B1D10065KS

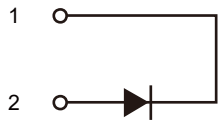
SiC Schottky Diode

Product Summary

V_{RRM}	650 V
I_F (T_C=145°C)	10 A
Q_C	29 nC

TO-220-isolated

Electrical Connection



Features

- Ceramic package provides 2.5kV isolation
- 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

- Electrically isolated package
- 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- Cathode
- Pin2- Anode

Package Parameters

Part Number	Marking	Package
B1D10065KS	B1D10065KS	TO-220-isolated

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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=145℃	28 10	A
I_{FSM}	Non-repetitive forward surge current	T_C=25℃, t_p=10ms Half sine wave	75	A
$\int i^2dt$	i^2t value	T_C=25℃, t_p=10ms	28.12	A^2S
P_{tot}	Power dissipation	T_C=25℃ T_C=110℃	89 38	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C
V_{isol}	Isolation voltage	AC, t=1s	2500	V_{rms}
	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		1.671		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=10A T_j=25℃ I_F=10A T_j=175℃		1.43 1.75		V
I_R	Reverse current	V_R=650V T_j=25℃ V_R=650V T_j=175℃		1 20		μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=400V T_j=25°C $Q_C=\int_0^{V_R} C(V)dV$		29		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		457 49.7 49.3		pF
E_C	Capacitance stored energy	V_R=400V		7.5		μJ

