

Silicon Carbide (SiC) MOSFET – EliteSiC, 33 mohm, 650 V, M2, TO-247-4L

NTH4L045N065SC1

Features

- Typ. $R_{DS(on)} = 33\text{ m}\Omega$ @ $V_{GS} = 18\text{ V}$
 Typ. $R_{DS(on)} = 45\text{ m}\Omega$ @ $V_{GS} = 15\text{ V}$
- Ultra Low Gate Charge ($Q_{G(tot)} = 105\text{ nC}$)
- High Speed Switching with Low Capacitance ($C_{oss} = 162\text{ pF}$)
- 100% Avalanche Tested
- $T_J = 175^\circ\text{C}$
- This Device is Halide Free and RoHS Compliant with exemption 7a,
 Pb-Free 2LI (on second level interconnection)

Typical Applications

- SMPS (Switching Mode Power Supplies)
- Solar Inverters
- UPS (Uninterruptable Powere 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-to-Source Voltage		V_{GSop}	-5/+18	V	
Continuous Drain Current (Note 1)	Steady State	$T_C = 25^\circ\text{C}$	I_D	55	A
Power Dissipation (Note 1)			P_D	187	W
Continuous Drain Current (Note 1)	Steady State	$T_C = 100^\circ\text{C}$	I_D		

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THERMAL CHARACTERISTICS

Parameter	Symbol	Max	Unit
Junction-to-Case – Steady State (Note 1)	$R_{\theta JC}$	0.8	°C/W
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	40	

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	650	–	–	V	
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	$I_D = 20\text{ mA}$, referenced to 25°C	–	0.15	–	V/°C	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 650\text{ V}$	$T_J = 25^\circ\text{C}$	–	–	10	μA
			$T_J = 175^\circ\text{C}$	–	–	1	mA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = +22/-8\text{ V}, V_{DS} = 0\text{ V}$	–	–	250	nA	

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 8\text{ mA}$	1.8	2.8		
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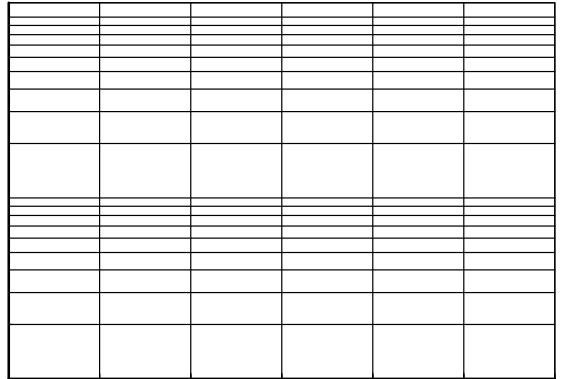
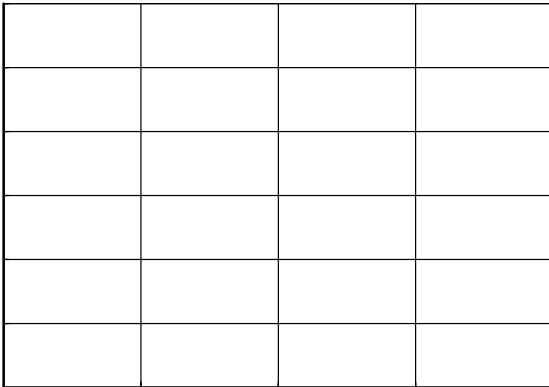
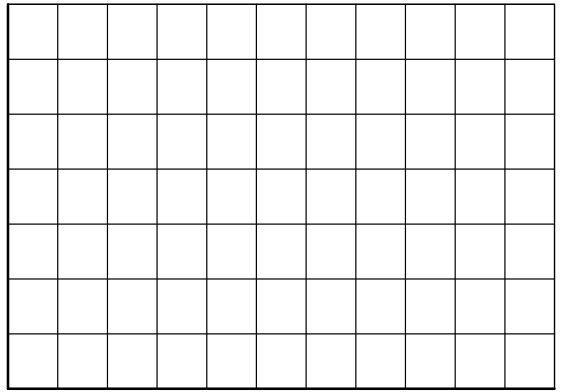
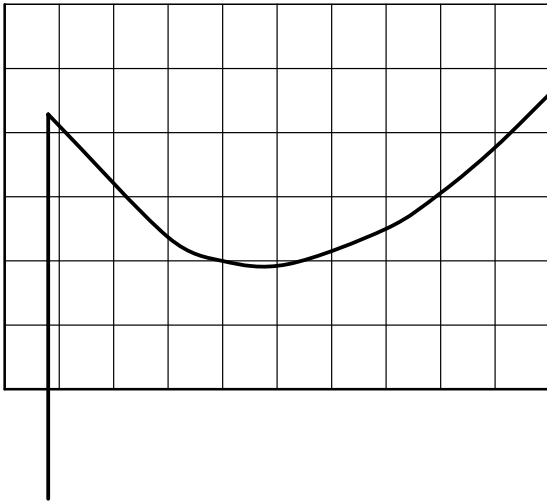
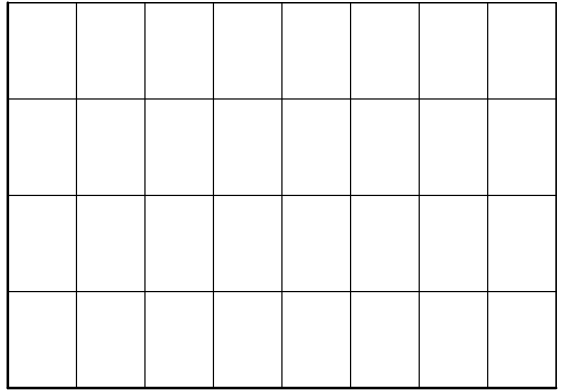
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ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified) (continued)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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TYPICAL CHARACTERISTICS



