Silicon Carbide (SiC) MOSFET – 20 mohm, 900 V, M2, TO-247-3L

NVHL020N090SC1

$V_{(BR)DSS}$	$R_{DS(ON)}$ MAX	I_D MAX
900 V	28 mΩ @ 15 V	118 A

N−CHANNEL MOSFET

Features

- Typ. $R_{DS(on)}$ = 20 mΩ @ V_{GS} = 15 V
- Typ. $R_{DS(on)}$ = 16 mΩ @ V_{GS} = 18 V
- Ultra Low Gate Charge (typ. $Q_{G(tot)}$ = 196 nC)
- Low Effective Output Capacitance (typ. C_{oss} = 296 pF)
- 100% UIL 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)

Typical Applications

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

TO−247 LONG LEADS
CASE 340CX

MARKING DIAGRAM

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

Parameter		Symbol	Value	Unit
Drain−to−Source Voltage		V_{DSS}	900	V
Gate−to−Source Voltage		V_{GS}	+22/−8	V
Recommended Operation Values of Gate−Source Voltage	T_C < 175°C	V_{GSop}	+15/−5	
			472	A
Single Drain Capability(Note 3)	T_A = 25°C, t_p = 10 μs, R_G = 4.7 Ω	I_{DSC}	854	A
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to +175	°C
Source Current (Body Diode)		I_S	153	A
Single Pulse Drain−to−Source Avalanche Energy (I_L = 23 A_{pk}, L = 1 mH) (Note 4)		E_{AS}	264	mJ

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. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Repetitive rating, limited by max junction temperature.
3. Peak current might be limited by transconductance.
4. E_{AS} of 264 mJ is based on starting T_J = 25°C; L = 1 mH, I_{AS} = 23 A, V_{DD} = 100 V, V_{GS} = 15 V.

$Y = **onsemi** Logo
&Z = Assembly Plant Code
&3 = Date Code (Year & Week)
&K = Lot
NVHL020N090SC1 = Specific Device Code

ORDERING INFORMATION

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Table 1. THERMAL CHARACTERISTICS

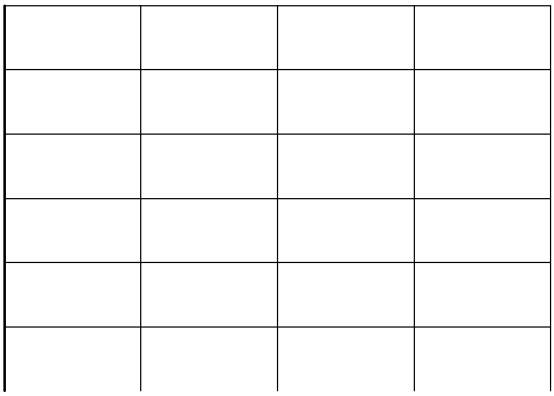
Parameter	Symbol	Max	Units
Thermal Resistance Junction−to−Case (Note 1)	$R_{\theta JC}$	0.30	°C/W
Thermal Resistance Junction−to−Ambient (Note 1)	$R_{\theta JA}$		

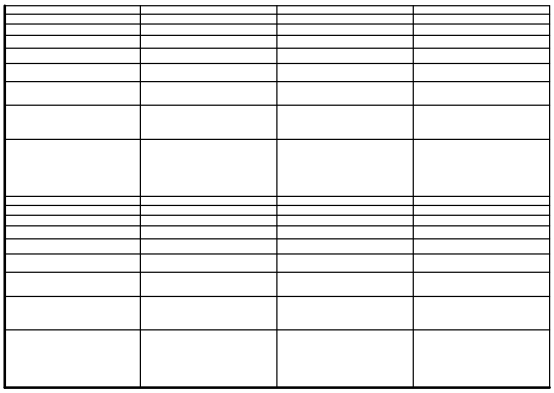
Table 2. ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DRAIN−SOURCE DIODE CHARACTERISTICS						
Reverse Recovery Time	t_{RR}	V_{GS} = −5/15 V, I_{SD} = 60 A, dI_S/dt = 1000 A/μs, V_{DS} = 720 V		28		ns
Reverse Recovery Charge	Q_{RR}			199		nC
Reverse Recovery Energy	E_{REC}			4		μJ
Peak Reverse Recovery Current	I_{RRM}			14		A
Charge Time	Ta			16		ns
Discharge Time	Tb			12		ns

