基本半导体
BASiC Semiconductor

B2D02120K1

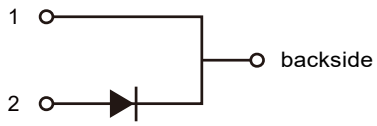
SiC Schottky Diode

Product Summary

V_{RRM}	1200 V
I_F (T_C=165°C)	2 A
Q_C	13 nC

Package: TO-220-2

Electrical Connection



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 and backside - Cathode
- Pin2 - Anode

Package Parameters

Part Number	Marking	Package
B2D02120K1	B2D02120K1	TO-220-2

Packing Quantities

Tube Packing	PCS/Tube	Tube/Box	PCS/Box
TO-220-2	50	10	500

Maximum Ratings (T_C=25°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°C T_C=165°C	11 2	A
I_{FSM}	Non-repetitive forward surge current	T_C=25°C, t_p=10ms Half sine wave	20	A
$\int i^2dt$	i²t value	T_C=25°C, t_p=10ms	2	A^2S
P_{tot}	Power dissipation	T_C=25°C T_C=110°C	80 35	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C
	TO-220 mounting torque	M3 Screw	0.7	Nm

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		1.87		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=2A T_j=25°C I_F=2A T_j=175°C		1.35 1.9	1.6 2.9	V
I_R	Reverse current	V_R=1200V T_j=25°C V_R=1200V T_j=175°C		1 20	60 200	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=800V T_j=25°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		139 13 10		pF
E_C	Capacitance stored energy	V_R=800V		7		μJ

