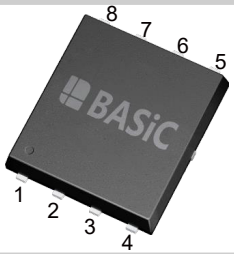
B2D04065D1

SiC Schottky Diode

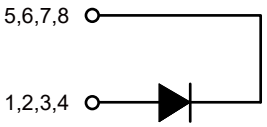
Product Summary

V_{RRM}	650 V
I_F (T_C=150°C)	4 A
Q_C	14 nC

Package: DFN 5*6



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

- Pin 1,2,3,4 - Anode
- Pin 5,6,7,8 - Cathod

Package Parameters

Part Number	Marking	Package
B2D04065D1	B2D04065D1	DFN 5*6

Packing Quantities

Tape & Reel Packing	PCS/Reel	Reels/Box	PCS/Box
DFN 5*6	4000	2	8000

Maximum Ratings (T_c=25°C 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°C	13	A
		T_C=135°C	6	
		T_C=150°C	4	
I_{FSM}	Non-repetitive forward surge current	T_C=25°C, t_p=10ms Half sine wave	33	A
$\int i^2dt$	i²t value	T_C=25°C, t_p=10ms	5.4	A^2S
P_{tot}	Power dissipation	T_C=25°C T_C=110°C	45 19	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		3.3		K/W

Electrical Characteristics
Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	650			V
V_F	Diode forward voltage	I_F=4A T_j=25°C I_F=4A T_j=175°C		1.3 1.6	1.6 2.2	V
I_R	Reverse current	V_R=650V T_j=25°C V_R=650V T_j=175°C		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 $Q_C=\int_0^{V_R} C(V)dV$		14		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		195 23 22		pF
E_C	Capacitance stored energy	V_R=400V		3.3		μJ

