

TPDH10S120C1P

Silicon Carbide Schottky Diode

General Description

Topdiode 10A 1200V 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.

Features

Zero Reverse Recovery Current

Temperature-Independent Switching

Extremely Fast Switching

Positive Temperature Coefficient on V_F

Low Switching Losses

Higher Efficiency

Applications

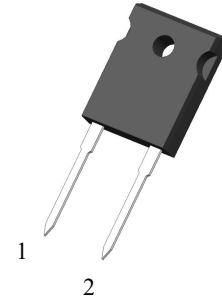
Switch Mode Power Supplies (SMPS)

Boost Diodes in PFC or DC/DC Stages

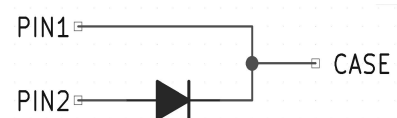
Free Wheeling Diodes in Inverter Stages

AC/DC Converters

Package TO-247-2



Equivalent Schematic



Summary

Symbol	Value
$I_{F(AV)}$	10A@164°C
V_{RRM}	1200V
$V_{F(typ.)}$	1.34V@25°C
$Q_C(typ.)$	61.4nC

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		1300	V
V _R	DC Peak Reverse Voltage		1200	V
I _F	Continuous Forward Current	T _C =25°C	70	A
		T _C =135°C	23.4	A
		T _C =164°C	10	A
I _{FSM}	Non-Repetitive Peak Forward Surge Current	T _C =25°C, t _p =10ms, Half Sine Pulse	100	A
P _{tot}	Power Dissipation	T _C =25°C	232	W
		T _C =110°C	100	W
T _J , T _{stg}	Operating Junction and Storage Temperature		-55 to +175	°C
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		0.65		°C/W

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F =10A T _J =25°C		1.3	1.5	V
		I _F =10A T _J =175°C		1.8	2.2	V
I _R	Reverse Current	V _R =1200V T _J =25°C		2	100	μA
		V _R =1200V T _J =175°C		15	100	μA
Q _C	Total Capacitive Charge	V _R =800V T _J =25°C f=1MHz		61.4		nC
C	Total Capacitance	V _R =0V T _J =25°C f=1MHz		819		pF
		V _R =400V T _J =25°C f=1MHz		58		pF
		V _R =800V T _J =25°C f=1MHz		43		pF
E _C	Capacitance Stored Energy	V _R =800V		17.8		μJ

