Silicon Carbide Schottky Diode

Features

- 5kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

V_{RRM}	=	**5000** V
I_F (T_C=135 ˚C)	=	66A (TO247-2L)
I_F (T_C=135 ˚C)	=	45A (ceramic)
Q_C	=	365 nC

Benefits

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

Package

TO-247-2L ceramic

Halogen-Free

RoHS

Applications

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

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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	5000	V		
V_R	DC Peak Reverse Voltage	5000	V		
I_F	Continuous Forward Current (TO-247-2L/ceramic)	66/45	A	T_C=25˚C	Fig. 3 Fig. 9
		33/22		T_C=135˚C	
		25/16		Tc=152˚C	
I_{FRM}	Repetitive Peak Forward Surge Current	63	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		53		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	81	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse	
		70		T_C=110˚C, t_P=10 ms, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	1150	A	T_C=25˚C, t_P=10μs, Square Wave Pulse	
		950		T_C=110˚C, t_P=10μs, Square Wave Pulse	
P_{tot}	Power Dissipation (TO-247-2L/ceramic)	833/405	W	T_C=25˚C	Fig. 4 Fig. 10
		361/176		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		1.4	1.9	V	I_F=10A, T_J=25°C	Fig. 1
			2.4	3.2		I_F=10A, T_J=175°C	
I_R	Reverse Current		0.6		mA	V_R=5000V, T_J=25°C	Fig. 2
			1.4			V_R=5000V, T_J=175°C	
Q_C	Total Capacitive Charge		365		nC	V_R=2000V, I_F =10A di/dt=200A/us, T_J=25°C	Fig. 5
C	Total Capacitance		3880		pF	V_R=0V, T_J=25°C, f=1MHz	Fig. 6
			131			V_R=1000V,T_J=25°C, f=1MHz	
			98			V_R=2000V,T_J=25°C,f=1MHz	
E_C	Capacitance Stored Energy		241		μJ	V_R=0~2000 V	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.18	°C/W	TO-247-2L Fig. 8
		0.37		ceramic Fig. 11

