基本半导体
BASiC Semiconductor

B2D10120K1

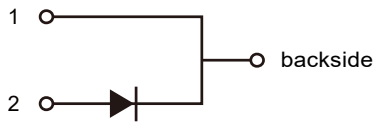
SiC Schottky Diode

Product Summary

V_{RRM}	1200 V
I_F (T_C=155°C)	10 A
Q_C	51 nC

Package: TO-220-2

Electrical Connection



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

Halogen

RoHS

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 and backside - Cathode
- Pin2 - Anode

Package Parameters

Part Number	Marking	Package
B2D10120K1	B2D10120K1	TO-220-2

Maximum Ratings (T_c=25℃ 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℃ T_C=155℃	35 10	A
I_{FSM}	Non-repetitive forward surge current	T_C=25℃, t_p=10ms Half sine wave	90	A
$\int i^2dt$	i²t value	T_C=25℃, t_p=10ms	40.5	A^2S
P_{tot}	Power dissipation	T_C=25℃ T_C=110℃	185 80	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		0.81		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25℃	1200			V
V_F	Diode forward voltage	I_F=10A T_j=25℃ I_F=10A T_j=175℃		1.37 2	1.7 2.8	V
I_R	Reverse current	V_R=1200V T_j=25℃ V_R=1200V T_j=175℃		10 30	100 300	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=800V T_j=25°C $Q_C=\int_0^{V_R} C(V)dV$		51		nC
C	Total capacitance	V_R=1V f=1MHz V_R=400V f=1MHz V_R=800V f=1MHz		582 47 35		pF
E_C	Capacitance stored energy	V_R=800V		26		μJ

