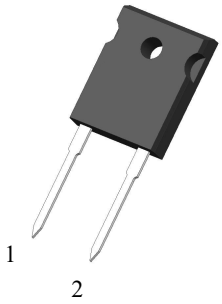
TPDH40S65C1P

Silicon Carbide Schottky Diode

General Description

Topdiode 40A 650V SiC diode is an ultrahigh performance power Schottky diode designed for high frequency applications where high efficiency and high reliability are required. The wide band gap material allows the design of a Schottky diode structure with lower leakage current and conduction losses.

Package TO-247-2



Features

Zero Forward and Reverse Recovery Voltage

Temperature-Independent Switching Behavior

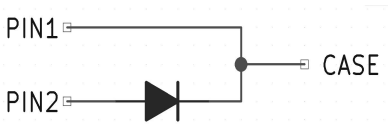
Extremely Fast Switching

Positive Temperature Coefficient on V_F

Low Switching Losses

Higher Efficiency

Equivalent Schematic



Applications

Power Inverters

Motor Drives

EV Chargers

Power Factor Correction

Server Power Supplies

Summary

Symbol	Value
$I_{F(AV)}$	40A@153℃
V_{RRM}	650V
$V_{F(typ.)}$	1.46V
$Q_{C(typ.)}$	99nC

Maximum ratings (T_C = 25℃ unless otherwise specified)

Symbol	Parameter	Test Conditions	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	T_C=25℃	650	V
V_{RSM}	Surge Peak Reverse Voltage	T_C=25℃	650	V
V_{DC}	DC Blocking Voltage	T_C=25℃	650	V
I_F	Continuous Forward Current	T_C=25℃	163	A
		T_C=135℃	60	A
		T_C=153℃	40	A
I_{FSM}	Non-Repetitive Peak Forward Surge Current	T_C=25℃, t_p=10ms, Half Sine Wave	230	A
P_{tot}	Power Dissipation	T_C=25℃	469	W
T_J,T_{stg}	Operating Junction and Storage Temperature		-55 to +175	℃
M	TO-247 Mounting Torque	M3 Screw	1	Nm

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Thermal Resistance from Junction to Case		0.32		℃/W
T_{sold}	Soldering Temperature		260		℃

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=40A T_J=25℃		1.46	1.8	V
		I_F=40A T_J=175℃		1.8	2.2	V
I_R	Reverse Current	V_R=650V T_J=25℃		1	100	μA
		V_R=650V T_J=175℃		6	400	μA
Q_C	Total Capacitive Charge	V_R=400V T_J=25℃		99		nC
C	Total Capacitance	V_R=0V T_J=25℃ f=1MHz		2040		pF
		V_R=200V T_J=25℃ f=1MHz		188		pF
		V_R=400V T_J=25℃ f=1MHz		158		pF
E_C	Capacitance Stored Energy	V_R=400V		15		μJ