Typical Performance

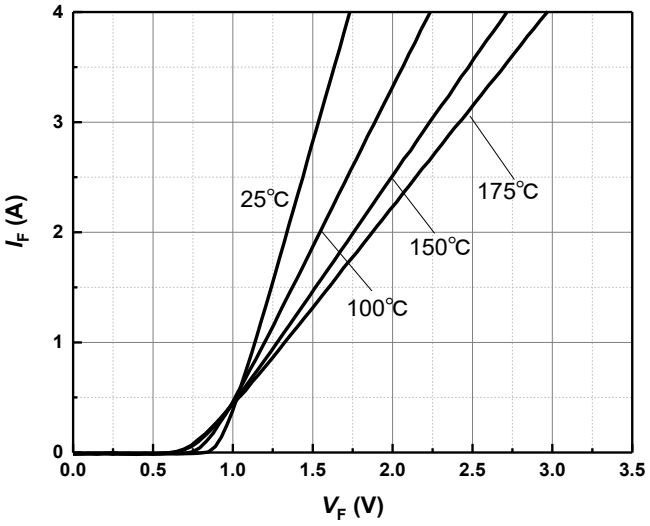


Figure 1 Typical forward characteristics

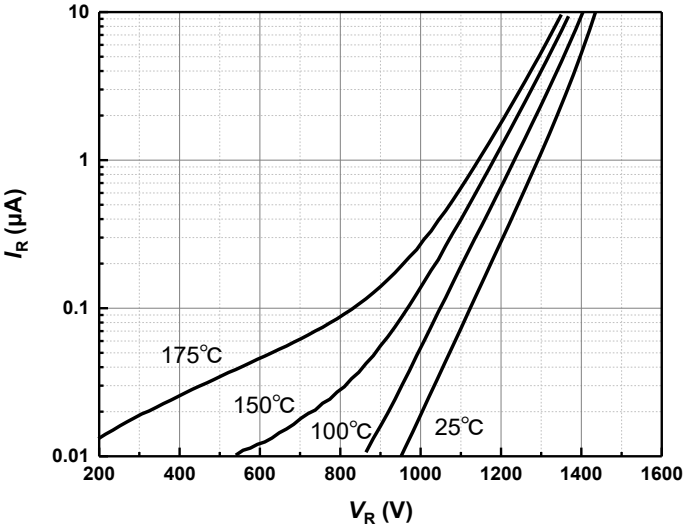


Figure 2 Typical reverse current as function of reverse voltage

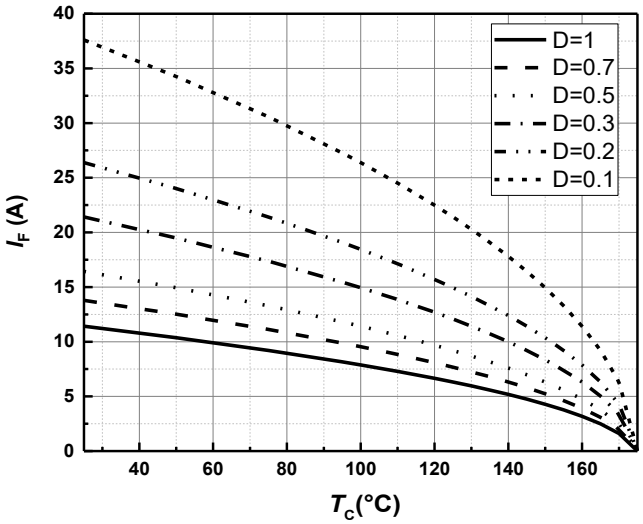


Figure 3 Diode forward current as function of temperature, D=duty cycle

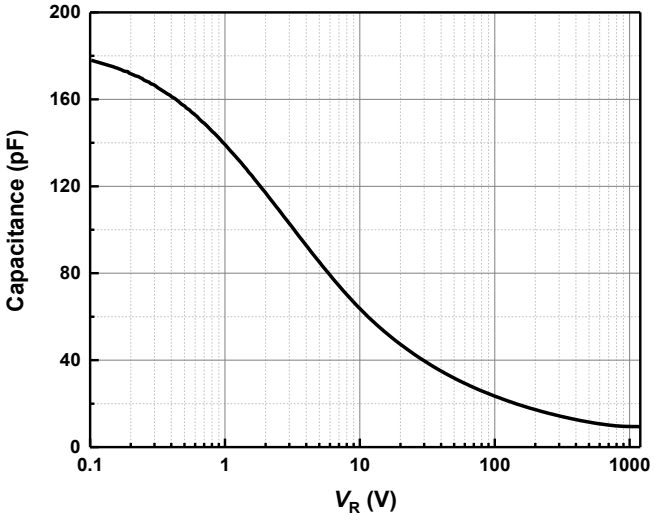


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

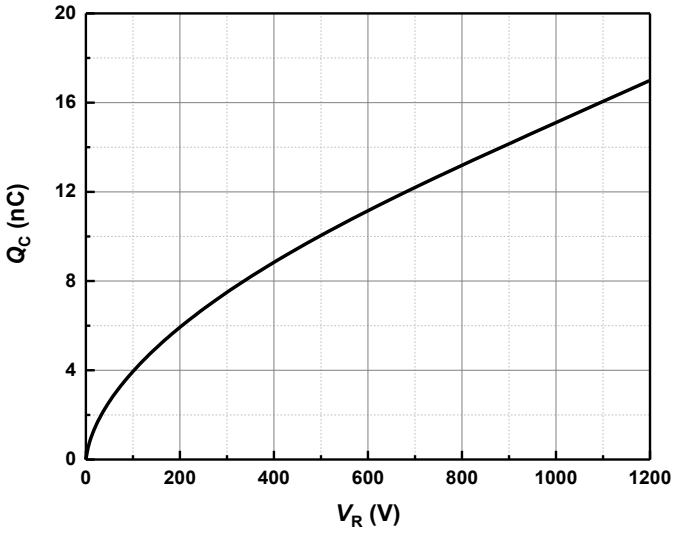


Figure 5 Typical reverse charge as function of reverse voltage

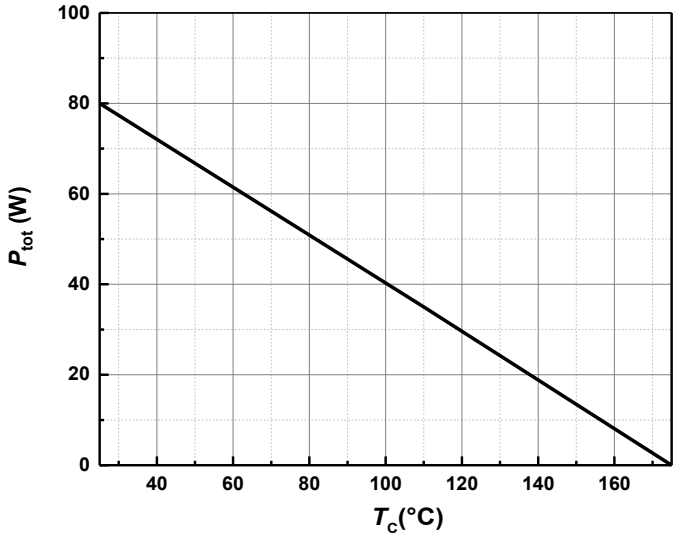


