B3DM060120N

SiC Schottky Diode

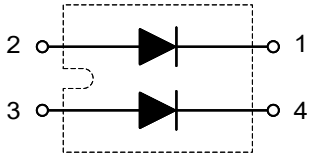
Product Summary

V_{RRM}	1200 V
I_F (T_C=125°C)	60 A*
Q_C	359 nC*

Package: SOT-227

*Backside is isolated

Electrical Connection



Features

- Low leakage current (I_R)
- Zero reverse recovery current
- Temperature independent switching behavior
- Positive temperature coefficient on V_F
- High surge current capacity
- Low capacitive charge

Benefits

- System cost savings due to smaller magnetics
- System efficiency improvement over Si diodes
- Reduction of heat sink requirements
- Enabling higher frequency
- Reduced EMI
- Isolation voltage: 2500V

Applications

- Switch mode power supplies (SMPS)
- Uninterruptible power supplies
- Server/telecom power supplies
- Power factor correction
- Solar

Package Pin Definitions

- Pin 1,4 - Cathode
- Pin 2,3 - Anode

Package Parameters

Part Number	Marking	Package
B3DM060120N	B3DM060120N	SOT-227

* Per Leg, ** Per Device

Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{RSM}	Non-repetitive peak reverse voltage		1200	V
E_{AS}	Single pulse avalanche energy	T_C=25°C, L=4mH, I_{AS}=13A, V=140V	338.5*	mJ
I_F	Continuous forward current	T_C=25°C	118*/236**	A
		T_C=125°C	60*/120**	
I_{FSM}	Non-repetitive forward surge current	T_C=25°C, t_p=10ms, Half sine wave	540*	A
		T_C=110°C, t_p=10ms, Half sine wave	520*	
I_{FRM}	Repetitive forward surge current	T_C=25°C, t_p=10ms, Half sine wave	360*	A
$I_{F,Max}$	Non-repetitive forward surge current	T_C=25°C, t_p=10μs, Half sine wave	3600*	A
		T_C=110°C, t_p=10μs, Half sine wave	3300*	
$\int i^2dt$	i²t value	T_C=25°C, t_p=10ms	1458*	A^2S
P_{tot}	Power dissipation	T_C=25°C T_C=110°C	375*/750** 163*/326**	W
T_j	Operating junction temperature		-40~175	°C
T_{stg}	Storage temperature		-40~175	°C

* Per Leg, ** Per Device

Thermal and Mechanical Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case			0.40*/ 0.20**		K/W
M_d	Mounting torque	M4-0.7 screws			1.5	N/m
M_{dt}	Terminal connection torque	M4-0.7 screws			1.3	N/m
W_t	Package weight			29		g
V_{ISOL}	Isolation voltage	I_{ISOL}<1mA, RMS, 50Hz,1min	2500			V
d_{Ctt}	Creepage Distance on Surface	Terminal to Terminal	10.4			mm
d_{Ctb}		Terminal to Backside	9.6			mm
d_{Stt}	Clearance Distance Through Air	Terminal to Terminal	4.4			mm
d_{Stb}		Terminal to Backside	8.4			mm

* Per Leg, ** Per Device

Electrical Characteristics(Per Leg)
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=60A T_j=25°C I_F=60A T_j=175°C		1.42 1.99	1.70 2.77	V
I_R	Reverse current	V_R=1200V T_j=25°C V_R=1200V T_j=175°C		10 60	100 600	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=800V T_j=25°C $Q_C=\int_0^{V_R} C(V)dV$		359		nC
C	Total capacitance	V_R=1V f=1MHz V_R=400V f=1MHz V_R=800V f=1MHz		4404 336 248		pF
E_C	Capacitance stored energy	V_R=800V		101.4		μJ

Typical Performance(Per Leg)