Typical Performance

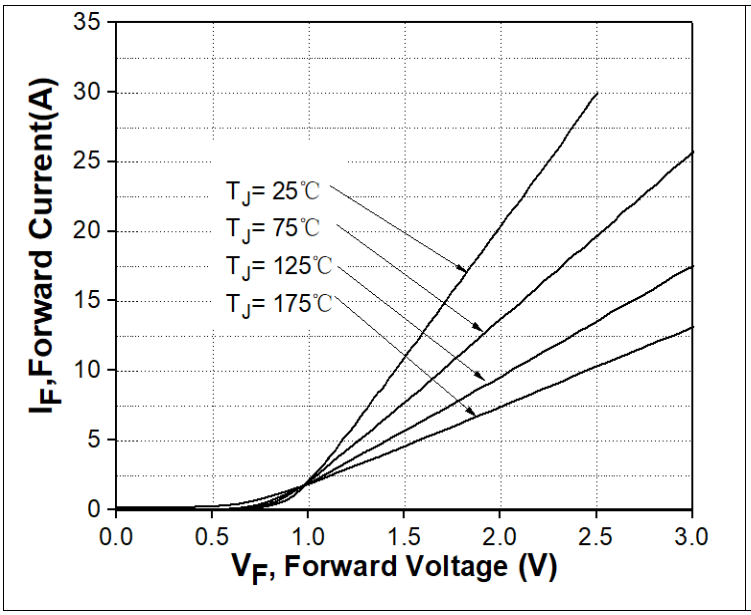


Figure 1. Forward Characteristics

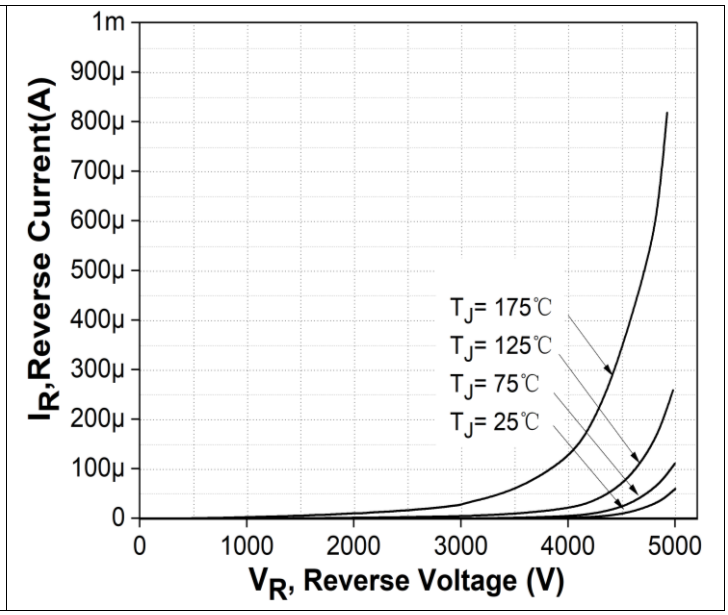


Figure 2. Reverse Characteristics

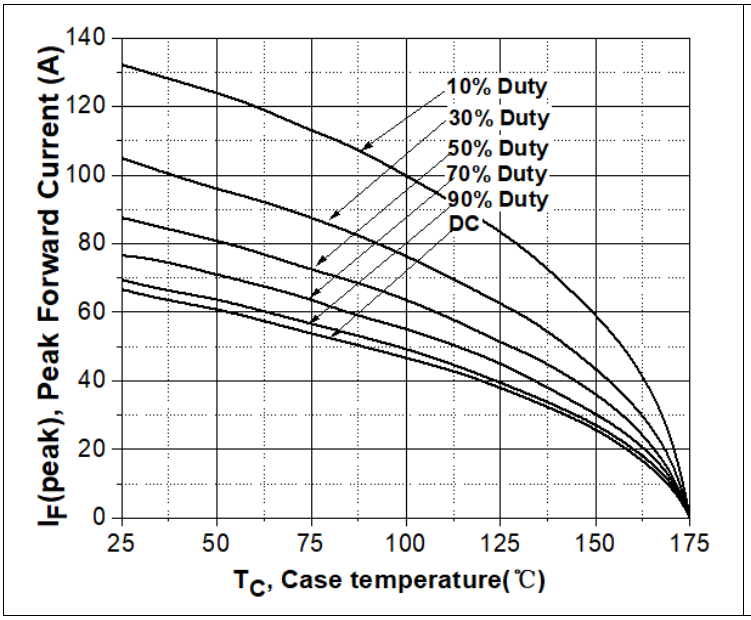


Figure 3. Current Derating（TO-247-2L）

