

V_{DS} **1200 V**

$I_D(T_c=25^{\circ}C)$ **20 A**

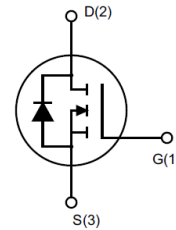
$R_{DS(on)}$ **160 m Ω**

Features:

- Low On-Resistance with High Blocking Voltage
- Low Capacitance
- Avalanche Ruggedness
- Halogen Free, Rohs Compliant

Benefits

- High Frequency Operation
- Enabling higher switching frequency
- Increased power density
- Reduction of Heat Sink Requirements



Applications

- Switch Mode Power Supplies (SMPS)
- Power Inverter & Solar Inverter
- Motor Drivers & EV Charging station
- DC/DC Converter

Package Pin definitions

- Pin1- Gate
- Pin2- Drain
- Pin3- Source

Package Parameters

Part Number	Marking	Package
B1M160120HC	B1M160120HC	TO-247-3L

Electrical Characteristics
Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{DSmax}	Drain – Source Voltage	$V_{GS}=0V$ $I_D=100\mu A$	1200	V
V_{GSmax}	Gate – Source Voltage		-10/25	V
V_{GSop}	Recommend Gate – Source Voltage		-5/20	V
I_D	Continuous Drain Current	$V_{GS} = 20V$ $T_c=25^{\circ}C$ $V_{GS} = 20V$ $T_c=100^{\circ}C$	20 13	A
$I_{D,pulse}$	Pulsed Drain Current	Pulse with t_p limited by T_{jmax}	40	A
P_{tot}	Power Dissipation	$T_c=25^{\circ}C$ $T_j=150^{\circ}C$	118	W
T_j	Operating junction temperature		-55~150	$^{\circ}C$
T_{stg}	Storage temperature		-55~135	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case			1.085	K/W

Static Characteristics (T_j=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V _{(BR)DSS}	Drain-Source Breakdown voltage	V _{GS} =0V I _D =100μA	1200			V
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} I _{DS} =2.5mA V _{GS} = V _{DS} I _{DS} =2.5mA T _j =150°C		2.7 2.1		V
I _{GSS}	Gate-Source leakage current	V _{GS} = 20V V _{DS} =0V			250	nA
I _{DSS}	Zero Gate Voltage Drain current	V _{DS} = 1200V V _{GS} =0V V _{DS} = 1200V V _{GS} =0V T _j =150°C		0.7 5	45 200	μA
R _{DS(on)}	Drain-Source On-state Resistance	V _{GS} = 20V I _{DS} =10A V _{GS} = 20V I _{DS} =10A T _j =150°C		160 244	189	mΩ
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} =1000V f=1MHz V _{AC} =25mV		1100		pF
C _{oss}	Output Capacitance			73		pF
C _{rss}	Reverse Transfer Capacitance			18		pF
E _{on}	Tun-on Energy	V _{DS} = 800V V _{GS} =-5/20V		85		μJ
E _{off}	Tun-off Energy	I _{DS} =10A R _{G-ext} =5Ω L=600μH		85		μJ
R _{G(int)}	Internal Gate Resistance	f=1MHz V _{AC} =25mV		2.8		Ω
Q _{gs}	Gate to Source Charge	V _{DS} = 800V V _{GS} =-5/20V I _{DS} =10A R _{G-ext} =5Ω L=600μH		12.5		nC
Q _{gd}	Gate to Drain Charge			31		nC
Q _g	Total Gate Charge			60		nC

Reverse Diode Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V _{SD}	Diode Forward Voltage	V _{GS} =-5V I _{SD} =5A		5.1		V
Q _{rr}	Reverse Recovery Charge	V _{DS} = 800V V _{GS} =0V I _{SD} =10A		82		nC
I _{rrm}	Peak Reverse Recovery Current	di/dt=400A/μS		2.45		A

