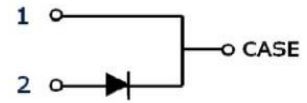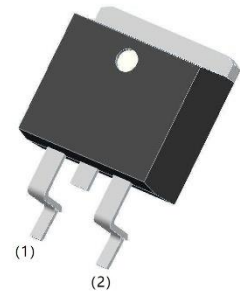# B1D10065F

SiC Schottky Diode

V_{RRM} = **650 V**

I_F(Tc=150°C) = **10 A**

Q_C = **32 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-Anode

Package Parameters

Part Number	Marking	Package
B1D10065F	B1D10065F	TO-263-2L

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	32 15 10	A
I_{FSM}	Non-Repetitive Forward Surge Current	Tc=25°C , t_p=10ms, sine halfwave	70	A
$\int i^2 dt$	i²t Value	Tc=25°C ,t_p=10ms	24.5	A²S
P_{tot}	Power Dissipation	Tc=25°C Tc=110°C	131 57	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		1.144		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		64.42		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=10A T_j=25°C I_F=10A T_j=175°C		1.43 1.8		V
I_R	Reverse current	V_R=650V T_j=25°C V_R=650V T_j=175°C		0.07 3.5		μA

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

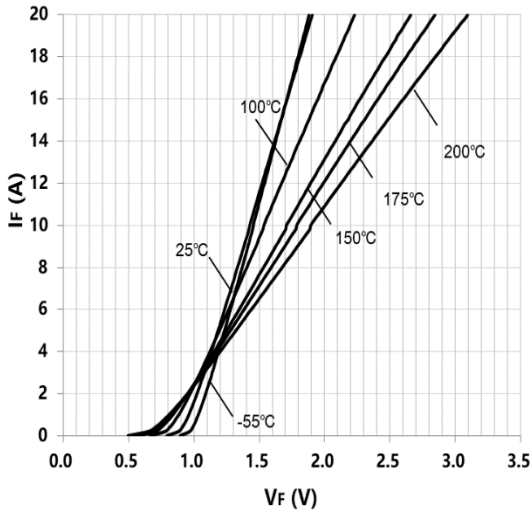| Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitve charge	V_R=400V T_j=25°C $Q_c = \int_0^{VR} C(V)dV$		32		nC
C	Total Capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		475 55 54		pF

Typical Performance

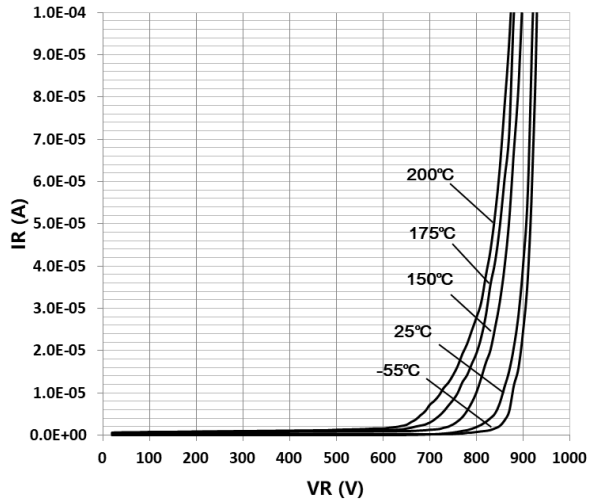Figure 1. **Typical forward characteristics**

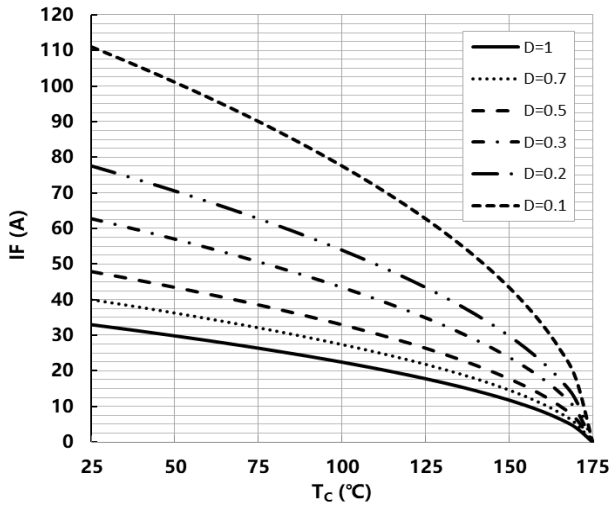Figure 2. **Typical reverse current as function of reverse voltage**

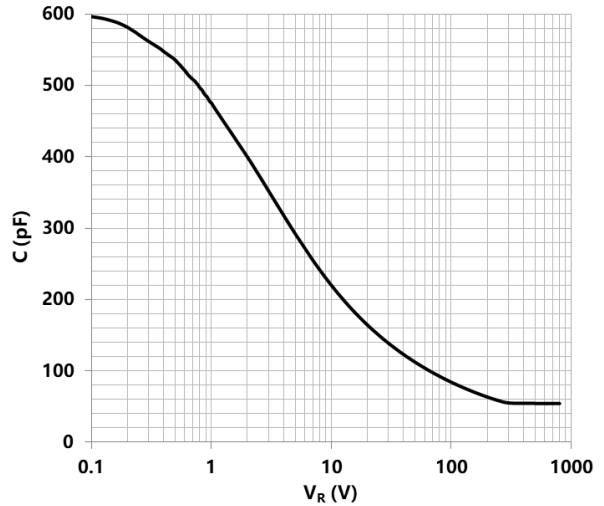Figure 3. **Diode forward current as function of temperature,** D=duty cycle

