SiC Schottky Diode

V_{RRM} = 650 V

I_F(Tc=150°C) = 4 A

Q_C = 11.3 nC

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)
- Uninterruptable power supplies
- Motor Drivers
- Power Factor Correction

Pacakge Pin definitions

- Pin1-Cathode
- Pin2-Cathode
- Pin3-Anode

Package Parameters

Part Number	Marking	Package
B1D04065E	B1D04065E	TO-252-3L

Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
V_{RSM}	Surge Peak Reverse Voltage		650	V
I_F	Continuous Forward Current	Tc=25°C Tc=135°C Tc=150°C	14 6 4	A
I_{FSM}	Non-Repetitive Forward Surge Current	Tc=25°C , t_p=10ms, sine halfwave	32	A
$\int i^2 dt$	i^2t Value	Tc=25°C ,t_p=10ms	5.12	A^2S
P_{tot}	Power Dissipation	Tc=25°C Tc=110°C	60 25	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~135	°C

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		2.46		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		119.7		K/W

Electrical Characteristics

Static Characteristics（Tj=25°C unless otherwise specified）

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		1.45 1.9		V
I_R	Reverse current	V_R=650V T_j=25°C V_R=650V T_j=175°C		0.05 3		μA

Dynamic Characteristics（Tj=25°C unless otherwise specified）

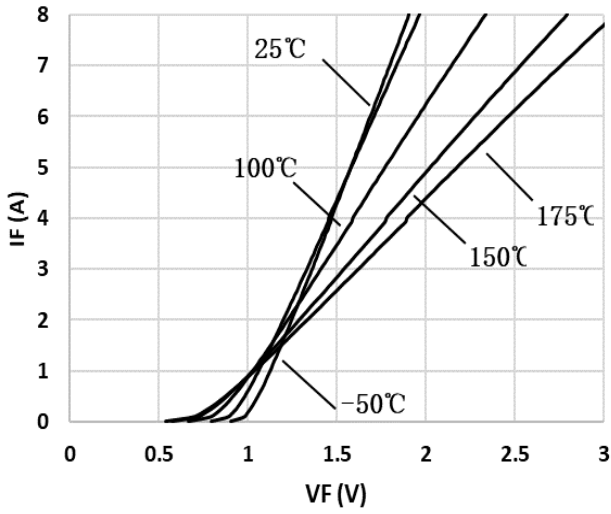| Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=400V T_j=25°C $Q_c = \int_0^{VR} C(V)dV$		11.3		nC
C	Total Capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		177 28.6 28.4		pF

Figure 1. **Typical forward characteristics**
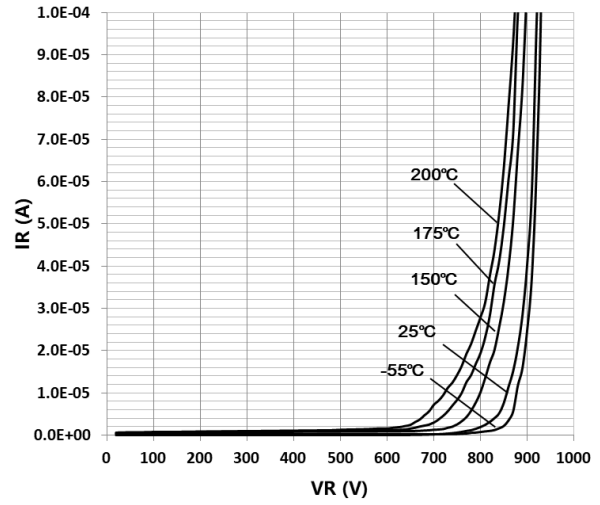

