

Product Summary

V_{RRM}	650 V
$I_F (T_C=110^{\circ}\text{C})$	60 A*
Q_C	185 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

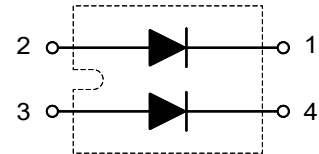
Package Parameters

Part Number	Marking	Package
B3DM060065N	B3DM060065N	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		650	V
V_{RSM}	Non-repetitive peak reverse voltage		650	V
E_{AS}	Single pulse avalanche energy	$T_c=25^\circ\text{C}$, $L=4\text{mH}$, $I_{AS}=12\text{A}$, $V=140\text{V}$	288*	mJ
I_F	Continuous forward current	$T_c=25^\circ\text{C}$	106*/212**	A
		$T_c=110^\circ\text{C}$	60*/120**	
I_{FSM}	Non-repetitive forward surge current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, Half sine wave	420*	A
		$T_c=110^\circ\text{C}$, $t_p=10\text{ms}$, Half sine wave	390*	
I_{FRM}	Repetitive forward surge current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, Half sine wave	360*	A
$\int i^2 dt$	i^2t value	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$	882*	A ² S
P_{tot}	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	250*/500** 108*/216**	W
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			0.60*/ 0.30**		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	$T_J = 25^\circ C$	650			V
V_F	Diode forward voltage	$I_F = 60A$ $T_J = 25^\circ C$ $I_F = 60A$ $T_J = 175^\circ C$		1.36 1.66	1.6 2.09	V
I_R	Reverse current	$V_R = 650V$ $T_J = 25^\circ C$ $V_R = 650V$ $T_J = 175^\circ C$		5 40	100 400	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R = 800V$ $T_J = 25^\circ C$ $Q_C = \int_0^{t_{VR}} C(V)dV$		185		nC
C	Total capacitance	$V_R = 1V$ $f = 1MHz$ $V_R = 200V$ $f = 1MHz$ $V_R = 400V$ $f = 1MHz$		2980 335 298		pF
E_C	Capacitance stored energy	$V_R = 400V$		28.3		μJ

Typical Performance(Per Leg)