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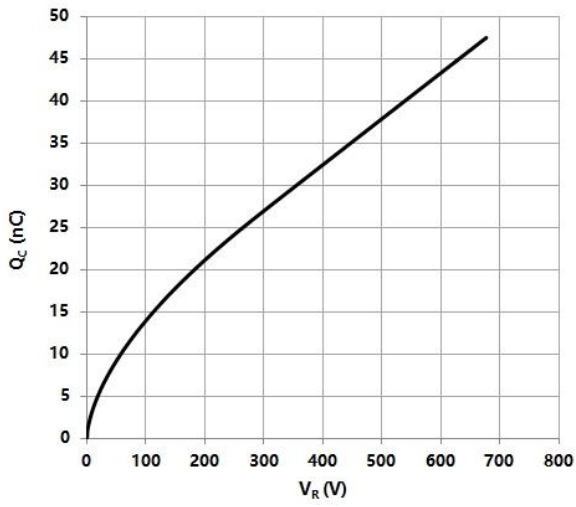
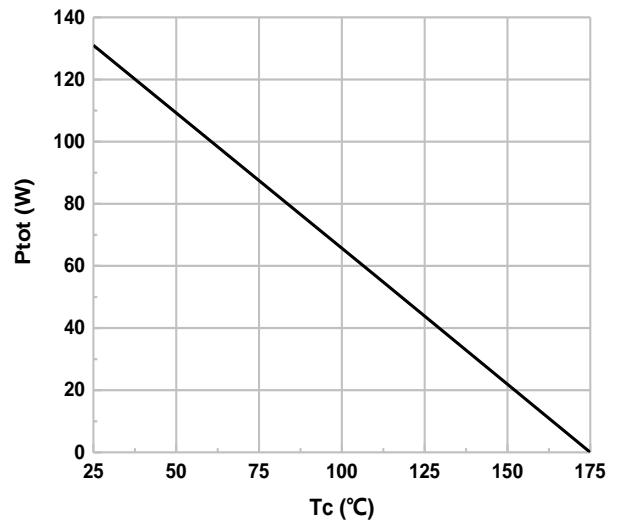Figure 5. **Typical reverse charge as function of reverse voltage**

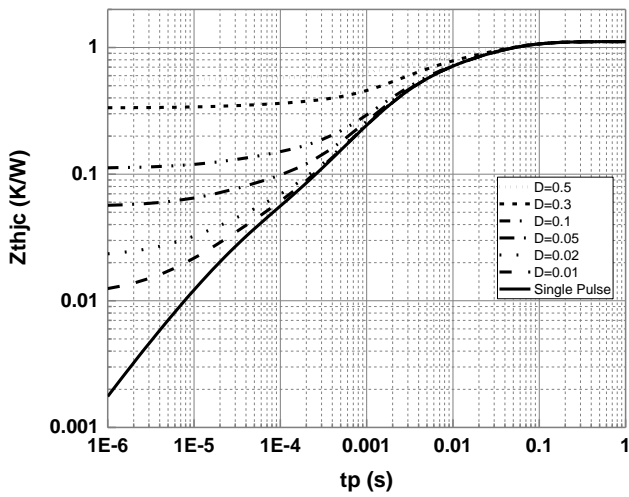Figure 6. **Power dissipation as function of case temperature**

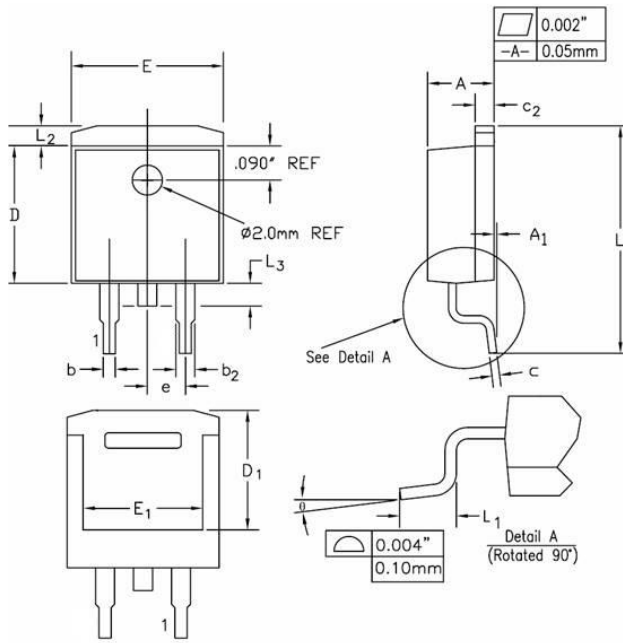Figure 7. **Max. transient thermal impedance,** $Z_{th,jc}=f(t)$, parameter: D=t /T

Package Dimensions

POS	Inches		Millimeters	
	Min	Max	Min	Max
A	0.17	0.18	4.32	4.57
A1	-	0.01	-	0.25
b	0.028	0.037	0.71	0.94
b2	0.045	0.055	1.15	1.4
c	0.014	0.025	0.356	0.635
c2	0.048	0.055	1.22	1.4
D	0.35	0.37	8.89	9.4
D1	0.255	0.324	6.48	8.23
E	0.395	0.405	10.04	10.28
E1	0.31	0.318	7.88	8.08
e	0.1	BSC.	2.54	BSC.
L	0.58	0.62	14.73	15.75
L1	0.09	0.11	2.29	2.79
L2	0.045	0.055	1.15	1.39
L3	0.05	0.07	1.27	1.77
θ	0°	8°	0°	8°

Revision History:

Revision : Preliminary Version

Previous Revision:

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