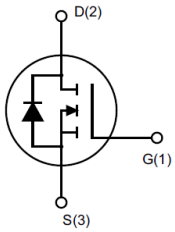
V_{DS} = **1200 V**

$I_{D(Tc=25°C)}$ = **42 A**

$R_{DS(on)}$ = **80 mΩ**

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

Pacakge Pin definitions

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

Package Parameters

Part Number	Marking	Package
B1M080120HC	B1M080120HC	TO-247-3L

Electrical Characteristics

Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{DSmax}	Drain – Source Voltage	V_{GS}=0V I_D=100μA	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 Tc=25°C V_{GS} = 20V Tc=100°C	42 29	A
$I_{D,pulse}$	Pulsed Drain Current	Pulse with t_p limited by T_{jmax}	80	A
P_{tot}	Power Dissipation	Tc=25°C Tj=150°C	295	W
T_j	Operating junction temperature		-55~150	°C
T_{stg}	Storage temperature		-55~135	°C

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		0.419		K/W

Static Characteristics（Tj=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		2.9 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}=20A V_{GS}= 20V I_{DS}=20A T_j=150°C		80 110		mΩ
C_{iss}	Input Capacitance	V_{GS}= 0V V_{DS}=1000V f=1MHz V_{AC}=25mV		2224		pF
C_{oss}	Output Capacitance			108		pF
C_{rss}	Reverse Transfer Capacitance			25		pF
$t_{d(on)}$	Turn On Delay Time	V_{DS}= 800V V_{GS}=-5/20V I_{DS}=20A R_{G-ext}=2.2Ω L=600μH		21		ns
t_r	Rise Time			68		ns
$t_{d(off)}$	Turn Off Delay Time			37		ns
t_f	Fall Time			27		ns
E_{on}	Tun-on Energy	V_{DS}= 800V V_{GS}=-5/20V I_{DS}=20A R_{G-ext}=2.2Ω L=600μH		254		μJ
E_{off}	Tun-off Energy			180		μJ
$R_{G(int)}$	Internal Gate Reistance	f=1MHz V_{AC}=25mV		1.48		Ω
Q_{gs}	Gate to Source Charge	V_{DS}= 800V V_{GS}=-5/20V I_{DS}=20A		37		nC
Q_{gd}	Gate to Drain Charge			54		nC
Q_g	Total Gate Charge			129		nC

Reverse Diode Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{SD}	Diode Forward Voltage	V_{GS}=-5V I_{SD}=10A		6.7		V
Q_{rr}	Reverse Recovery Charge	V_{DS}= 800V V_{GS}=-5V I_{SD}=20A di/dt=400A/μs		108		nC
I_{rrm}	Peak Reverse Recovery Current			25		A