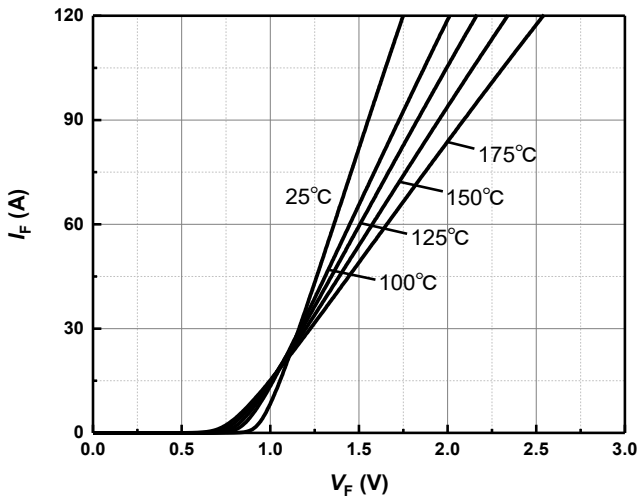


Figure 1 Typical forward characteristics

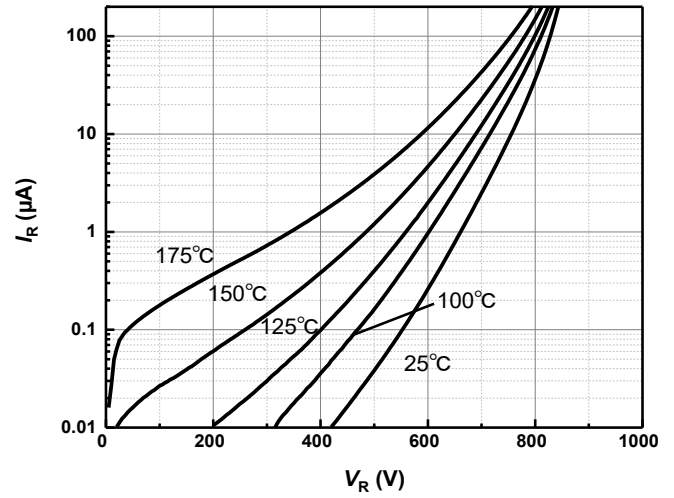


Figure 2 Typical reverse current as function of reverse voltage

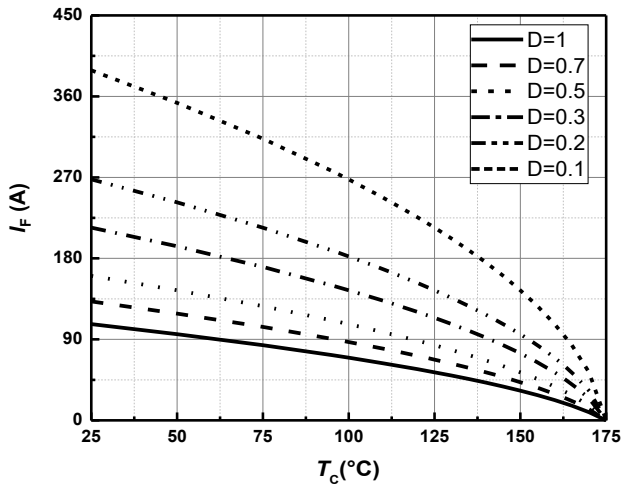


Figure 3 Diode forward current as function of temperature, D=duty cycle

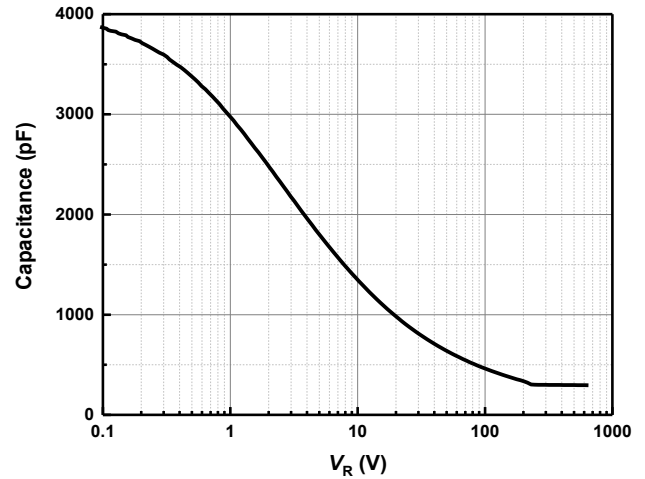


Figure 4 Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

Typical Performance

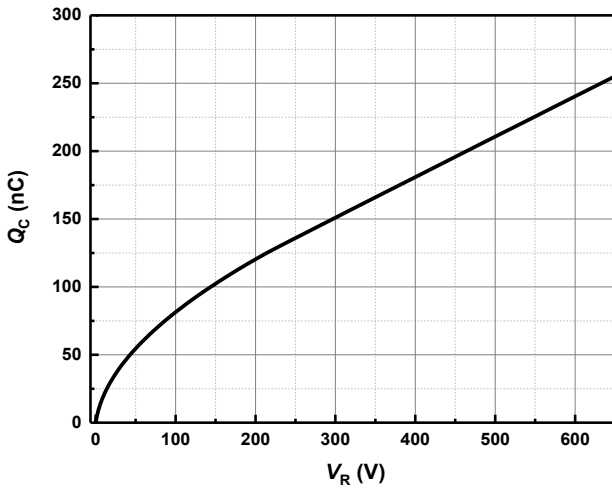


Figure 5 Typical reverse charge as function of reverse voltage

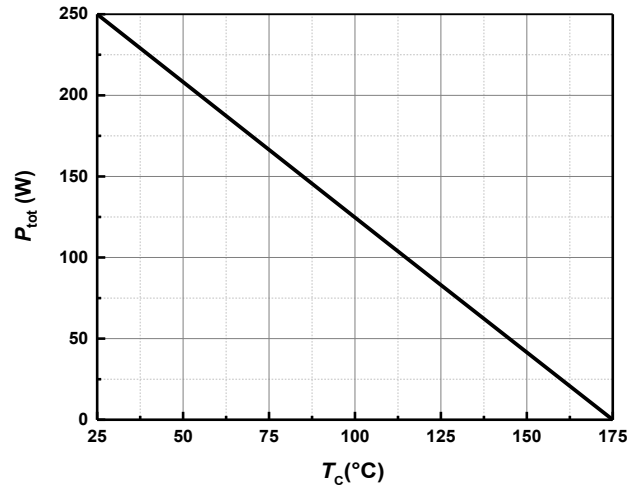


