

Product Summary

V_{RRM}	650 V
$I_F (T_c=95^\circ\text{C})$	4 A
Q_c	14 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

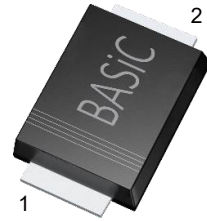
Package Pin Definitions

- Pin1 - Cathode
- Pin2 - Anode

Package Parameters

Part Number	Marking	Package
B2D04065U	2465	SMAF

Package: SMAF



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	$T_c=25^\circ\text{C}$ $T_c=95^\circ\text{C}$	6 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 ² S
P_{tot}	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	12 5	W
T_j	Operating junction temperature		-55~150	$^\circ\text{C}$
T_{stg}	Storage temperature		-55~150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		12		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_J=25^{\circ}C$				
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	1.5 2.2	V
I_R	Reverse current	$V_R=650V$ $T_J=25^{\circ}C$ $V_R=650V$ $T_J=175^{\circ}C$		1 10	70 100	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400V$ $T_J=25^{\circ}C$ $Q_C=\int_0^{V_R} C(V)dV$		14		nC
C	Total capacitance	$V_R=1V$ $f=1MHz$ $V_R=300V$ $f=1MHz$ $V_R=600V$ $f=1MHz$		183 26 25		pF
E_C	Capacitance stored energy	$V_R=400V$		3		μJ