Typical Performance

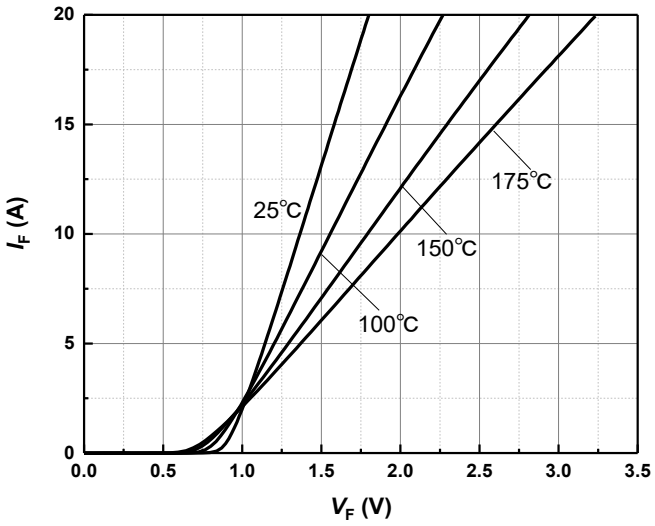


Figure 1 Typical forward characteristics

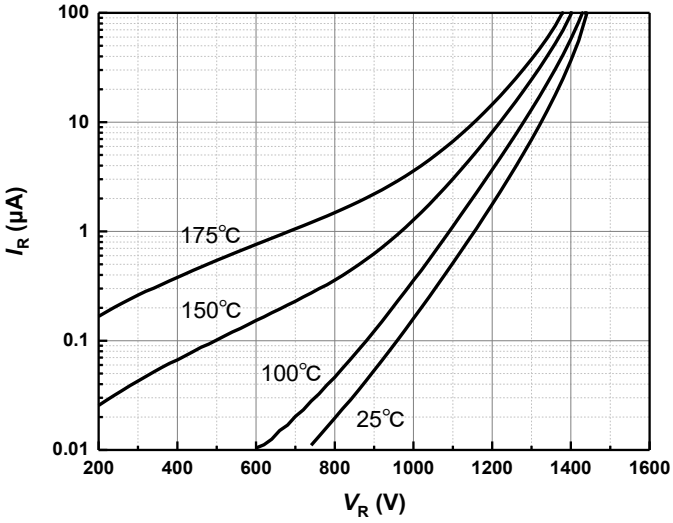


Figure 2 Typical reverse current as function of reverse voltage

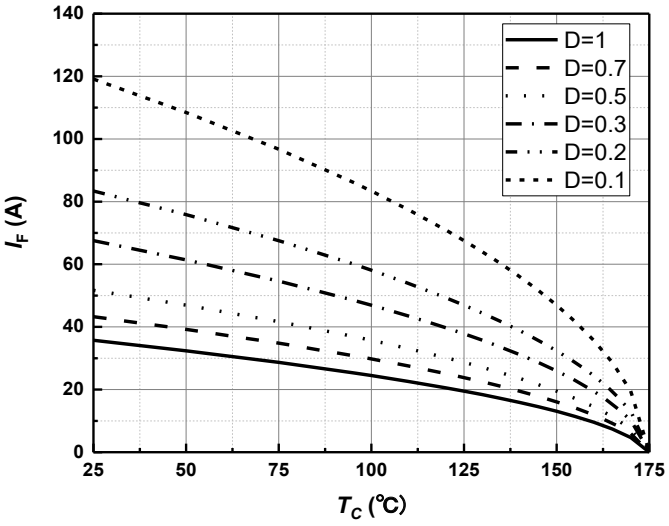


Figure 3 Diode forward current as function of temperature, D=duty cycle

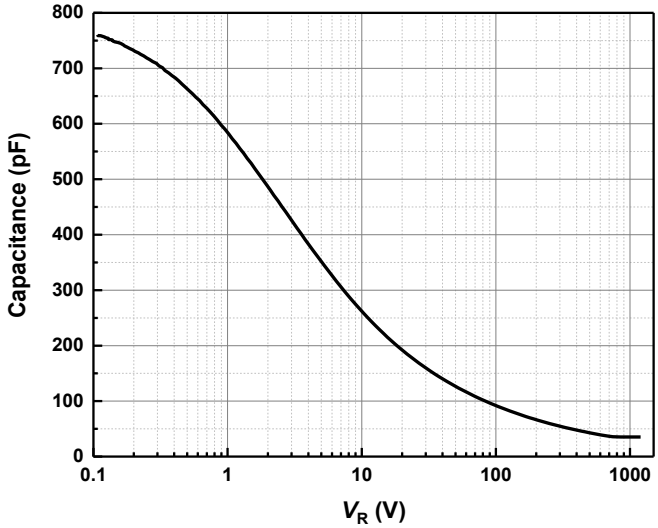


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

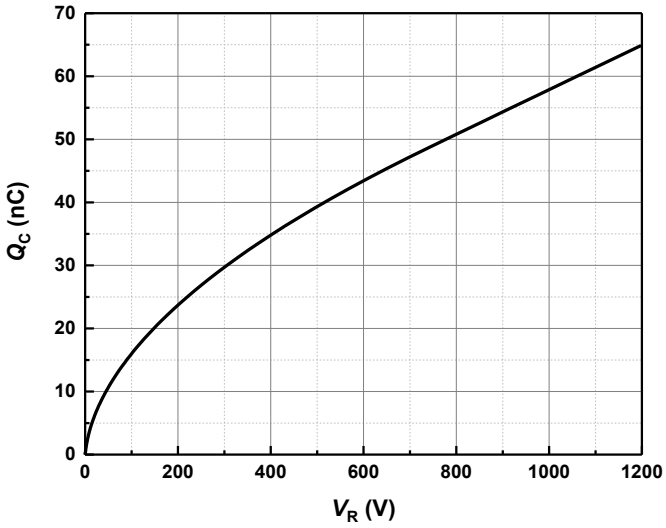


Figure 5 Typical reverse charge as function of reverse voltage

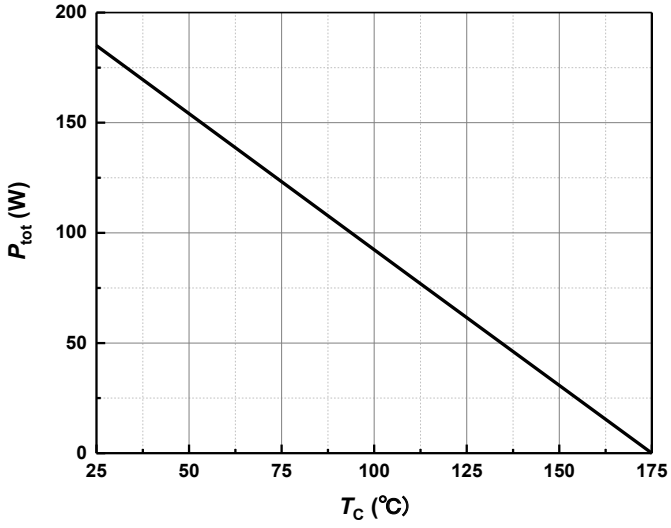


Figure 6 Power dissipation as function of case temperature

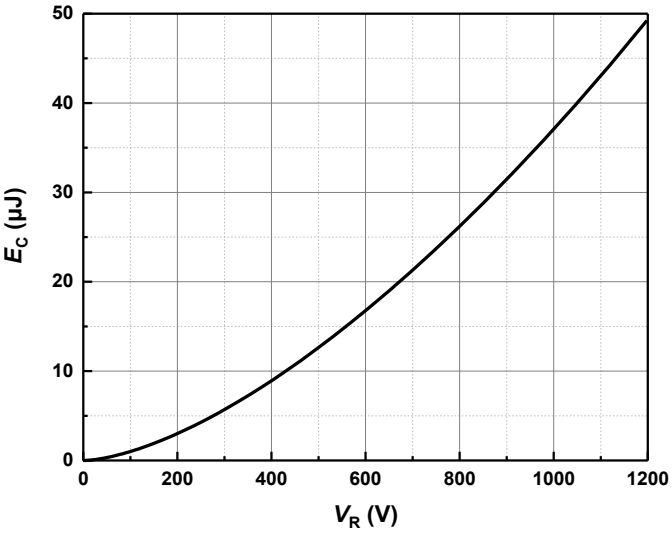