Figure 2. **Typical reverse current as function of reverse voltage**
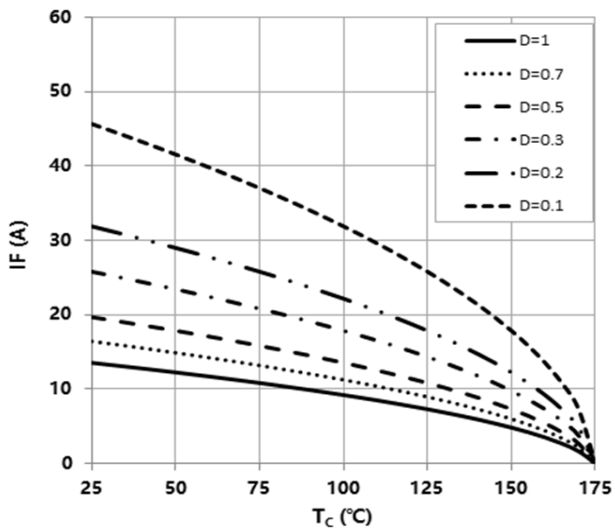

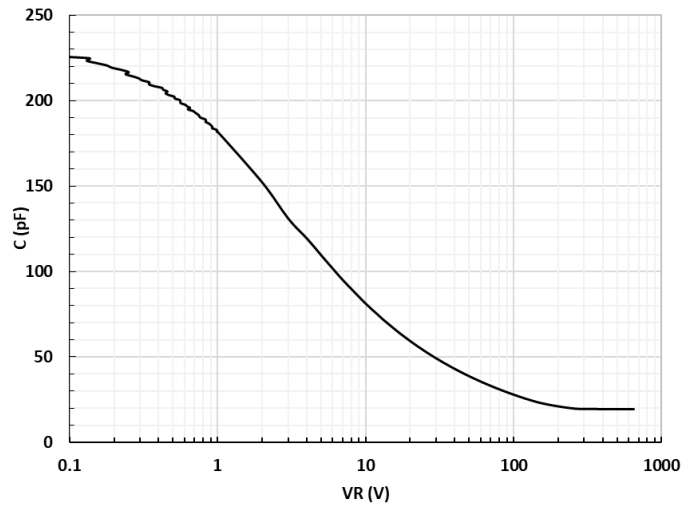Figure 3. **Diode forward current as function of temperature,** D=duty cycle

Figure 4. **Typical capacitance as function of reverse voltage,** $C=f(V_R)$; T_j=25°C; f=1 MHz
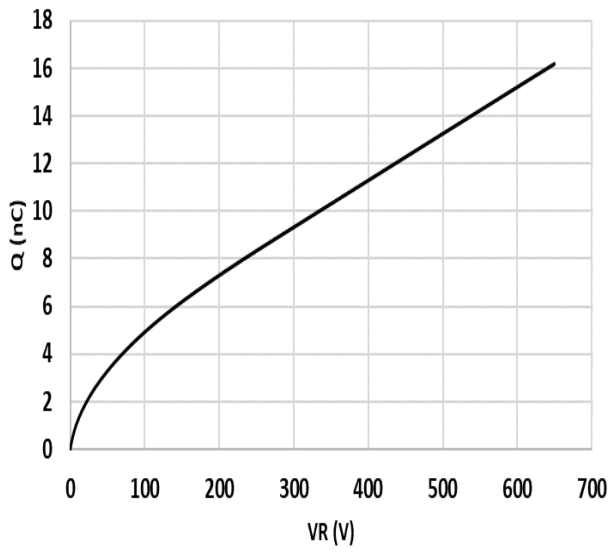
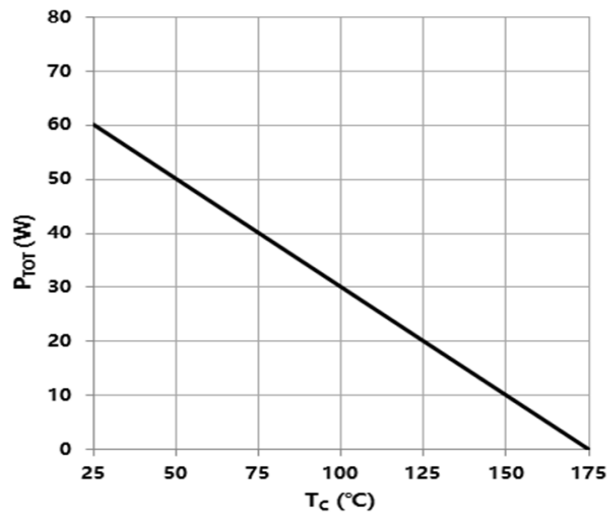Figure 5. **Typical reverse charge as function of reverse voltage**

