Silicon Carbide (SiC) MOSFET – EliteSiC, 160 mohm, 1200 V, M1, TO-247-3L

NTHL160N120SC1

Features

- Typ. $R_{DS(on)}$ = 160 mΩ
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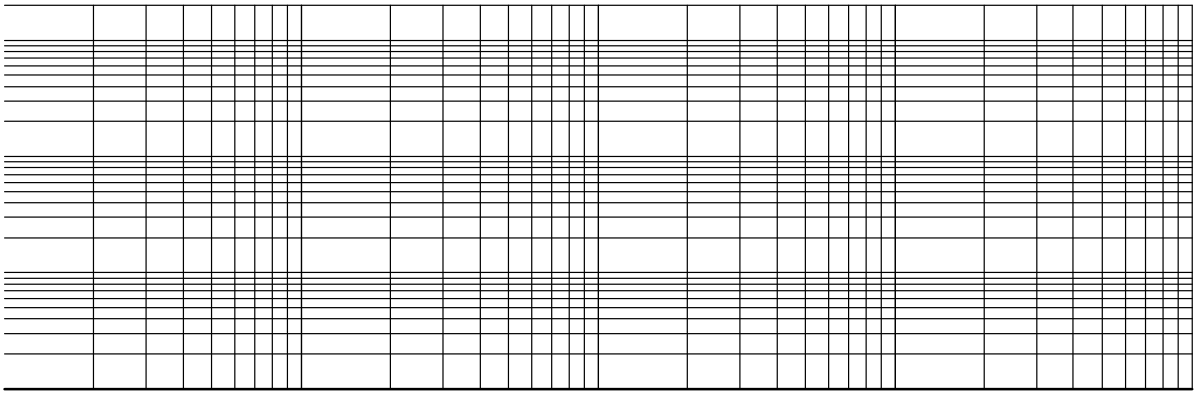
ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