Figure 7 Capacitance stored energy

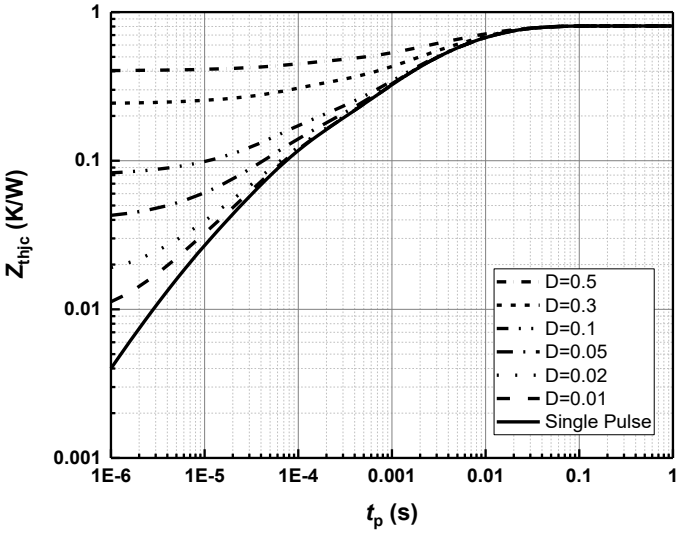
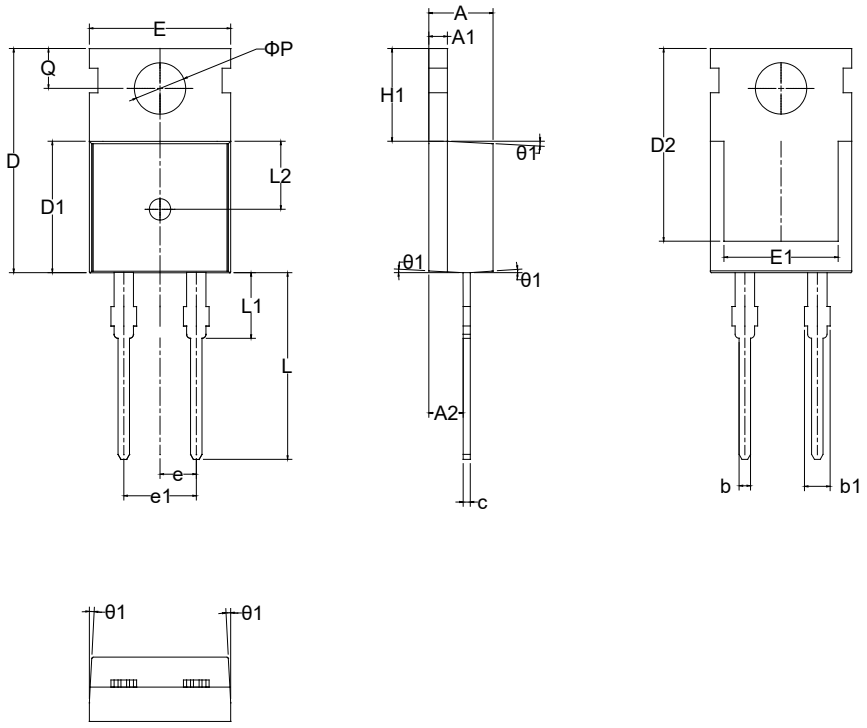


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	-	1.40
A2	2.49	2.69	2.89
b	0.75	-	0.96
b1	1.22	-	1.47
c	0.30	-	0.48
D	15.15	15.45	15.75
D1	8.82	9.05	9.25
D2	11.40	-	12.88
E	9.86	10.16	10.36
E1	6.86	-	8.89
e	2.54 BSC		
e1	5.08 BSC		
H1	6.10	6.30	6.50
L	12.70	-	13.70
L1	-	-	4.10
L2	2.50 REF		
ϕP	3.70	3.84	3.99
Q	2.54	-	2.94
θ1	5°	7°	9°

Revision History

Document Version	Date of Release	Description of Changes
Rev 0.0	2022-07-11	Release of the datasheet.

Information

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

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