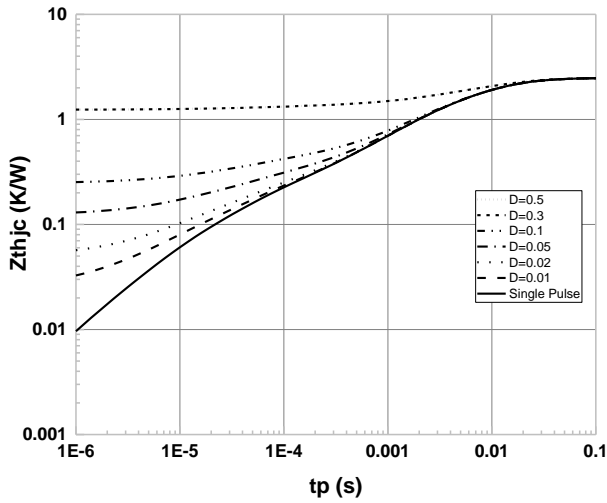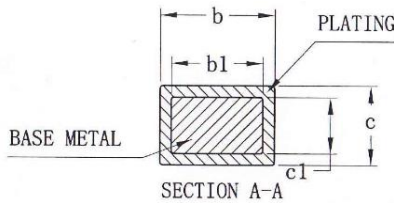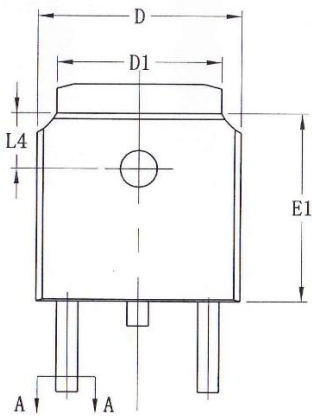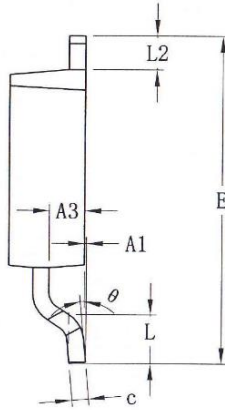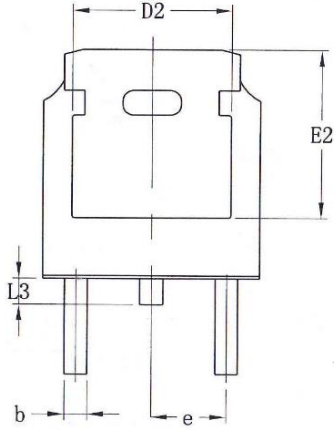Figure 6. **Power dissipation as function of case temperature**

Figure 7. **Max. transient thermal impedance,** $Z_{th,ic}$=f(t), parameter: D=t /T

Package Dimensions

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A1	0.00	—	0.10
A2	2.20	2.30	2.40
A3	1.02	1.07	1.12
b	0.74	—	0.82
b1	0.73	0.76	0.79
c	0.51	—	0.55
c1	0.50	0.51	0.52
D	6.50	6.60	6.70
D1	5.33REF		
D2	4.83REF		
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.30REF		
e	2.286BSC		
L	1.40	1.50	1.60
L2	0.90	—	1.25
L3	0.60	0.80	1.00
L4	1.70	1.80	1.90
θ	0		8°

Revision History:

2019-05-30,Rev.1.0

Previous Revision:

Rev.1.0   Release of datasheet

BASiC Semiconductor Ltd.
Shenzhen, China
© 2018 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.