

Silicon Carbide Schottky Diode

$$V_{RRM} = 3300 \text{ V}$$

$$I_F (T_C=160^\circ\text{C}) = 10\text{A}$$

$$Q_c = 146\text{nC}$$

Features

- 3300V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching

Package



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



TO-247-2L



Maximum Rated Values ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	3300	V		
V_R	DC Peak Reverse Voltage	3300	V		
I_F	Continuous Forward Current	75	A	$T_C=25^{\circ}\text{C}$	Fig. 3
		38		$T_C=135^{\circ}\text{C}$	
		10		$T_C=160^{\circ}\text{C}$	
I_{FRM}	Repetitive Peak Forward Surge Current	95	A	$T_C=25^{\circ}\text{C}$, $t_P=10\text{ ms}$, Half Sine Pulse	
		90		$T_C=110^{\circ}\text{C}$, $t_P=10\text{ ms}$, Half Sine Pulse	
I_{FSM}	Non-Repetitive Forward Surge Current	119	A	$T_C=25^{\circ}\text{C}$, $t_P=10\text{ ms}$, Half Sine Pulse	
		110		$T_C=110^{\circ}\text{C}$, $t_P=10\text{ ms}$, Half Sine Pulse	
$I_{F,MAX}$	Non-Repetitive Forward Surge Current	752	A	$T_C=25^{\circ}\text{C}$, $t_P=10\mu\text{s}$, Square Wave Pulse	
		684		$T_C=110^{\circ}\text{C}$, $t_P=10\mu\text{s}$, Square Wave Pulse	
P_{tot}	Power Dissipation	898	W	$T_C=25^{\circ}\text{C}$	Fig. 4
		389		$T_C=110^{\circ}\text{C}$	
T_J	Operating Temperature	-55 to +175	$^{\circ}\text{C}$		
T_{stg}	Storage Temperature	-55 to +175	$^{\circ}\text{C}$		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics ($T_J=25^{\circ}\text{C}$)

Symbol	Parameter	Value			Unit	Test Conditions	Note
		Min.	Typ.	Max.			
V_F	Forward Voltage		1.75		V	$I_F=10\text{A}$, $T_J=25^{\circ}\text{C}$	Fig. 1
			2.3	3		$I_F=10\text{A}$, $T_J=175^{\circ}\text{C}$	
I_R	Reverse Current		1.2	300	μA	$V_R=3300\text{V}$, $T_J=25^{\circ}\text{C}$	Fig. 2
			76	500		$V_R=3300\text{V}$, $T_J=175^{\circ}\text{C}$	
Q_C	Total Capacitive Charge		146		nC	$V_R=2000\text{V}$, $T_J=25^{\circ}\text{C}$	Fig. 5
C	Total Capacitance		1153		pF	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	Fig. 6
			122			$V_R=1000\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	
			35			$V_R=2000\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	
E_C	Capacitance Stored Energy		148		μJ	$V_R=2000\text{ V}$	Fig. 7

Thermal Characteristics

Symbol	Parameter	Value	Unit	Note
$R_{\theta JC}$	Thermal Resistance(Junction to Case)	0.167	$^{\circ}\text{C/W}$	Fig. 8