Typical Performance

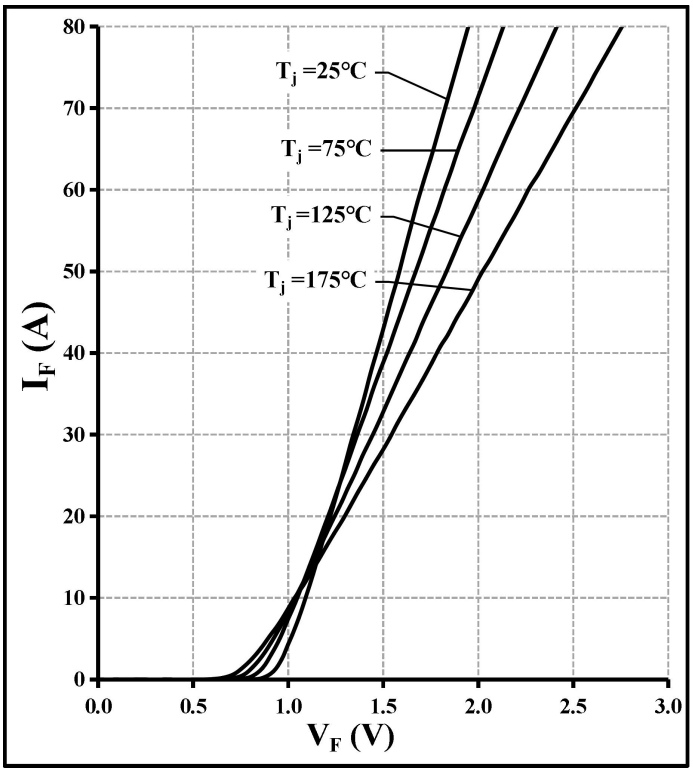


Figure 1: Forward Characteristics

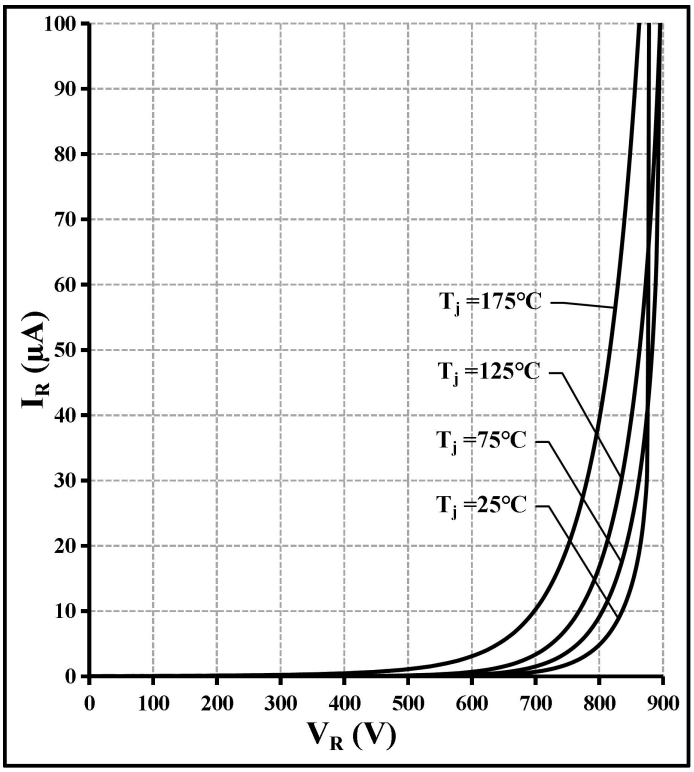


Figure 2: Reverse Characteristics

