Silicon Carbide Schottky Diode

Features

- 650V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

V_{RRM}	=	650 V
I_F (T_C=135 ˚C)	=	27 A
Q_C	=	90 nC

Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Package

Halogen-Free

RoHS

Applications

- Switch Mode Power Supplies (SMPS)
- Power Factor Correction
- Motor Drives

Silicon Carbide Schottky Diode

Maximum Rated Values (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	650	V		
V_R	DC Peak Reverse Voltage	650	V		
I_F	Continuous Forward Current	62	A	T_C=25˚C	Fig. 3
		27		T_C=135˚C	
		20		Tc=150˚C	
I_{FRM}	Repetitive Peak Forward Surge Current	104	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		91		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	130	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		112.9		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	557	A	T_C=25˚C, t_P=10μs, Square Wave Pulse	
		422		T_C=110˚C, t_P=10μs, Square Wave Pulse	
P_{tot}	Power Dissipation	192	W	T_C=25˚C	Fig. 4
		83		T_C=110˚C	
T_J	Operating Temperature	-55 to +175	˚C		
T_{stg}	Storage Temperature	-55 to +175	˚C		
	TO-220 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics (T_J=25℃)

Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
V_F	Forward Voltage		1.4	2.0	V	I_F=20A, T_J=25°C	Fig. 1
			1.6	2.2		I_F=20A, T_J=175°C	
I_R	Reverse Current		0.8	100	μA	V_R=650V, T_J=25°C	Fig. 2
			10			V_R=650V, T_J=175°C	
Q_C	Total Capacitive Charge		90		nC	V_R=650V,T_J=25°C	Fig. 5
C	Total Capacitance		1349		pF	V_R=0V, T_J=25°C, f=1MHz	Fig. 6
			110			V_R=400V, T_J=25°C, f=1MHz	
			108			V_R=650V, T_J=25°C, f=1MHz	
E_C	Capacitance Stored Energy		17		μJ	V_R=650 V	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.78	°C/W	Fig. 8