Typical Performance

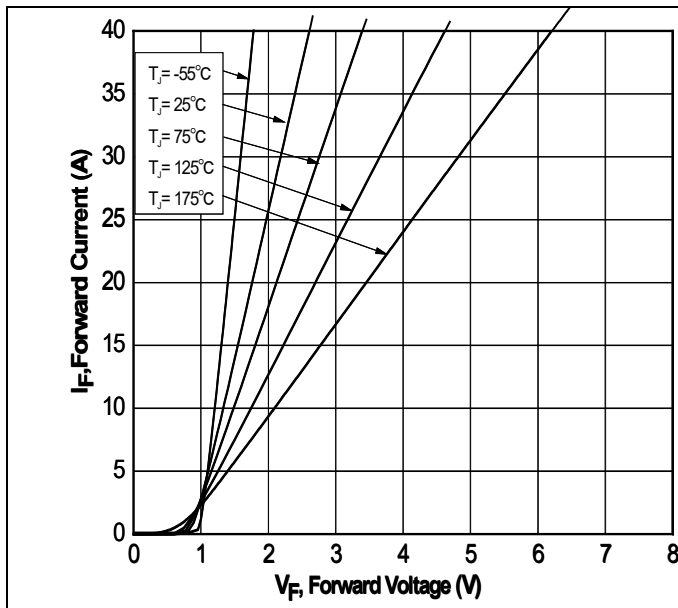


Figure 1. Forward Characteristics

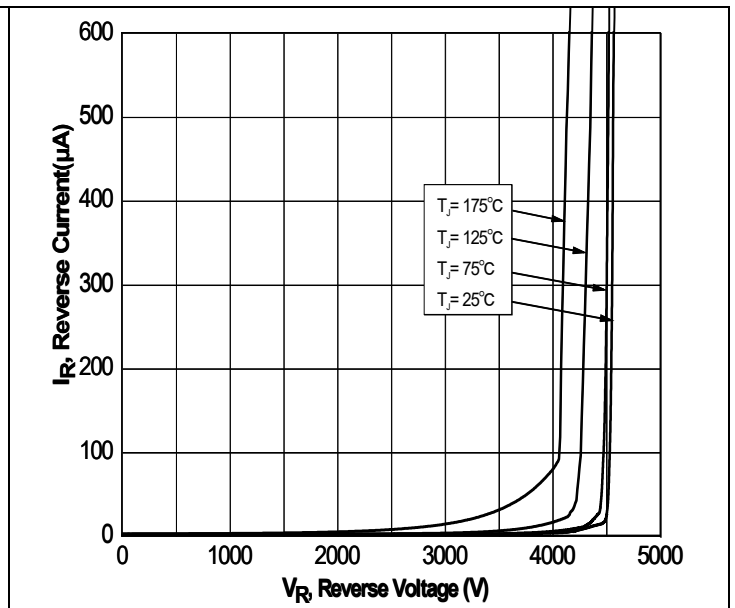


Figure 2. Reverse Characteristics

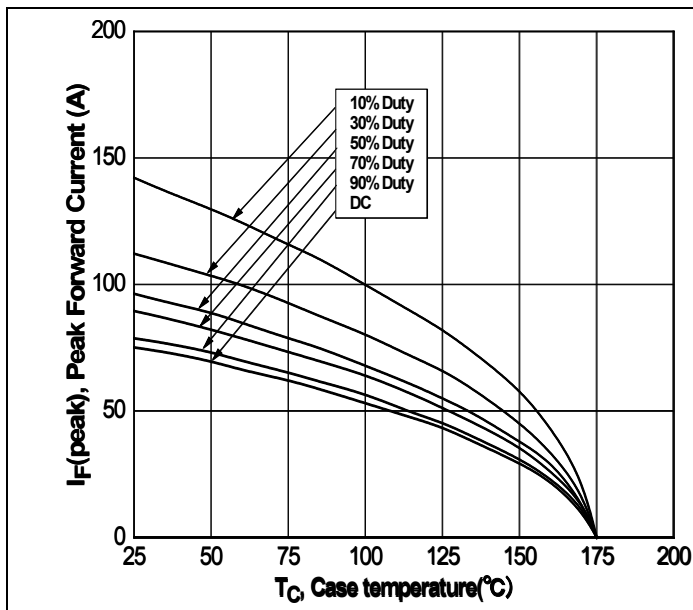


Figure 3. Current Derating

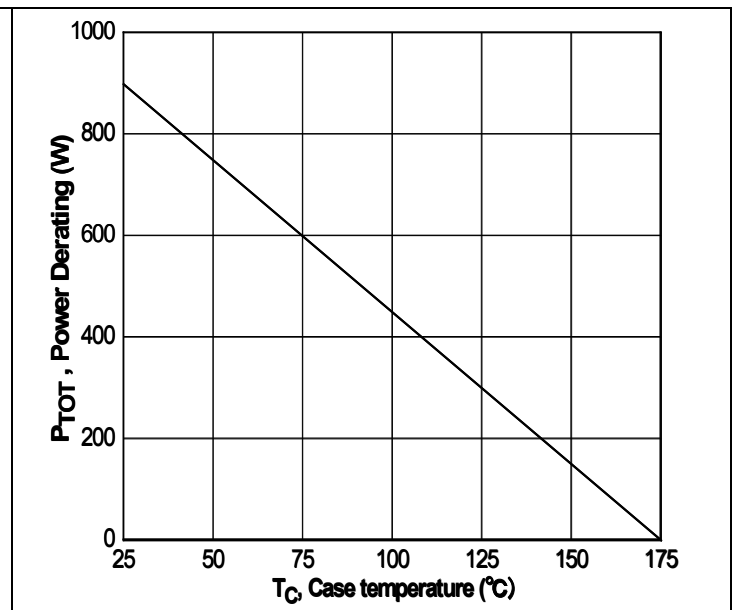