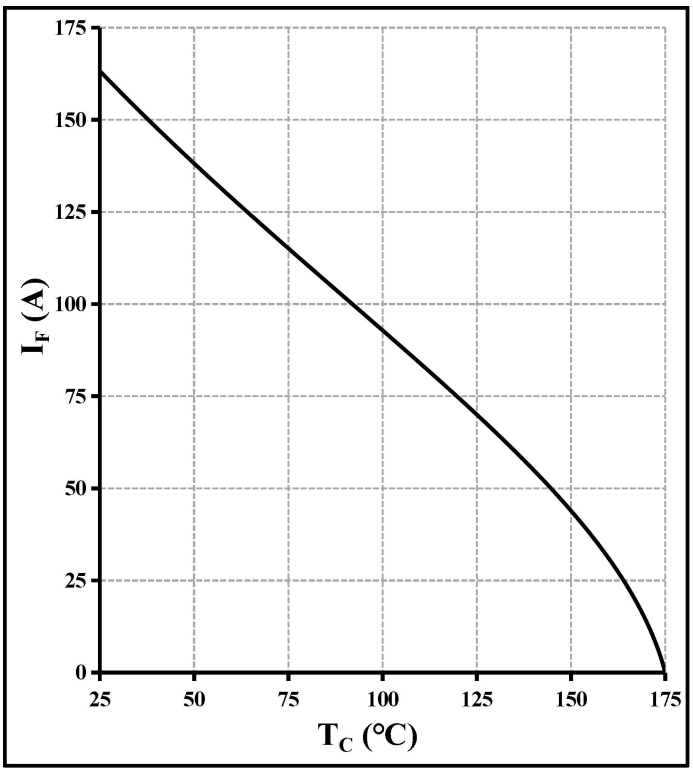


Figure 3: Current Derating

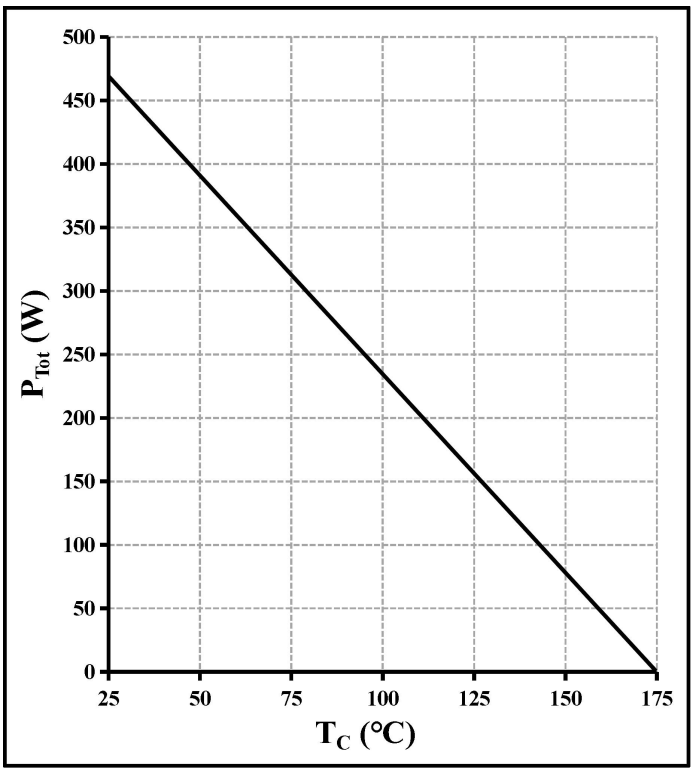


Figure 4: Power Derating

Typical Performance

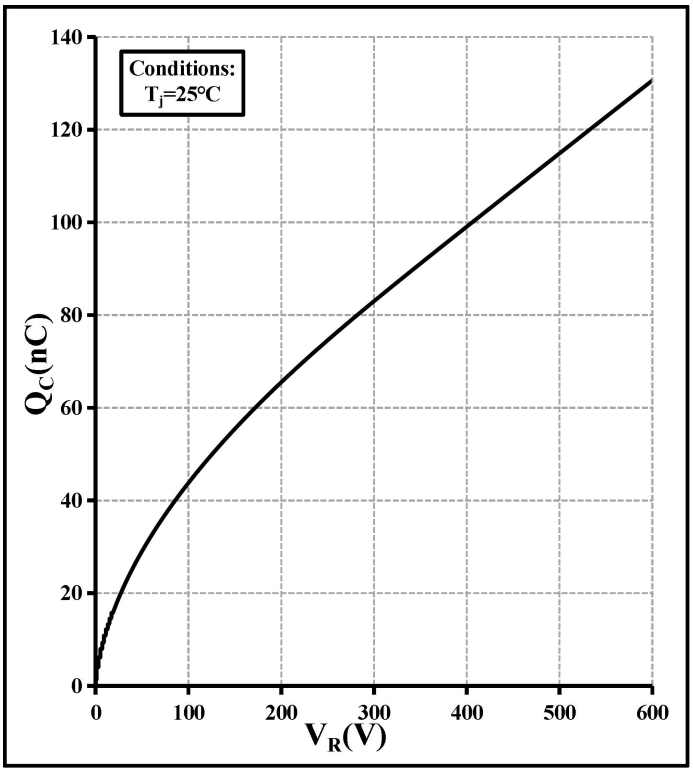


