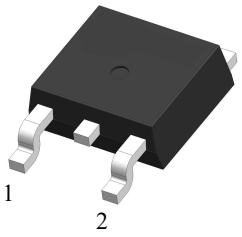
TPDG15S65C1P

Silicon Carbide Schottky Diode

General Description

Topdiode 15A 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-263



Feature

Zero Reverse Recovery Current

Temperature-Independent Switching Behavior

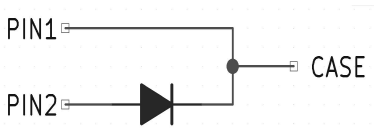
Extremely Fast Switching

Positive Temperature Coefficient on V_F

Low Switching Losses

Higher Efficiency

Equivalent Schematic



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
$I_{F(AV)}$	15A@149℃
V_{RRM}	650V
$V_{F(typ.)}$	1.36V
$Q_{C(typ.)}$	41nC

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℃	53	A
		T_C=135℃	20.3	A
		T_C=149℃	15	A
I_{FSM}	Non-Repetitive Peak Forward Surge Current	T_C=25℃, t_p=10ms, Half Sine Wave	100	A
P_{tot}	Power Dissipation	T_C=25℃	121	W
		T_C=110℃	52.3	W
T_J,T_{stg}	Operating Junction and Storage Temperature		-55 to +175	℃

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Thermal Resistance from Junction to Case		1.24		℃/W

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=15A T_J=25℃		1.36	1.6	V
		I_F=15A T_J=175℃		1.53	1.9	V
I_R	Reverse Current	V_R=650V T_J=25℃		1	100	μA
		V_R=650V T_J=175℃		2	400	μA
Q_C	Total Capacitive Charge	V_R=400V T_J = 25℃		41		nC
C	Total Capacitance	V_R=0V T_J=25℃ f=1MHz		831		pF
		V_R=200V T_J=25℃ f=1MHz		79.3		pF
		V_R=400V T_J=25℃ f=1MHz		62		pF
E_C	Capacitance Stored Energy	V_R=400V		6		μJ