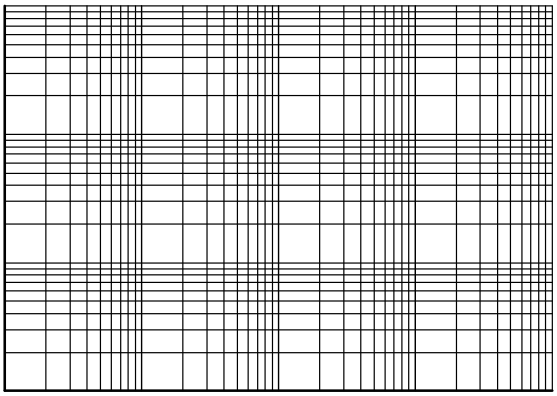
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

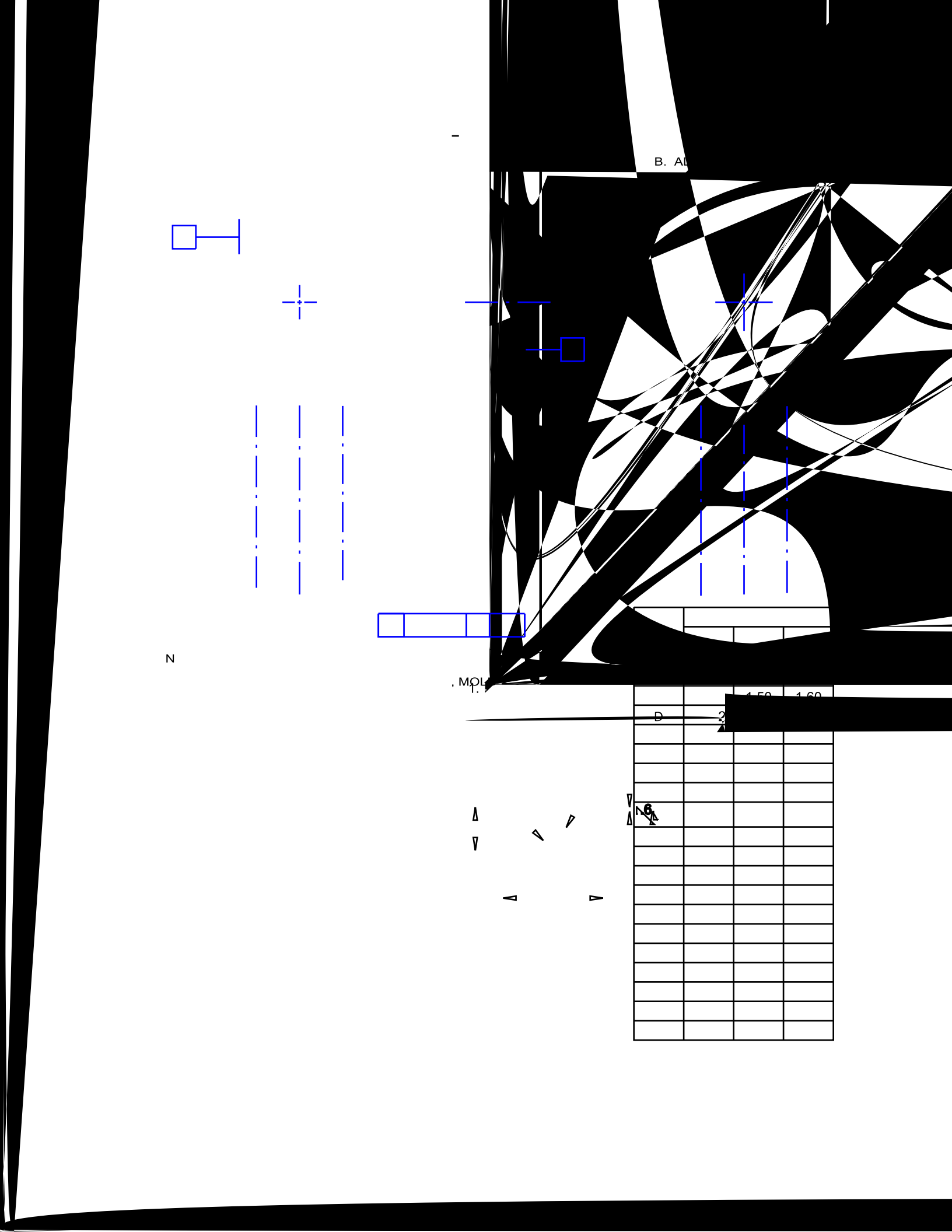
TYPICAL CHARACTERISTICS





TYPICAL CHARACTERISTICS (continued)




B. Al
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