

Product Summary

V_{RRM}	1200 V
$I_F (T_C=165^{\circ}\text{C})$	2 A
Q_C	13 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

Applications

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

Package Pin Definitions

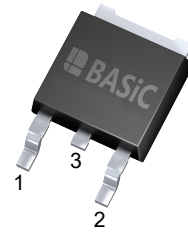
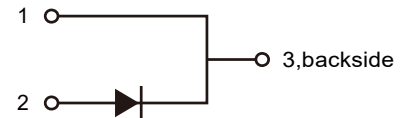
- Pin1,3 and backside - Cathode
- Pin2 - Anode

Package Parameters

Part Number	Marking	Package
B2D02120E1	B2D02120E1	TO-252-3

Packing Quantities

Tape & Reel Packing	PCS/Reel	Reels/Box	PCS/Box
TO-252-3	2500	2	5000

Package: TO-252-3

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
I_F	Continuous forward current	$T_c=25^\circ\text{C}$ $T_c=165^\circ\text{C}$	11 2	A
I_{FSM}	Non-repetitive forward surge current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$ Half sine wave	22	A
		$T_c=110^\circ\text{C}$, $t_p=10\text{ms}$ Half sine wave	18	
$I_{F, MAX}$	Non-repetitive peak forward current	$T_c=25^\circ\text{C}$, $t_p=10\mu\text{s}$ Square-wave Pluse	240	A
		$T_c=110^\circ\text{C}$, $t_p=10\mu\text{s}$ Square-wave Pluse	220	
$\int i^2 dt$	i^2t value	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$	2.4	A^2S
P_{tot}	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	77 34	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		1.94		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_J=25^{\circ}C$	1200			V
V_F	Diode forward voltage	$I_F=2A$ $T_J=25^{\circ}C$ $I_F=2A$ $T_J=175^{\circ}C$		1.35 1.92	1.6 2.8	V
I_R	Reverse current	$V_R=1200V$ $T_J=25^{\circ}C$ $V_R=1200V$ $T_J=175^{\circ}C$		1 20	70 200	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=800V$ $T_J=25^{\circ}C$ $Q_C=\int_0^{V_R} C(V)dV$		13		nC
C	Total capacitance	$V_R=1V$ $f=1MHz$ $V_R=400V$ $f=1MHz$ $V_R=800V$ $f=1MHz$		133 13 10		pF
E_C	Capacitance stored energy	$V_R=800V$		7		μJ