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TYPICAL CHARACTERISTICS (CONTINUED)

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TYPICAL CHARACTERISTICS (CONTINUED)

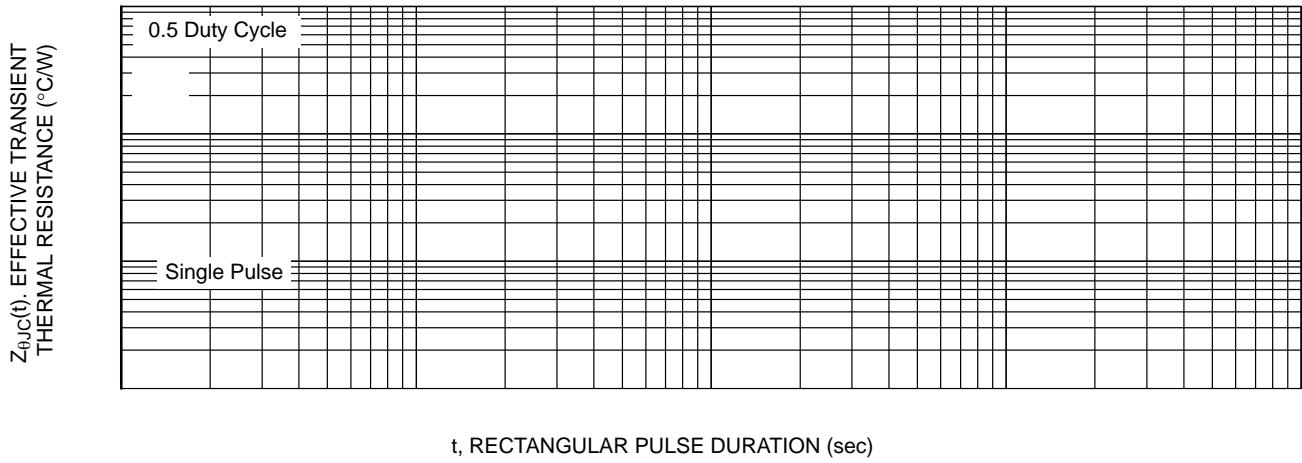


Figure 13. Junction-to-Case Thermal Response

TO-247-4LD
CASE 340CJ
ISSUE A

DATE 16 SEP 2019

A E A B
A2 E1 \emptyset p1
D2

E/2 Q

D D1

\emptyset

L1

b2 A1

b1 (3X) L

1 4

e1 b(4X) c

e 2X

\oplus 0.254 (M) B A (M)

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