

### Product Summary

$V_{RRM}$	1200 V
$I_F (T_C=110^\circ\text{C})$	100 A*
$Q_c$	545 nC*

### 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
B3DM100120N	B3DM100120N	SOT-227

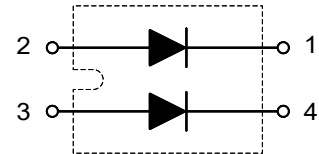
\* Per Leg, \*\* Per Device

### Package: SOT-227



\*Backside is isolated

### Electrical Connection



**Maximum Ratings ( $T_c=25^\circ\text{C}$  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	$T_c=25^\circ\text{C}$ , $L=4\text{mH}$ , $I_{AS}=13\text{A}$ , $V=140\text{V}$	338	mJ
$I_F$	Continuous forward current	$T_c=25^\circ\text{C}$	166*/332**	A
		$T_c=110^\circ\text{C}$	100*/200**	
$I_{FSM}$	Non-repetitive forward surge current	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half sine wave	750*	A
		$T_c=110^\circ\text{C}$ , $t_p=10\text{ms}$ , Half sine wave	700*	
$I_{FRM}$	Repetitive forward surge current	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half sine wave	600*	A
$\int i^2 dt$	$i^2t$ value	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$	2812.5*	A <sup>2</sup> S
$P_{tot}$	Power dissipation	$T_c=25^\circ\text{C}$	500*/1000**	W
		$T_c=110^\circ\text{C}$	217*/434**	
$T_j$	Operating junction temperature		-40~175	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-40~175	$^\circ\text{C}$

\* 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			0.30*/ 0.15**		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	$I_{ISOL} < 1\text{mA, RMS,}$ 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

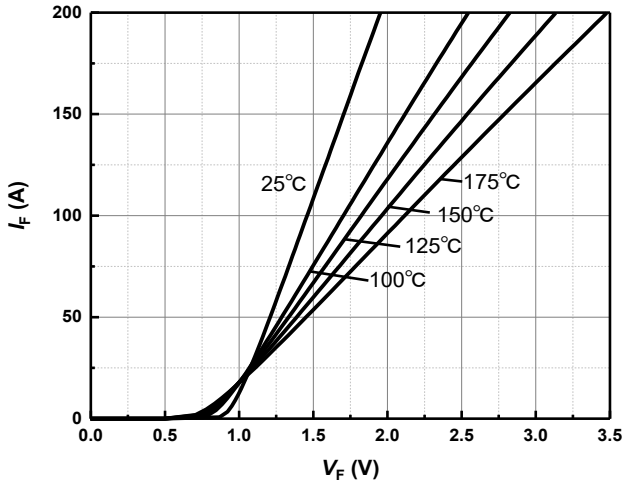
**Electrical Characteristics(Per Leg)**  
**Static Characteristics**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$V_{DC}$	DC blocking voltage	$T_j = 25^\circ\text{C}$	1200			V
$V_F$	Diode forward voltage	$I_F = 100\text{A } T_j = 25^\circ\text{C}$ $I_F = 100\text{A } T_j = 175^\circ\text{C}$		1.46 2.13	1.70 2.78	V
$I_R$	Reverse current	$V_R = 1200\text{V } T_j = 25^\circ\text{C}$ $V_R = 1200\text{V } T_j = 175^\circ\text{C}$		10 60	100 600	$\mu\text{A}$

