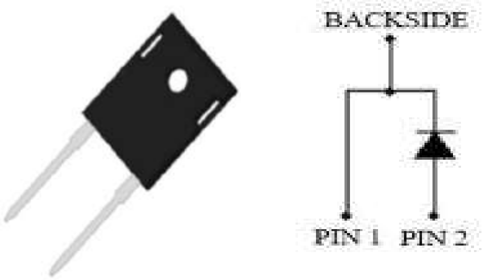
TO-247-2Silicon Carbide Schottky Diode
SiC Diode 1200V 20A 106nC

General Description

This product family offers state of the art performance. It is designed for high frequency applications here high efficiency and high reliability are required.

Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on VF
- Temperature Independent Switching Behavior



TO-247-2
Pin definition

Applications

- Motor Drives
- Solar
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

Key performance parameters

Type	V_R	I_F $T_C=150°C$	Q_C
KWSC 120C20T2	1200 V	20A	106 nC

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedures.

Maximum Ratings

T_C=25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Peak Reverse Surge Voltage	V_{RSM}	1200	V
DC Blocking Voltage	V_R	1200	V

Maximum Ratings

T_C=25°C, unless otherwise specified

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{RSM}	Surge peak reverse voltage		1200	V
I_F	Continuous forward current	T_C=25°C T_C=150°C	61 20	A
I_{FSM}	Non-Repetitive forward surge current	T_C=25°C , t_p=10ms, Half Sine Wave	185	A
$\int i^2dt$	i^2t value	T_c=25°C, t_p=10ms	171	A^2S
P_{tot}	Power dissipation	Tc=25°C Tc=110°C	267 116	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C

Thermal Resistance

Parameter	Symbol	Typ.	Max	Unit
Thermal resistance, junction-case	R_{thJC}	0.56		°C/W

Electrica Characteristic

T_C =25°C, unless otherwise specified

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=20A,T_j=25°C I_F=20A,T_j=175°C		1.39 1.98	1.70 2.85	V
I_R	Reverse current	V_R=1200V ,T_j=25°C V_R=1200V ,T_j=175°C		0.5 9	200 400	µA

AC Characteristic

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=800V ,T_j=25°C $Q_C = \int_0^{V} R \ C(V)dV$		106		nC
C	Total capacitance	V_R=1V f=1MHz V_R=400V f=1MHz V_R=800V f=1MHz		1144 99 74		pF
E_C	Capacitance stored energy	V_R=800V		30		µJ

