基本半导体
BASiC Semiconductor

B2D20065F

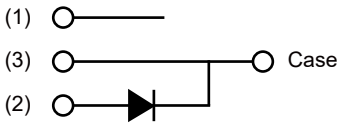
SiC Schottky Diode

Product Summary

V_{RRM}	650 V
I_F (T_C=150°C)	20 A
Q_C	65 nC

Package: TO-263-3

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

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 - NC
- Pin2 - Anode
- Pin3 and backside - Cathode

Package Parameters

Part Number	Marking	Package
B2D20065F	B2D20065F	TO-263-3

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℃	60 20	A
I_{FSM}	Non-repetitive forward surge current	T_C=25℃, t_p=10ms Half sine wave	155	A
$\int i^2dt$	i²t value	T_C=25℃, t_p=10ms	120	A^2S
P_{tot}	Power dissipation	T_C=25℃ T_C=110℃	177 77	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C
	TO-247 mounting torque	M3 Screw	0.7	

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		0.843		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=20A T_j=25 ℃ I_F=20A T_j=175 ℃		1.3 1.6	1.6 2.0	V
I_R	Reverse current	V_R=650V T_j=25 ℃ V_R=650V T_j=175 ℃		20 30	120 300	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=400V T_j=25°C $Q_C=\int_0^{V_R} C(V)dV$		65		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		1016 110 109		pF
E_C	Capacitance stored energy	V_R=400V		16		μJ