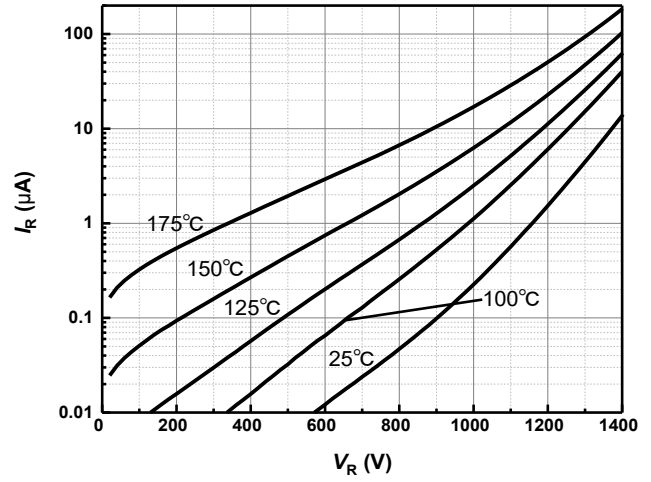
**AC Characteristics**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$Q_C$	Total capacitive charge	$V_R = 800\text{V } T_j = 25^\circ\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$		545		nC
$C$	Total capacitance	$V_R = 1\text{V } f = 1\text{MHz}$ $V_R = 400\text{V } f = 1\text{MHz}$ $V_R = 800\text{V } f = 1\text{MHz}$		6874 505 375		pF
$E_C$	Capacitance stored energy	$V_R = 800\text{V}$		152		$\mu\text{J}$

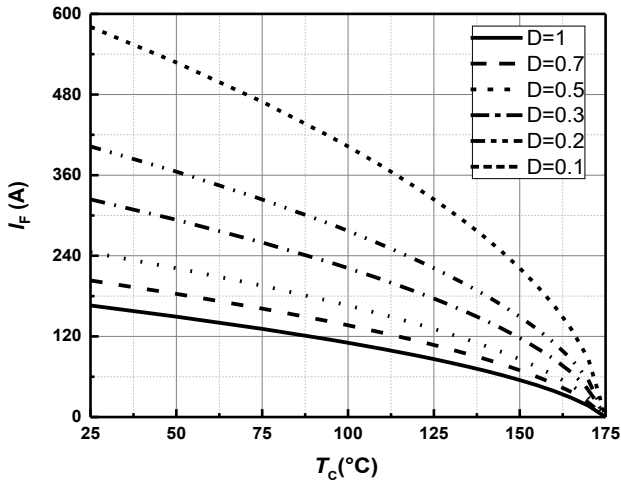
**Typical Performance(Per Leg)**



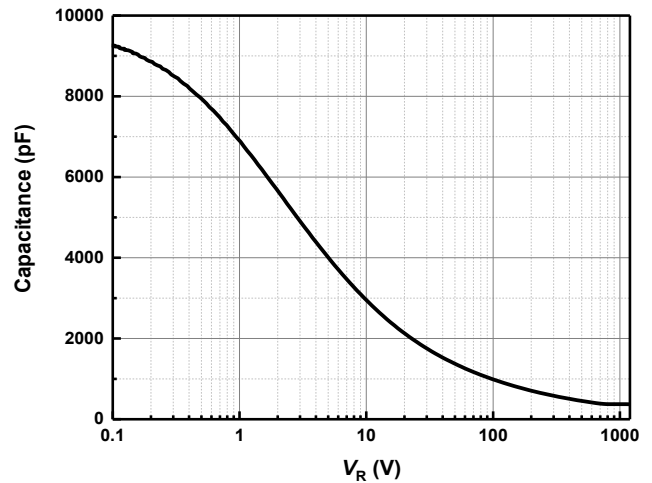
**Figure 1** Typical forward characteristics