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

Typical Performance

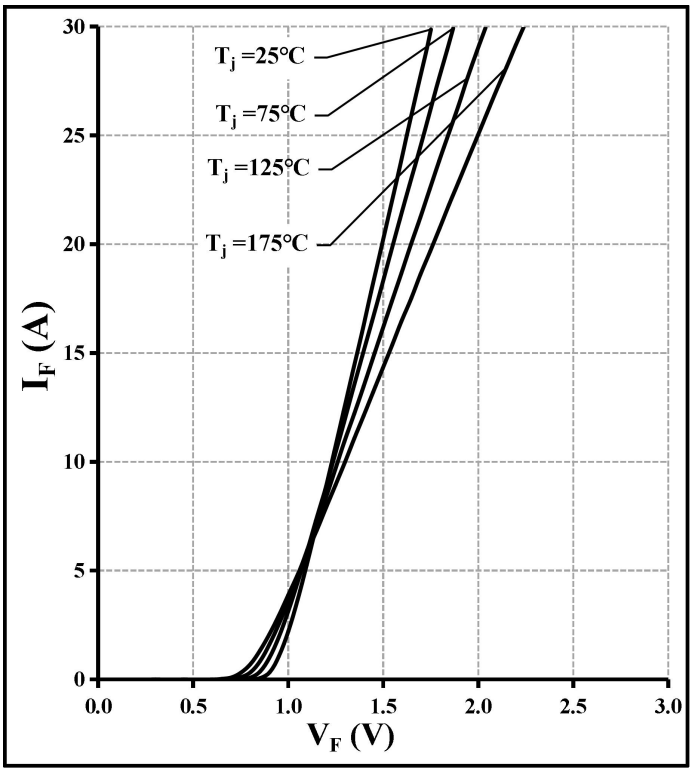


Figure 1: Forward Characteristics

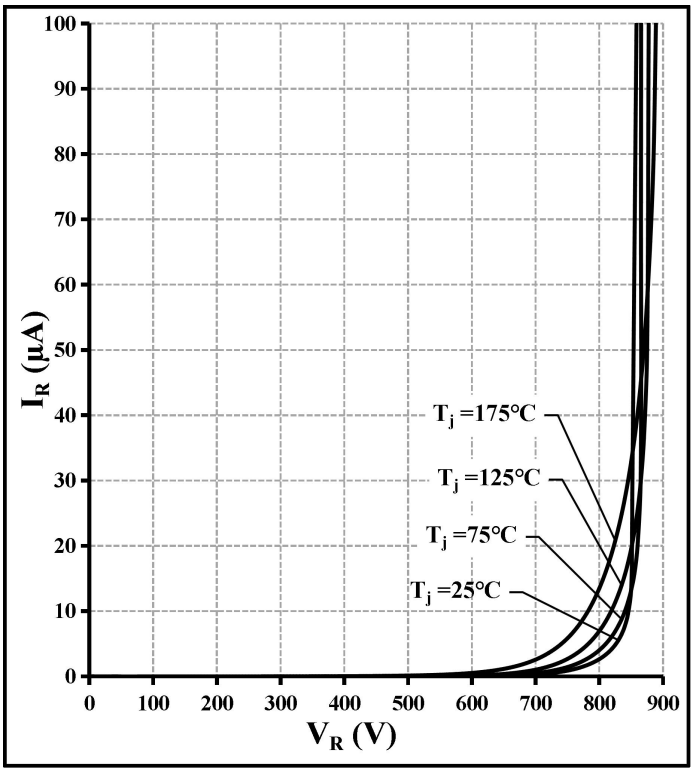


Figure 2: Reverse Characteristics