Silicon Carbide Schottky Diode

Typical Performance

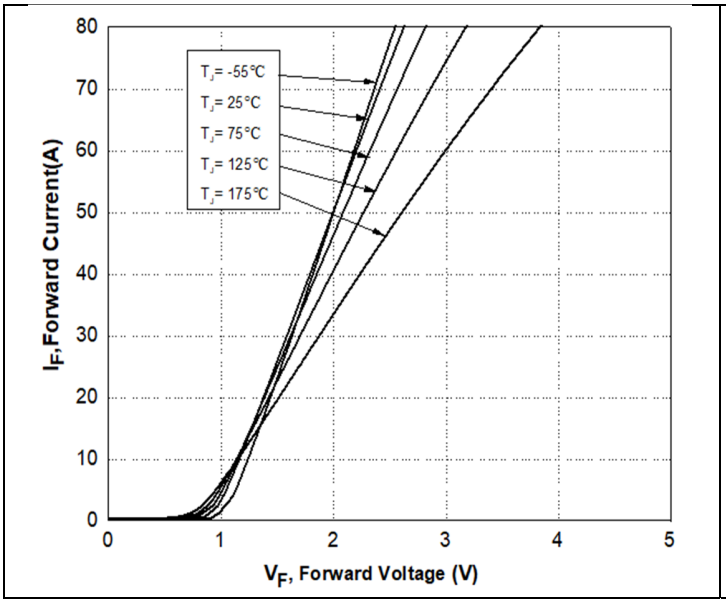

Figure 1. Forward Characteristics

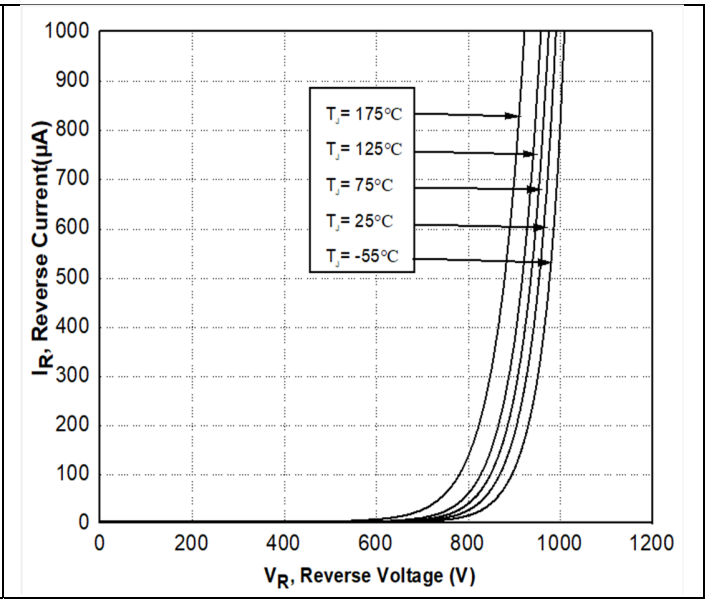

Figure 2. Reverse Characteristics

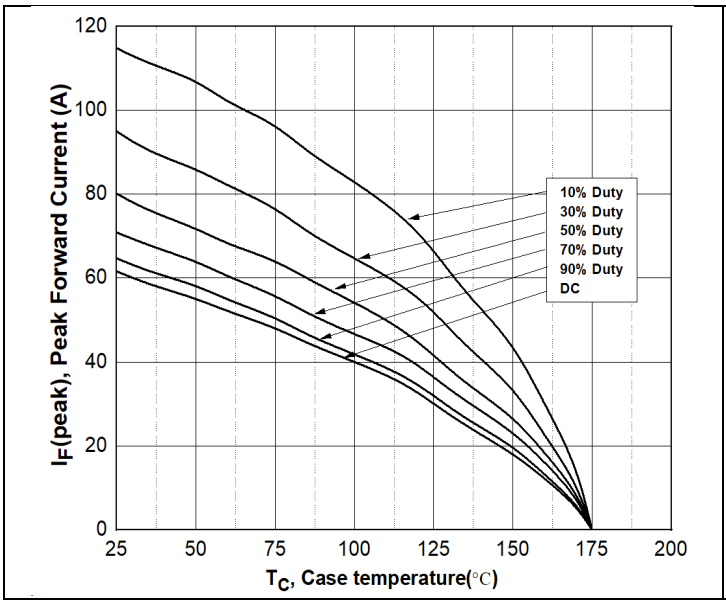

Figure 3. Current Derating

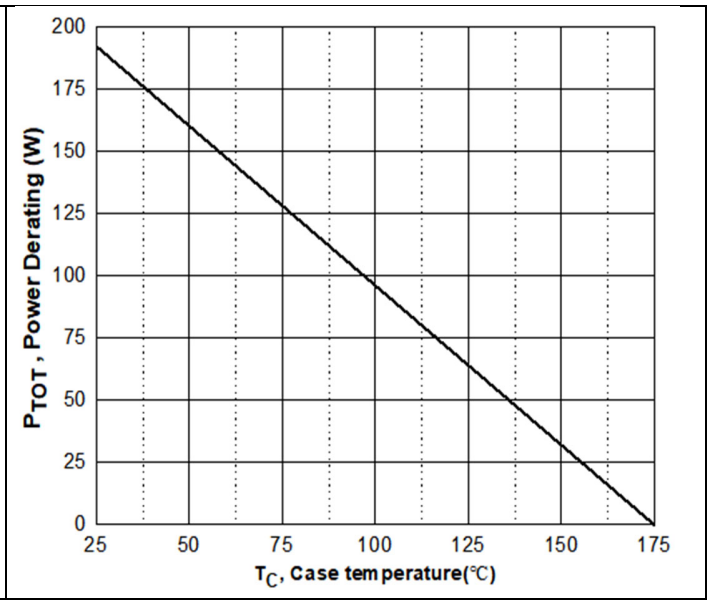

Figure 4. Power Derating

Typical Performance

