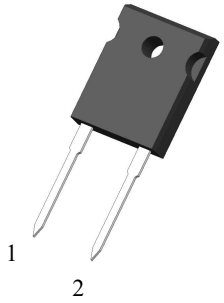
TPDH10S170C1P
Silicon Carbide Schottky Diode

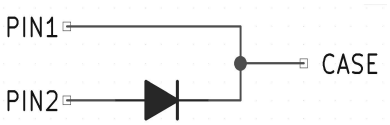
Package TO-247-2



General Description

Topdiode 10A 1700V SiC diode is an ultrahigh performance power Schottky diode designed for power electronics systems, where high efficiency and high reliability are required. SiC diodes can be easily paralleled to meet various application demands, without concern of thermal runaway. In combination with the reduced cooling requirements and improved thermal performance, SiC diodes are able to provide lower overall system costs in a variety of diverse applications.

Equivalent Schematic



Features

Zero Reverse Recovery Current

Temperature-Independent Switching

Extremely Fast Switching

Positive Temperature Coefficient on V_F

Low Switching Losses

Higher Efficiency

Applications

Switch Mode Power Supplies (SMPS)

Boost Diodes in PFC or DC/DC Stages

Free Wheeling Diodes in Inverter Stages

AC/DC Converters

Summary

Symbol	Value
$I_{F(AV)}$	10A@158℃
V_{RRM}	1700V
$V_{F(typ.)}$	1.45V@25℃
$Qc_{(typ.)}$	88.4nC

Maximum ratings (T_C = 25℃ unless otherwise specified)

Symbol	Parameter	Test Conditions	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1200	V
V_{RSM}	Surge Peak Reverse Voltage		1300	V
V_R	DC Peak Reverse Voltage		1200	V
I_F	Continuous Forward Current	T_C=25℃	51	A
		T_C=135℃	17.8	A
		T_C=158℃	10	A
I_{FSM}	Non-Repetitive Peak Forward Surge Current	T_C=25℃, t_p=10ms,Half Sine Pulse	85	A
P_{tot}	Power Dissipation	T_C=25℃	176	W
		T_C=110℃	76	W
T_J, T_{stg}	Operating Junction and Storage Temperature		-55 to +175	℃
M	TO-247 Mounting Torque	M3 Screw	1	Nm
		6-32 Screw	8.8	lbf-in

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Thermal Resistance from Junction to Case		0.85		℃/W

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=10A T_J=25℃		1.45	1.6	V
		I_F=10A T_J=175℃		2.1	2.3	V
I_R	Reverse Current	V_R=1700V T_J=25℃		3	100	μA
		V_R=1700V T_J=175℃		20	100	μA
Q_C	Total Capacitive Charge	V_R=1700V T_J=25℃ f=1MHz		88.4		nC
C	Total Capacitance	V_R=0V T_J=25℃ f=1MHz		791		pF
		V_R=800V T_J=25℃ f=1MHz		39		pF
		V_R=1700V T_J=25℃ f=1MHz		32.7		pF
E_C	Capacitance Stored Energy	V_R=1700V		54.4		μJ

Note:This is a majority carrier diode, so there is no reverse recovery charge.