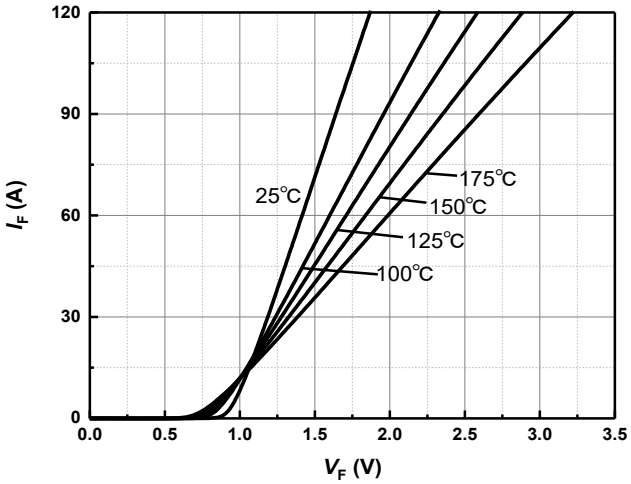


Figure 1 Typical forward characteristics

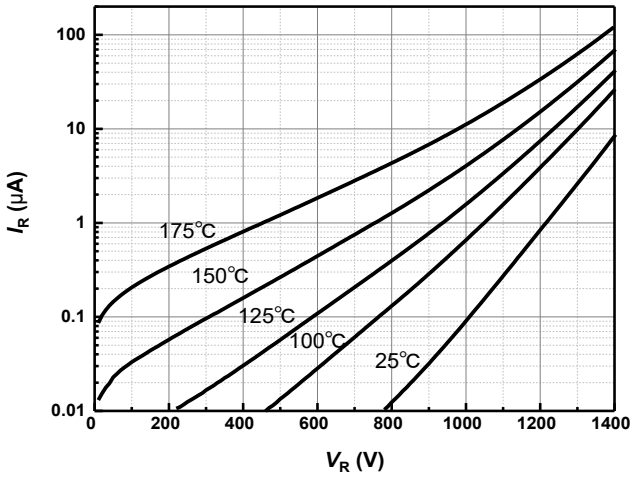


Figure 2 Typical reverse current as function of reverse voltage

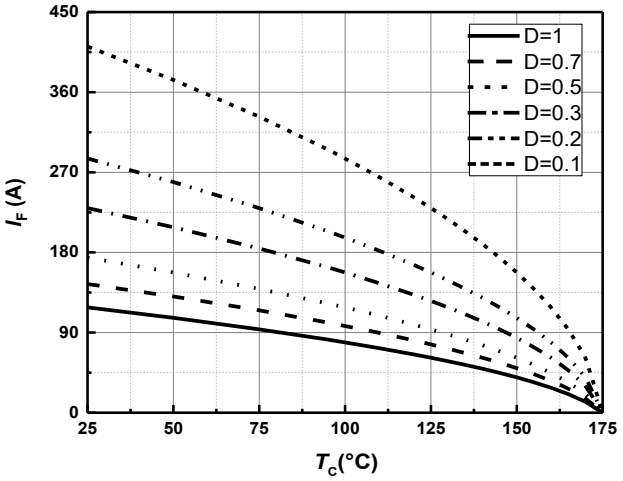


Figure 3 Diode forward current as function of temperature, D=duty cycle

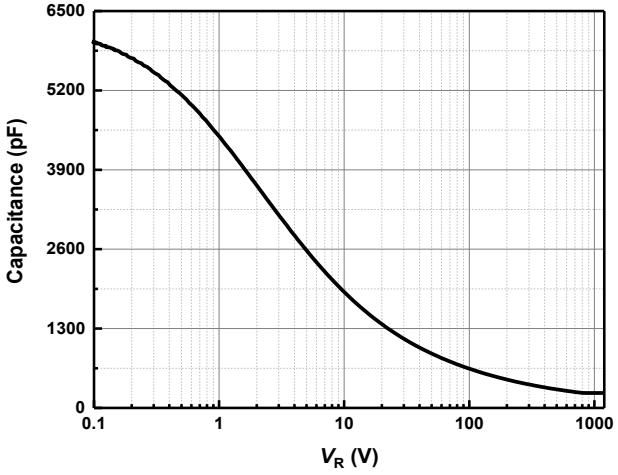


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

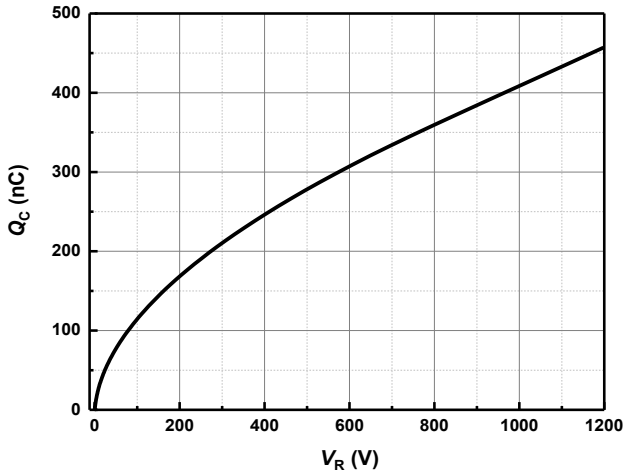


Figure 5 Typical reverse charge as function of reverse voltage