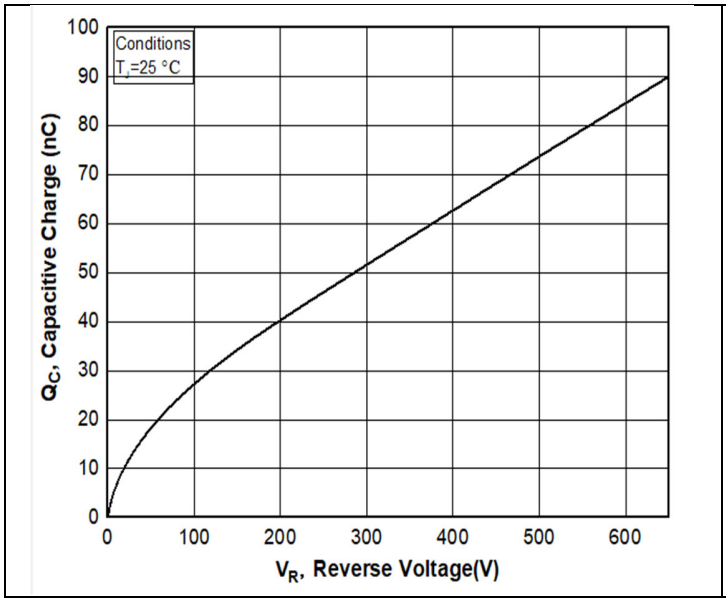

Figure 5. Capacitance Charge Vs. Reverse Voltage

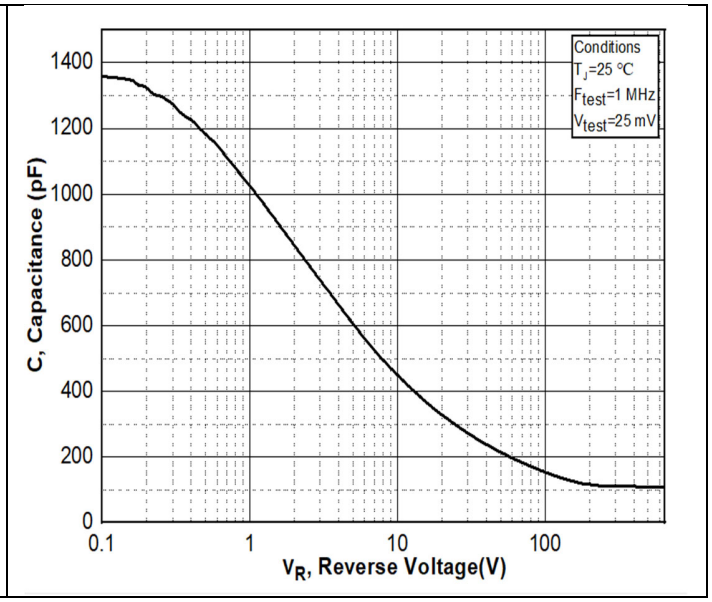

Figure 6. Capacitance Vs. Reverse Voltage

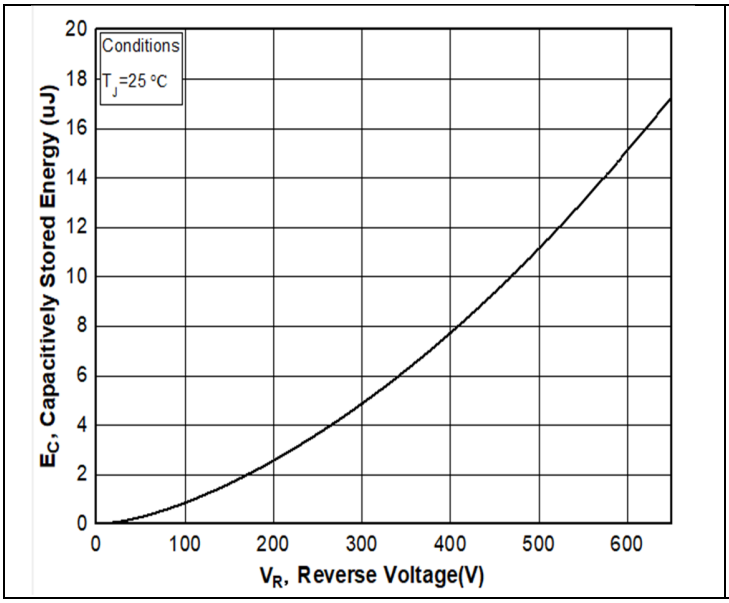

Figure 7. Capacitance Stored Energy

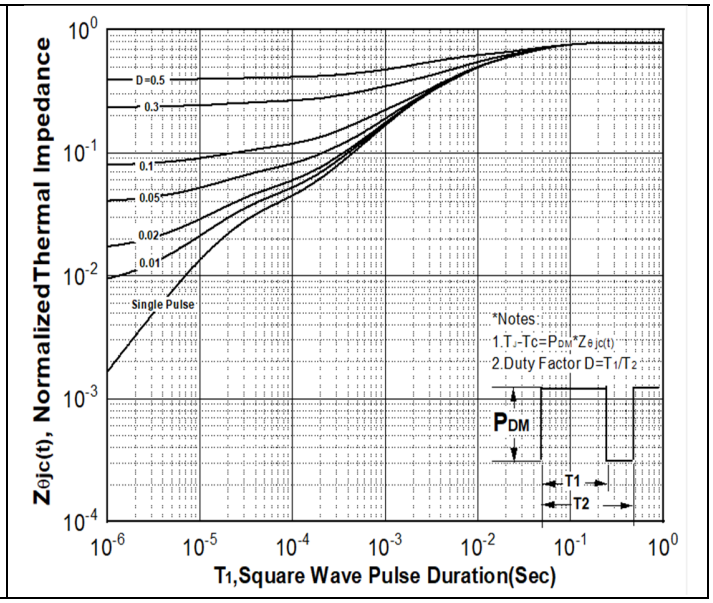

Figure 8. Transient Thermal Response Curve(Junction-to-Case)