Silicon Carbide Schottky Diode

Features

- 1200V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

V_{RRM}	=	1200 V
I_F (T_C=135 ˚C)	=	43 A
Q_C	=	194nC

Benefits

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

Applications

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

Package

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_R	DC Peak Reverse Voltage	1200	V		
I_F	Continuous Forward Current	89	A	T_C=25˚C	Fig. 3
		43		T_C=135˚C	
		31		Tc=150˚C	
I_{FRM}	Repetitive Peak Forward Surge Current	168	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		142		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	240	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		178		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	990	A	T_C=25˚C, t_P=10μs, Square Wave Pulse	
		926		T_C=110˚C, t_P=10μs, Square Wave Pulse	
P_{tot}	Power Dissipation	357	W	T_C=25˚C	Fig. 4
		155		T_C=110˚C	
T_J	Operating Temperature	-55 to +175	˚C		
T_{stg}	Storage Temperature	-55 to +175	˚C		
	TO-247 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		1.50	1.8	V	I_F=40A, T_J=25°C	Fig. 1
			2.10	3		I_F=40A, T_J=175°C	
I_R	Reverse Current		20	300	μA	V_R=1200V, T_J=25°C	Fig. 2
			159	500		V_R=1200V, T_J=175°C	
Q_C	Total Capacitive Charge		194		nC	V_R=800V,T_J=25°C	Fig. 5
C	Total Capacitance		2890		pF	V_R=0V, T_J=25°C, f=1MHz	Fig. 6
			174			V_R=400V, T_J=25°C, f=1MHz	
			171			V_R=800V, T_J=25°C, f=1MHz	
E_C	Capacitance Stored Energy		48		μJ	V_R=800 V	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.42	°C/W	Fig. 8