Typical Performance

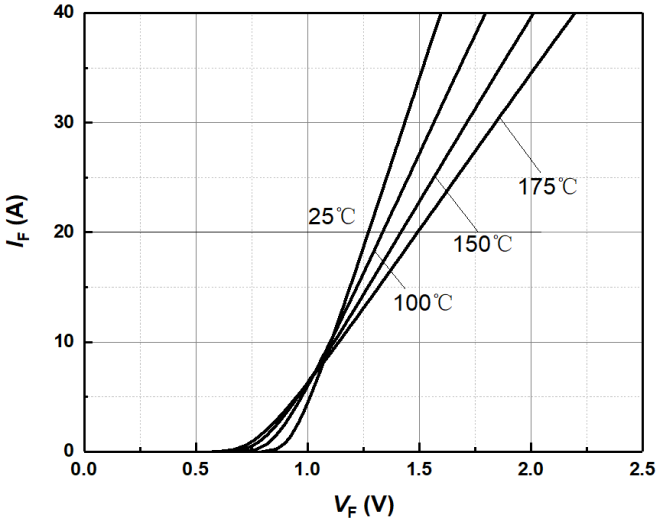


Figure 1 **Typical forward characteristics**

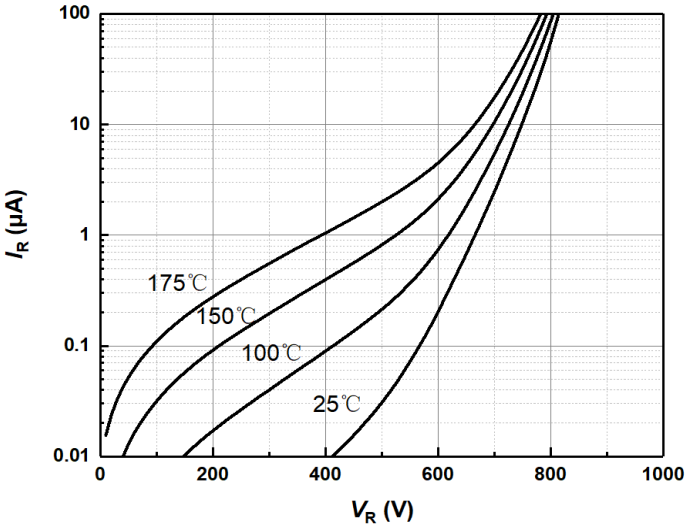


Figure 2 **Typical reverse current as function of reverse voltage**

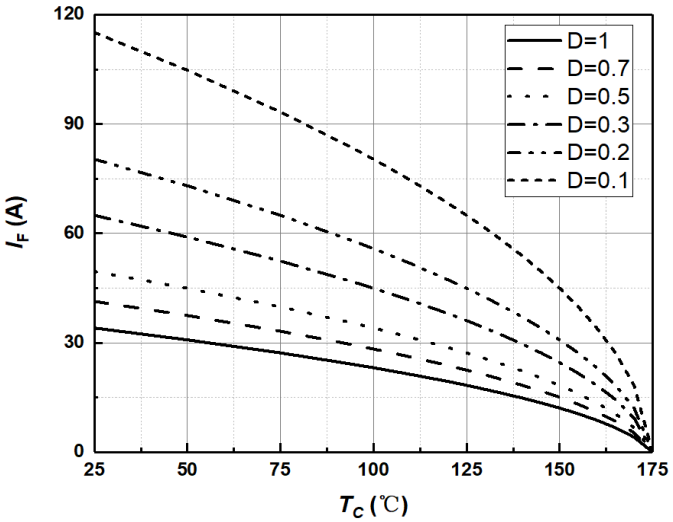


Figure 3 **Diode forward current as function of temperature, D=duty cycle**

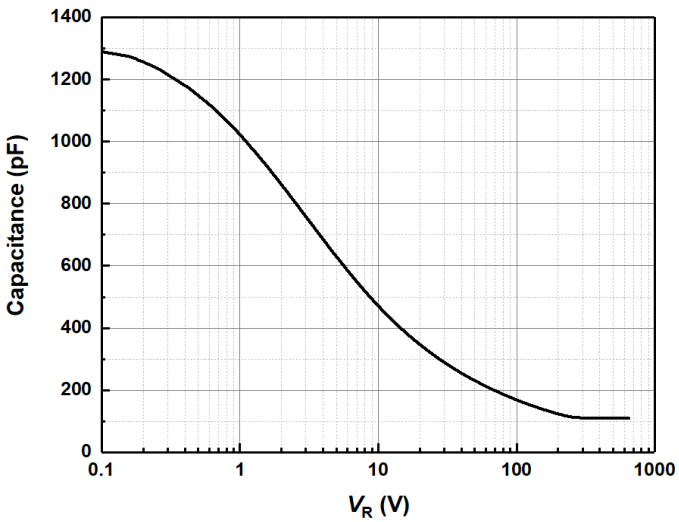


Figure 4 **Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz**

Typical Performance

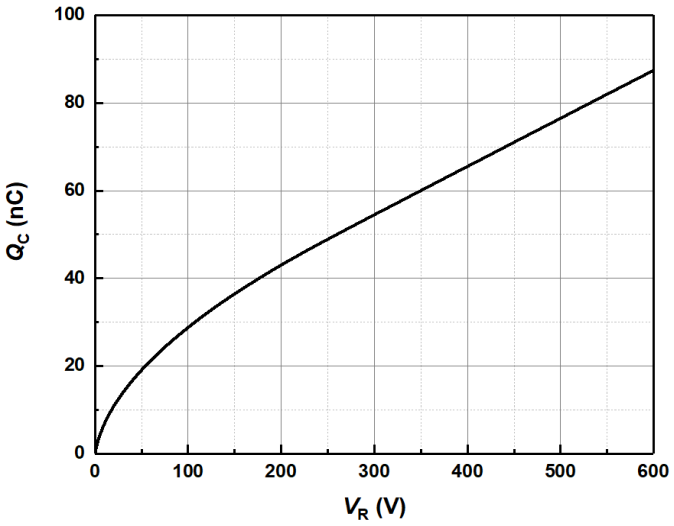


Figure 5 Typical reverse charge as function of reverse voltage