Typical Performance

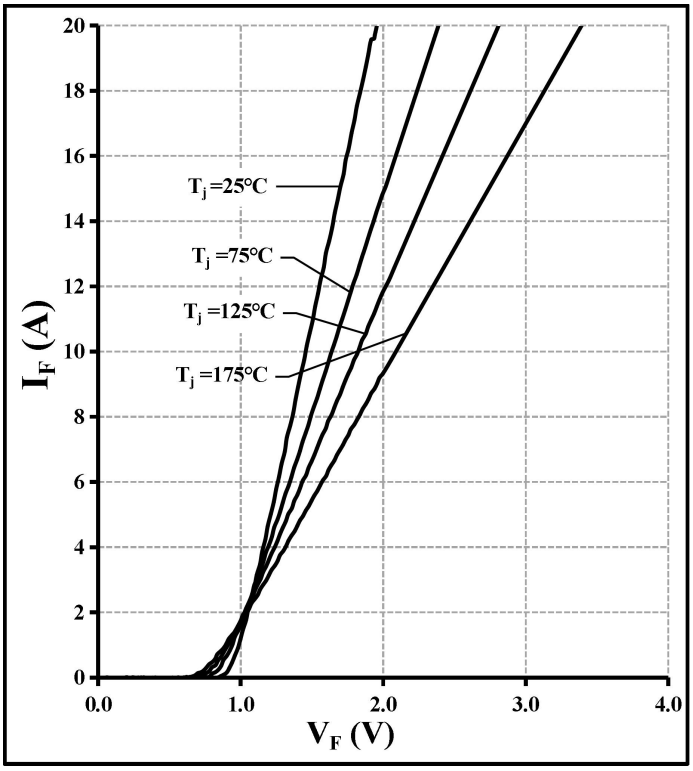


Figure 1: Forward Characteristics

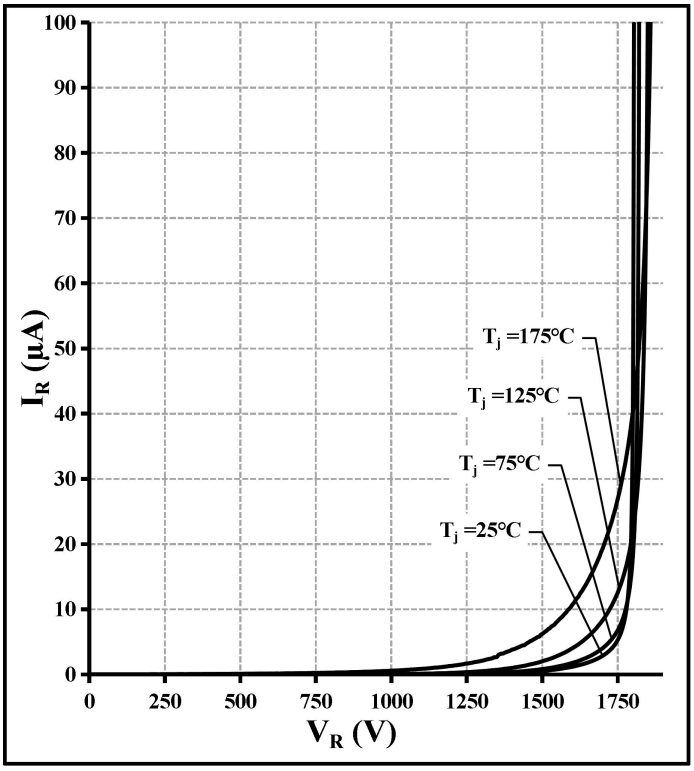


Figure 2: Reverse Characteristics

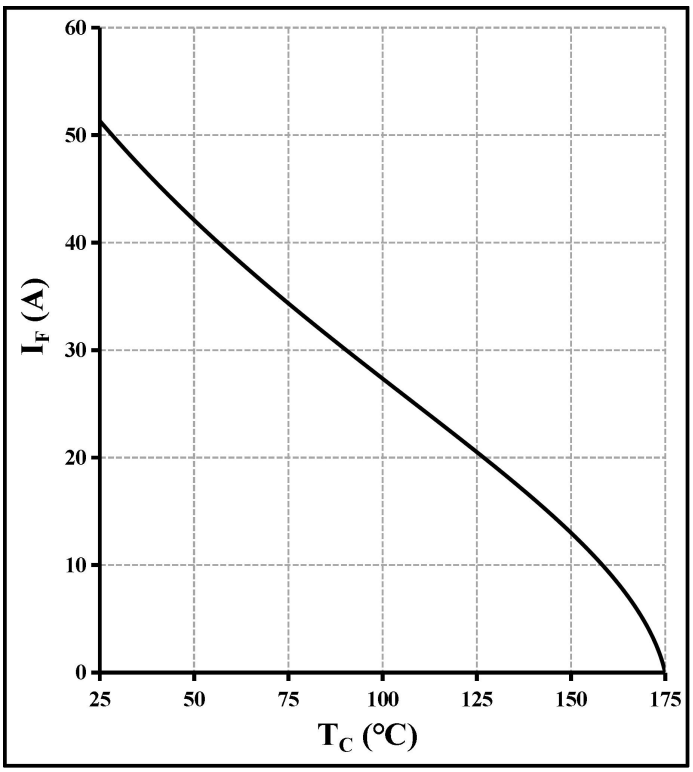