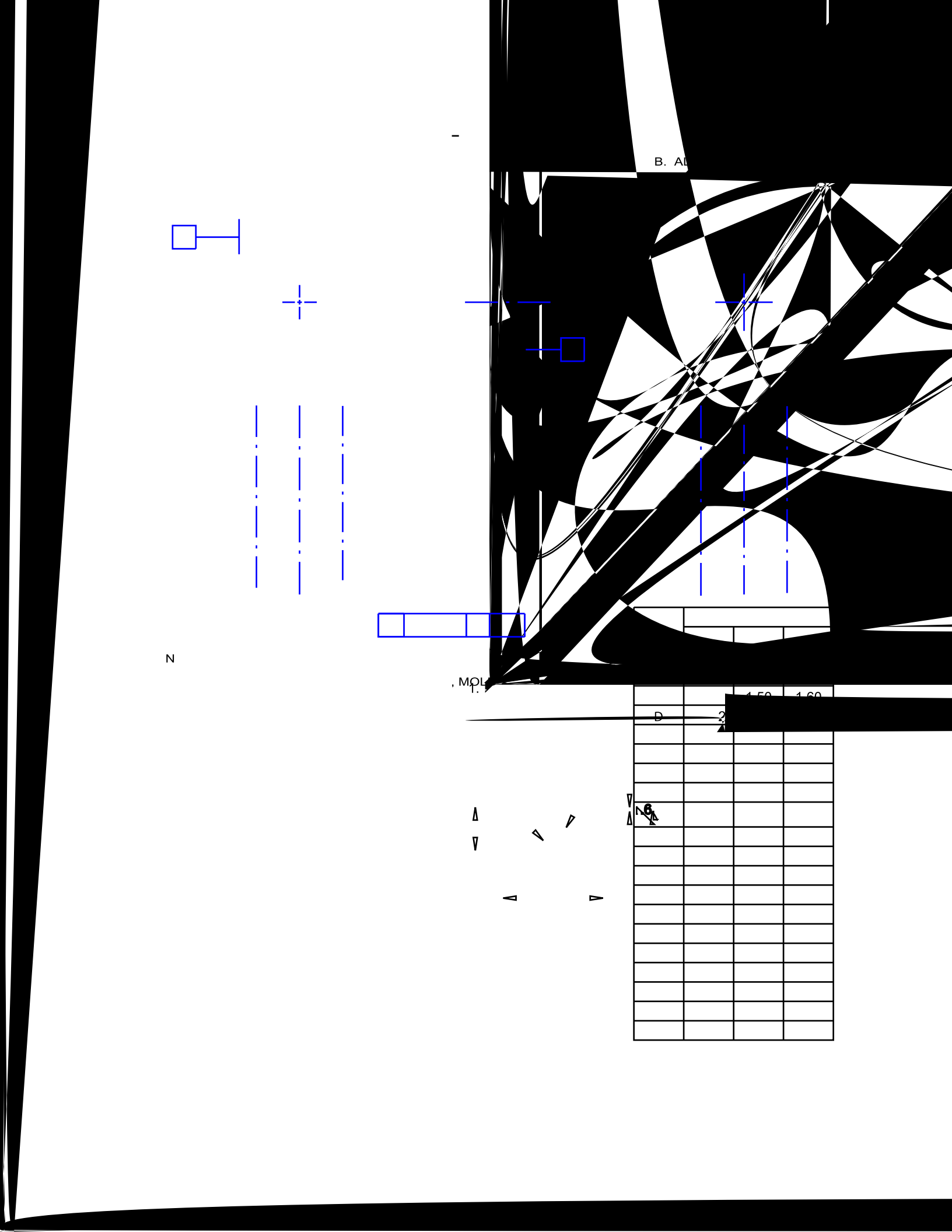
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA	1200	−	−	V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	I_D = 1 mA, referenced to 25°C	−	600	−	mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 25°C	−	−	100	μA
		V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 175°C	−	−	250	
Gate−to−Source Leakage Current	I_{GSS}	V_{GS} = +25/−15 V, V_{DS} = 0 V	−	−	±1	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 2.5 mA	1.8	3.1	4.3	V
Recommended Gate Voltage	V_{GOP}		−5	−	+20	V
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = 20 V, I_D = 12 A, T_J = 25°C	−	162	224	mΩ
		V_{GS} = 20 V, I_D = 12 A, T_J = 175°C	−	271	377	
Forward Transconductance	g_{FS}	V_{DS} = 10 V, I_D = 12 A	−	3	−	S
CHARGES, CAPACITANCES & GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 800 V	−	665	−	pF
Output Capacitance	C_{OSS}		−	50	−	
Reverse Transfer Capacitance	C_{RSS}		−	5	−	
Total Gate Charge	$Q_{G(tot)}$	V_{GS} = −5/20 V, V_{DS} = 600 V, I_D = 16 A	−	34	−	nC
Threshold Gate Charge	$Q_{G(th)}$		−	6	−	
Gate−to−Source Charge	Q_{GS}		−	12.5	−	
Gate−to−Drain Charge	Q_{GD}		−	9.6	−	
Gate Resistance	R_G	f = 1 MHz	−	1.4	−	Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = −5/20 V, V_{DS} = 800 V, I_D = 16 A, R_G = 6 Ω, Inductive Load	−	11	−	ns
Rise Time	t_r		−	19	−	
Turn−Off Delay Time	$t_{d(off)}$		−	15	−	
Fall Time	t_f		−	8	−	
Turn-On Switching Loss	E_{ON}		−	200	−	μJ
Turn-Off Switching Loss	E_{OFF}		−	−	34	
Total Switching Loss	E_{TOT}		−	234	−	
DRAIN−SOURCE DIODE CHARACTERISTICS						
Continuous Drain−to−Source Diode Forward Current	I_{SD}	V_{GS} = −5 V, T_J = 25°C	−	−	11	A
Pulsed Drain−to−Source Diode Forward Current (Note 2)	I_{SDM}	V_{GS} = −5 V, T_J = 25°C	−	−	69	A
Forward Diode Voltage	V_{SD}	V_{GS} = −5 V, I_{SD} = 6 A, T_J = 25°C	−	4	10	V
Reverse Recovery Time	t_{RR}	V_{GS} = −5/20 V, I_{SD} = 16 A, dI_S/dt = 1000 A/μs	−	15	−	ns
Reverse Recovery Charge	Q_{RR}		−	45	−	nC
Reverse Recovery Energy	E_{REC}		−	3.9	−	μJ
Peak Reverse Recovery Current	I_{RRM}		−	6.2	−	A
Charge Time	Ta		−	7.4	−	ns
Discharge Time	Tb		−	7	−	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.

NTHL160N120SC1

TYPICAL CHARACTERISTICS (CONTINUED)




B. Al
N
1.50
1.60
D
3
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