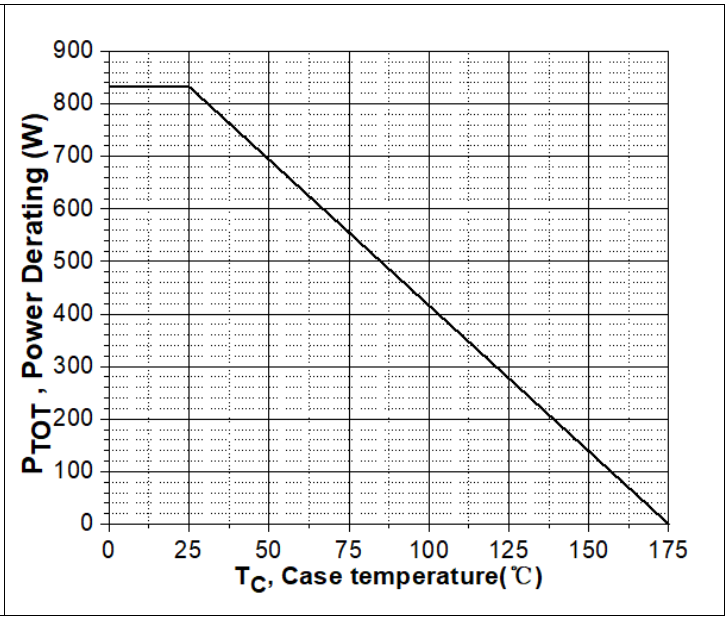


Figure 4. Power Derating（TO-247-2L）

Typical Performance

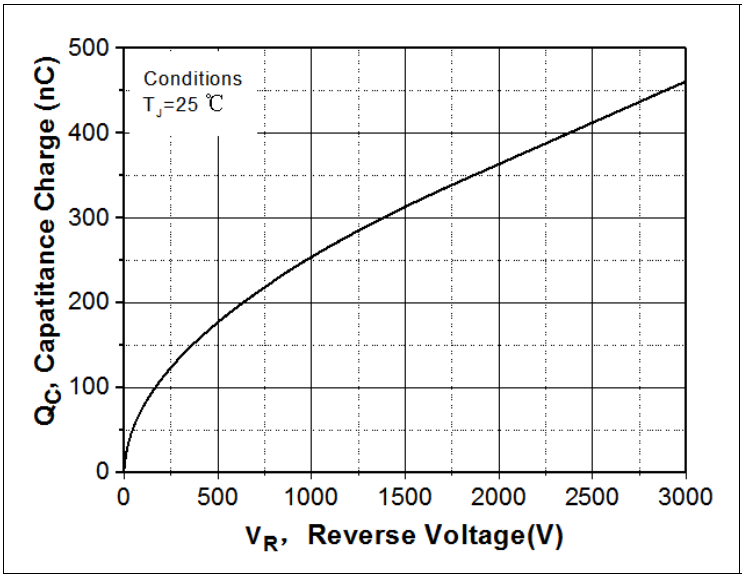


Figure 5. Capacitance Charge Vs. Reverse Voltage

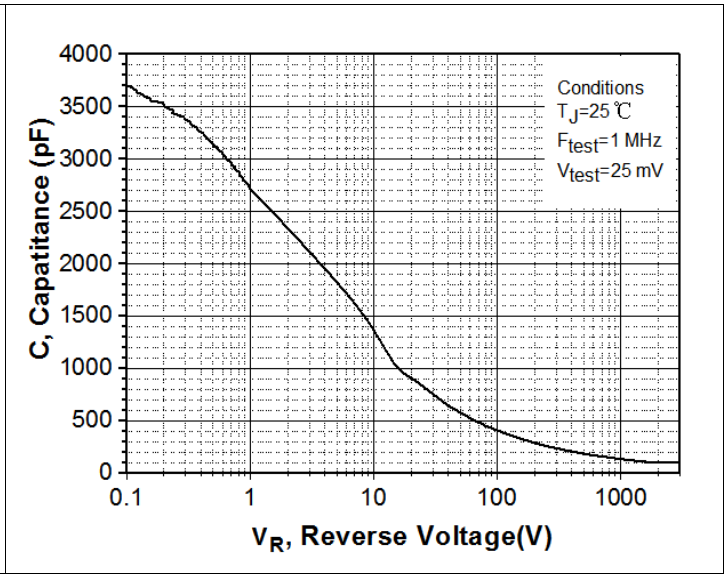


Figure 6. Capacitance Vs. Reverse Voltage