Typical Performance

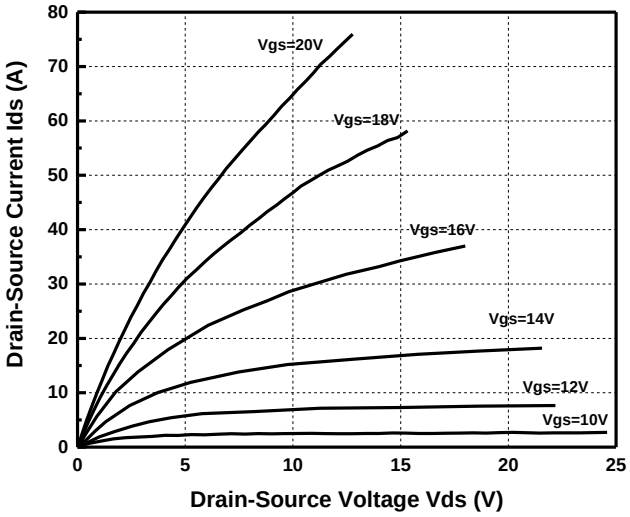


Figure 1. **Typical forward Output characteristics at Tj=-55°C**

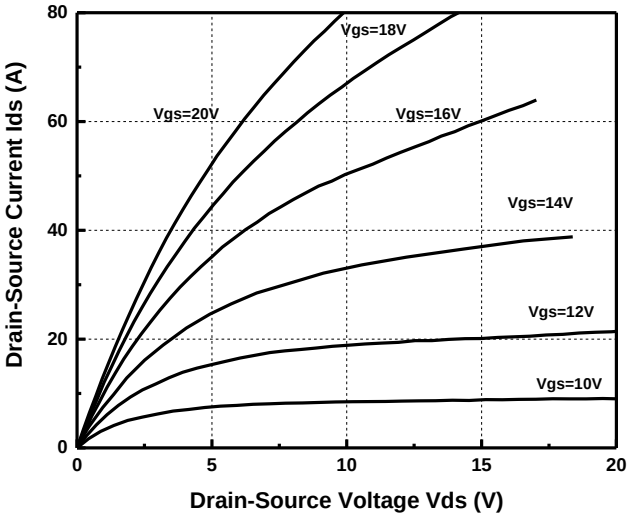


Figure 2. **Typical forward Output characteristics at Tj=25°C**

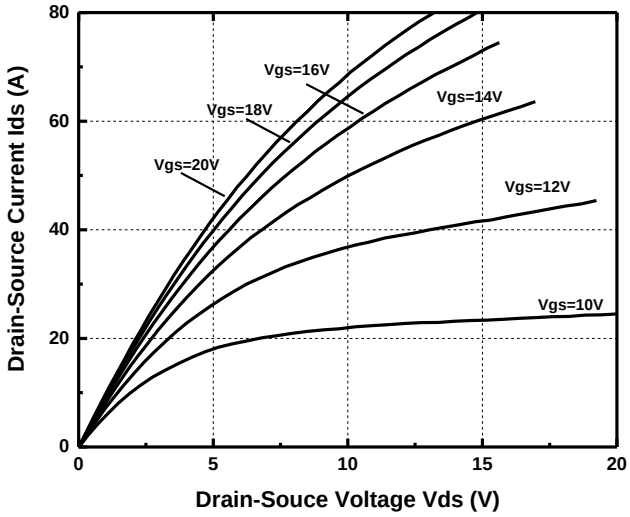


Figure 3. **Typical Forward Output Characteristics at Tj=150℃**

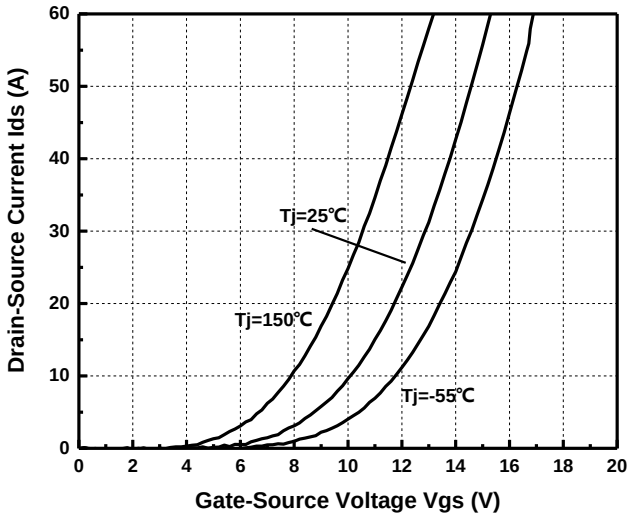