Typical Performance

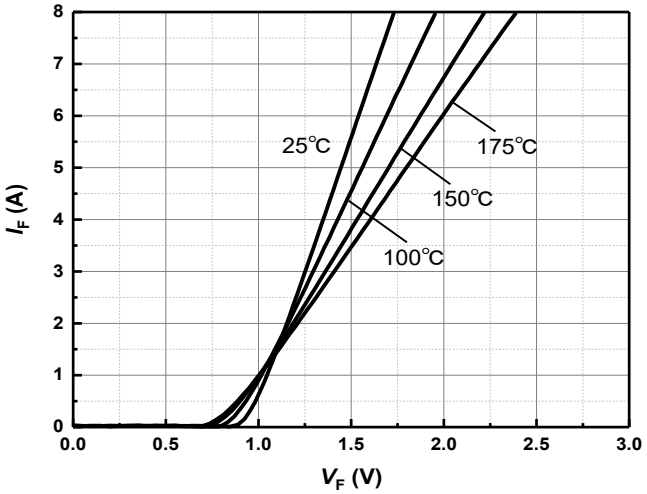


Figure 1 Typical forward characteristics

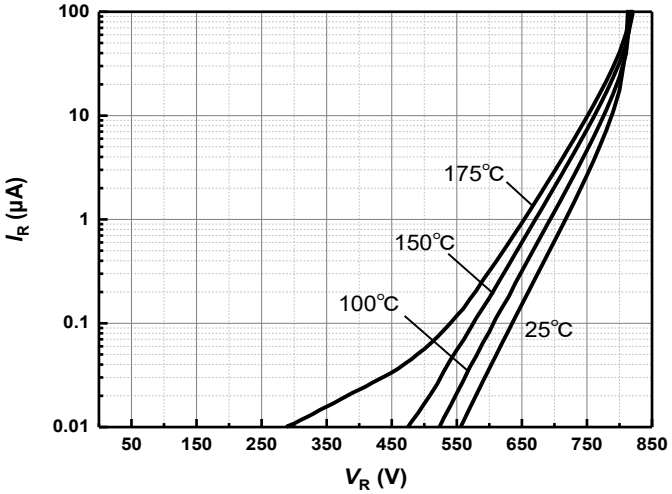


Figure 2 Typical reverse current as function of reverse voltage

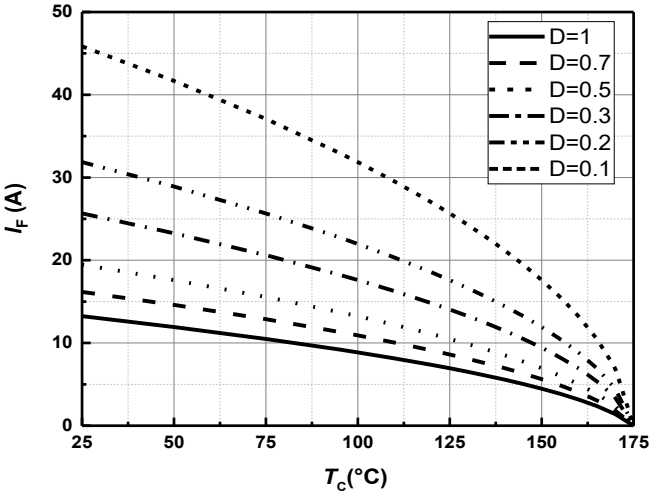


Figure 3 Diode forward current as function of temperature, D=duty cycle

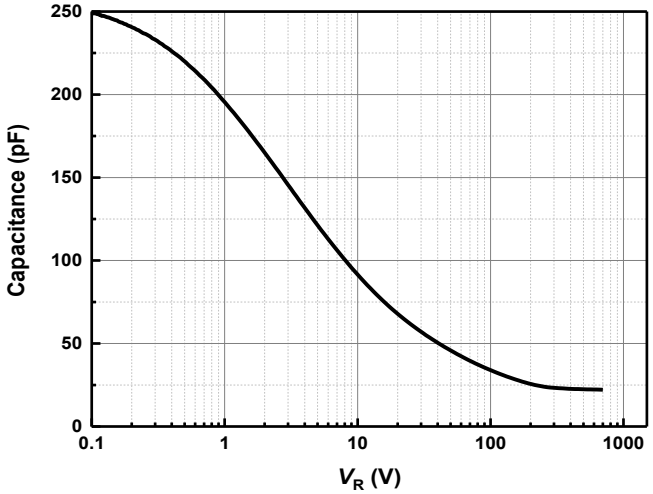


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

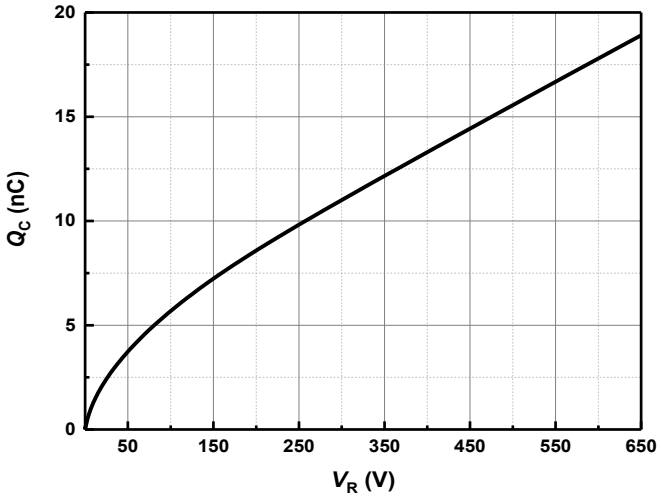


Figure 5 Typical reverse charge as function of reverse voltage

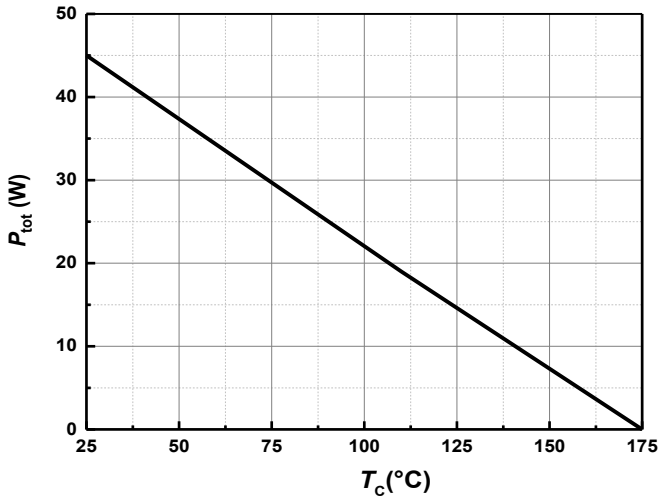


Figure 6 Power dissipation as function of case temperature

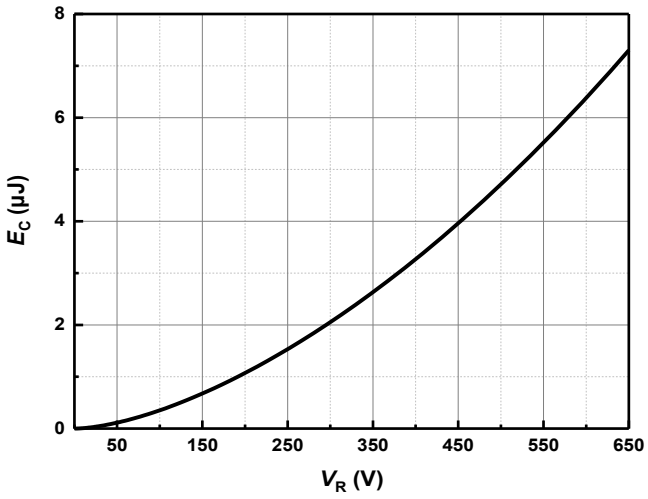


Figure 7 Capacitance stored energy