Typical Performance

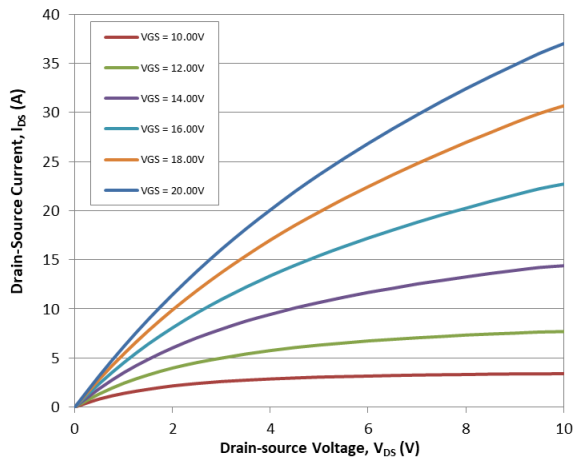


Figure 1. Typical forward Output characteristics at $T_j=25^\circ\text{C}$

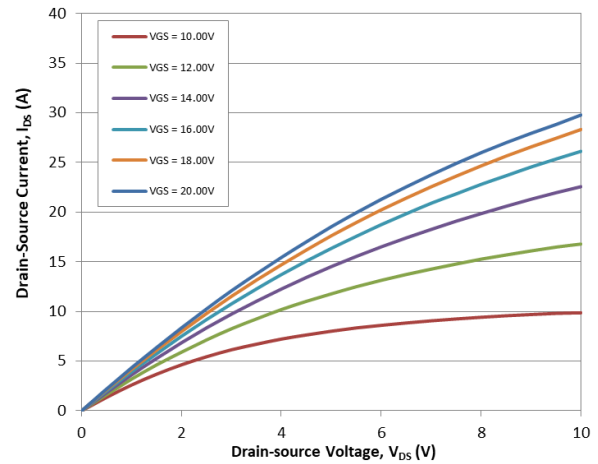


Figure 2. Typical forward Output characteristics at $T_j=150^\circ\text{C}$

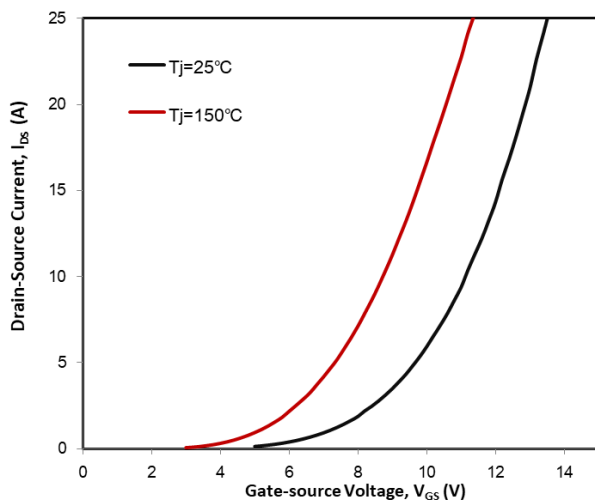


Figure 3. Transfer Characteristics for Various T_j

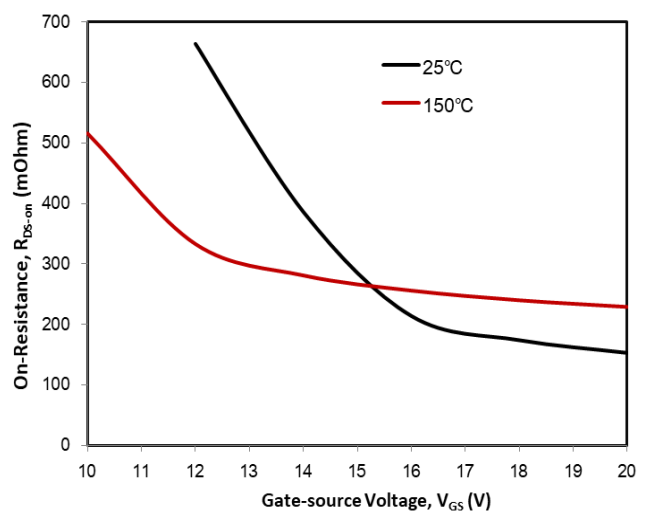


Figure 4. On-Resistance vs. Gate Voltage for various Temperature

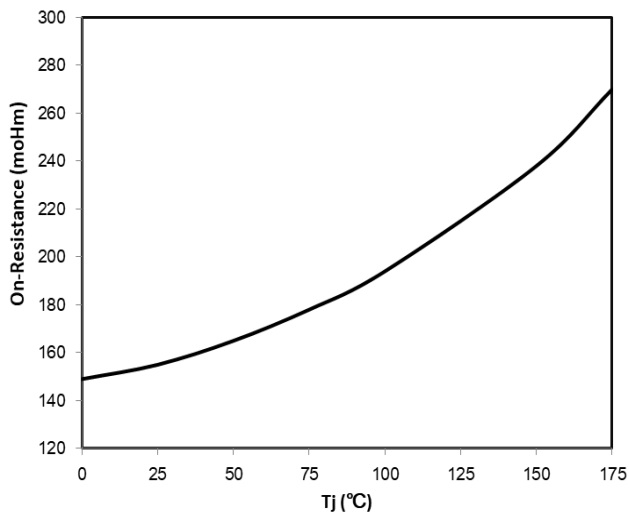


Figure 5. **On-Resistance vs. Temperature at Vgs=20V, Ids=10A**