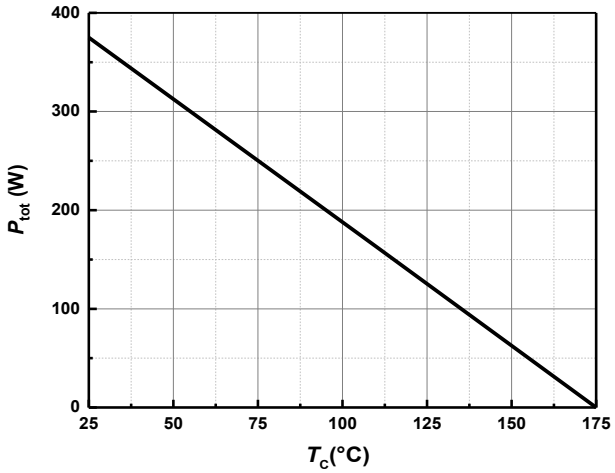


Figure 6 Power dissipation as function of case temperature

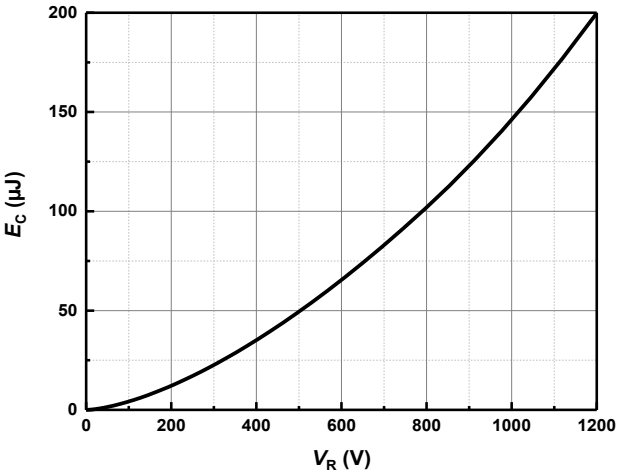


Figure 7 Capacitance stored energy

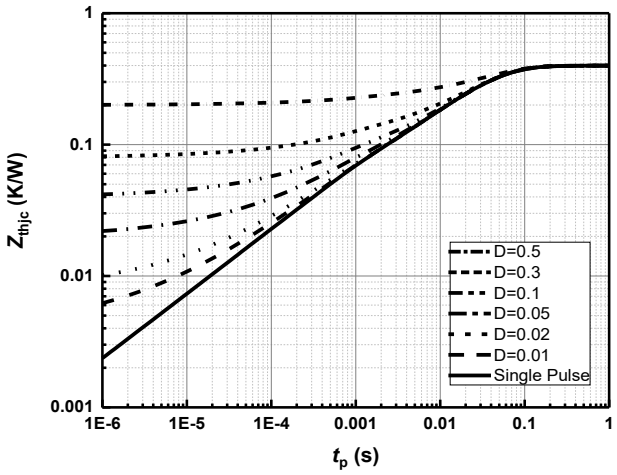


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Typical Performance

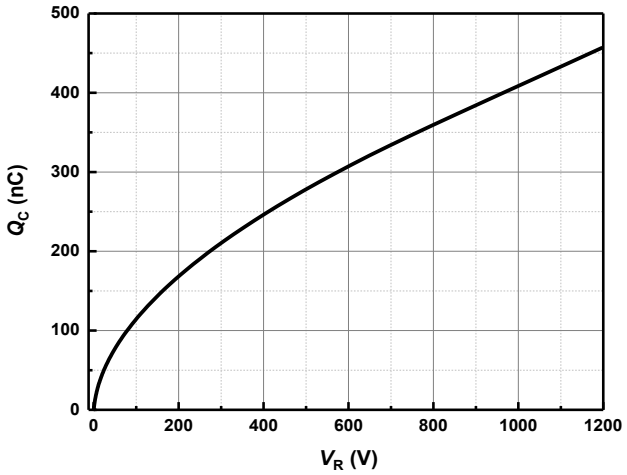
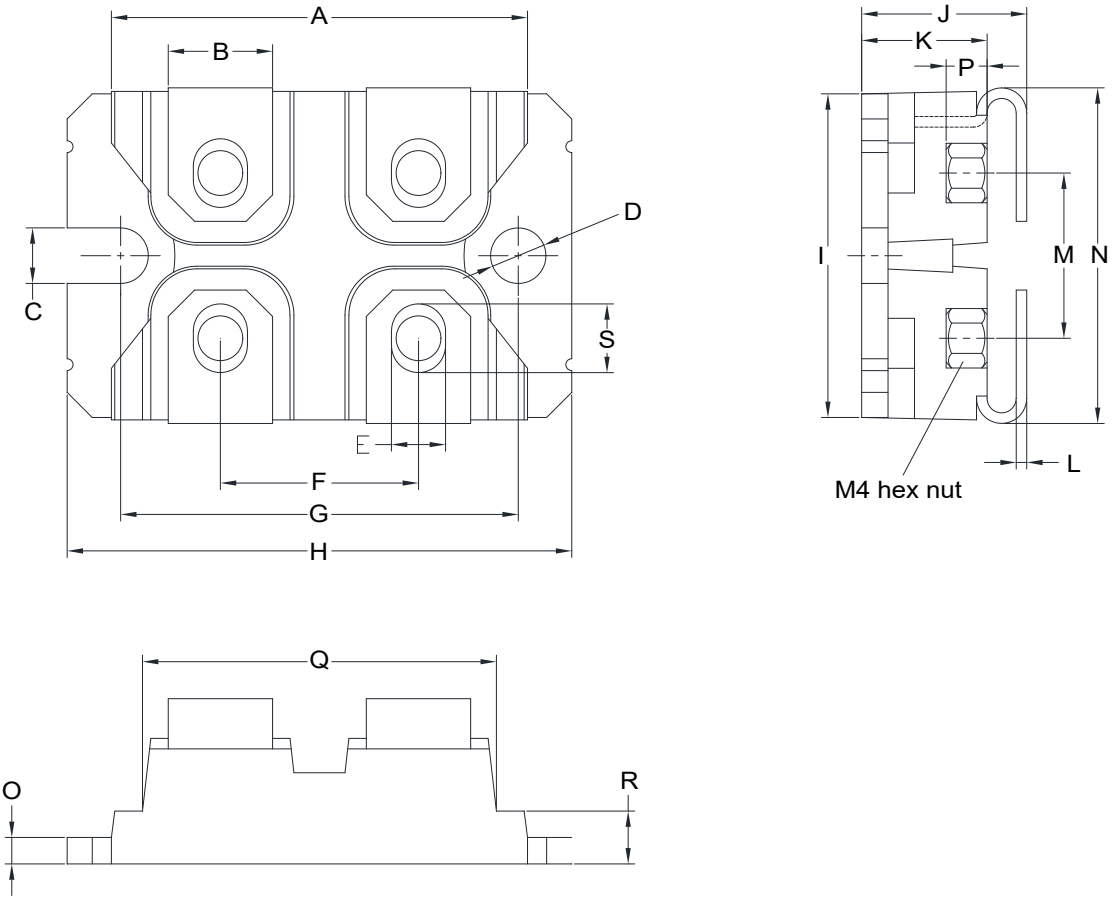


Figure 9 **Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)**

Package Dimensions



Items	mm	
	MIN	MAX
A	31.40	31.90
B	7.70	8.30
C	4.10	4.40
D	4.10	4.40
E	4.00	4.40
F	14.80	15.20
G	29.80	30.20
H	37.8	38.40
I	23.60	24.3
J	11.60	12.20
K	9.30	9.70
L	0.70	0.90
M	12.40	12.90
N	24.20	25.80
O	1.90	2.10
P	3.40	4.00
Q	26.60	27.00
R	3.80	4.40
S	4.50	5.20

Revision History

Document Version	Date of Release	Description of Changes
Rev. 0.0	2025-04-20	Release of the datasheet.
Rev. 0.1	2025-11-14	POD data update.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest BASiC Semiconductor Office.

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