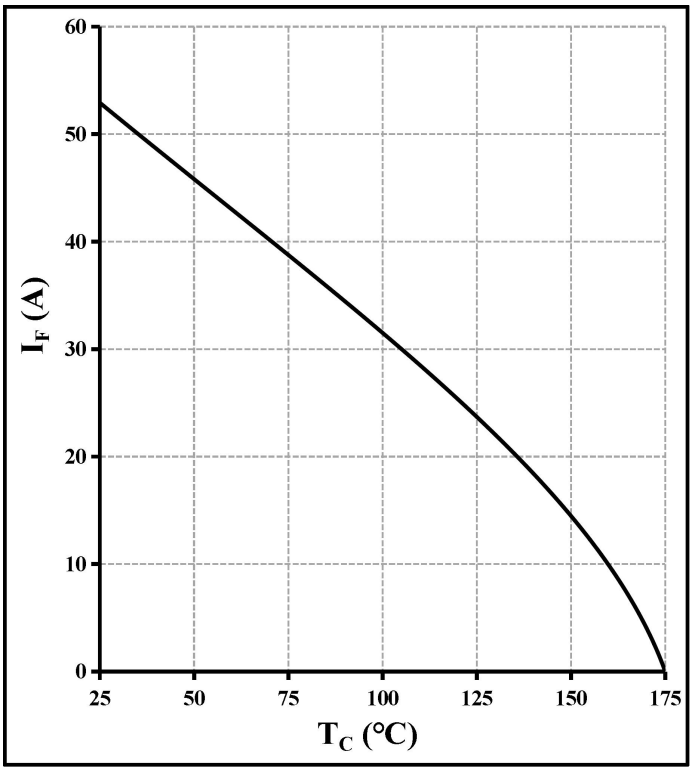


Figure 3: Current Derating

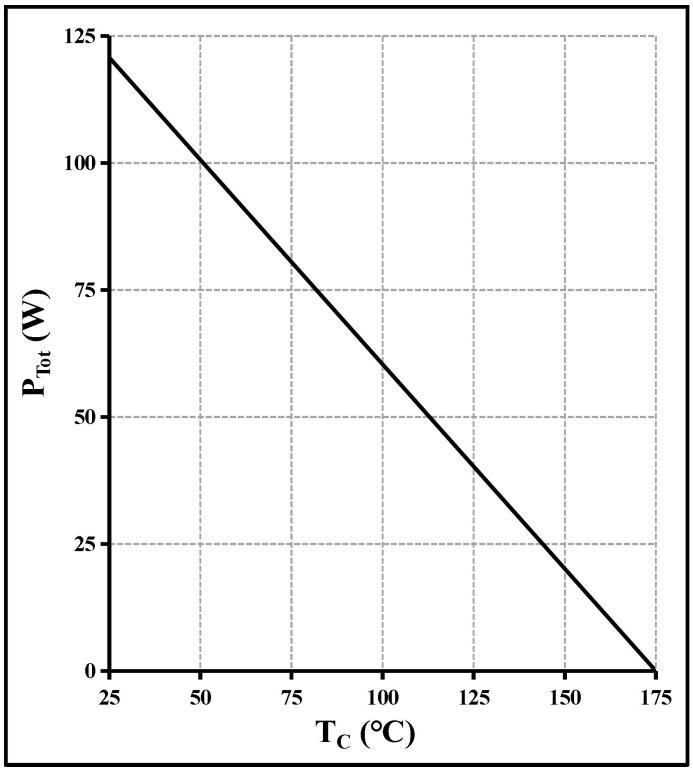


Figure 4: Power Derating

Typical Performance

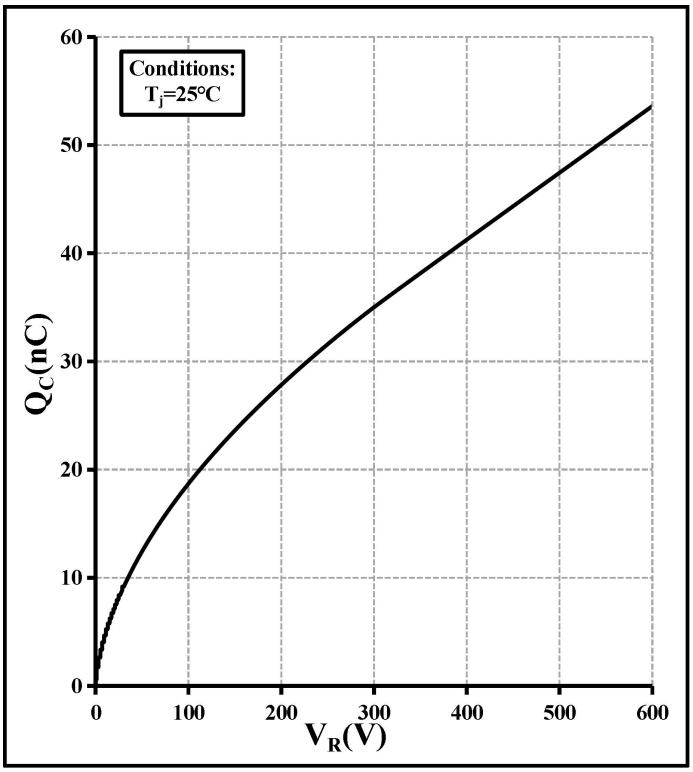