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

Typical Performance

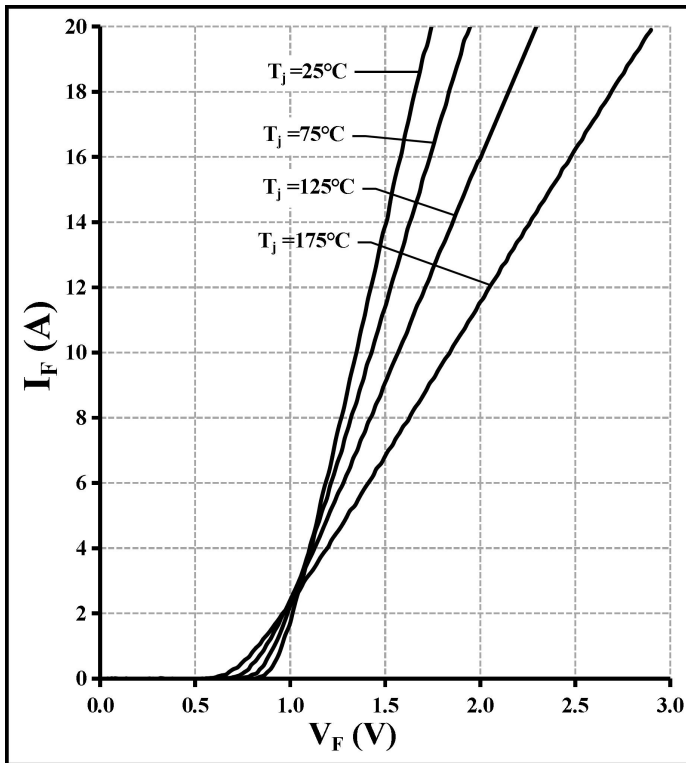


Figure 1: Forward Characteristics

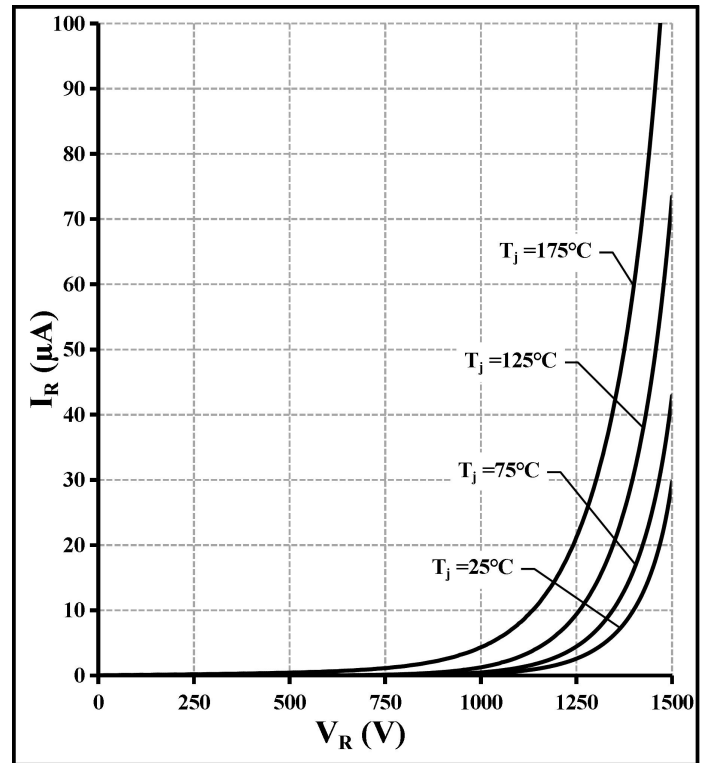


Figure 2: Reverse Characteristics

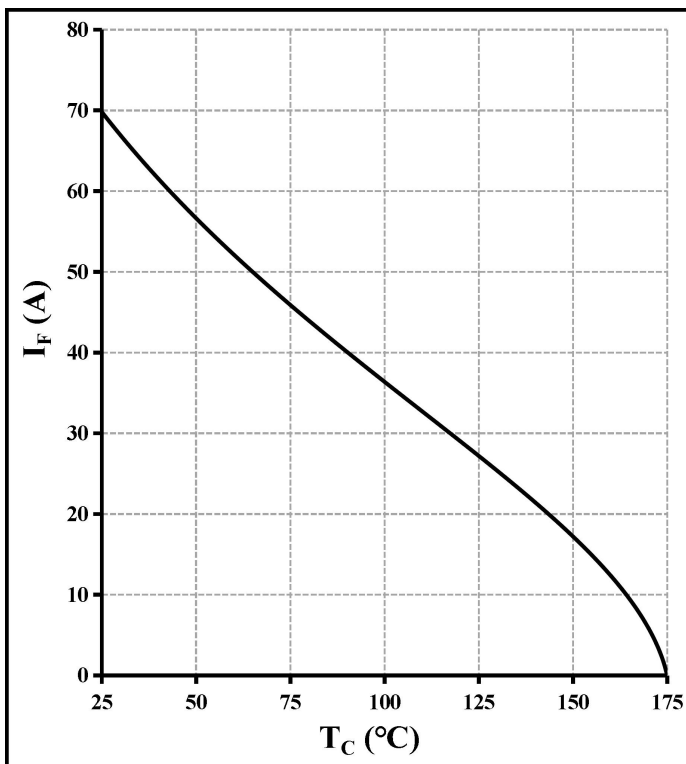