Figure 5: Total Capacitive Charge vs Reverse Voltage

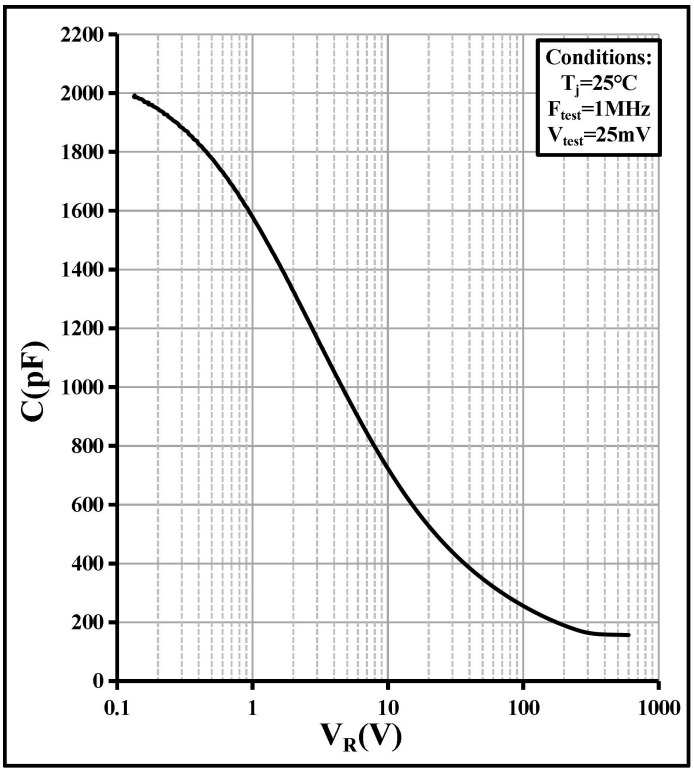


Figure 6: Capacitance vs Reverse Voltage

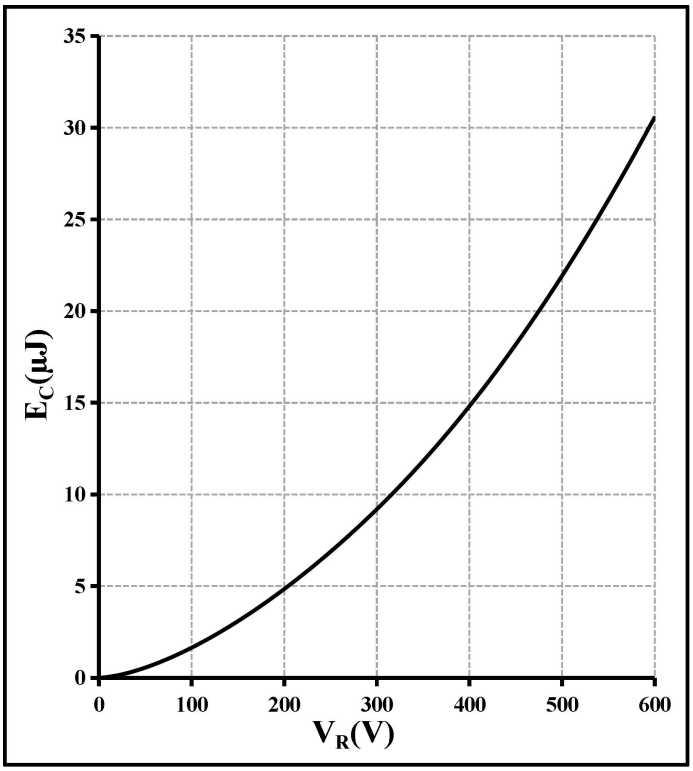