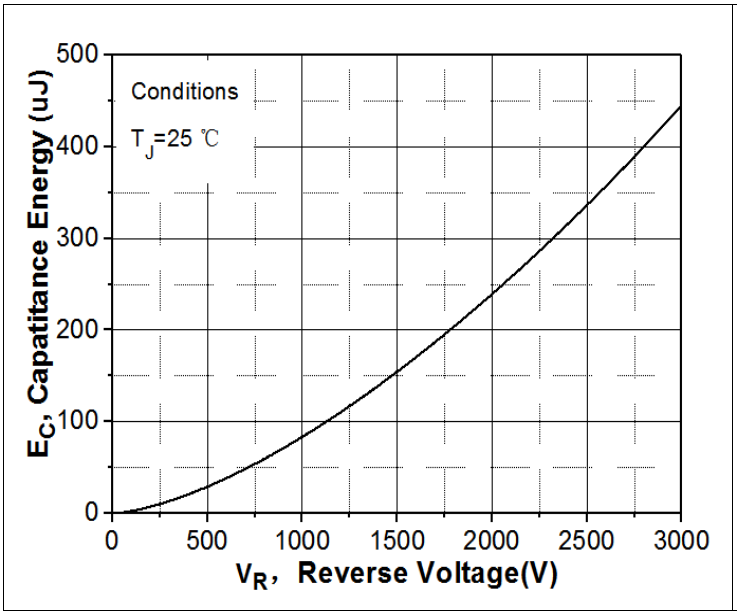


Figure 7. Capacitance Stored Energy

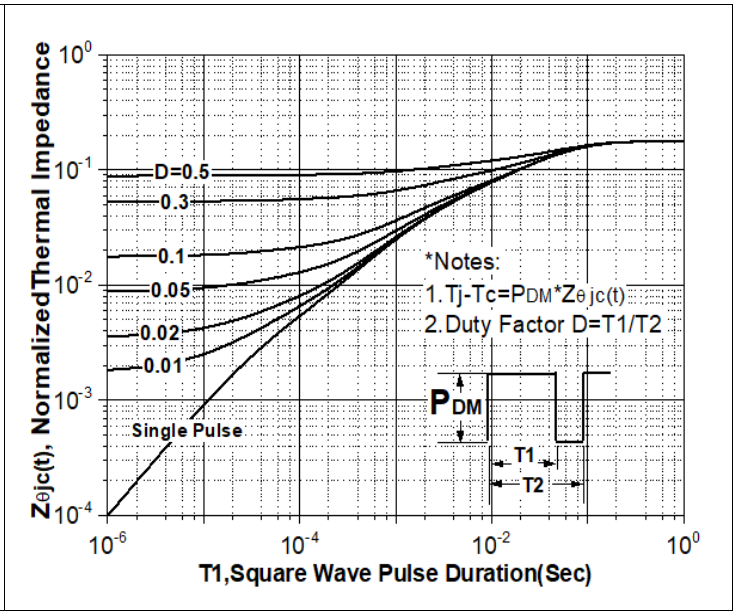


Figure 8. Transient Thermal Response Curve(Junction-to-Case)(TO-247-2L)

Typical Performance

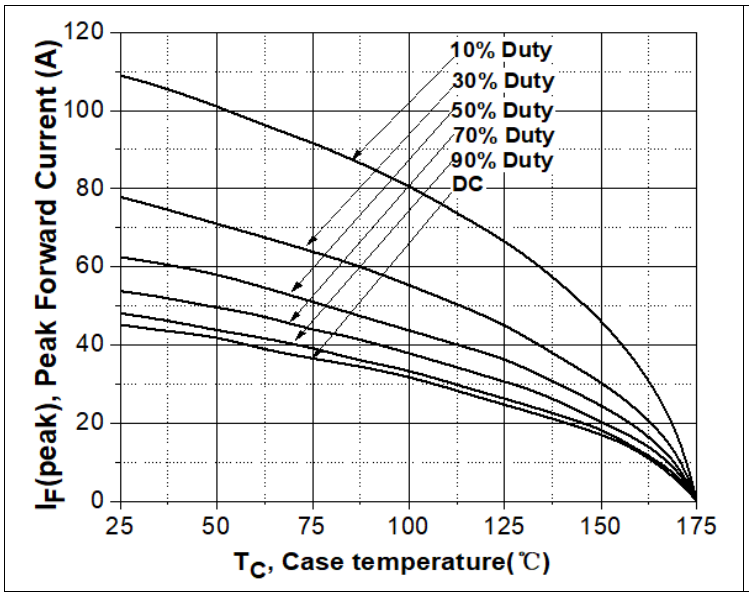


Figure 9. Current Derating (ceramic)