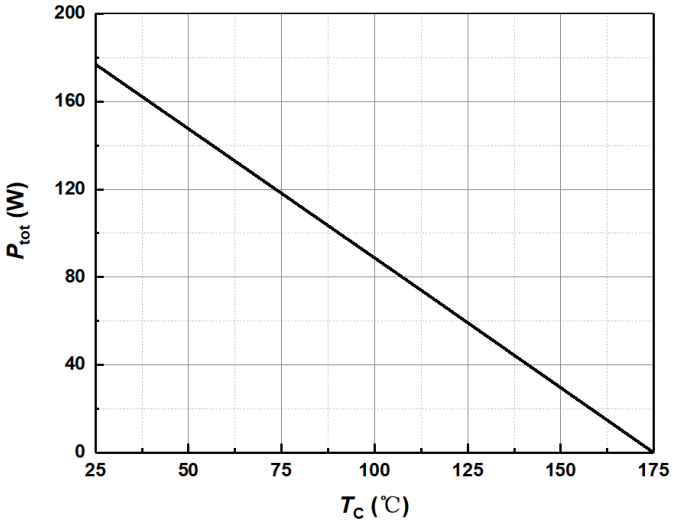


Figure 6 Power dissipation as function of case temperature

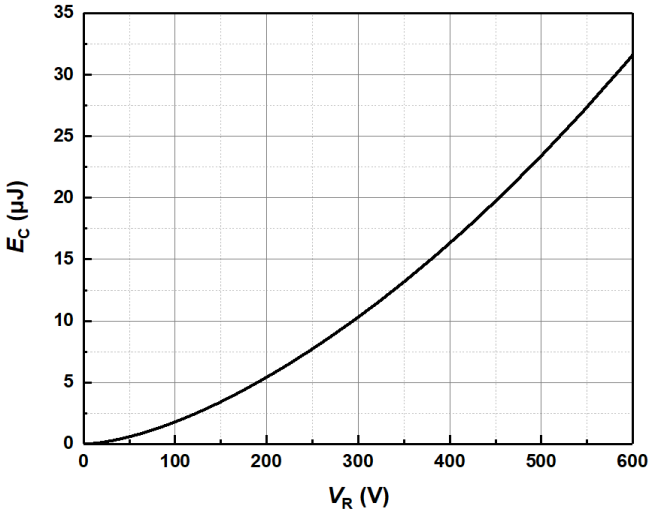


Figure 7 Capacitance stored energy

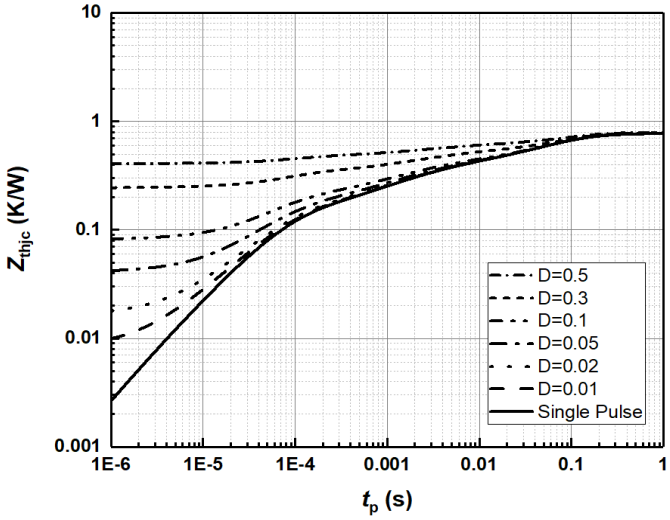
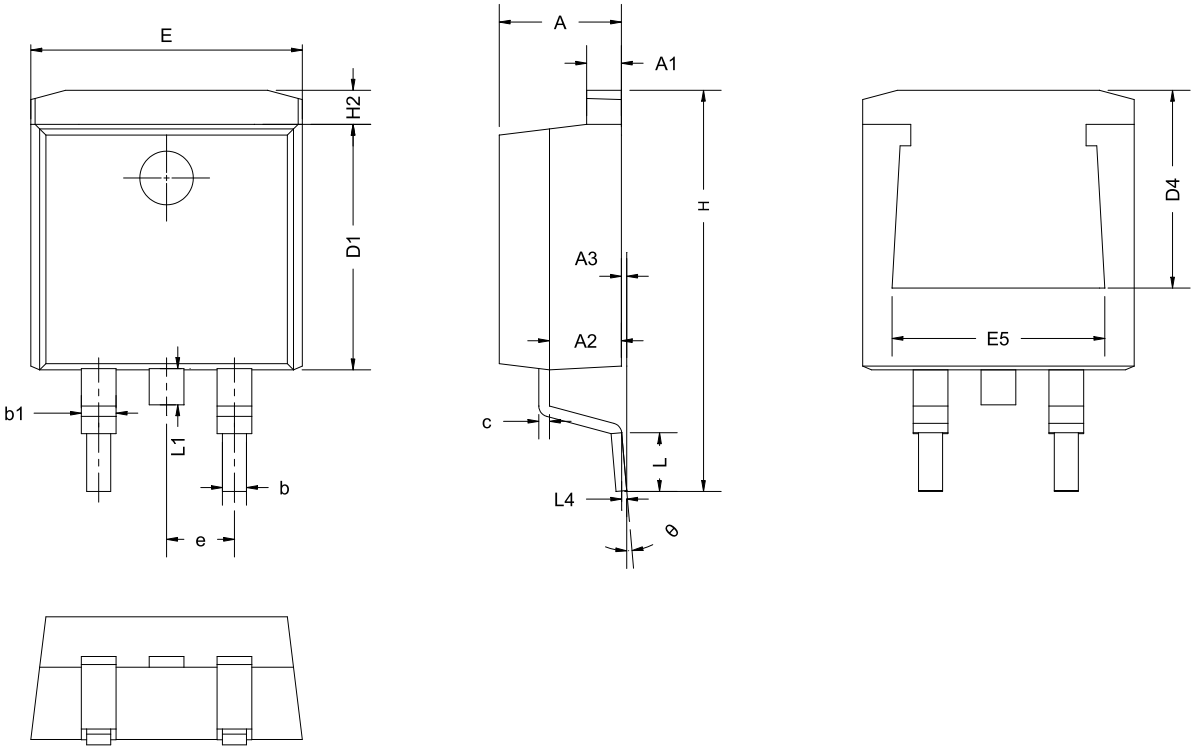


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.36	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4	0.25 BSC		
θ	0°	5°	9°

Revision History

Document Version	Date of Release	Description of Changes
Rev 0.0	2021-11-23	Release of the datasheet.

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