

Product Summary

V_{RRM}	650 V
$I_F (T_C=135^{\circ}\text{C})$	4 A
Q_C	12 nC

Features

- Extremely low reverse current
- No reverse recovery current
- Temperature independent switching
- Positive temperature coefficient on V_F
- Excellent surge current capability
- Low capacitive charge

Benefits

- Essentially no switching losses
- System efficiency improvement over Si diodes
- Increased power density
- Enabling higher switching frequency
- Reduction of heat sink requirements
- System cost savings due to smaller magnetics
- Reduced EMI

Applications

- Switch mode power supplies (SMPS)
- Uninterruptible power supplies
- Motor drivers
- Power factor correction

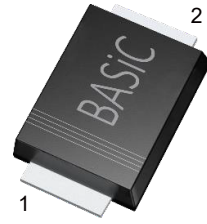
Package Pin Definitions

- Pin1 - Cathode
- Pin2 - Anode

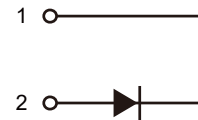
Package Parameters

Part Number	Marking	Package
B2D04065V	2465	SMBF

Package: SMBF



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
I_F	Continuous forward current	$T_c=25^\circ\text{C}$ $T_c=135^\circ\text{C}$	9 4	A
I_{FSM}	Non-repetitive forward surge current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, Half sine wave	32	A
$\int i^2 dt$	i^2t value	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$	5.12	A^2S
P_{tot}	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	25 10	W
T_j	Operating junction temperature		-55~175	$^\circ\text{C}$
T_{stg}	Storage temperature		-55~175	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		6		K/W

Electrical Characteristics
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	$I_F=4A$ $T_J=25^{\circ}C$ $I_F=4A$ $T_J=175^{\circ}C$		1.35 1.65		V
I_R	Reverse current	$V_R=650V$ $T_J=25^{\circ}C$ $V_R=650V$ $T_J=175^{\circ}C$		1 5		μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400V$ $T_J=25^{\circ}C$ $Q_C=\int_0^{V_{RS}} C(V)dV$		12		nC
C	Total capacitance	$V_R=1V$ $f=1MHz$ $V_R=300V$ $f=1MHz$ $V_R=600V$ $f=1MHz$		181 21.6 21.3		pF
E_C	Capacitance stored energy	$V_R=400V$		3		μJ