Figure 4. **Transfer Characteristics for Various Tj**

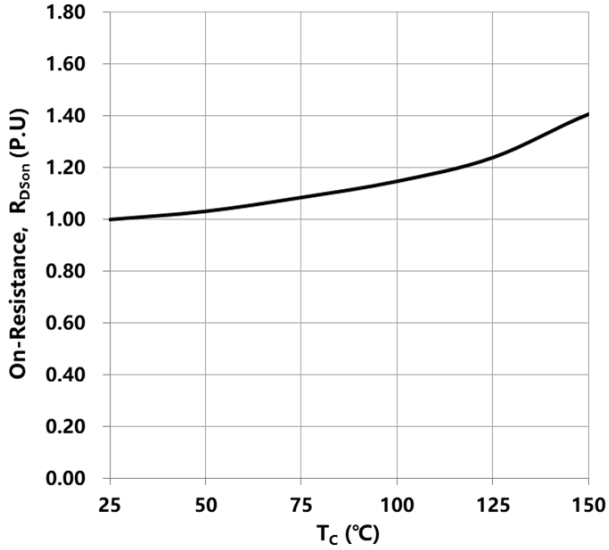


Figure 5. **On-Resistance vs. Temperature at V_{GS}=20V, I_{DS}=20A**

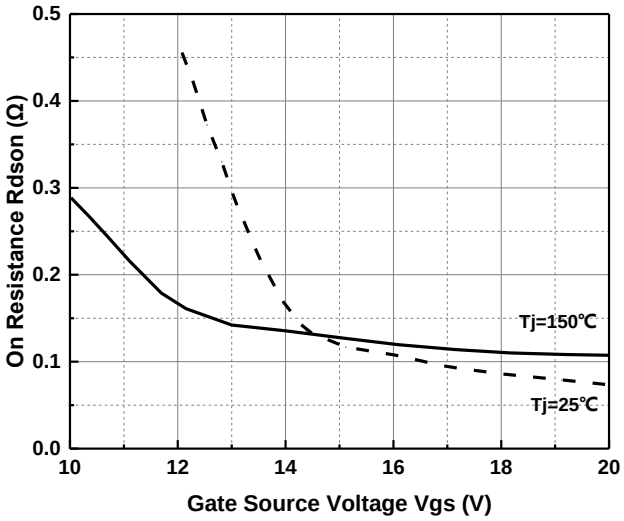


Figure 6. **On-Resistance vs. Gate Voltage for various Temperature**

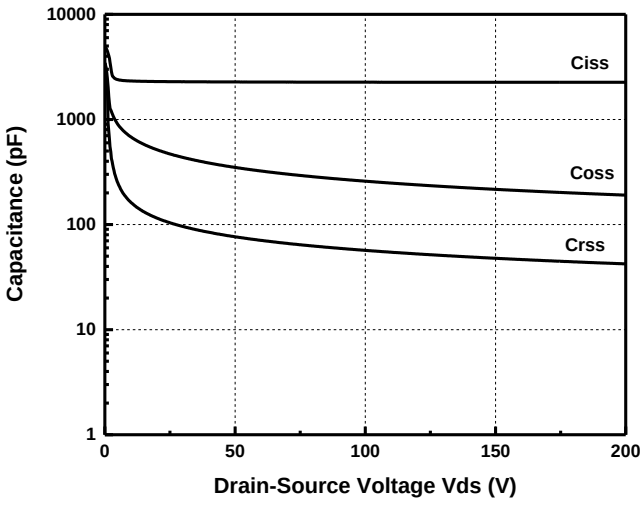


Figure 7. **Capacitance vs. Drain-Source Voltage (0-200V)**

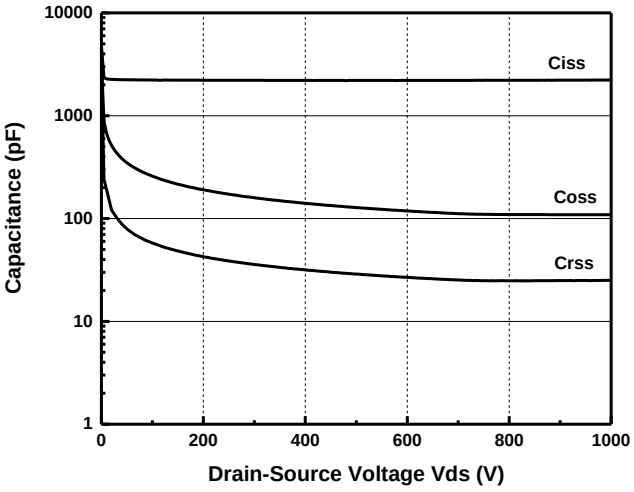