Typical Performance

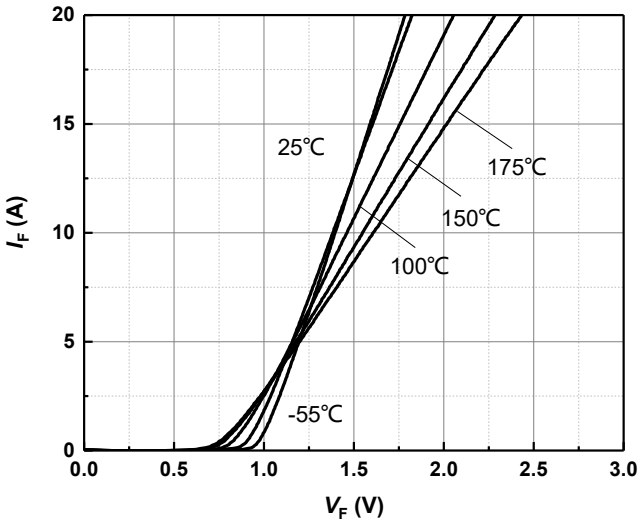


Figure 1 Typical forward characteristics

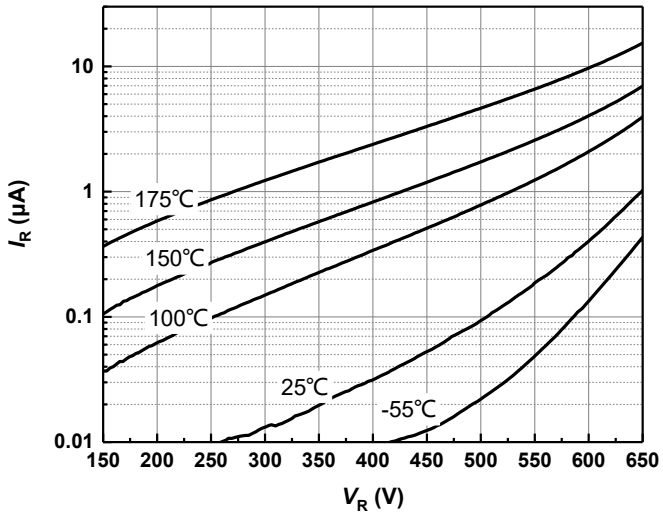


Figure 2 Typical reverse current as function of reverse voltage

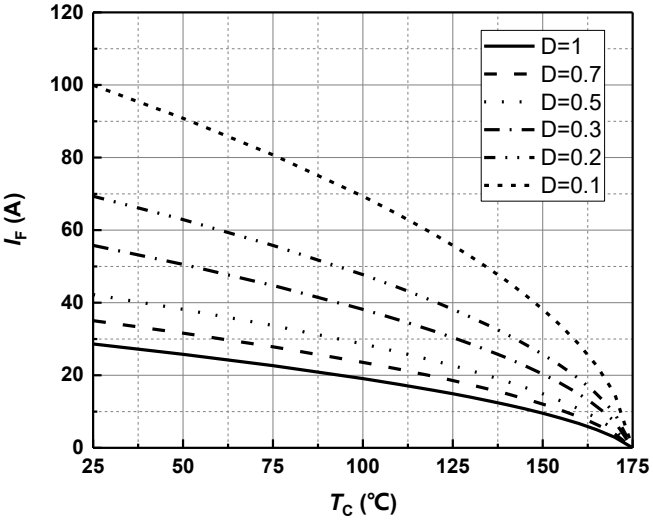


Figure 3 Diode forward current as function of temperature, D=duty cycle

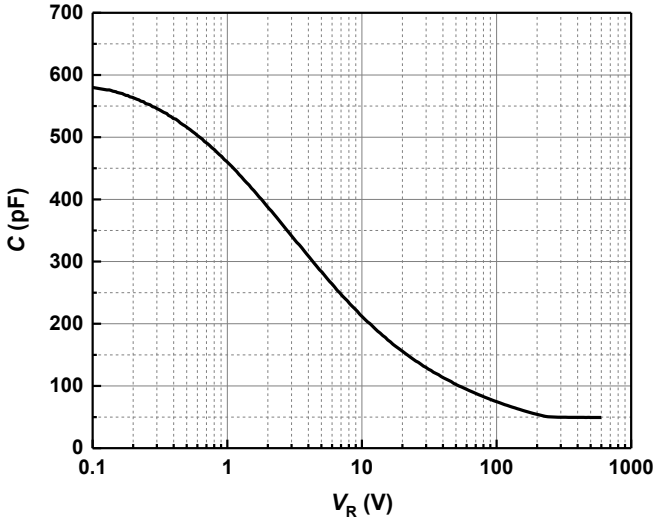


Figure 4 Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz

Typical Performance

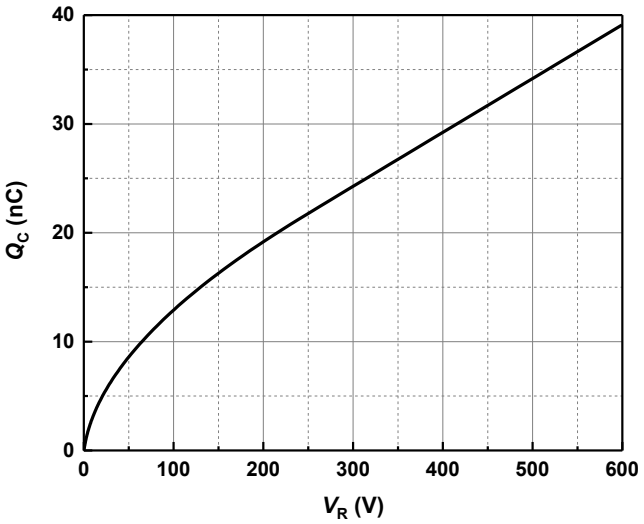


Figure 5 Typical reverse charge as function of reverse voltage

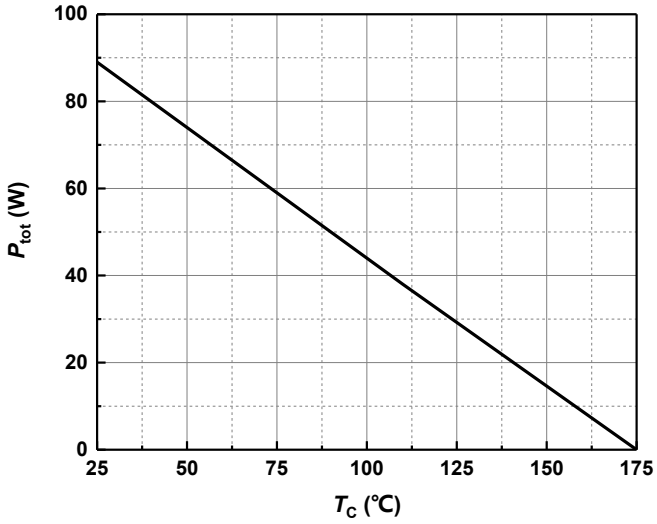


Figure 6 Power dissipation as function of case temperature

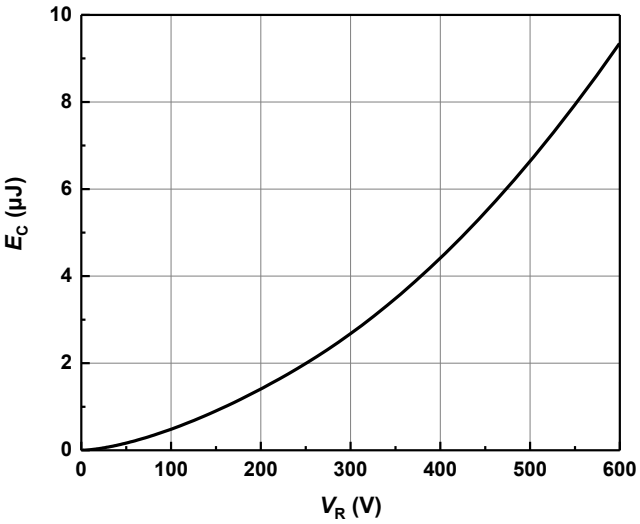