**Figure 2** Typical reverse current as function of reverse voltage

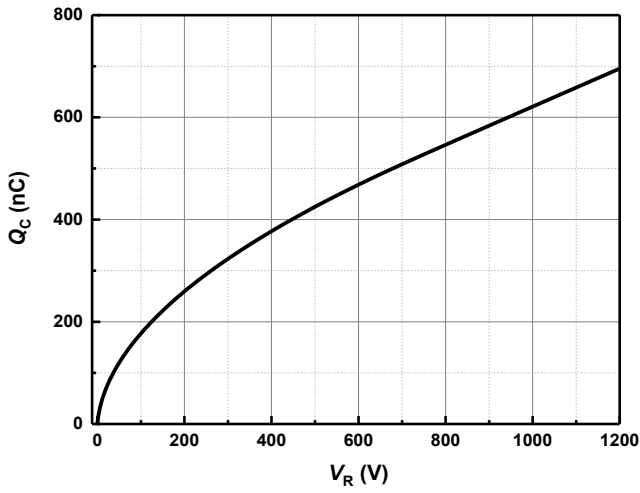


**Figure 3** Diode forward current as function of temperature, D=duty cycle

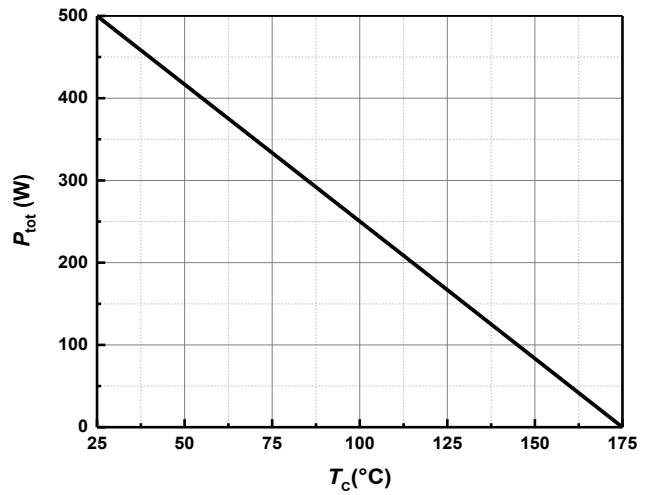


**Figure 4** Typical capacitance as function of reverse voltage,  $C=f(V_R)$ ;  $T_j=25^{\circ}$ C;  $f=1$  MHz

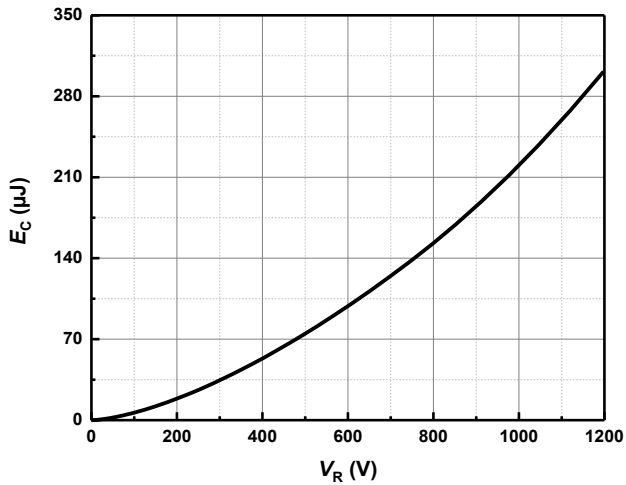
**Typical Performance**



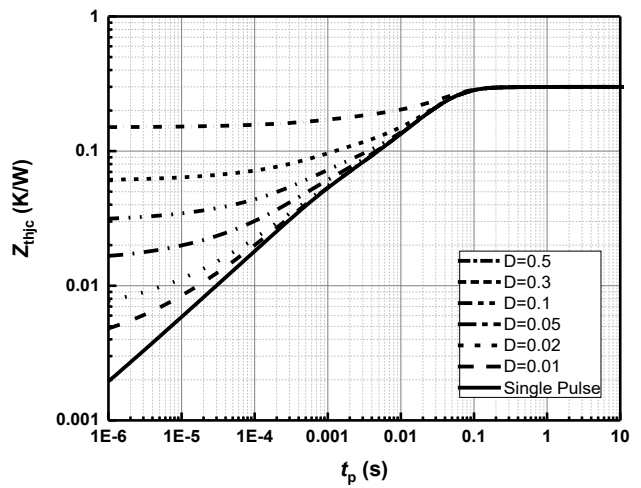
**Figure 5** Typical reverse charge as function of reverse voltage