Typical Performance

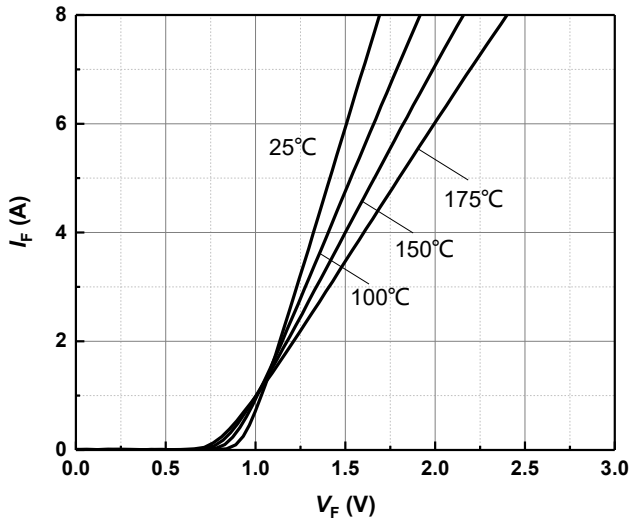


Figure 1 Typical forward characteristics

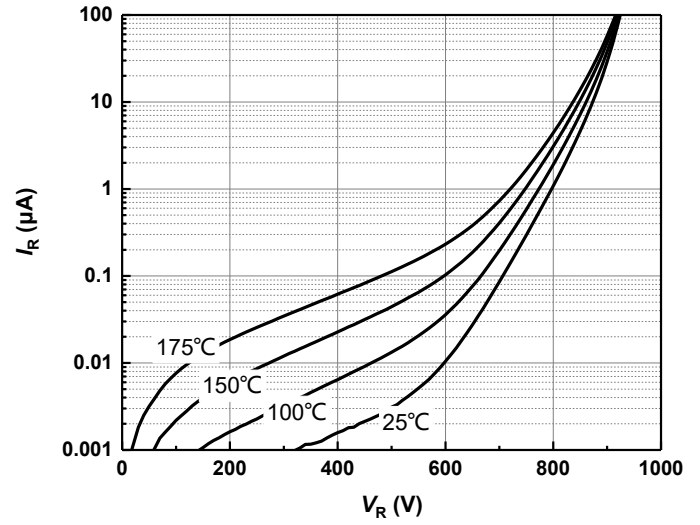


Figure 2 Typical reverse current as function of reverse voltage

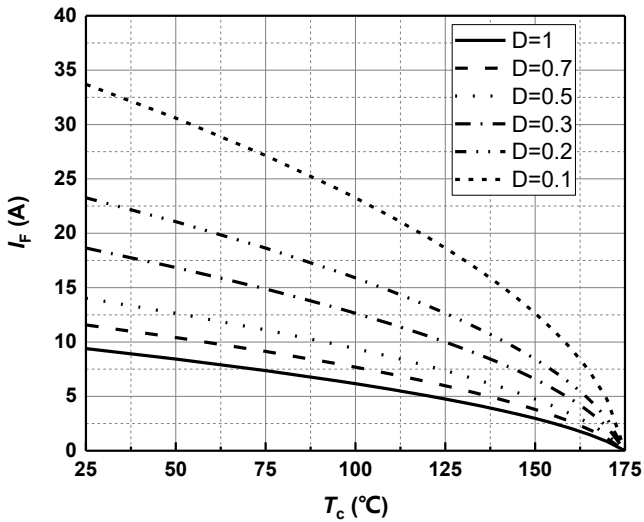


Figure 3 Diode forward current as function of temperature, D=duty cycle

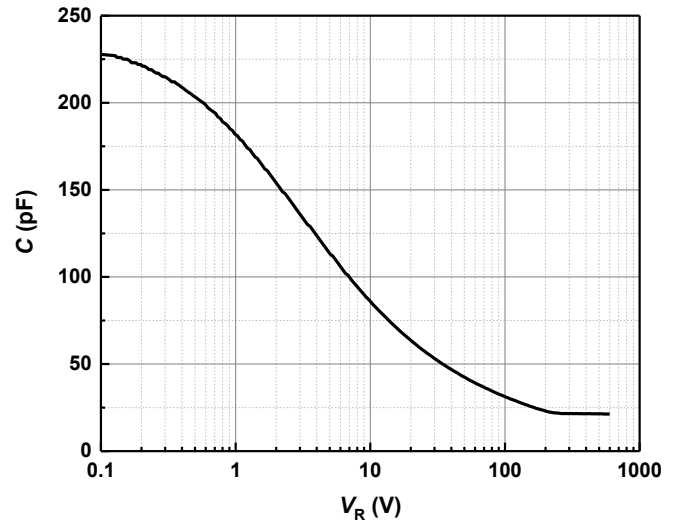


Figure 4 Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

Typical Performance

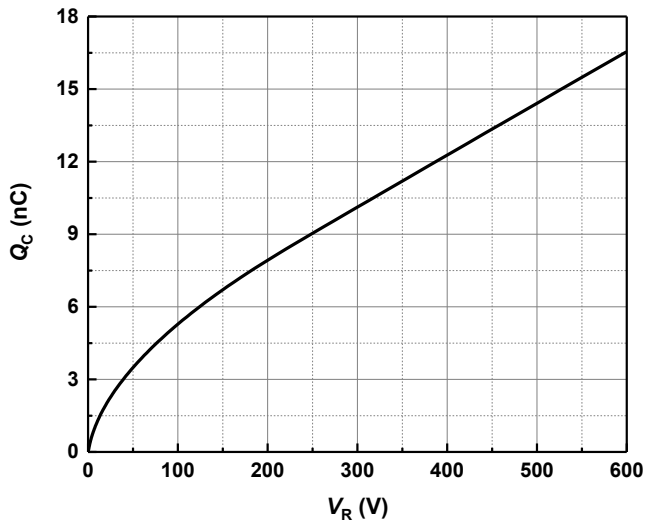


Figure 5 Typical reverse charge as function of reverse voltage

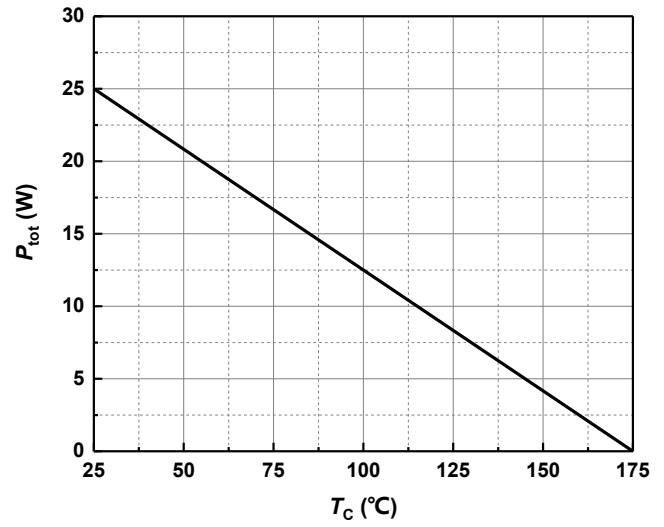


Figure 6 Power dissipation as function of case temperature