Typical Characteristics

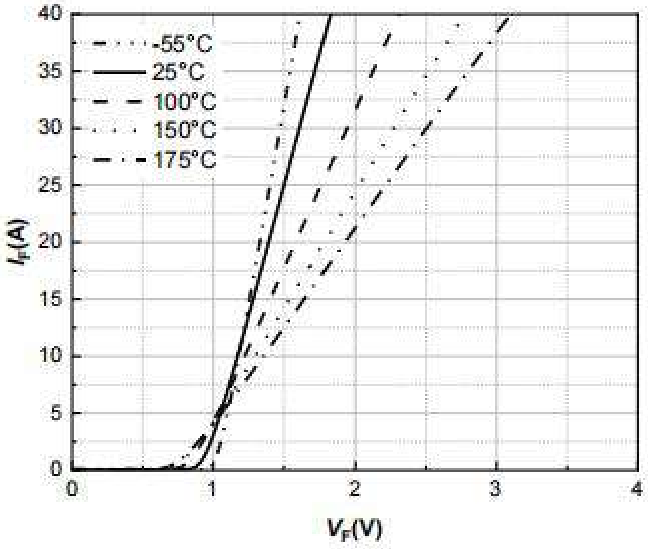


Figure 1. Typical forward characteristics

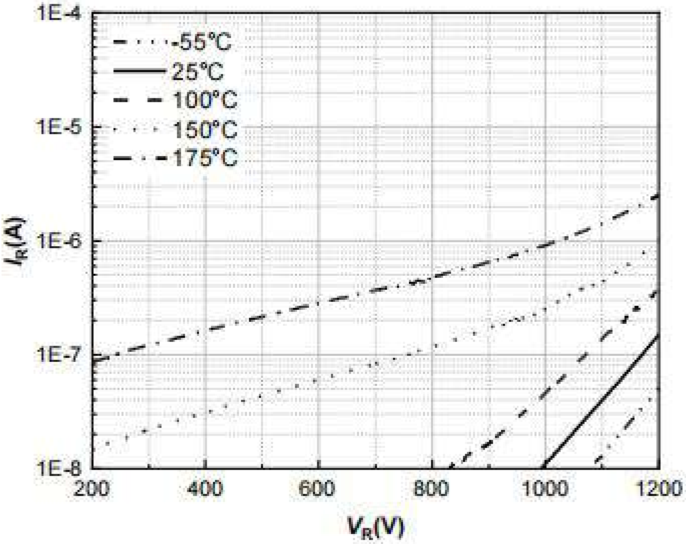


Figure 2. Typical reverse current as function of reverse voltage

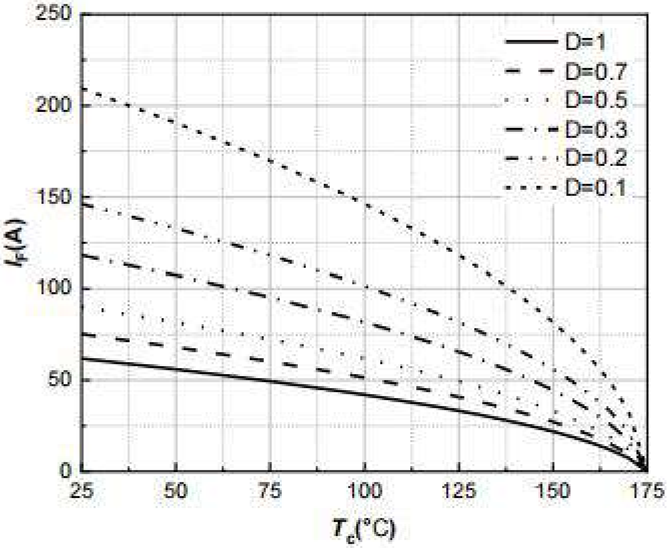


Figure 3. Diode forward current as function of temperature, D=duty cycle

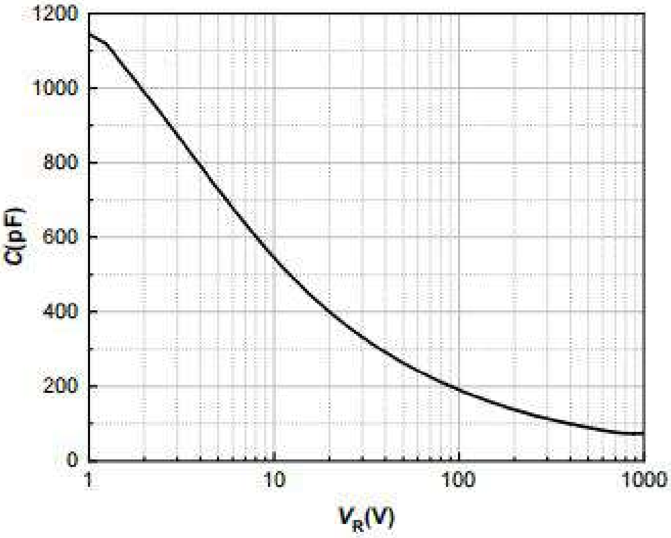


Figure 4.Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25℃; f=1 MHz

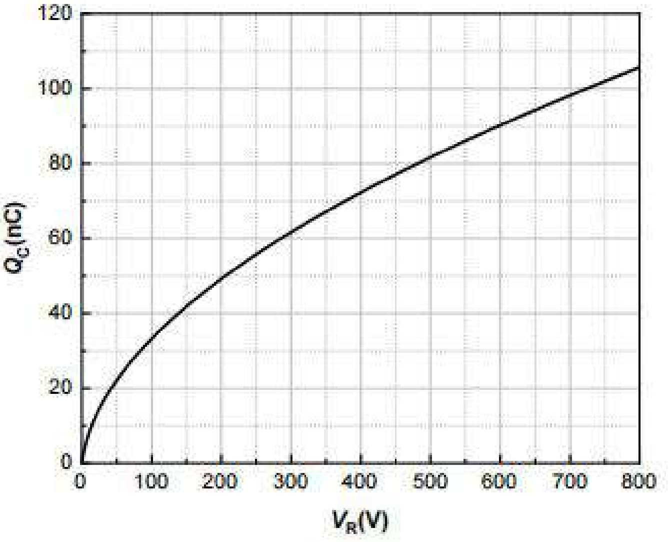


Figure 5. Typical reverse charge as function of reverse voltage

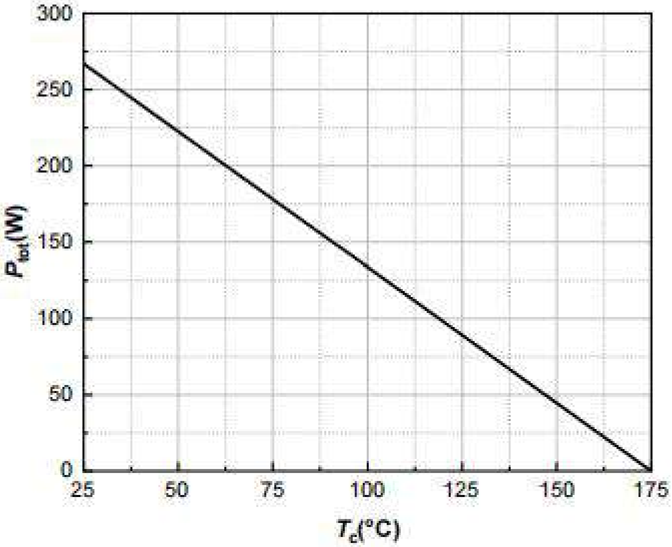