Typical Performance

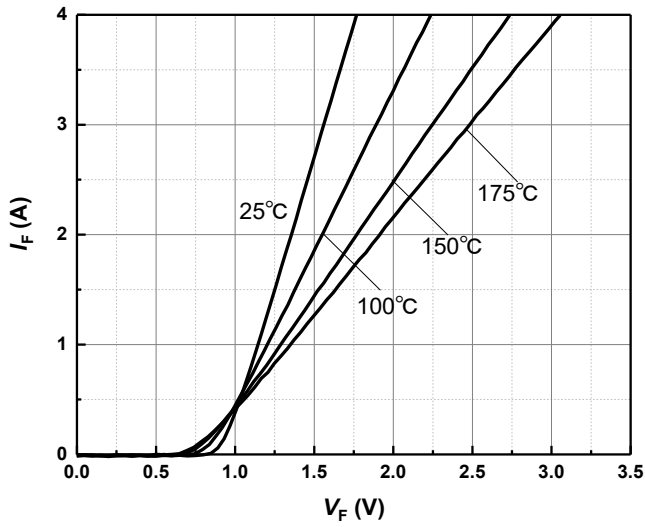


Figure 1 Typical forward characteristics

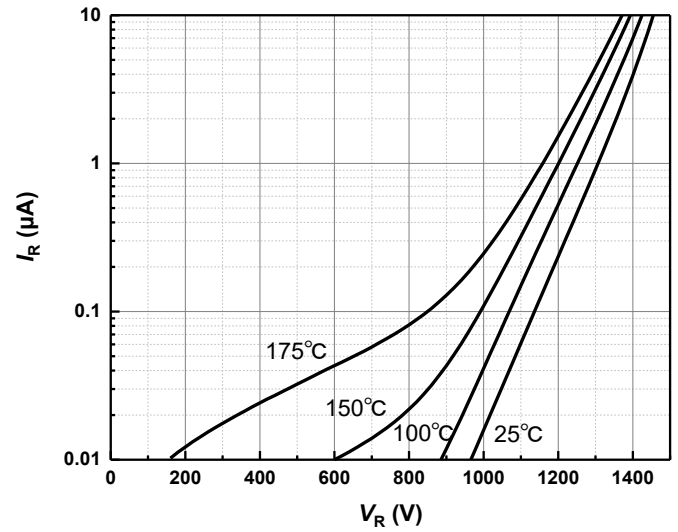


Figure 2 Typical reverse current as function of reverse voltage

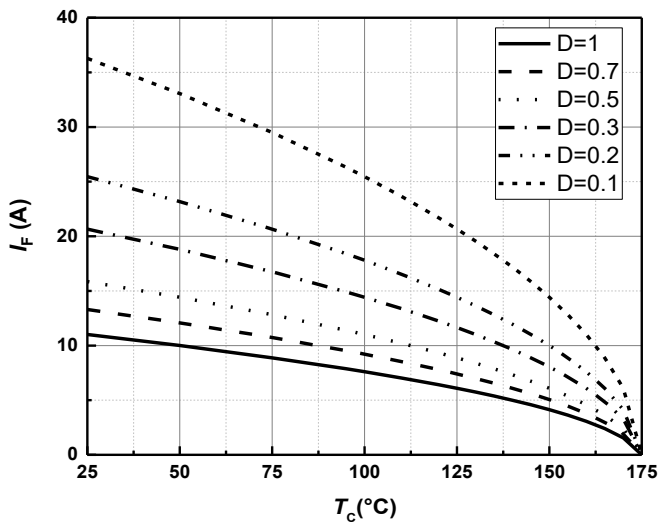


Figure 3 Diode forward current as function of temperature, D=duty cycle

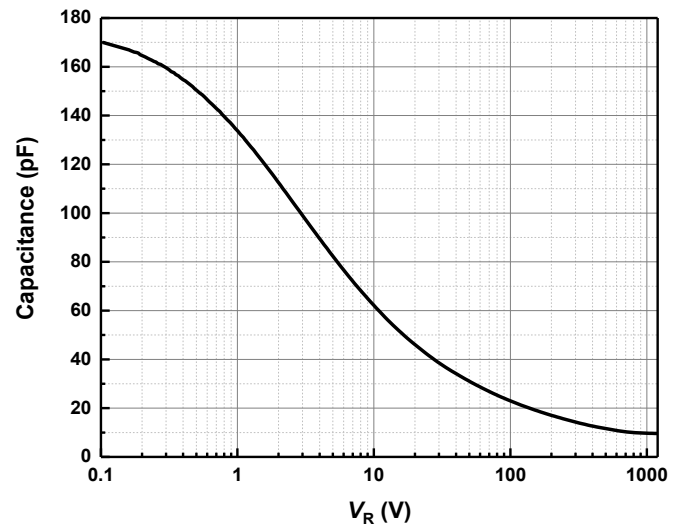


Figure 4 Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