Figure 6 Power dissipation as function of case temperature

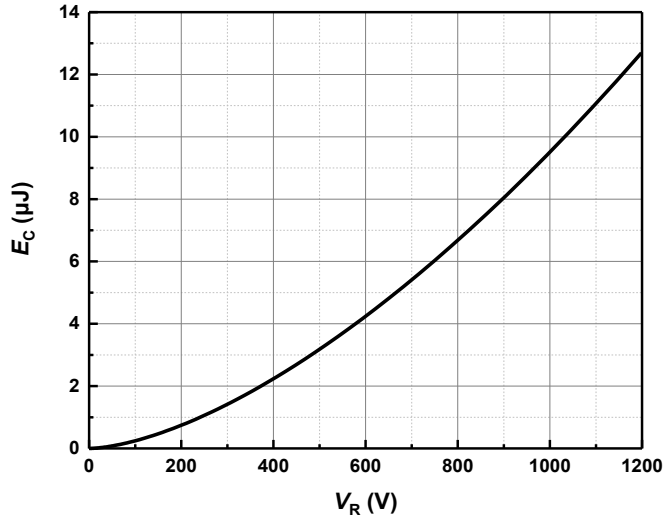


Figure 7 Capacitance stored energy

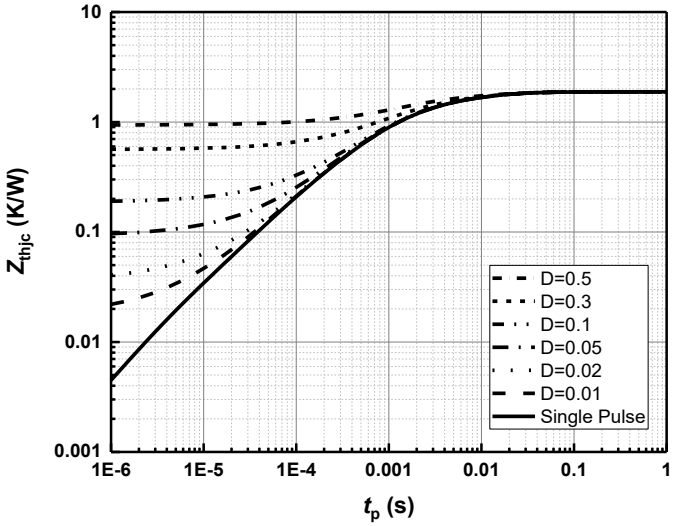
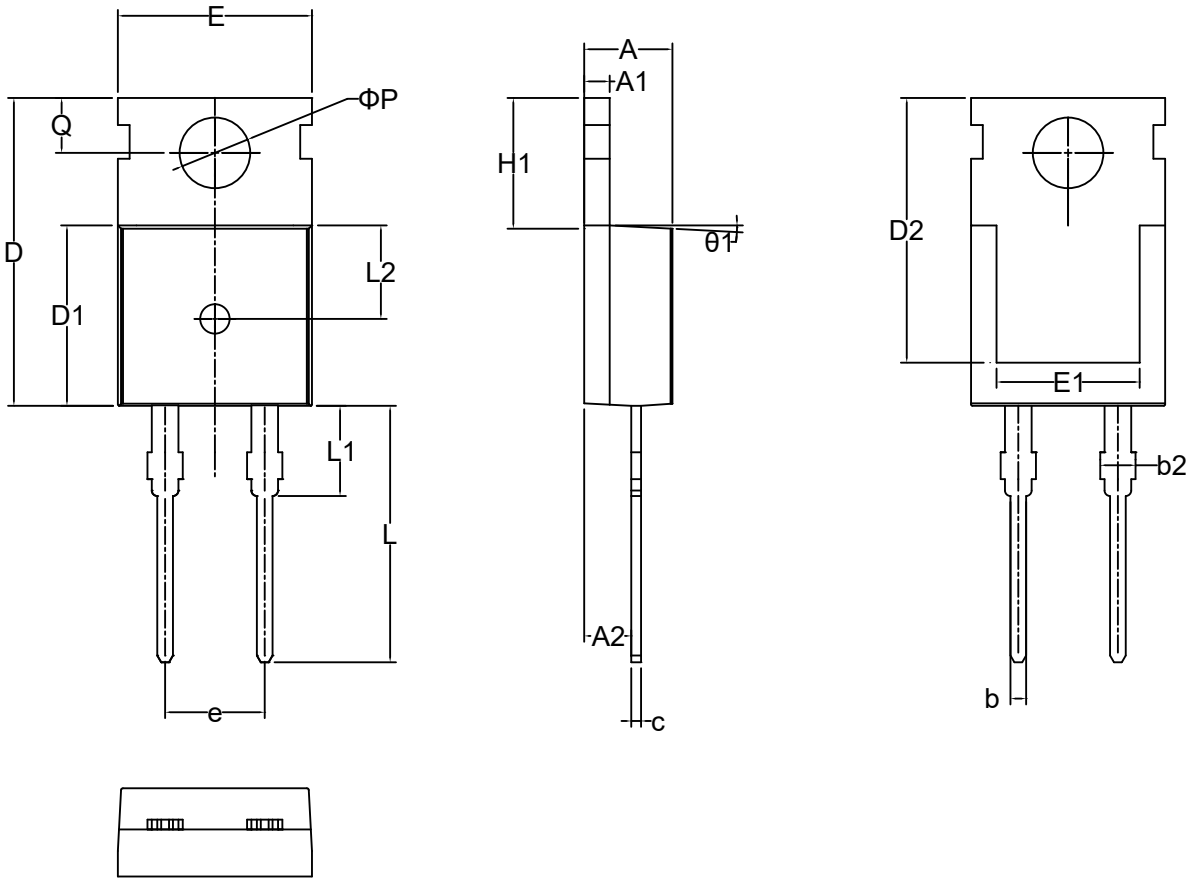
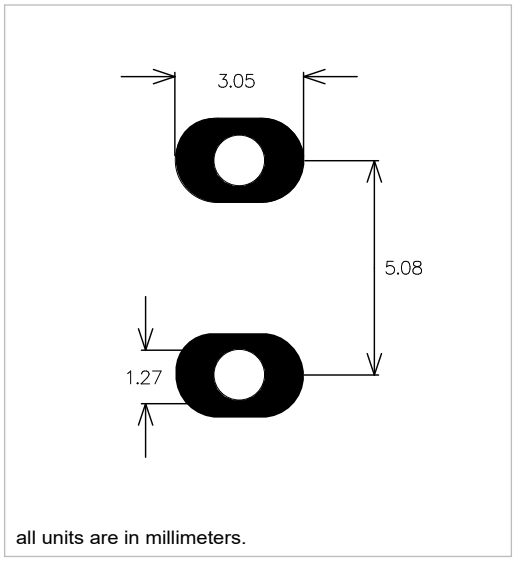


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions



Recommended Solder Pad Layout



SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	-	0.90
b2	1.42	-	1.57
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	4.98	5.08	5.18
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.60REF		
ΦP	3.55	3.60	3.65
Q	2.73	-	2.87
θ1	1°	3°	5°

REF： For reference only, no measurement is required.

Revision History

Document Version	Date of Release	Description of Changes
Rev 0.0	2022-06-15	Release of the datasheet.
Rev. 0.1	2023-11-29	POD.

BASiC Semiconductor Ltd.
Shenzhen, China
© 2023 BASiC Semiconductor Ltd.
All Rights Reserved.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest BASiC Semiconductor Office

Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, BASiC semiconductor Ltd. hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.