Figure 3: Current Derating

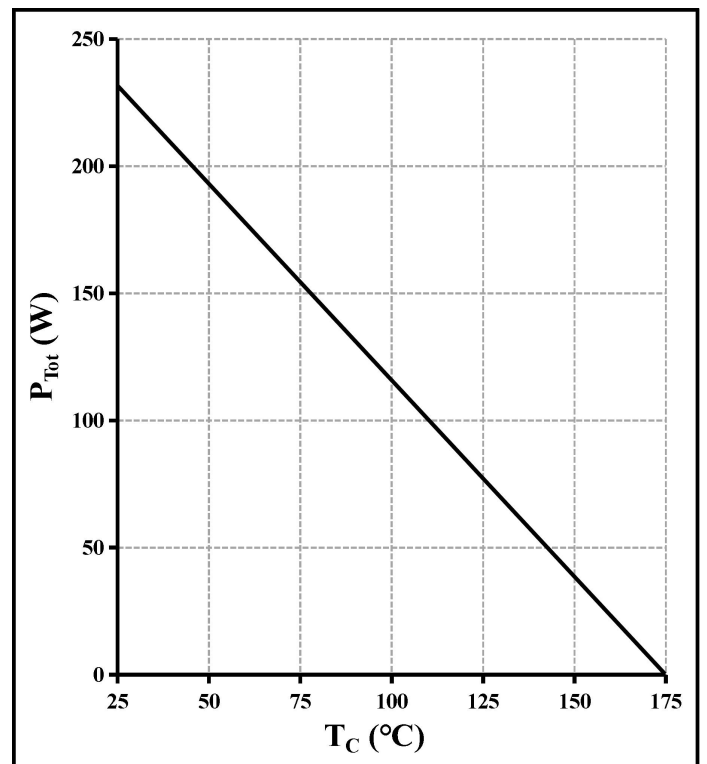


Figure 4: Power Derating

Typical Performance

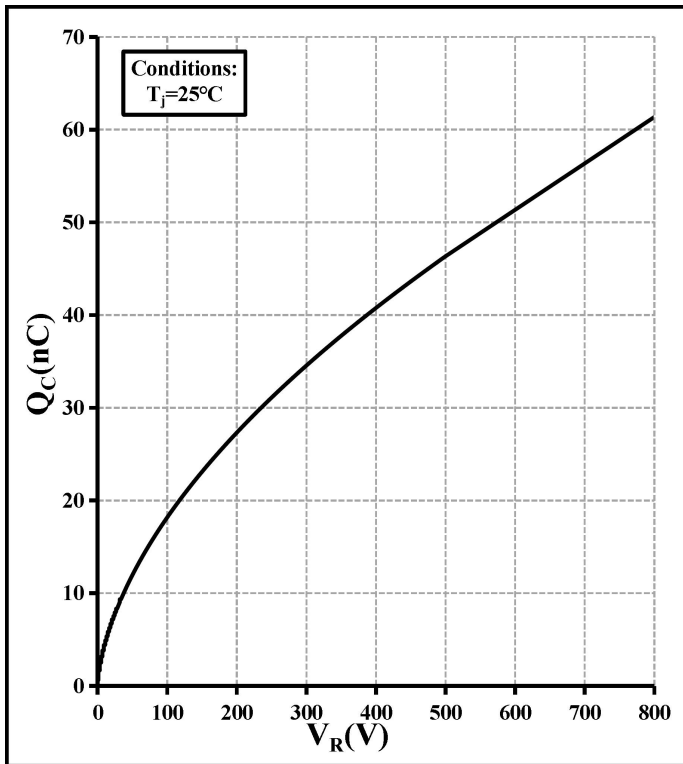


Figure 5: Recovery Charge vs Reverse Voltage

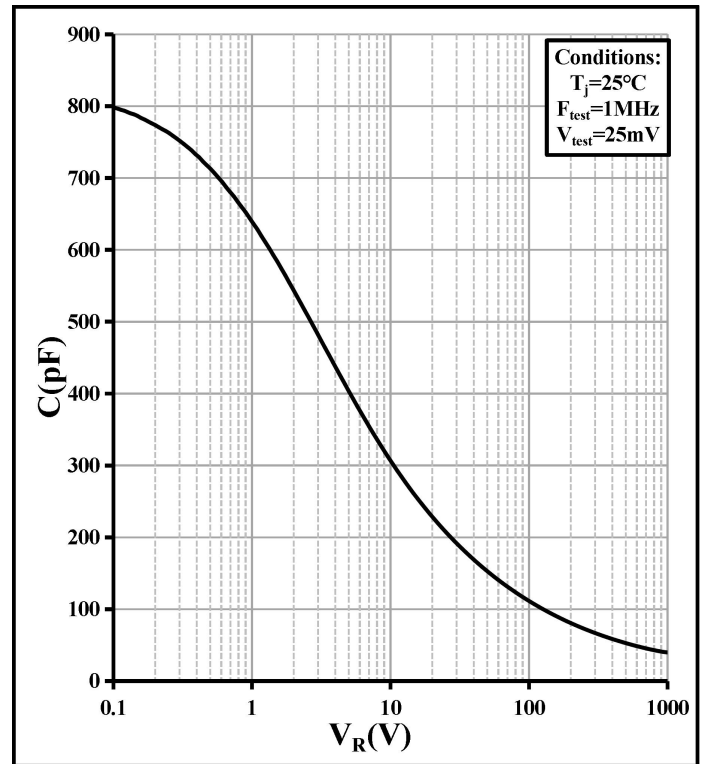