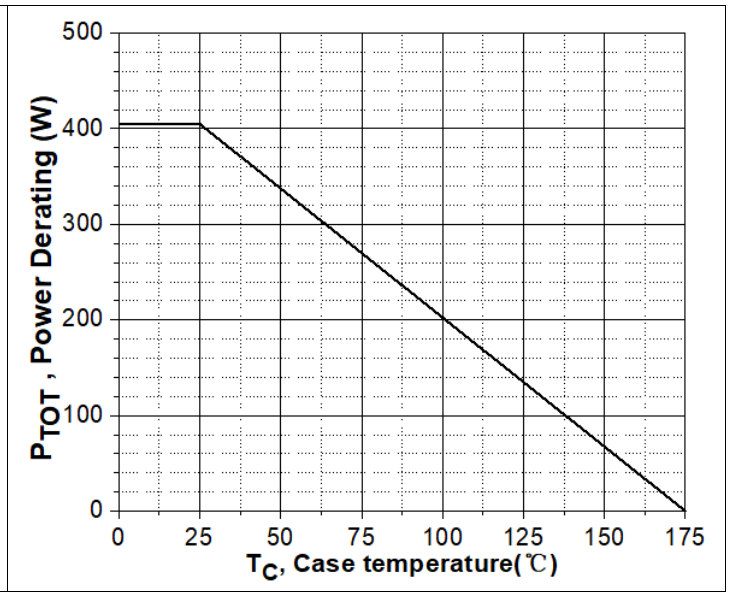
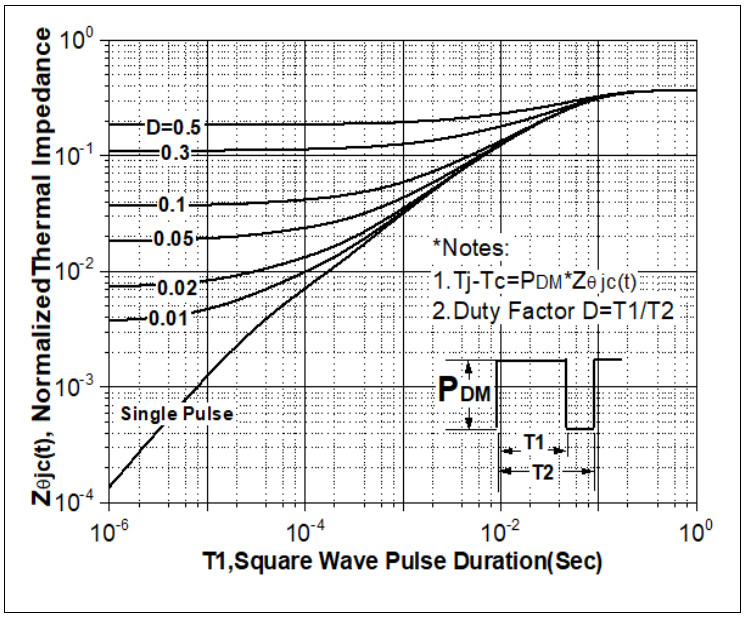
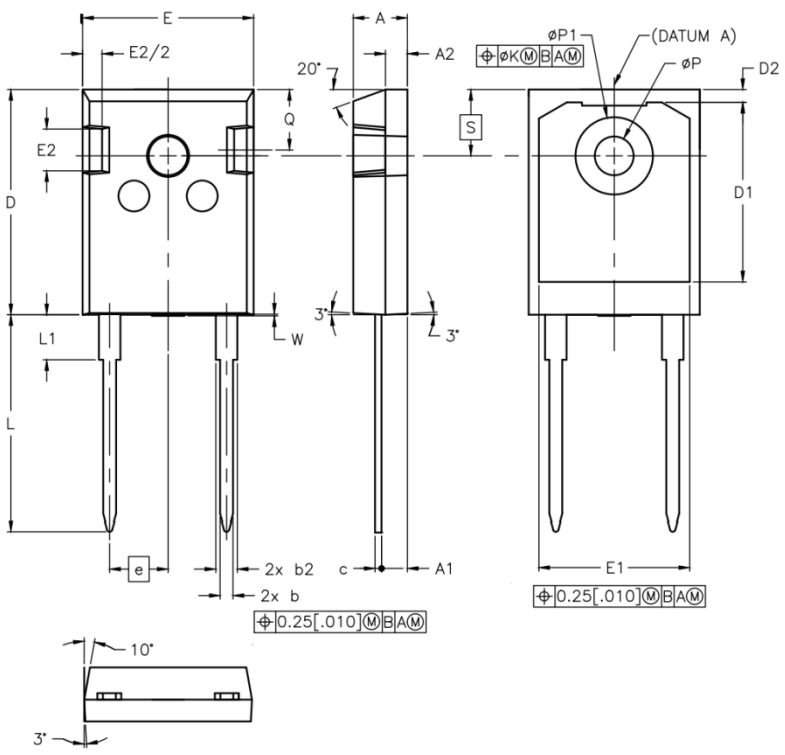


Figure 10. Power Derating (ceramic)



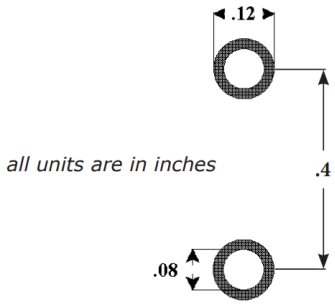
Package Dimensions

Package TO-247-2L



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.70	5.31
A1	.087	.102	2.21	2.59
A2	.059	.098	1.50	2.49
b	.039	.055	0.99	1.40
b2	.065	.094	1.65	2.39
c	.015	.035	0.38	0.89
D	.819	.845	20.80	21.46
D1	.515	-	13.08	-
D2	.020	.053	0.51	1.35
E	.620	.640	15.49	16.26
E1	.530	-	13.46	-
E2	.135	.157	3.43	3.99
e	.214		5.44	
ØK	.010		0.25	
L	.780	.800	19.81	20.32
L1	-	.177	-	4.50
ØP	.140	.144	3.56	3.66
ØP1	.278	.291	7.06	7.39
Q	.212	.244	5.38	6.20
S	.243		6.17	
W	-	.006	-	0.15

Recommended Solder Pad Layout



TO-247-2L