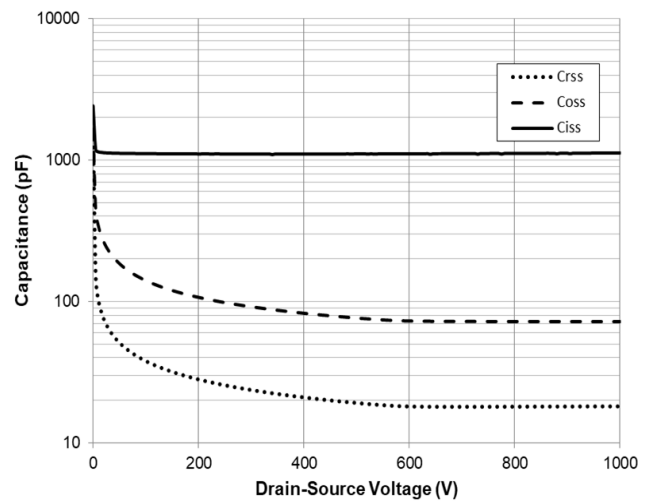


Figure 6. **Capacitance vs. Drain-Source Voltage (0 - 1000V)**

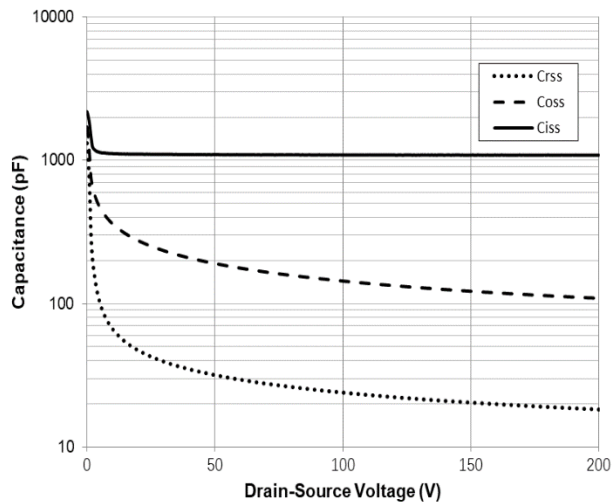


Figure 7. **Capacitance vs. Drain-Source Voltage (0-200V)**

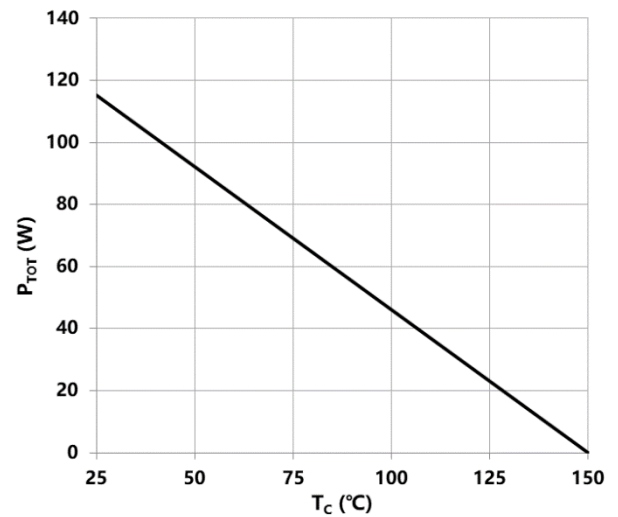


Figure 8. **Maximum Power Dissipation Derating vs. Case Temperature**

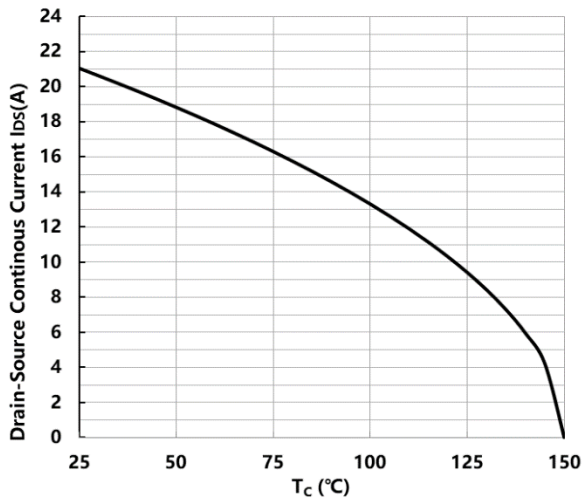


Figure 9. Continuous Drain current Derating vs. Case Temperature

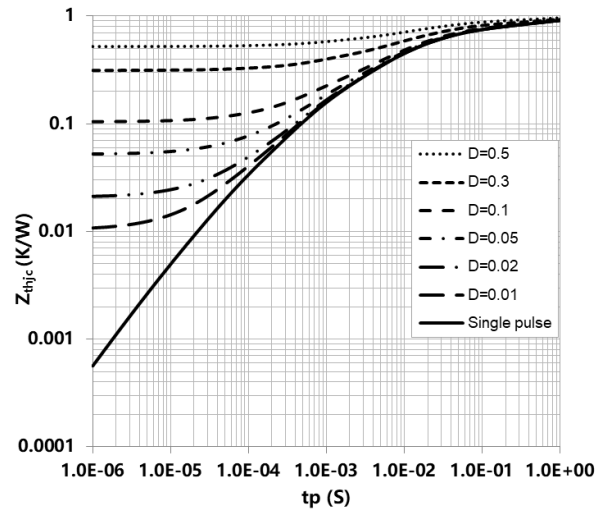


Figure 10. Transient Thermal Impedance (Junction-Case)

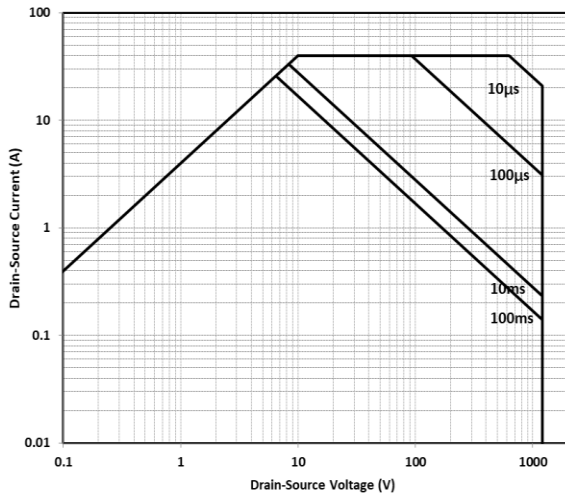