Figure 8. **Capacitance vs. Drain-Source Voltage (0 - 1000V)**

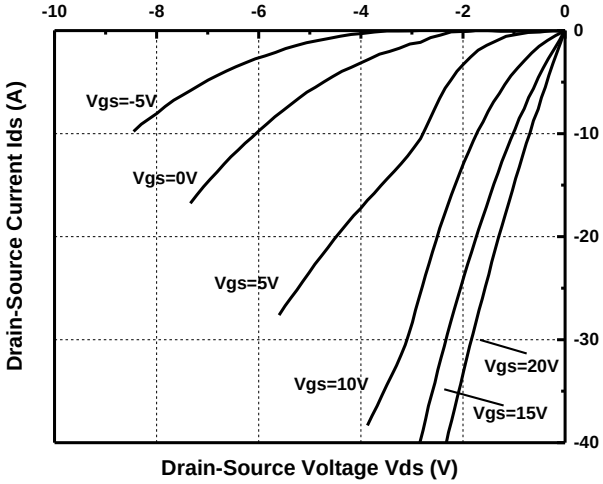


Figure 9. **Body Diode Characteristics at -55℃**

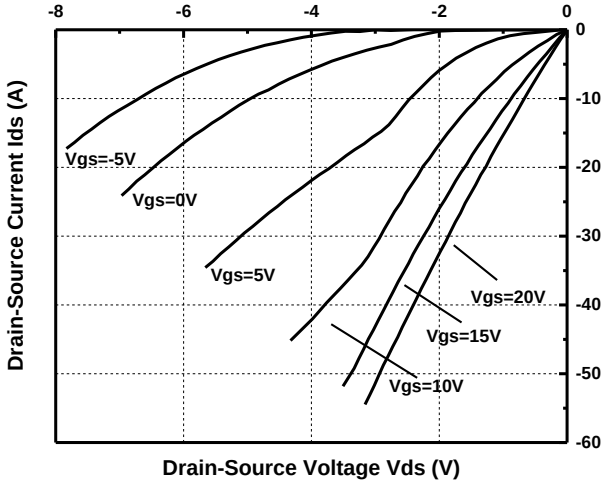


Figure 10. **Body Diode Characteristics at 25℃**

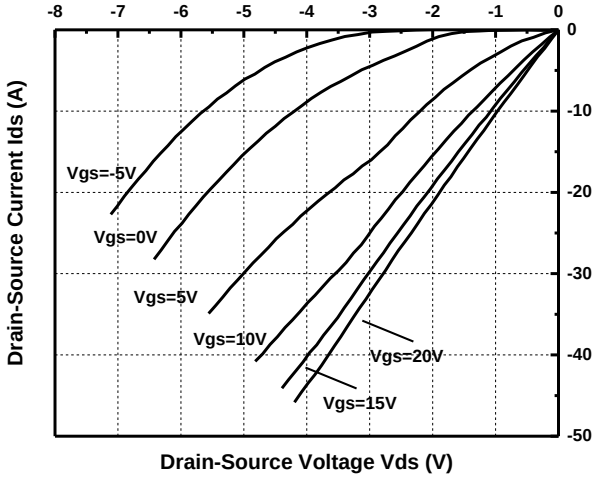


Figure 11. **Body Diode Characteristics at 150℃**

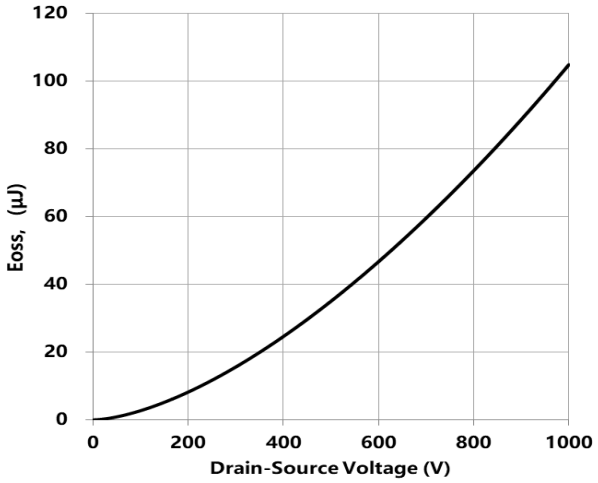


