–	ns
Charge time	t_a		–	11	–	
Discharge time	t_b		–	8	–	
	Q_{RR}		–	97	–	nC

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

Figure 2. Output Characteristics

0

Figure 3. Transfer Characteristics

Figure 4. On−Resistance vs. Gate Voltage

Figure 5. On−

TYPICAL CHARACTERISTICS

0.1

V_{DS}, Drain to Source Voltage (V)

Figure 7. Capacitance Characteristics

V_{DS}, Drain to Source Voltage (V)

Figure 8. Stored Energy vs. Drain to Source Voltage

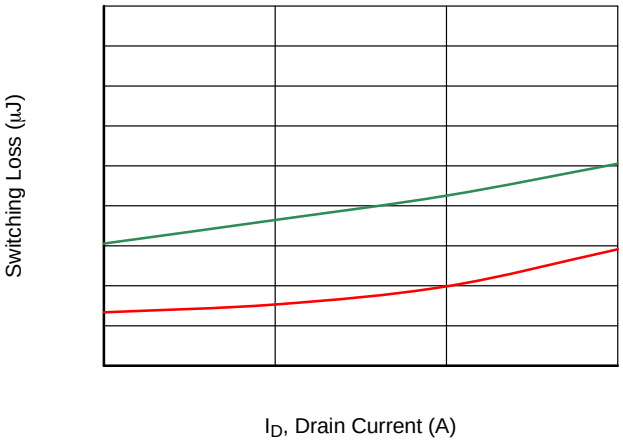
Figure 9. Gate Charge Characteristics

Figure 10. Reverse Conduction Characteristics

Figure 11. Reverse Conduction Characteristics

Figure 12. Safe Operating Area

TYPICAL CHARACTERISTICS



NVBG023N065M3S

D^{2}PAK7 (TO−263−7L HV)
CASE 418BJ
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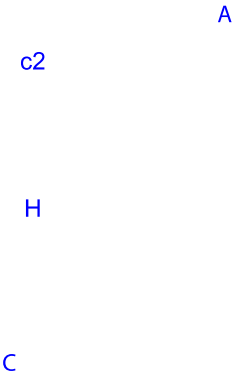

GENERIC
MARKING DIAGRAM*

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.