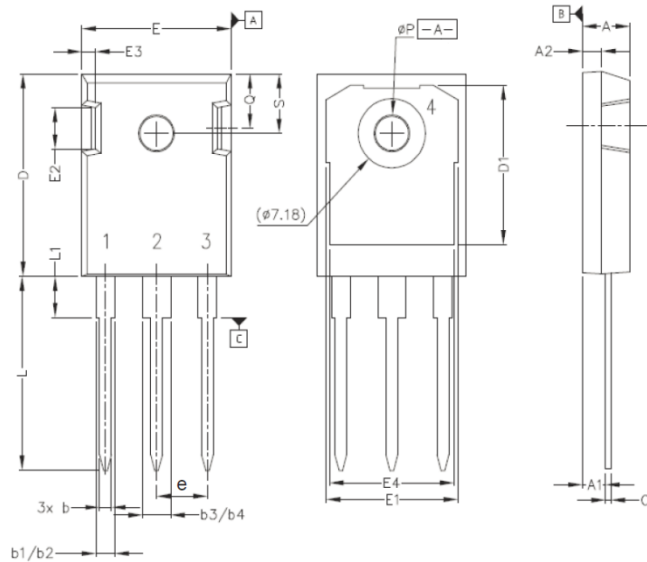


Figure 11. Safe Operating Area

Package Dimensions



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b2	.075	.085	1.91	2.16
b3	.113	.133	2.87	3.38
b4	.113	.123	2.87	3.13
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.557	13.10	14.15
E2	.145	.201	3.68	5.10
E3	.039	.075	1.00	1.90
E4	.487	.529	12.38	13.43
N	3		3	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
e	.214 BSC		5.44 BSC	

Revision History**Revision: Preliminary version**

Previous Revision:

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