Figure 3: Current Derating

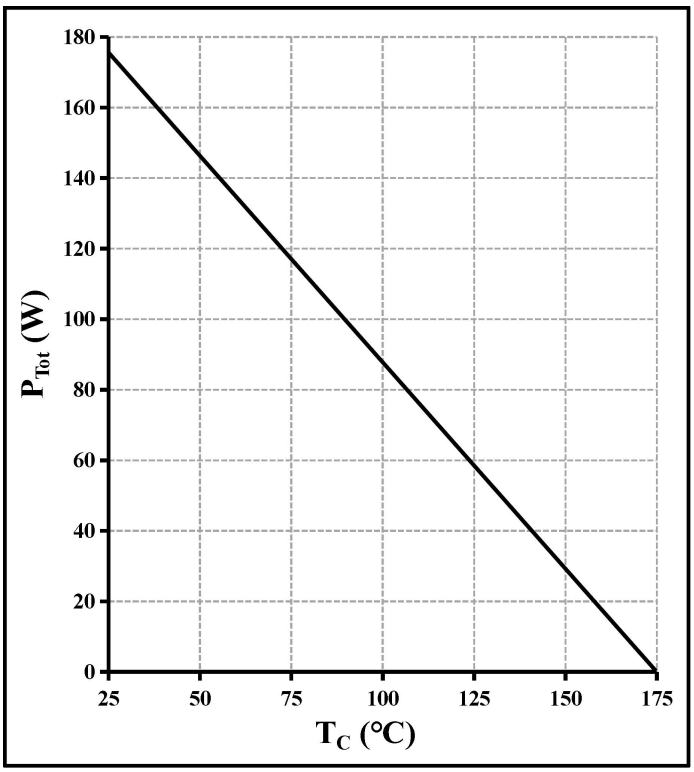


Figure 4: Power Derating

Typical Performance

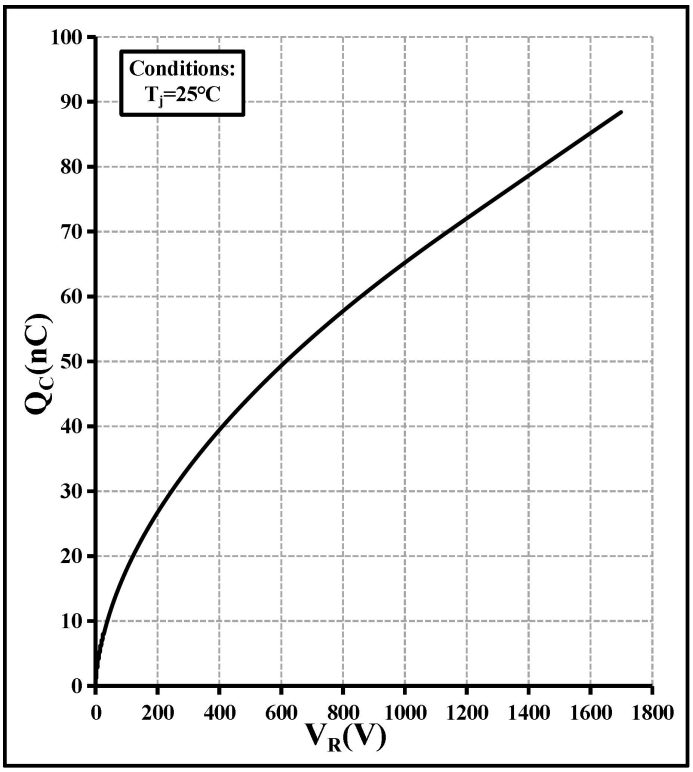


Figure 5: Recovery Charge vs Reverse Voltage