Figure 7: Typical Capacitance Stored Energy

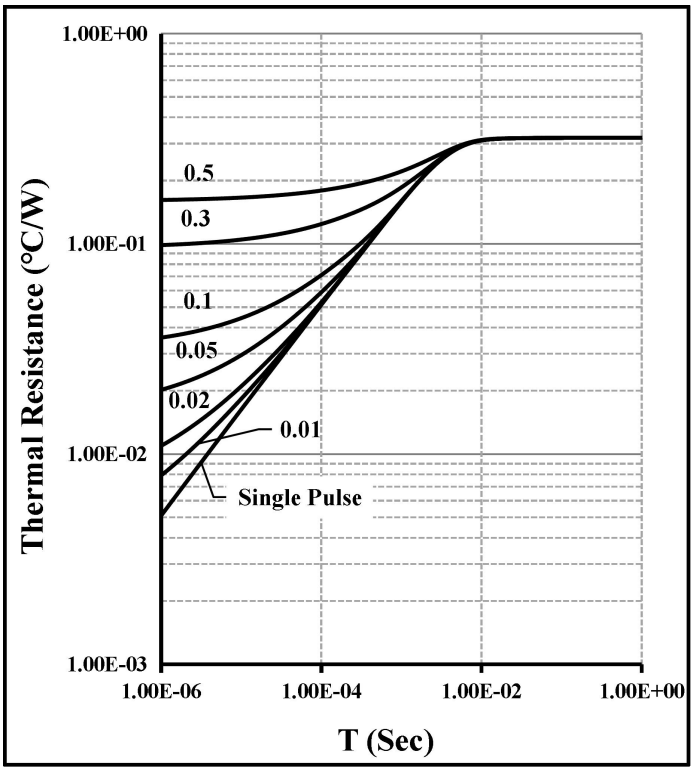
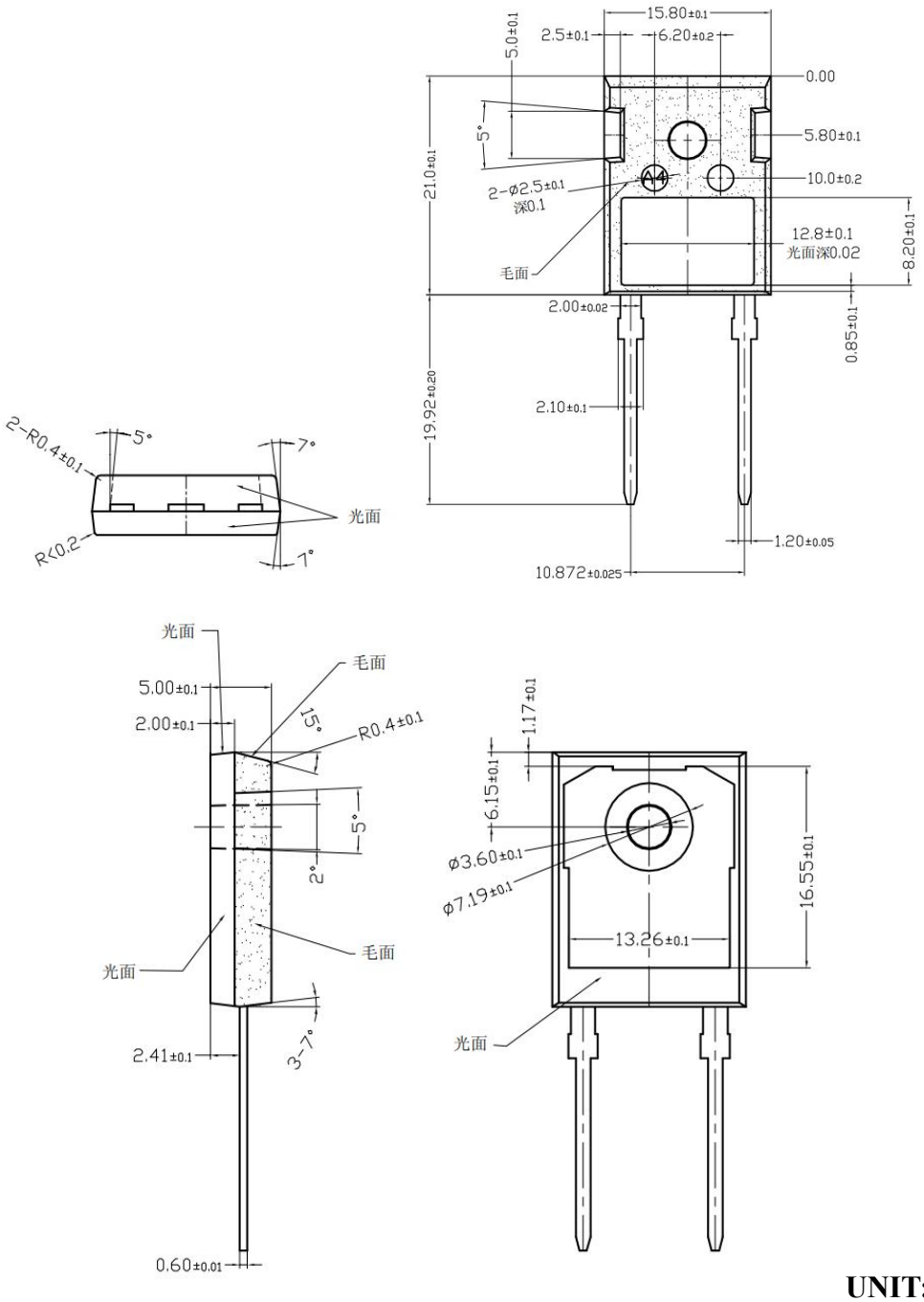


Figure 8: Transient Thermal Impedance

Package information

TO-247-2



UNIT:mm