Typical Performance

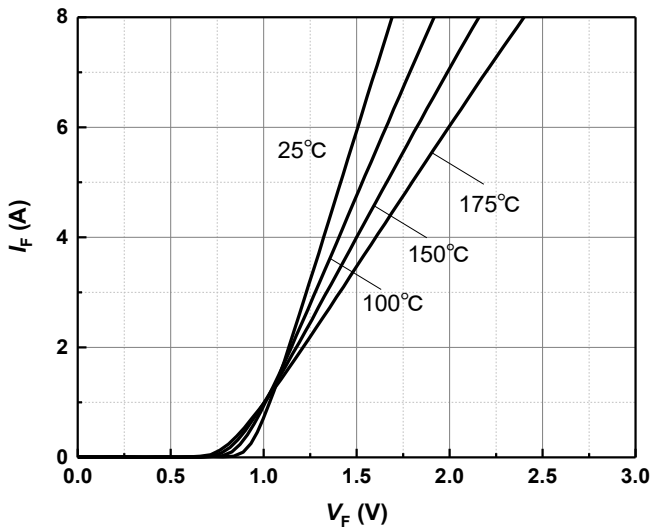


Figure 1 Typical forward characteristics

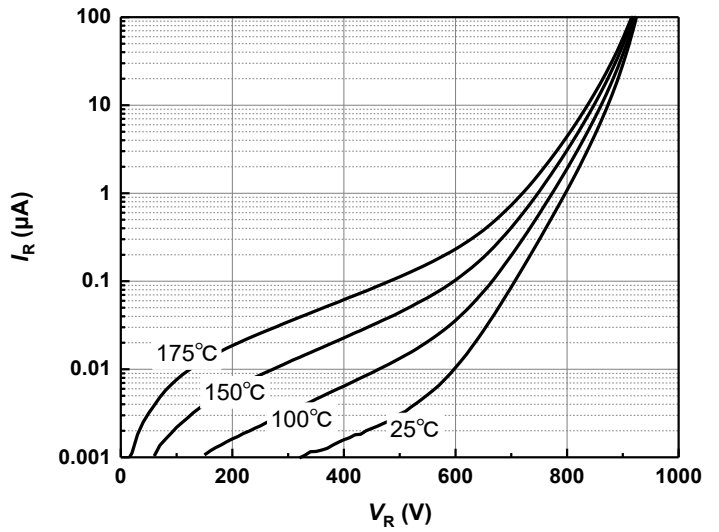


Figure 2 Typical reverse current as function of reverse voltage

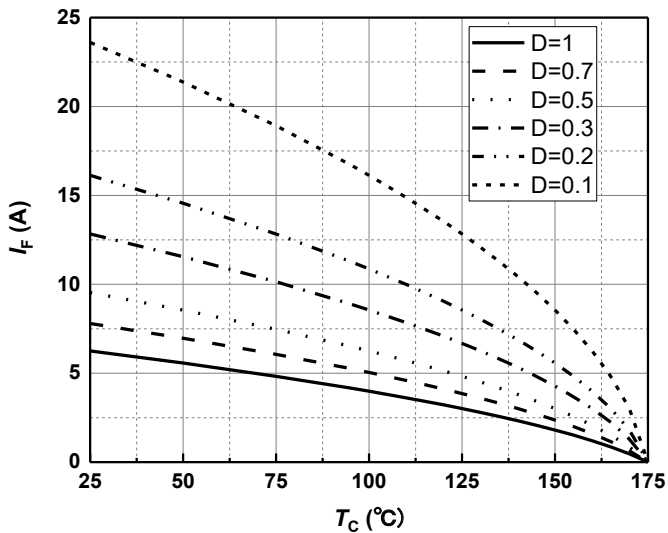


Figure 3 Diode forward current as function of temperature, D=duty cycle

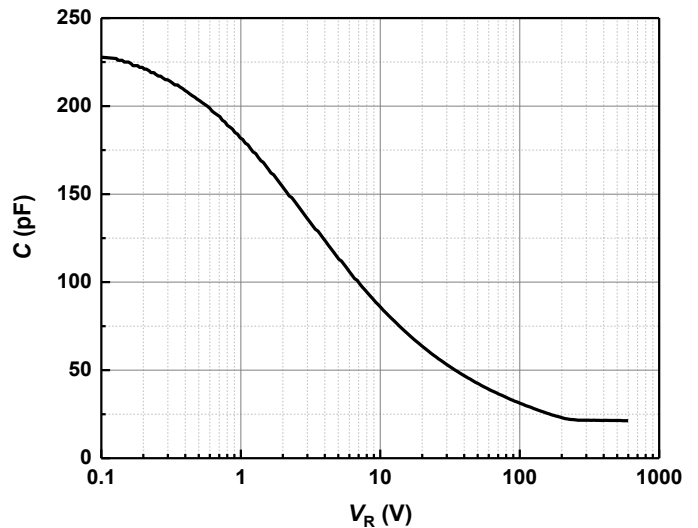


Figure 4 Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_j=25^{\circ}$ C; $f=1$ MHz