Typical Performance

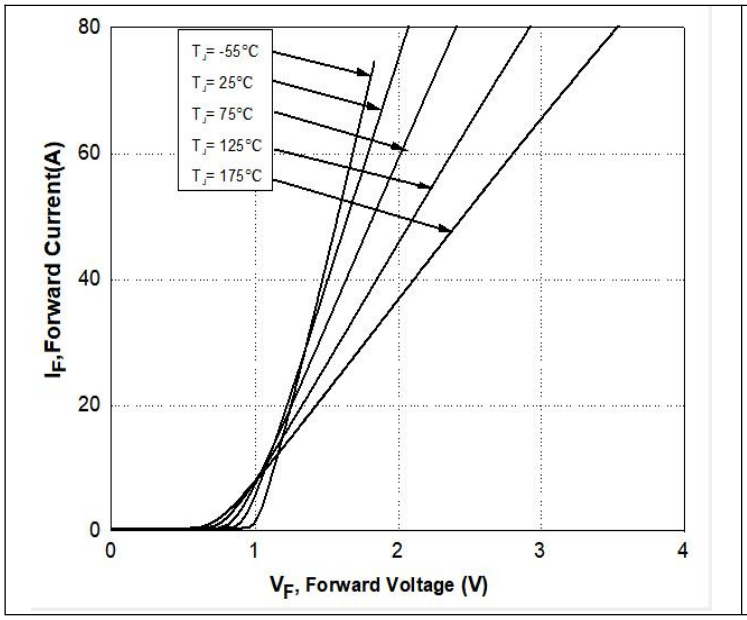


Figure 1. Forward Characteristics

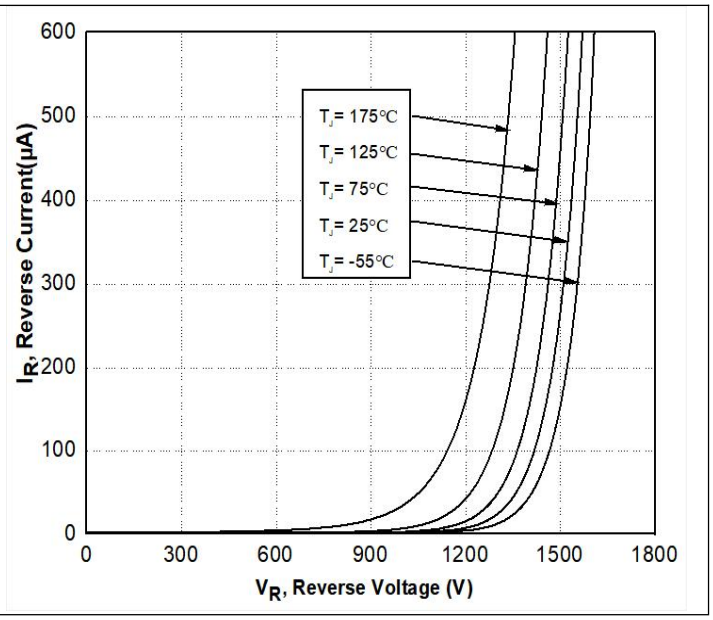


Figure 2. Reverse Characteristics

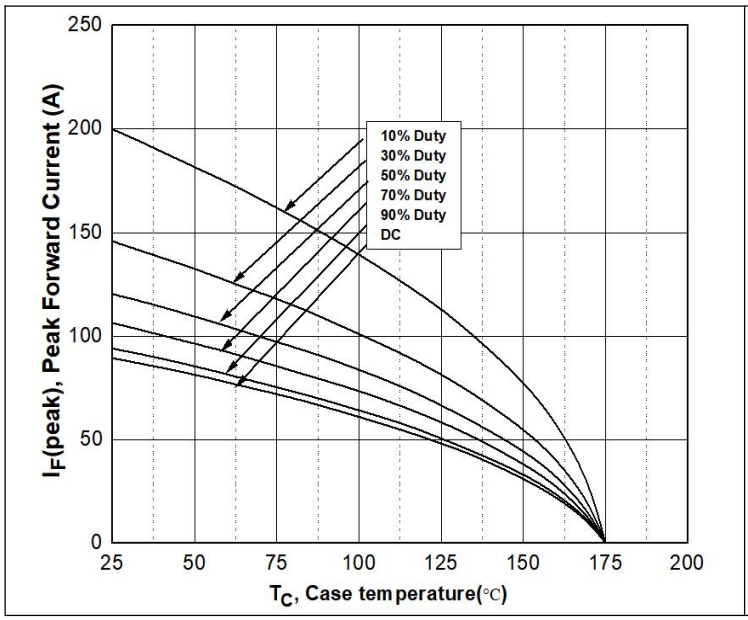


Figure 3. Current Derating

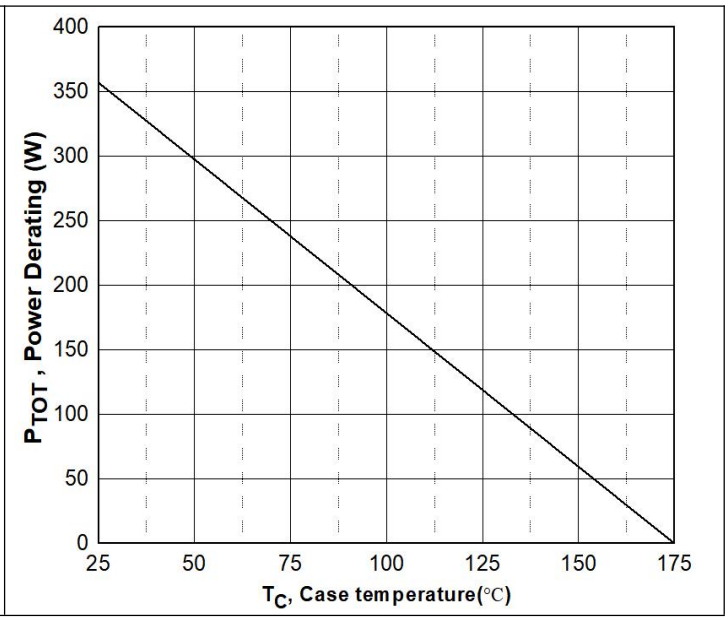


Figure 4. Power Derating

Typical Performance

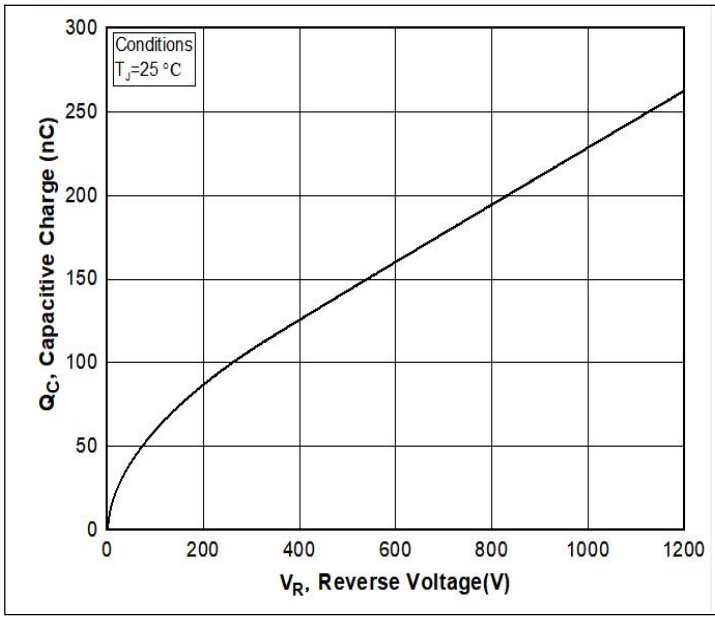