Typical Performance

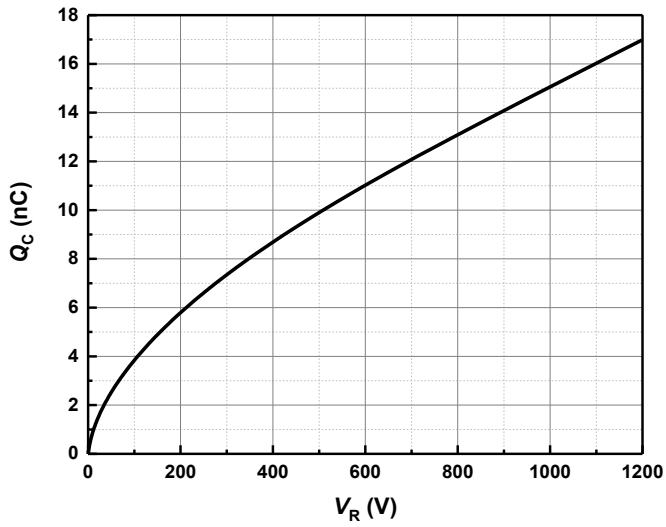


Figure 5 Typical reverse charge as function of reverse voltage

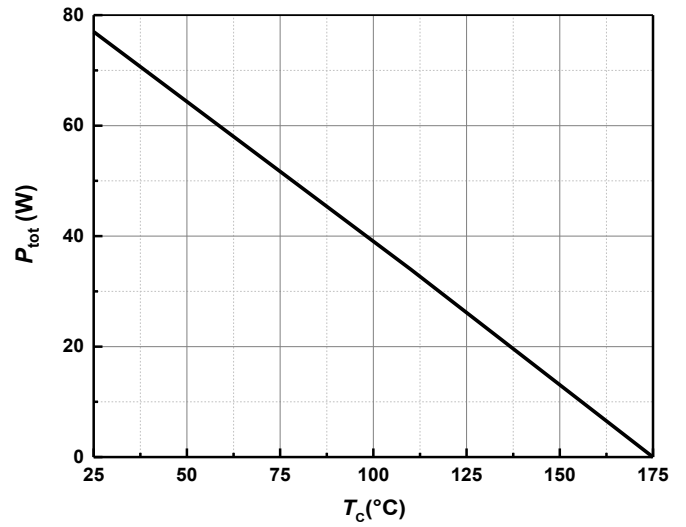


Figure 6 Power dissipation as function of case temperature

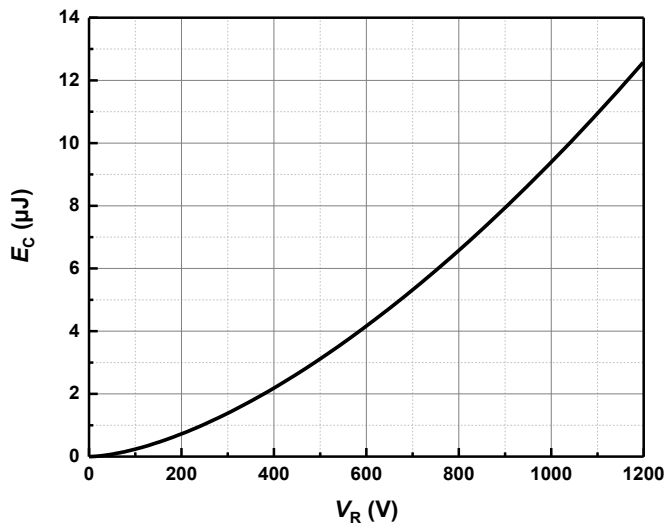


Figure 7 Capacitance stored energy

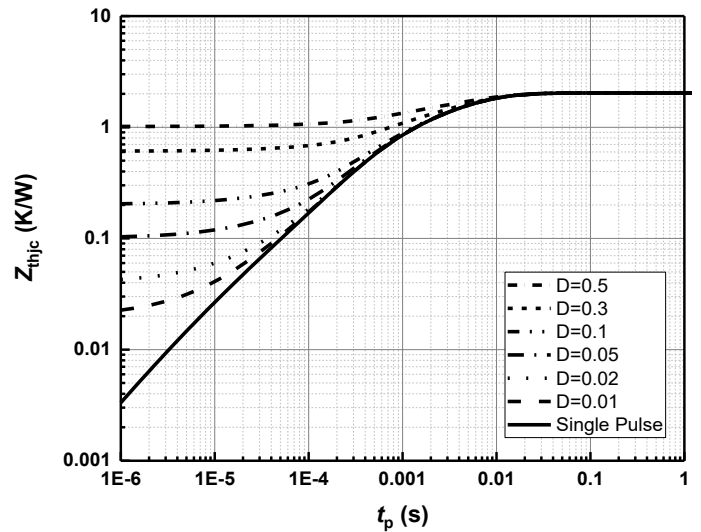


Figure 8 Max. transient thermal impedance, $Z_{thjc} = f(t_p)$, parameter: $D = t_p / T$