Typical Performance

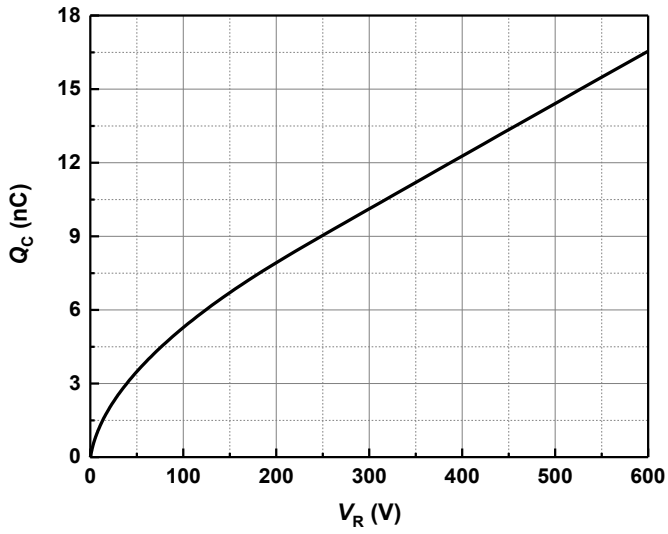


Figure 5 Typical reverse charge as function of reverse voltage

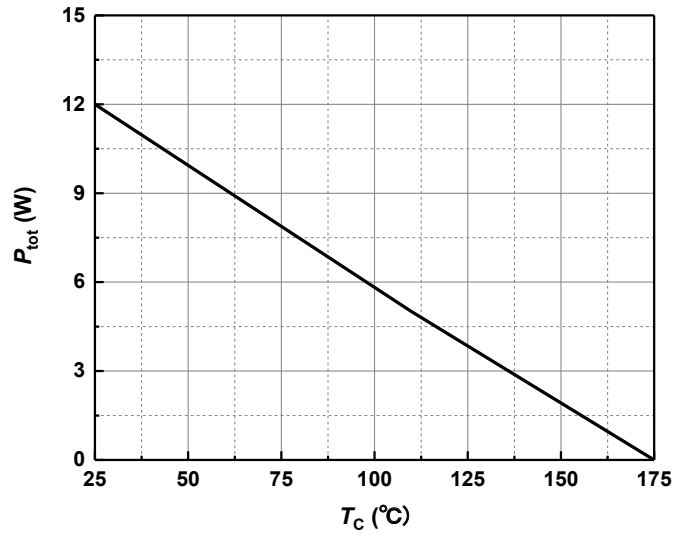


Figure 6 Power dissipation as function of case temperature

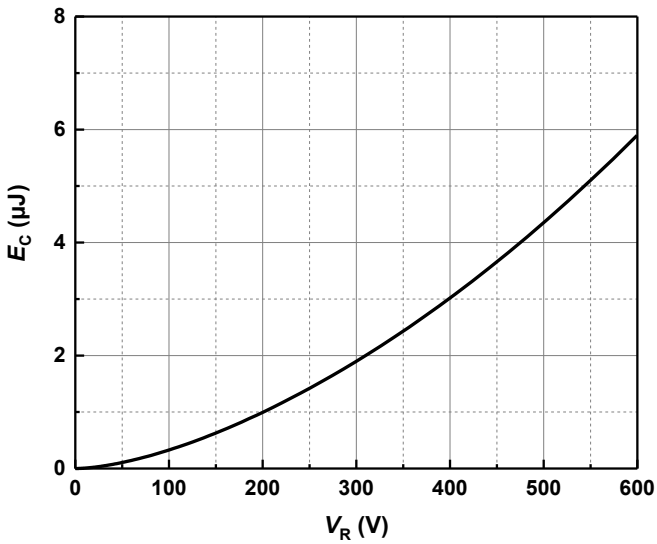
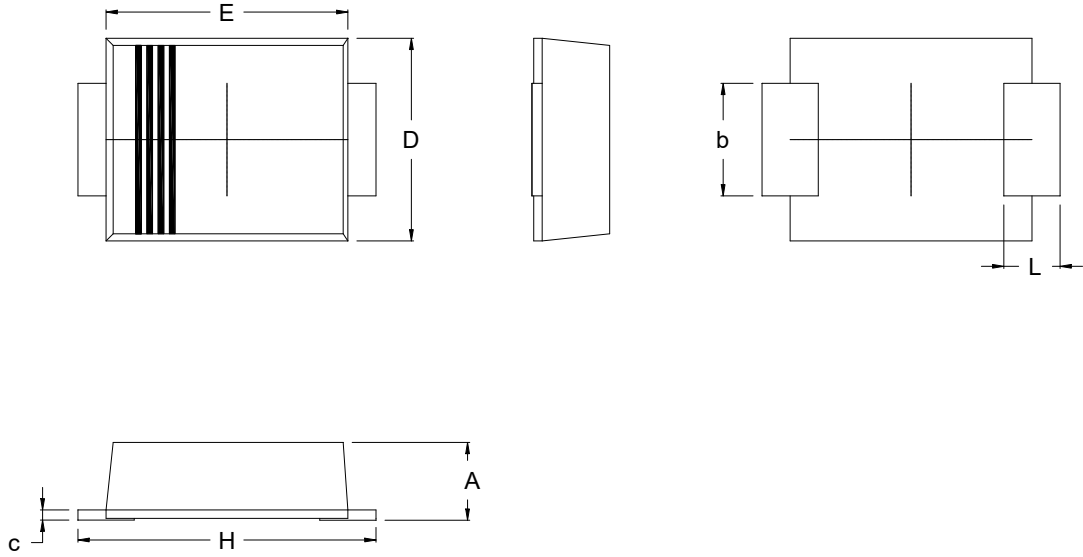


Figure 7 Capacitance stored energy

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	0.95	1	1.05
b	1.38	1.40	1.42
c	0.12	0.15	0.18
D	2.45	2.50	2.55
E	3.45	3.50	3.55
H	4.50	4.60	4.70
L	-	0.90	-

Revision History

Document Version	Date of Release	Description of Changes
Rev 1.0	2021-12-01	Release of the preliminary datasheet.
Rev 1.1	2022-03-30	Characteristics updated.

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