Figure 5. Capacitance Charge Vs. Reverse Voltage

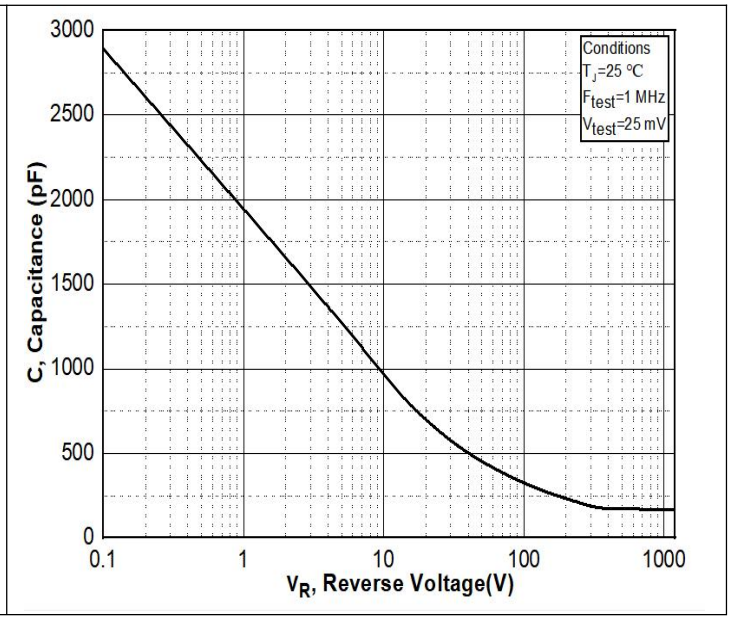


Figure 6. Capacitance Vs. Reverse Voltage

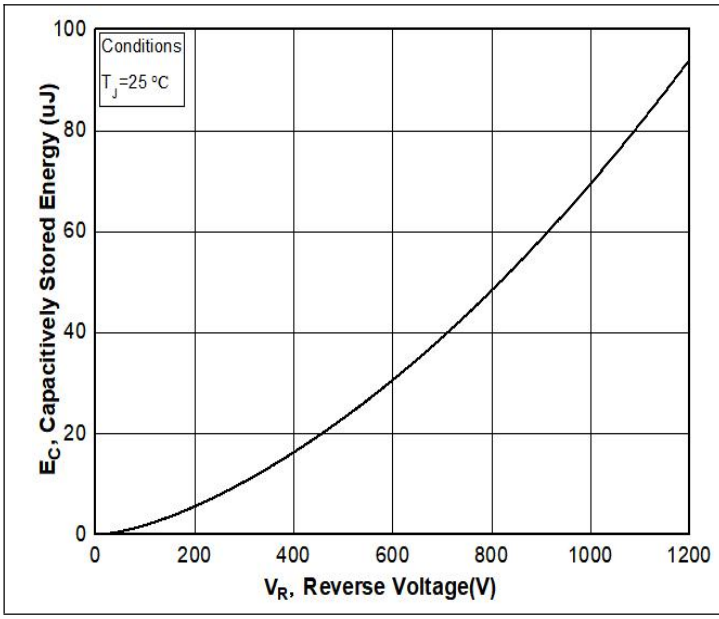


Figure 7. Capacitance Stored Energy

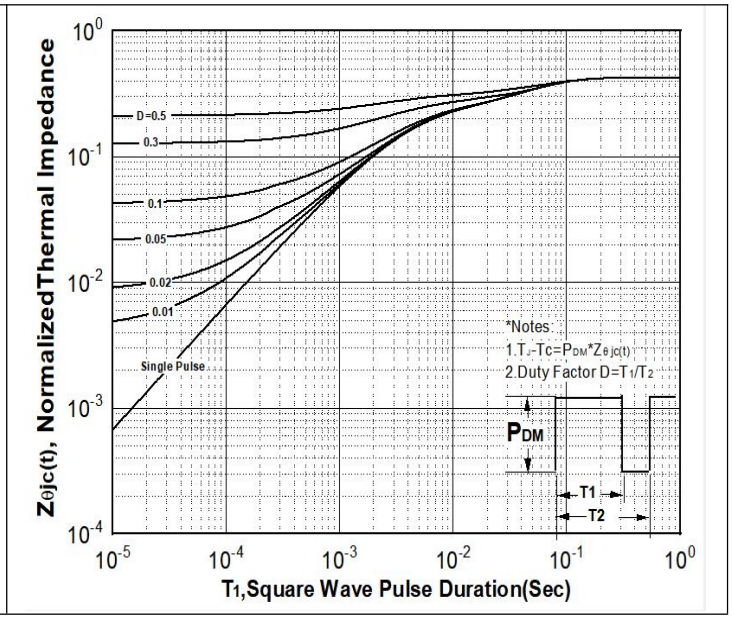
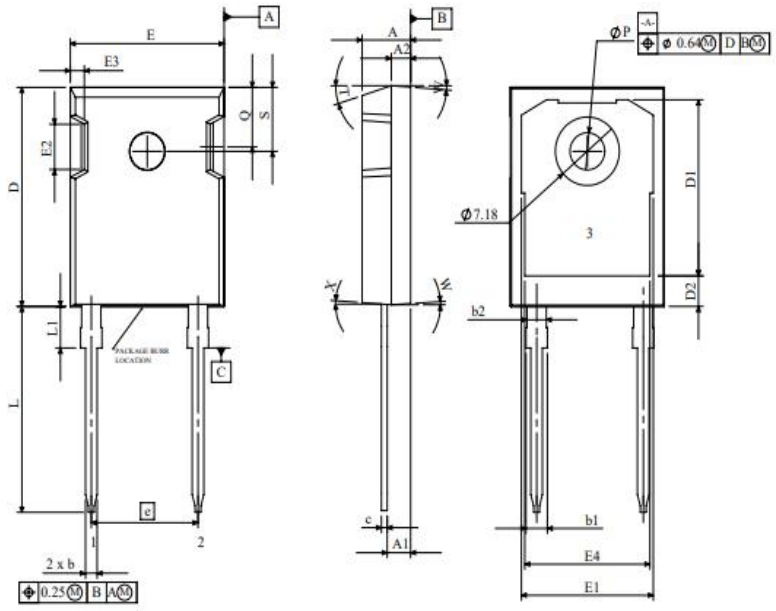


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

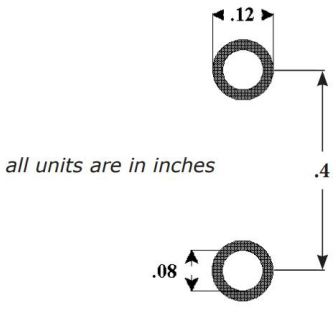
Package Dimensions

Package TO-247-2L



SYMBOL	MIN (mm)	MAX (mm)
A	4.86	5.21
A1	2.27	2.54
A2	1.91	2.16
b	1.07	1.33
b1	1.91	2.41
b2	1.91	2.16
c	0.55	0.68
D	20.80	21.10
D1	16.25	17.35
D2	2.87	3.38
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	10.88 BSC	
L	19.81	20.32
L1	4.08	4.60
ØP	3.50	3.65
Q	5.49	6.00
S	5.99	6.34
T	17.5° REF	
W	3.5° REF	
X	4° REF	

Recommended Solder Pad Layout



TO247-2L