Figure 6: Capacitance vs Reverse Voltage

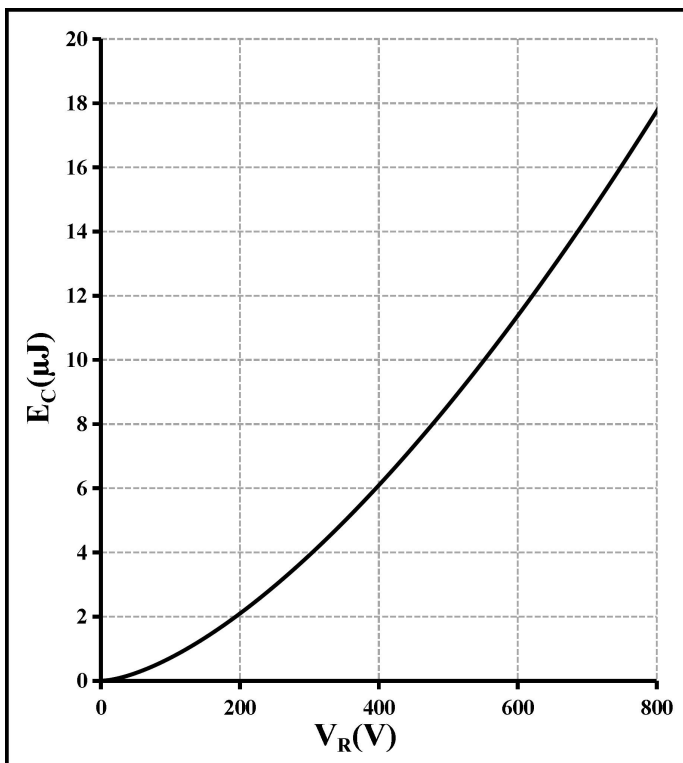


Figure 7: Typical Capacitance Stored Energy

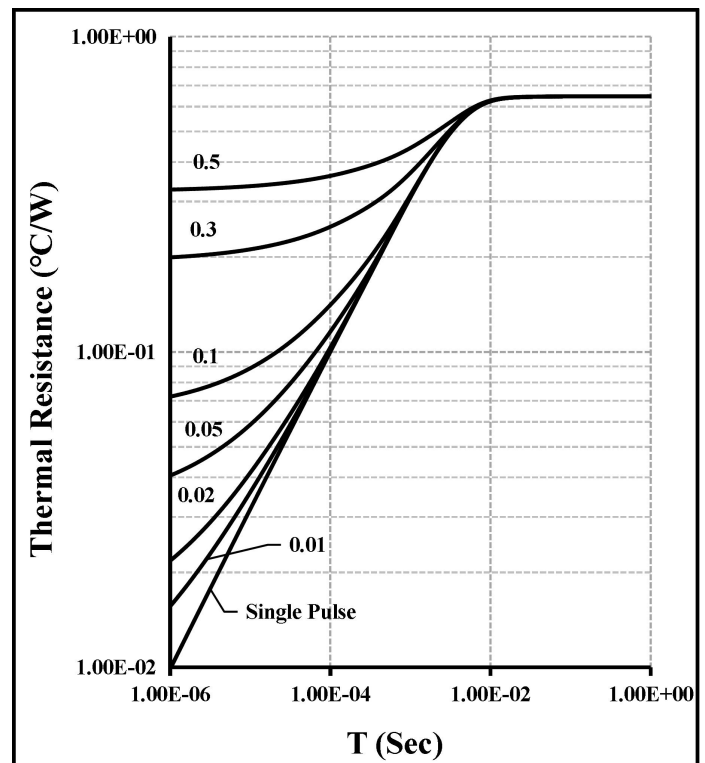


Figure 8: Transient Thermal Impedance

Package information

TO-247-2