Figure 6 Power dissipation as function of case temperature

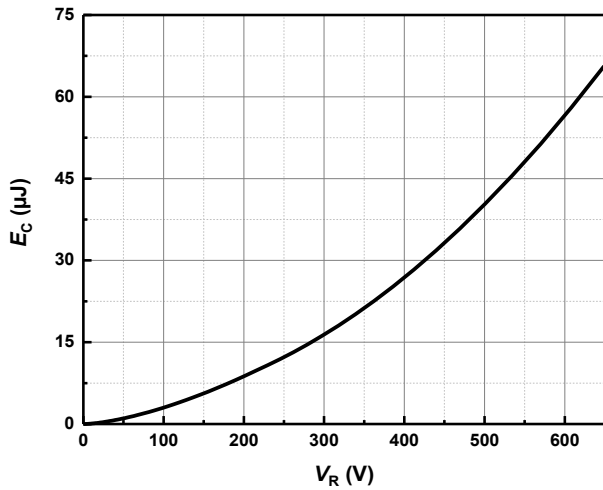


Figure 7 Capacitance stored energy

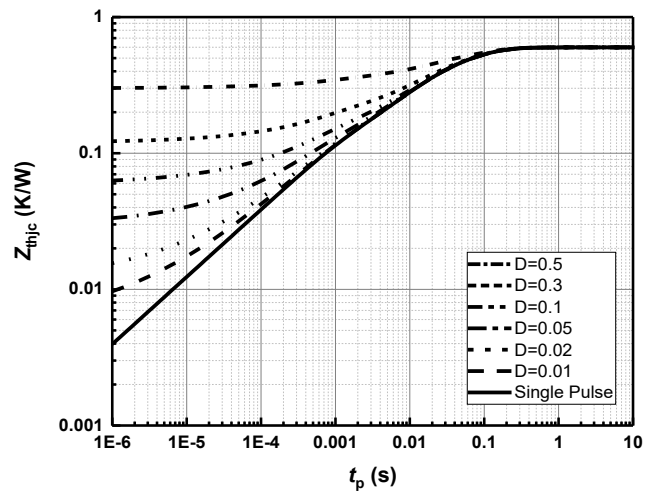
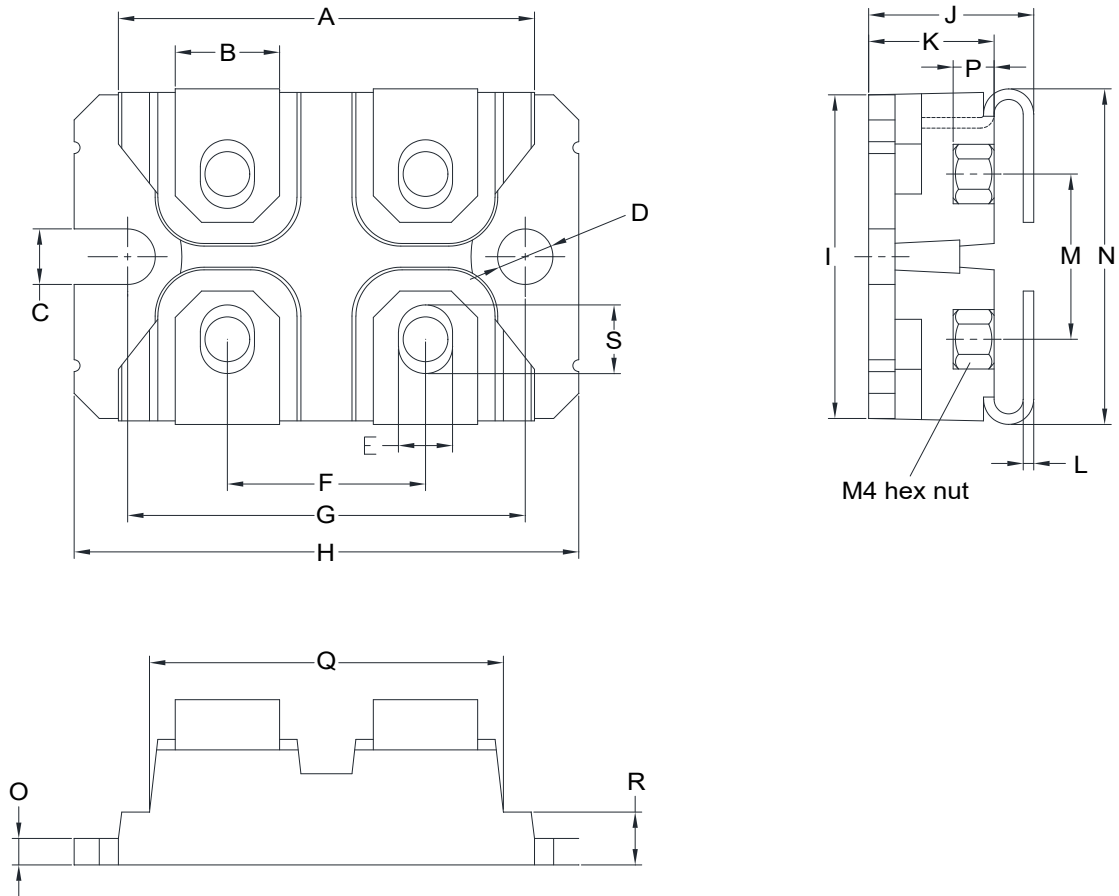


Figure 8 Max. transient thermal impedance, $Z_{thjc} = f(t_p)$, parameter: $D = t_p / T$

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

Document Version	Date of Release	Description of Changes
Rev. 0.0	2025-09-19	Release of the datasheet.
Rev. 0.0	2025-11-18	POD data update.

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