基本半导体
BASiC Semiconductor

B2D04065K1

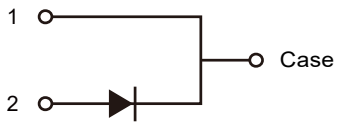
SiC Schottky Diode

Product Summary

V_{RRM}	650 V
I_F (T_C=150°C)	4 A
Q_C	14 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
B2D04065K1	B2D04065K1	TO-220-2

Maximum Ratings (T_C=25℃ 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℃ T_C=150℃	18 4	A
I_{FSM}	Non-repetitive forward surge current	T_C=25℃, t_p=10ms Half sine wave	34	A
$\int i^2dt$	i²t value	T_C=25℃, t_p=10ms	5	A^2S
P_{tot}	Power dissipation	T_C=25℃ T_C=110℃	91 39	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		1.643		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25℃	650			V
V_F	Diode forward voltage	I_F=4A T_j=25℃ I_F=4A T_j=175℃		1.33 1.6	1.5 2.1	V
I_R	Reverse current	V_R=650V T_j=25℃ V_R=650V T_j=175℃		1 20	70 200	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=400V T_j=25°C $Q_C=\int_0^{VR} C(V)dV$		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

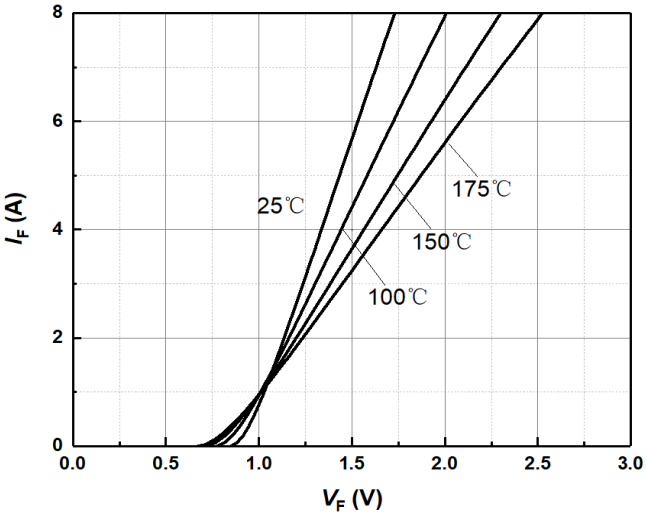


Figure 1 Typical forward characteristics

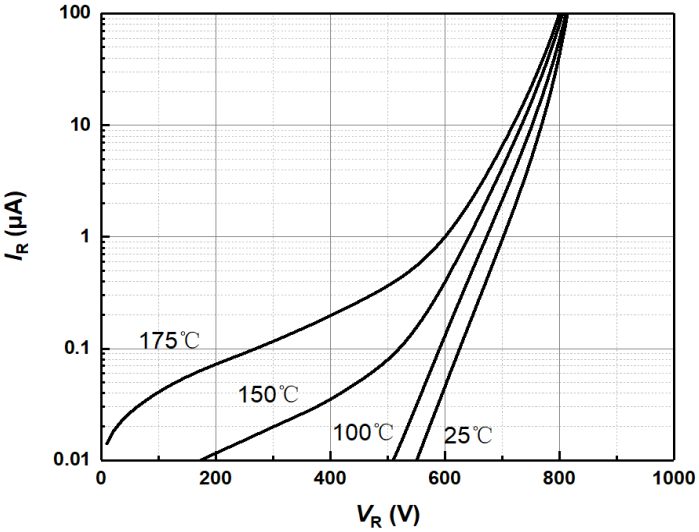


Figure 2 Typical reverse current as function of reverse voltage

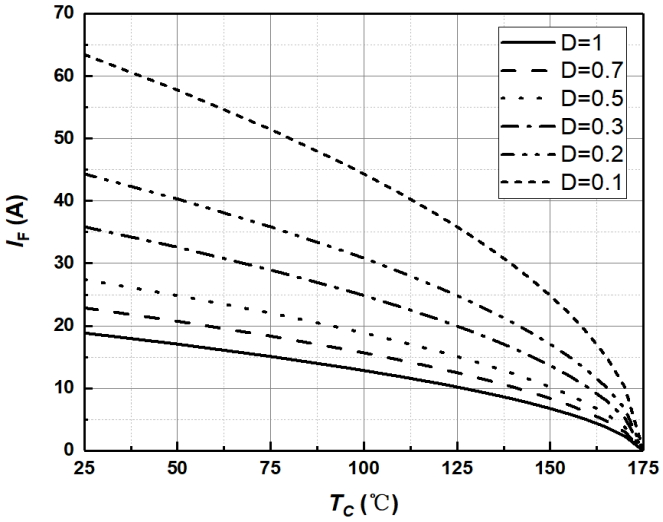


Figure 3 Diode forward current as function of temperature, D=duty cycle

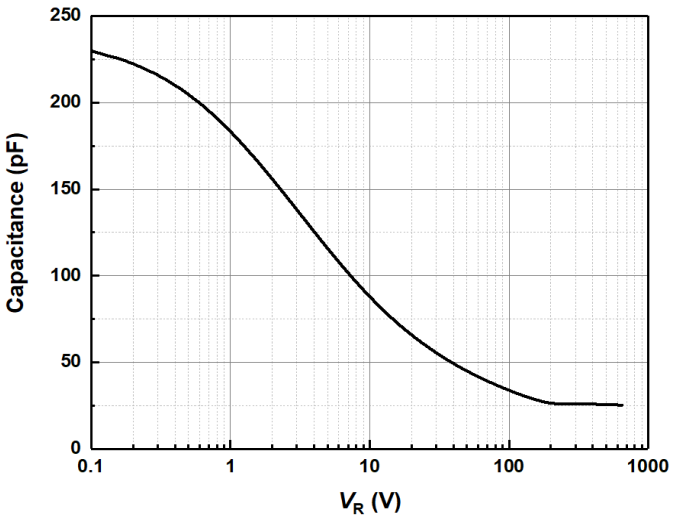


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

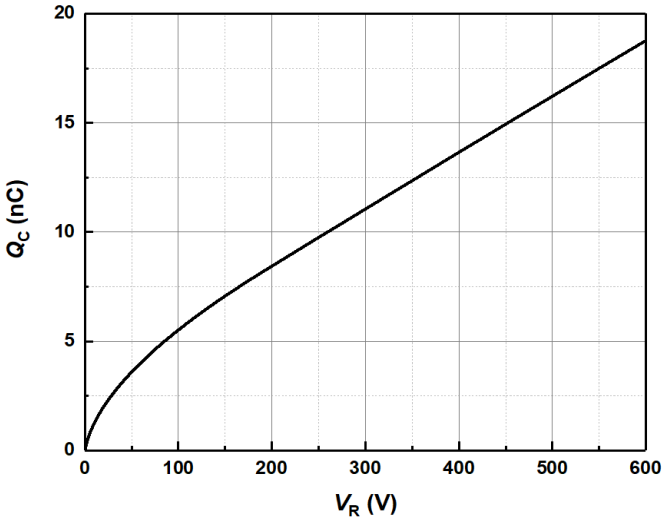


Figure 5 Typical reverse charge as function of reverse voltage