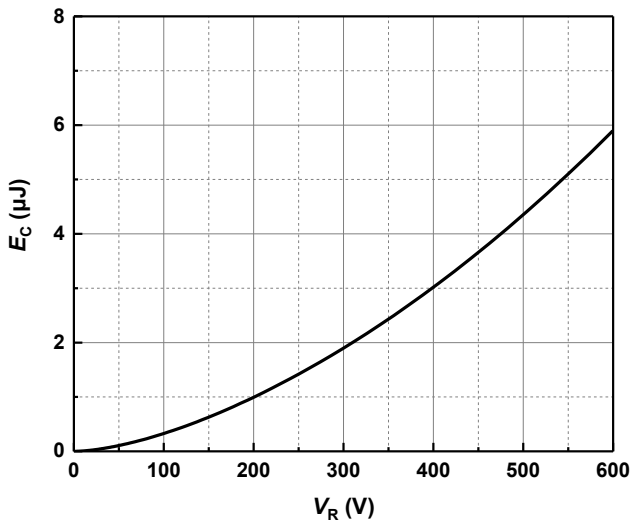
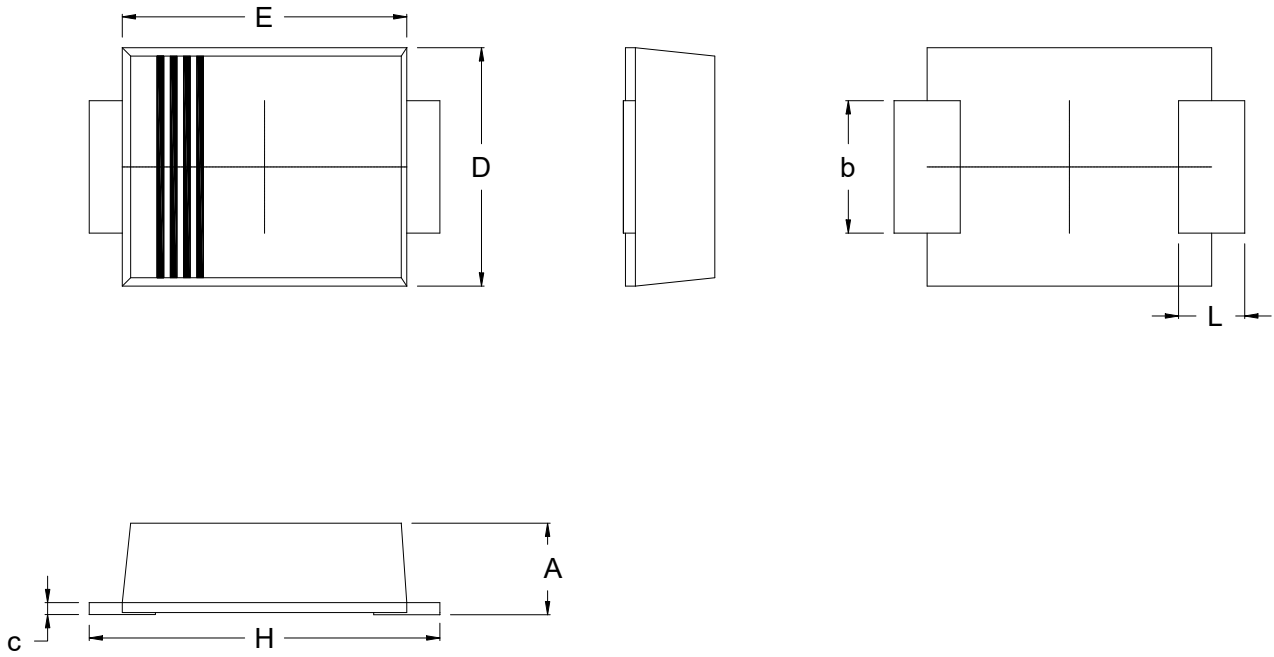


Figure 7 Capacitance stored energy

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	1.30	1.35	1.40
b	1.98	2.00	2.02
c	0.12	0.15	0.18
D	3.55	3.60	3.65
E	4.25	4.30	4.35
H	5.20	5.30	5.40
L	0.70	-	1.02

Revision History

Document Version	Date of Release	Description of Changes
Rev. 0.1	2021-03-18	Release of the preliminary datasheet.
Rev. 0.2	2021-04-02	Characteristics updated.
Rev. 0.3	2021-04-18	Characteristics updated.
Rev. 0.4	2022-09-05	Characteristics updated.

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