Figure 12. **Output Capacitor stored Energy**

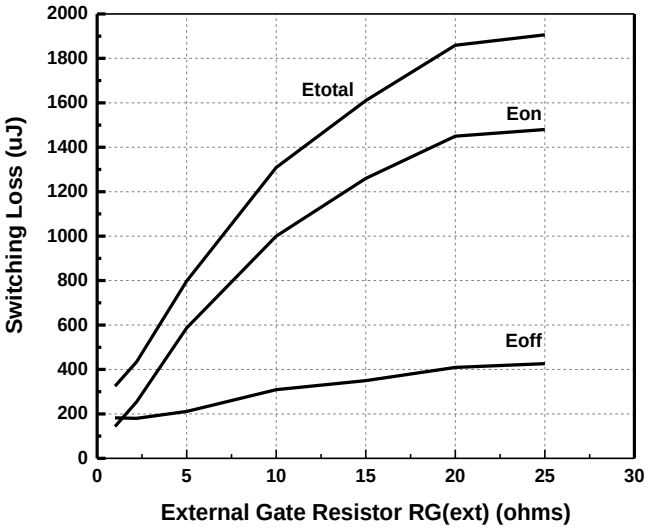


Figure 13. **Switching Times vs. Rg(ext)**

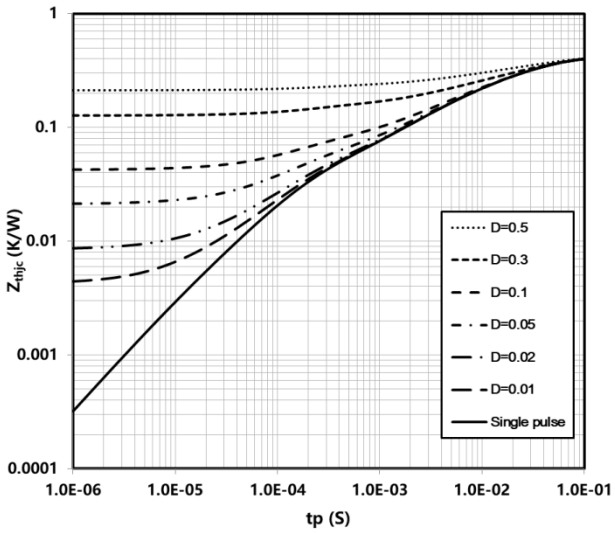


Figure 14. **Transient Thermal Impedance (Junction-Case)**

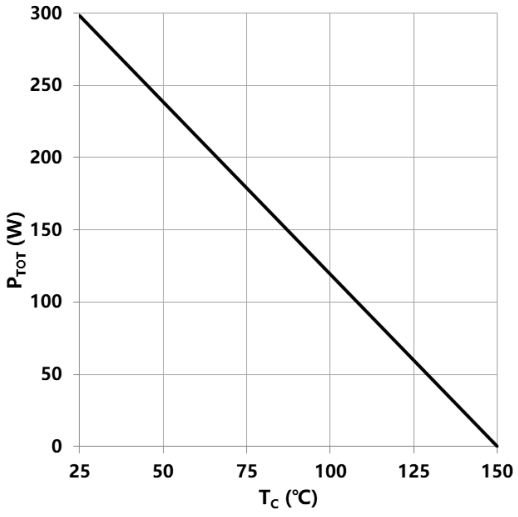


Figure 15. **Maximum Power Dissipation Derating vs.. Case Temperature**

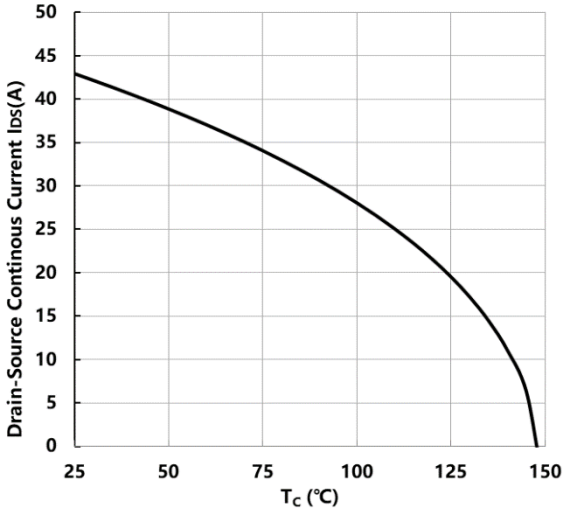