Figure 7 Capacitance stored energy

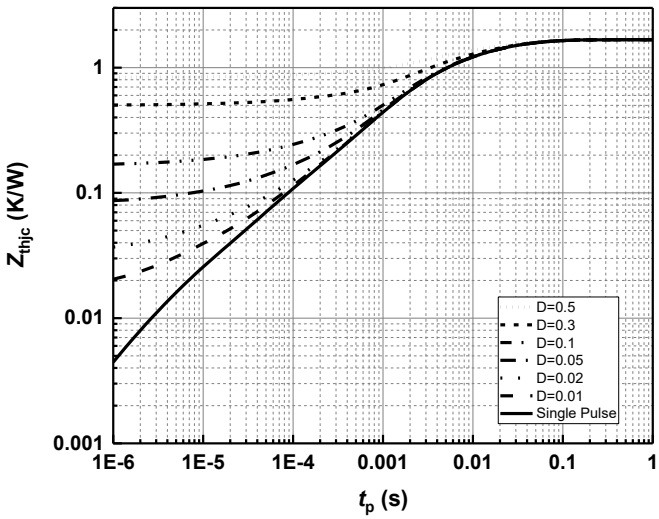
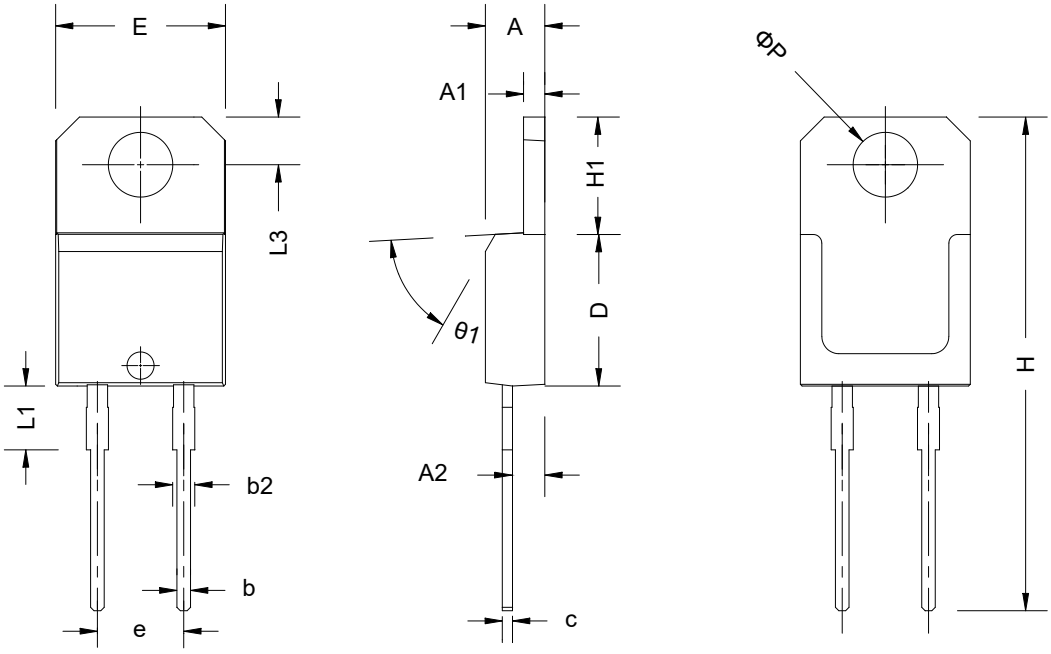
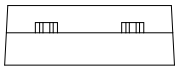


Figure 8 Max. transient thermal impedance, Z_{thjc}= f(t), parameter: $D = t / T$

Package Dimensions





SYMBOL	mm		
	MIN	NOM	MAX
A	4.40	4.50	4.60
b	0.61	0.75	0.88
c	0.46	0.58	0.70
A1	1. 21	1.265	1.32
A2	2.40	2.56	2.72
D	8.60	9.15	9.70
E	9.80	10.1	10.4
H1	6.55	6.75	6.95
e		5.08 BSC	
H	28.0	28.9	29.8
L1		3.75	
L2	1.14		1.70
L3	2.65	2.80	2.95
θ1		45°	
ϕ P			3.88

Revision History

Document Version	Date of Release	Description of Changes
Rev 1.0	2020-07-06	Release of the datasheet.
Rev 1.1	2022-07-14	Updated.

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