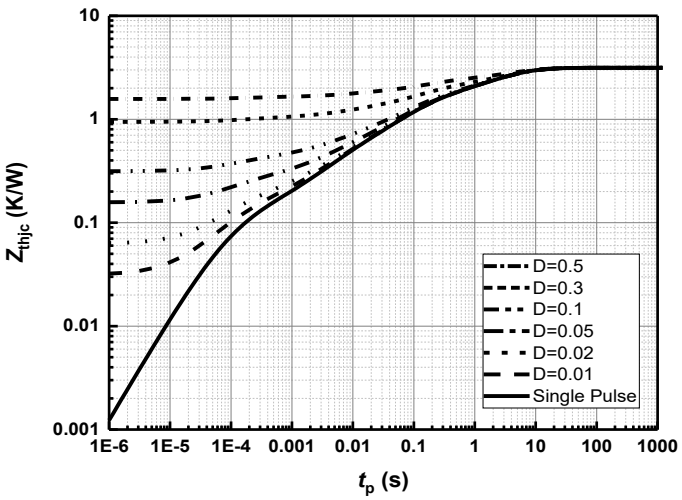
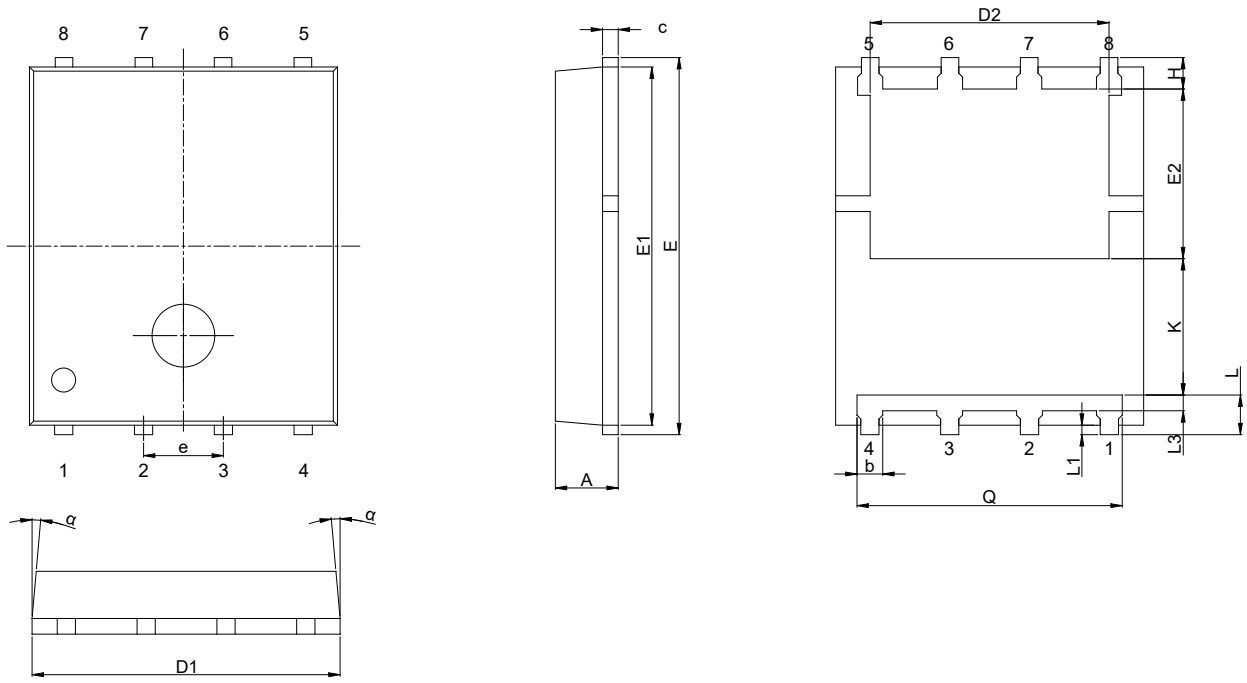


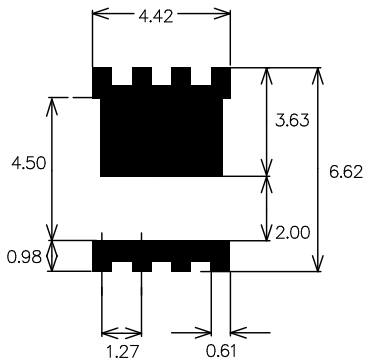
Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions



SYMBOL	mm		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
c	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	2.66	2.76	2.86
e	1.27 BSC		
H	0.41	0.51	0.61
K	2.00	2.10	2.20
L	0.53	0.63	0.73
L1	0.06	0.13	0.20
L3	0.15	0.25	0.35
Q	4.12	4.22	4.32
α	0°	-	12°

Recommended Solder Pad Layout



all units are in millimeters.

Revision History

Document Version	Date of Release	Description of Changes
Rev. 0.0	2023-02-01	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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