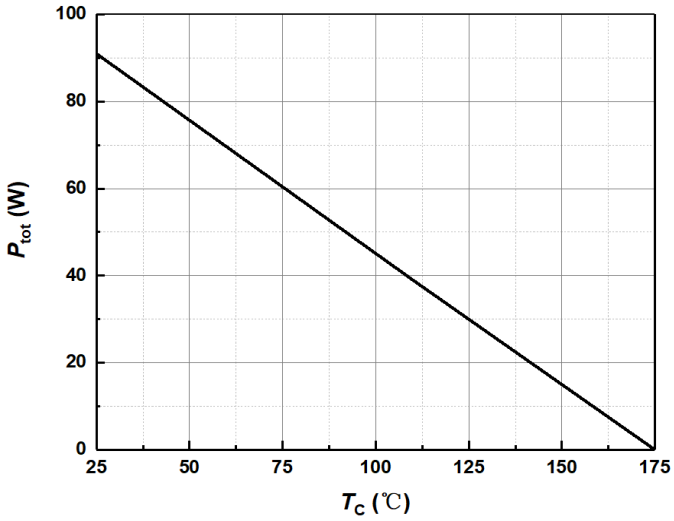


Figure 6 Power dissipation as function of case temperature

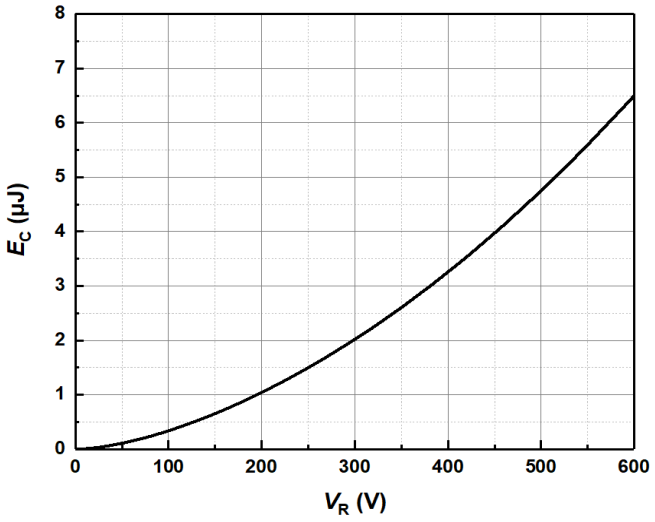


Figure 7 Capacitance stored energy

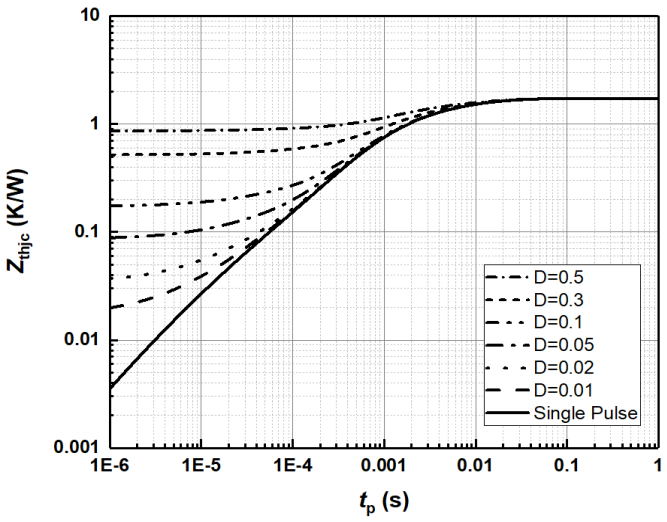
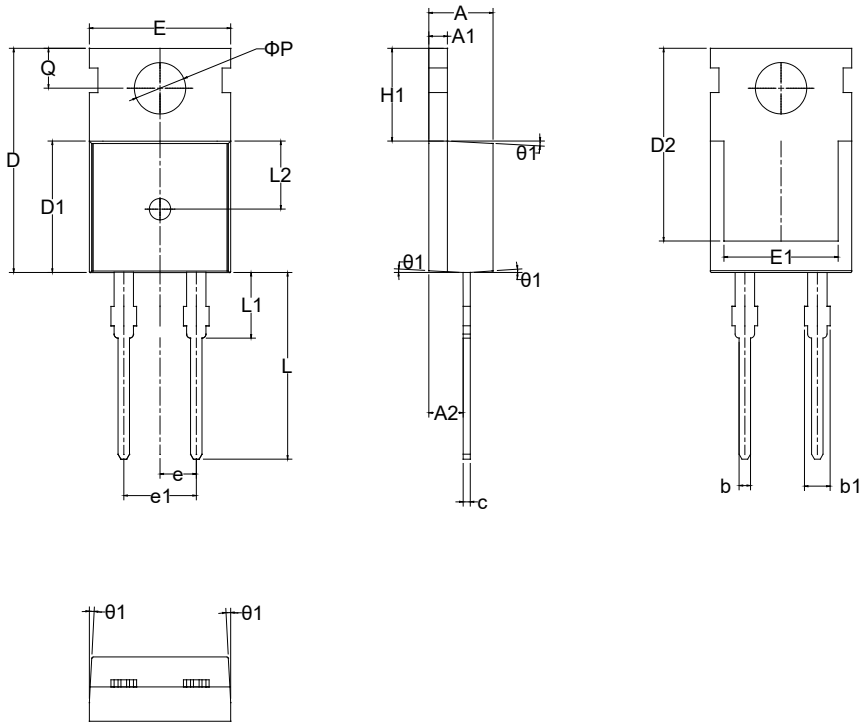


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	-	0.90
b1	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	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.60 REF		
ϕP	3.55	3.60	3.65
Q	2.73	-	2.87
θ1	1°	3°	5°

Revision History

Document Version	Date of Release	Description of Changes
Rev 0.0	2021-11-22	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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