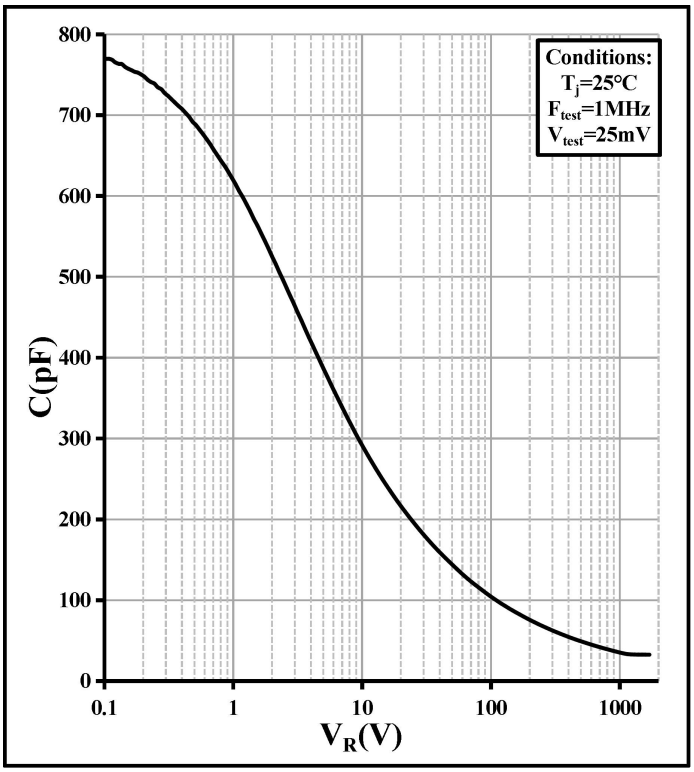


Figure 6: Capacitance vs Reverse Voltage

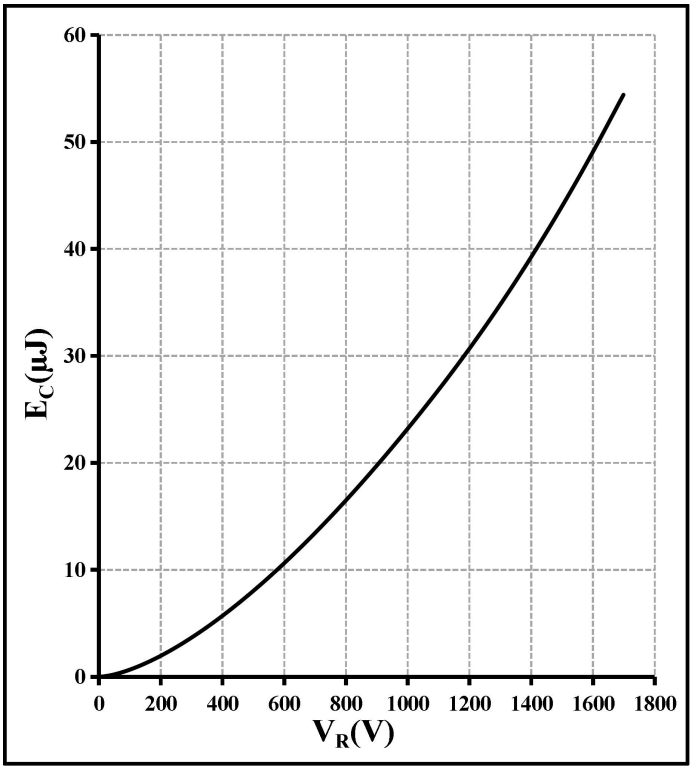


Figure 7: Typical Capacitance Stored Energy