Typical Performance

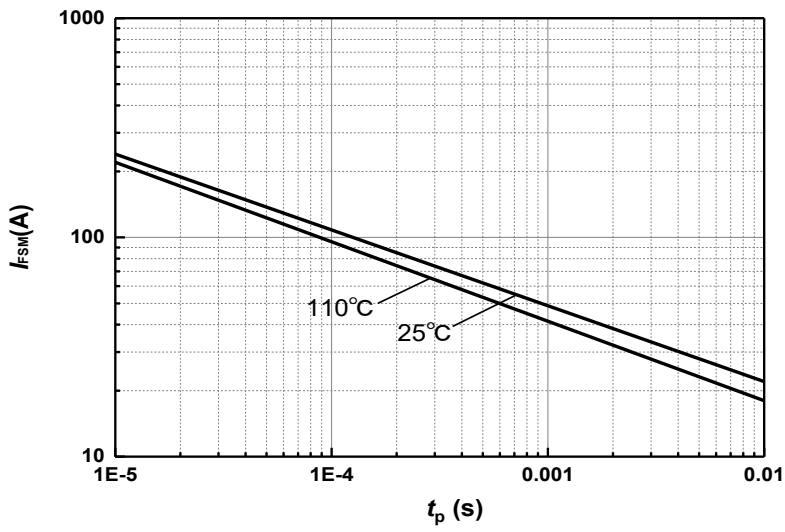
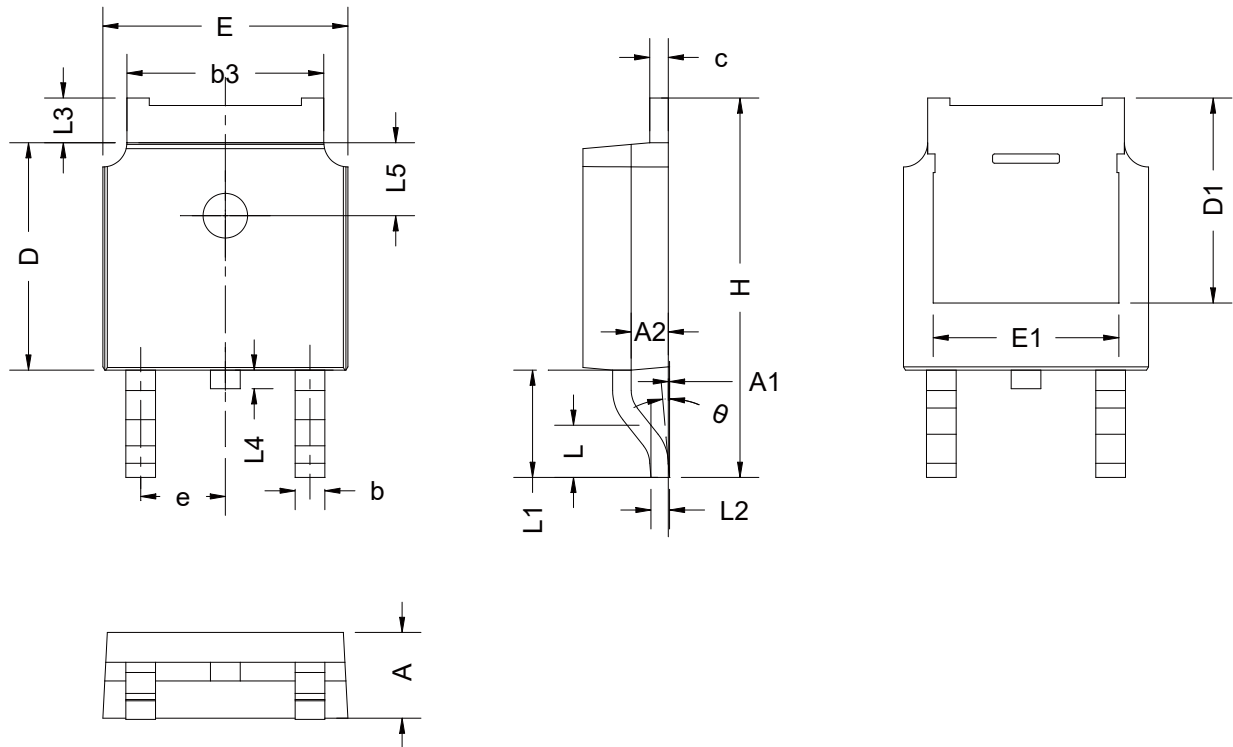
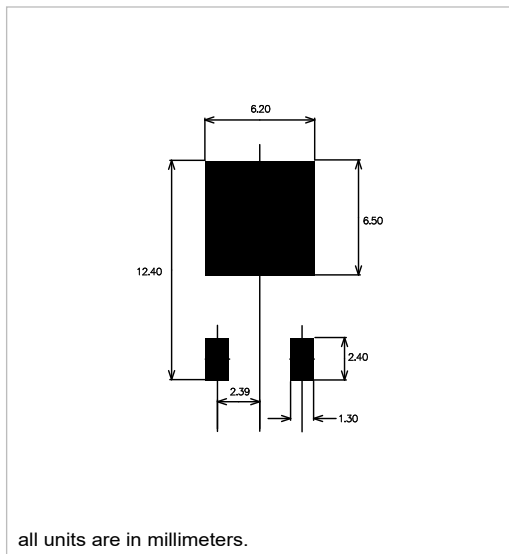


Figure 9 Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

Package Dimensions



Recommended Solder Pad Layout



SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	-	0.20
A2	0.90	1.07	1.17
b	0.68	0.78	0.90
b3	5.23	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30 REF		
E	6.40	6.60	6.73
E1	4.63	-	-
e	2.286 BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90 REF		
L2	0.51 BSC		
L3	0.88	-	1.28
L4	0.50	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°

Revision History

Document Version	Date of Release	Description of Changes
Rev. 0.0	2022-05-27	Release of the datasheet.
Rev. 1.0	2023-09-07	Characteristics updated.

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Shenzhen, China
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