Figure 5: Total Capacitive Charge vs Reverse Voltage

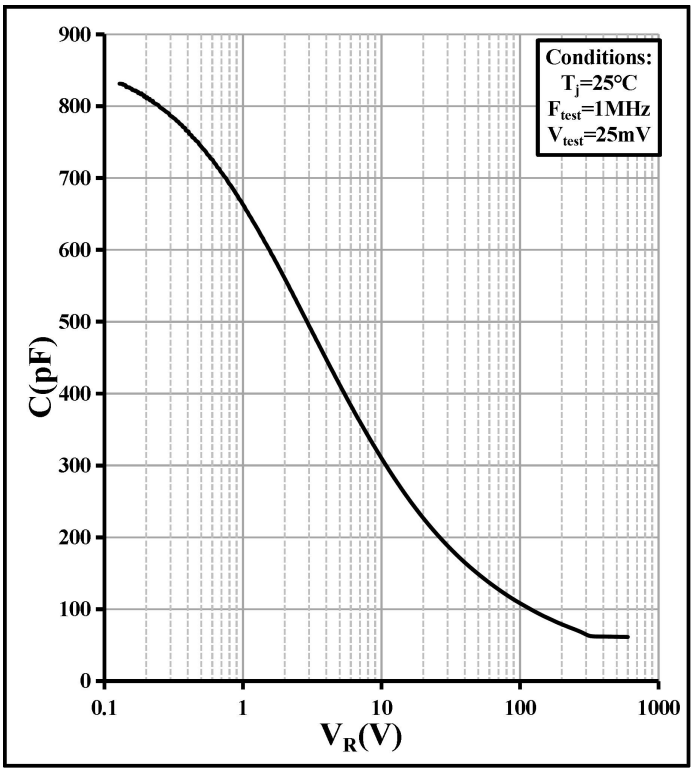


Figure 6: Capacitance vs Reverse Voltage

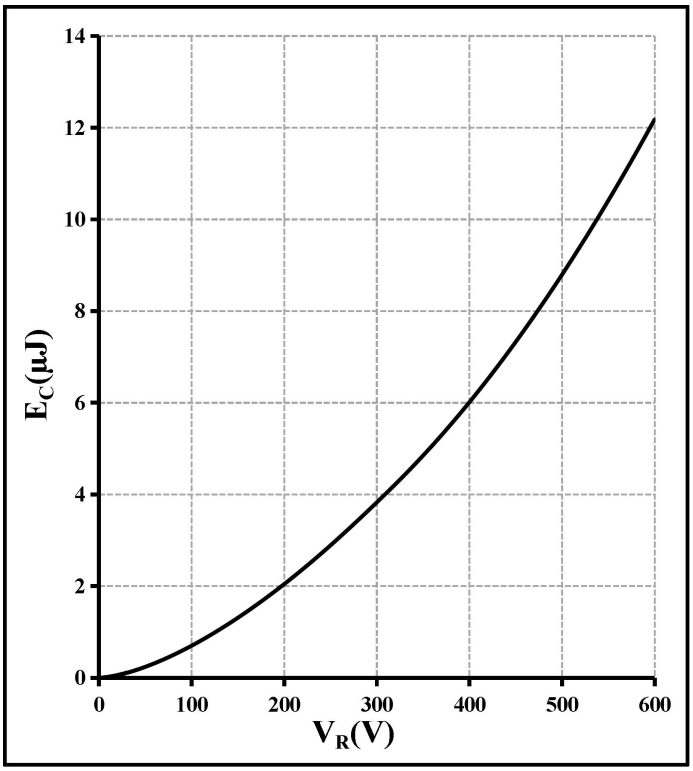


Figure 7: Typical Capacitance Stored Energy

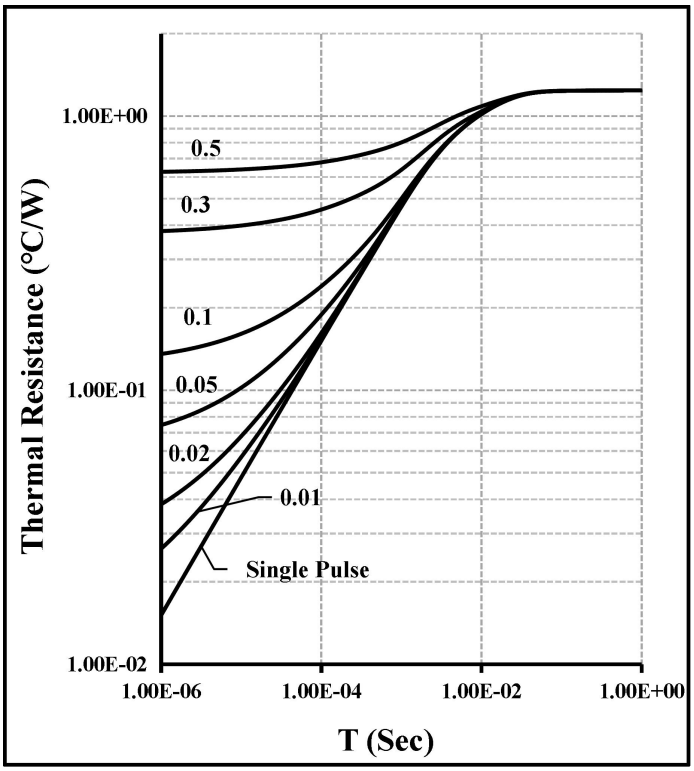