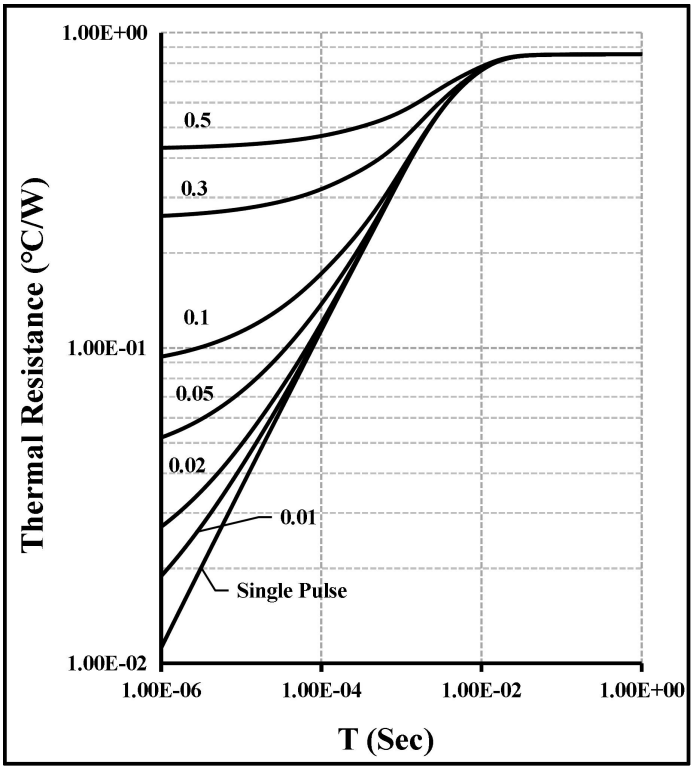
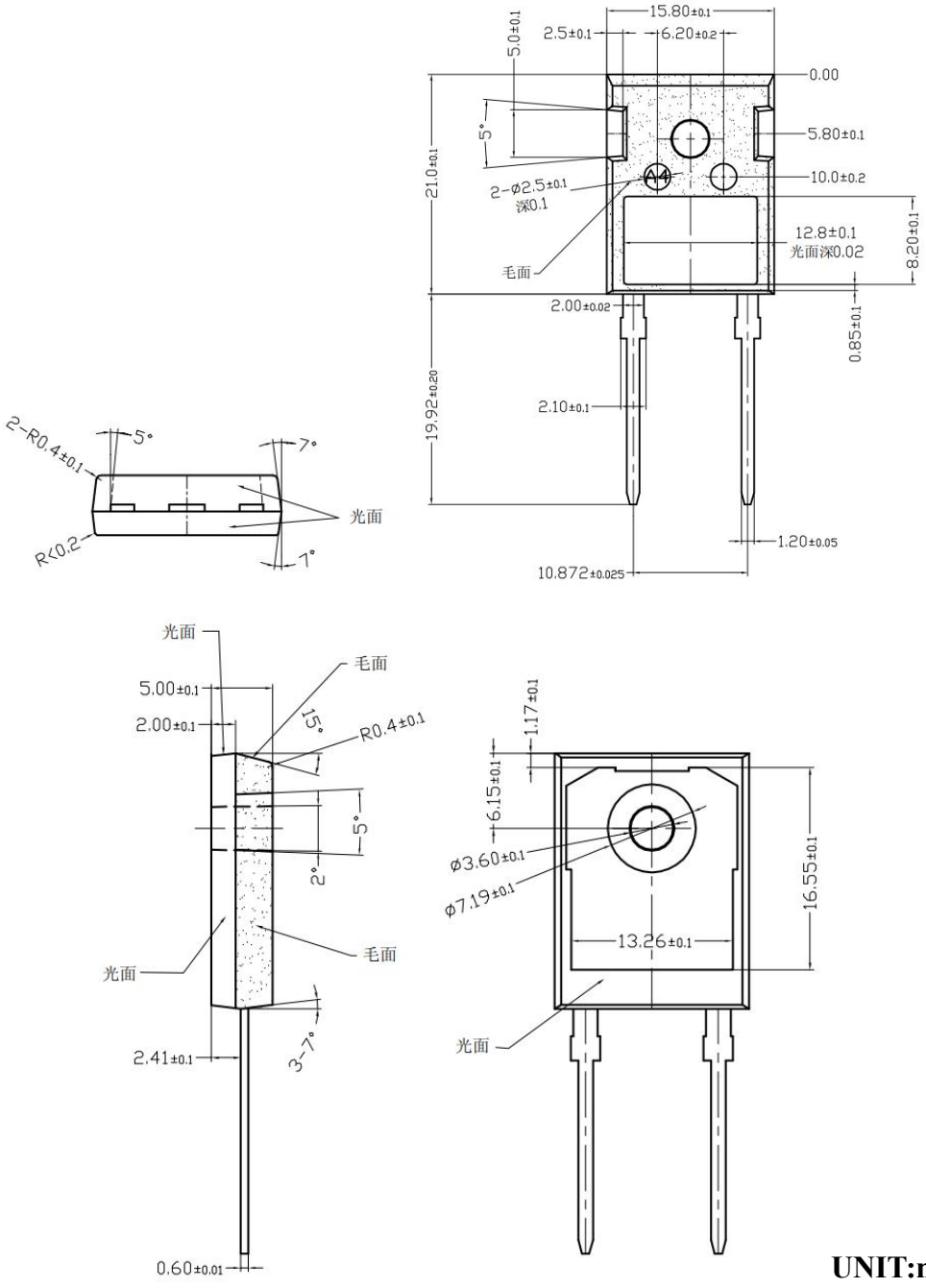


Figure 8: Transient Thermal Impedance

Package information

TO-247-2



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