Figure 6. Power dissipation as function of case temperature

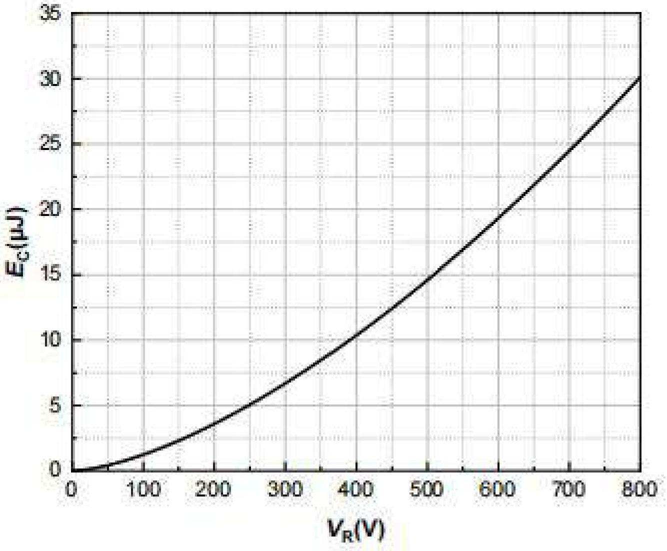


Figure7. Capacitance stored energy

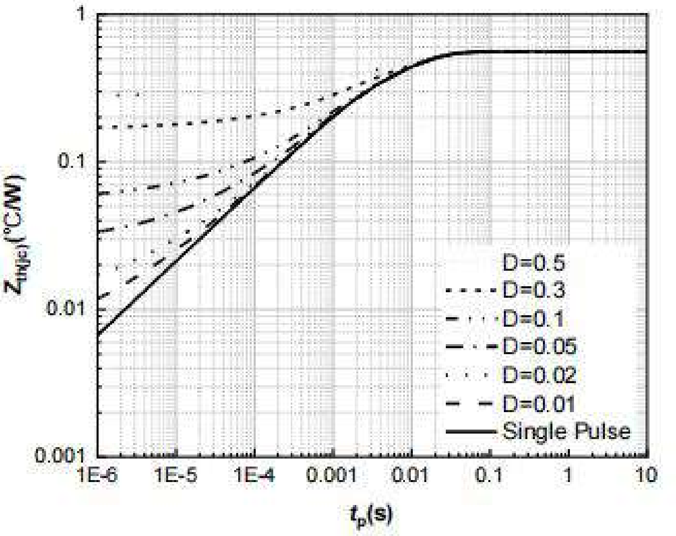
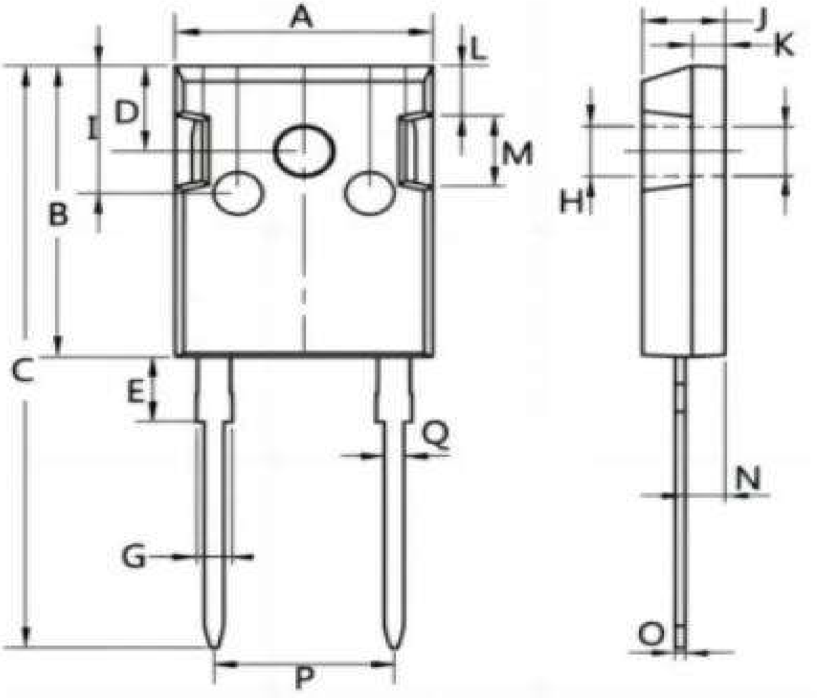


Figure 8. Max.transient thermal impedance,$Z_{th(jc)}=f_{(tp)}$,parameter:$D=t_p/T$

Package Outline Dimensions

Package Outline: TO-247-2



Dim.	Min.	Max.
A	15.51	15.71
B	20.40	20.50
C	40.5	42
D	5.80	6.15
E	4.25	4.40
G	2.05	2.15
H	3.62	4.59
I	8.15	8.60
J	4.95	5.05
K	1.96	1.99
L	3.65	3.8
M	4.50	5.05
N	2.30	2.85
O	0.59	0.61
P	Typ 10.8	
All Dimensions in millimeter		