**Figure 6** Power dissipation as function of case temperature

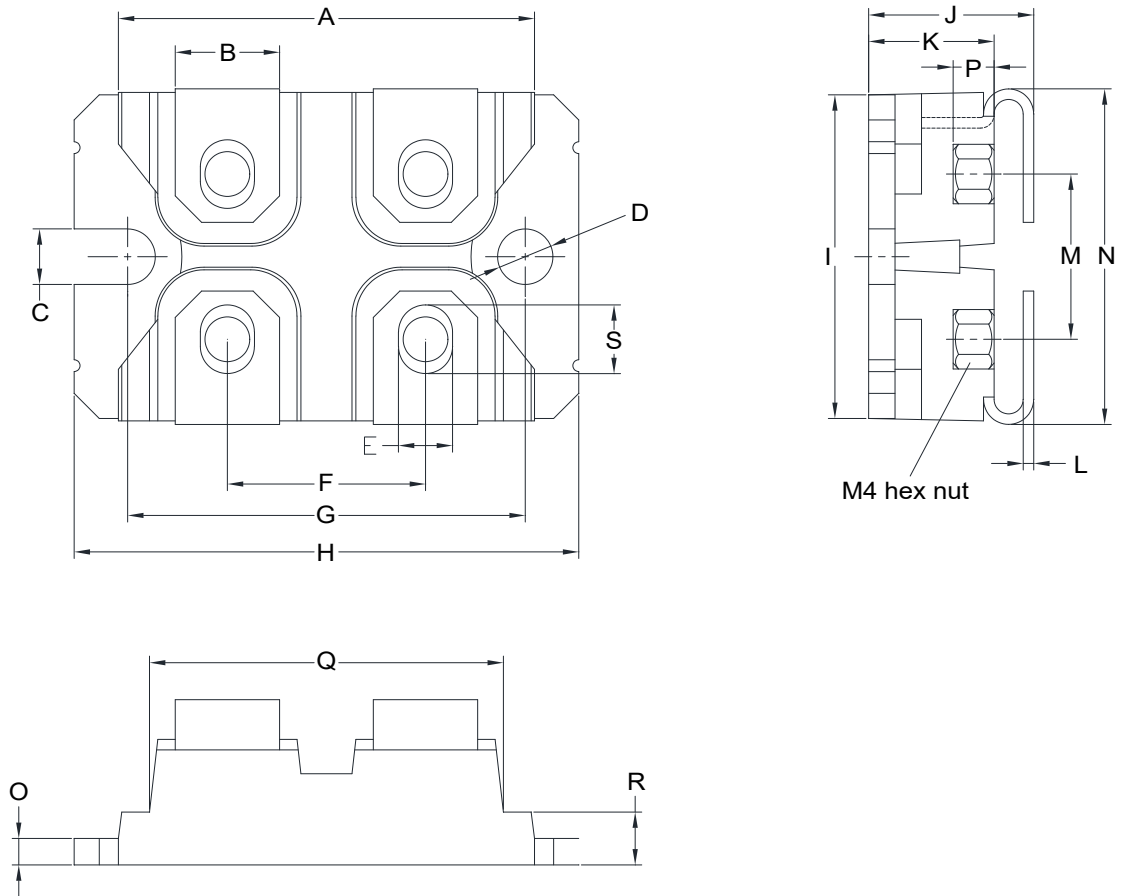


**Figure 7** Capacitance stored energy



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

**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**

<b>Document Version</b>	<b>Date of Release</b>	<b>Description of Changes</b>
Rev. 0.0	2025-05-23	Release of the datasheet.
Rev. 0.0	2025-11-17	POD data update.

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**Shenzhen, China**  
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