Figure 8: Transient Thermal Impedance

Package information

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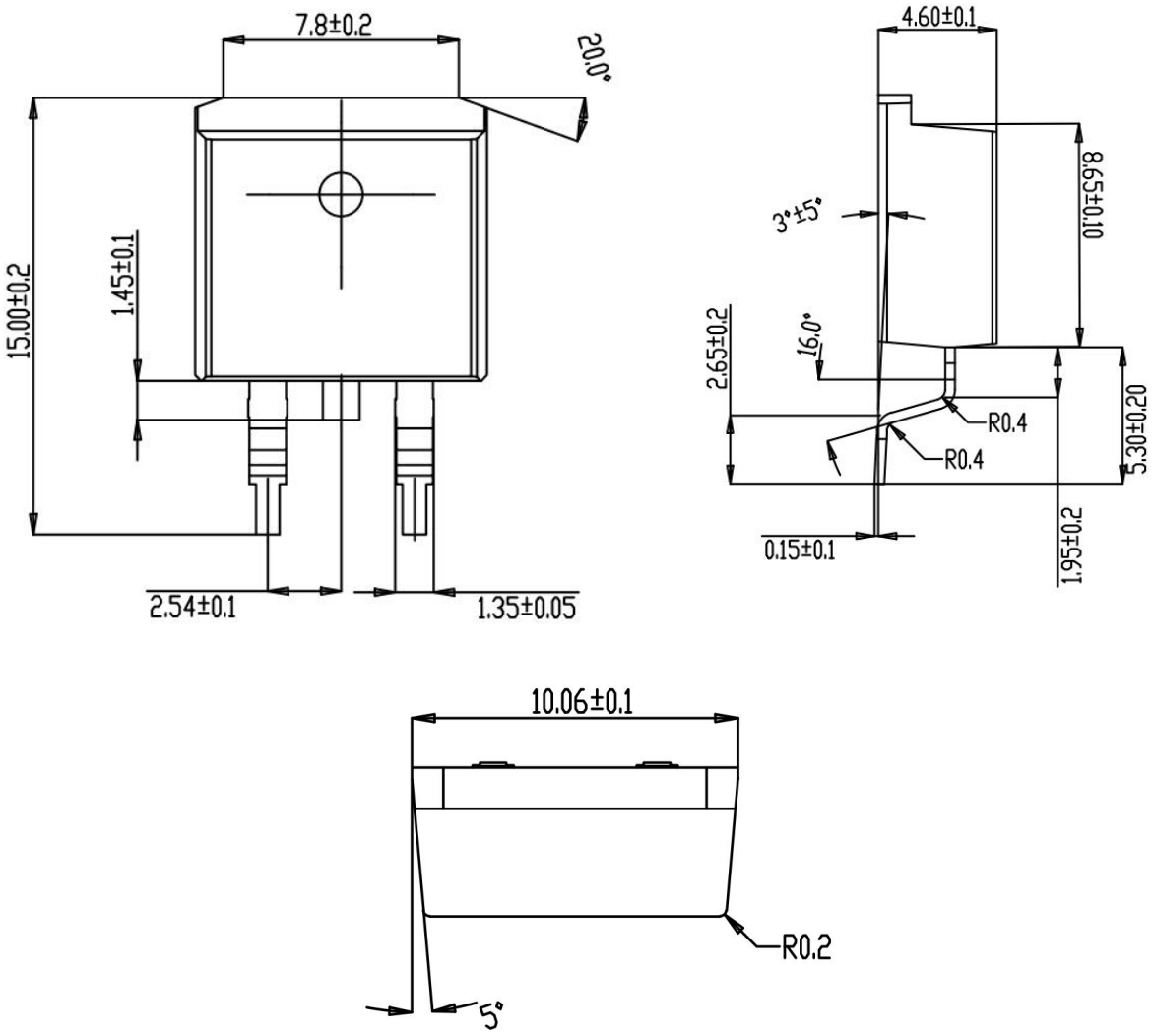

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