Figure 16. **Continuous Drain current Derating vs. Case Temperature**

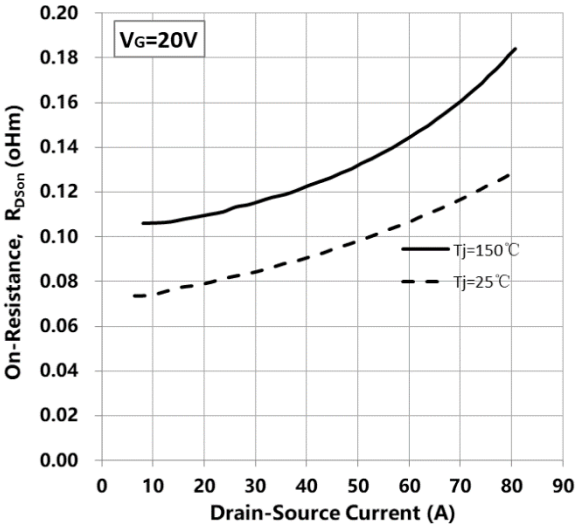


Figure 17. **On-Resistance vs. Drain current for Various Junction Temperature**

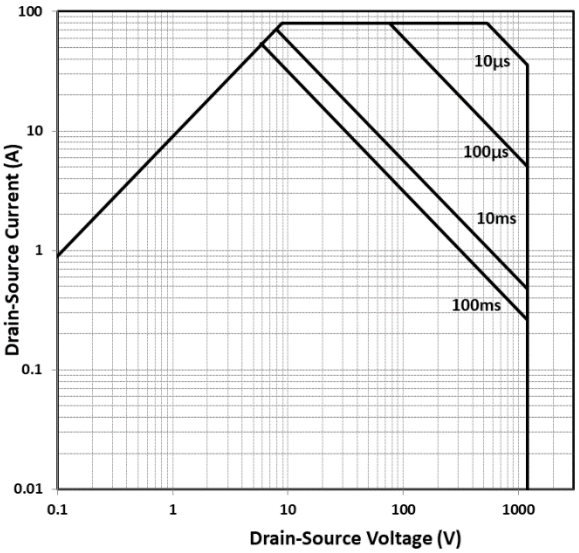
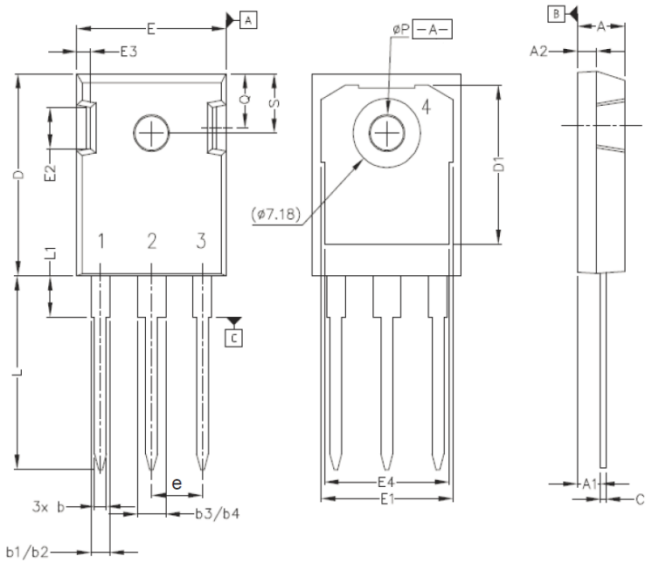


Figure 18. **Safe Operating Area**

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:

Information

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