Figure 4. Power Derating

Typical Performance

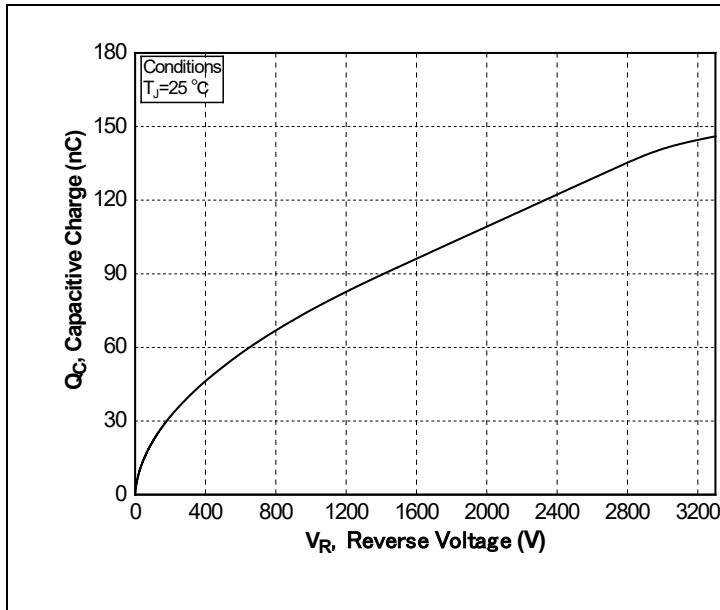


Figure 5. Capacitive Charge Vs. Reverse Voltage

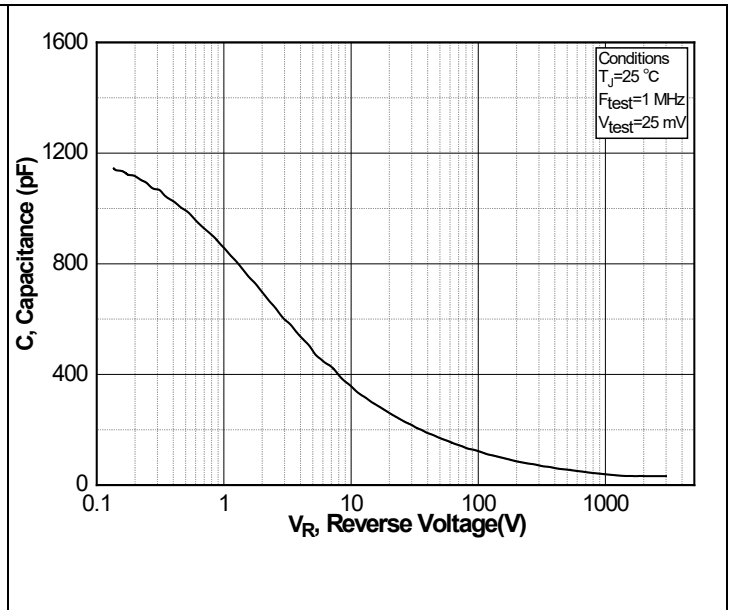


Figure 6. Capacitance Vs. Reverse Voltage

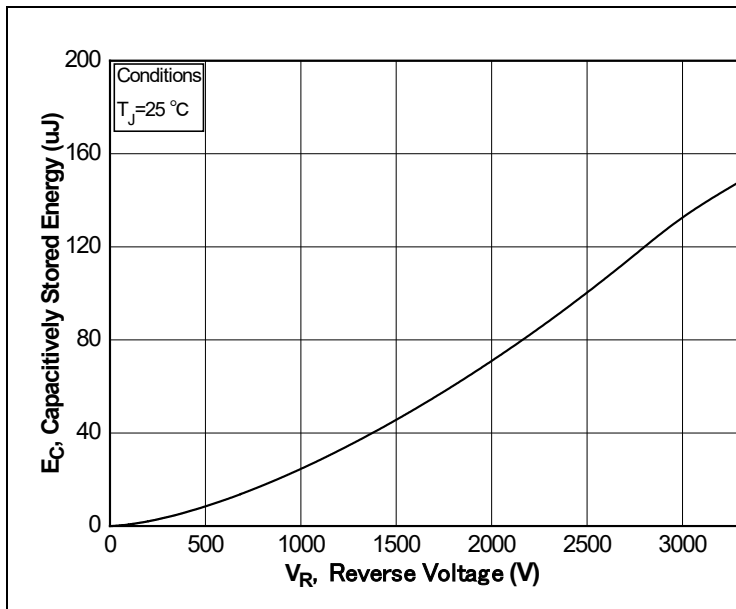


Figure 7. Capacitance Stored Energy

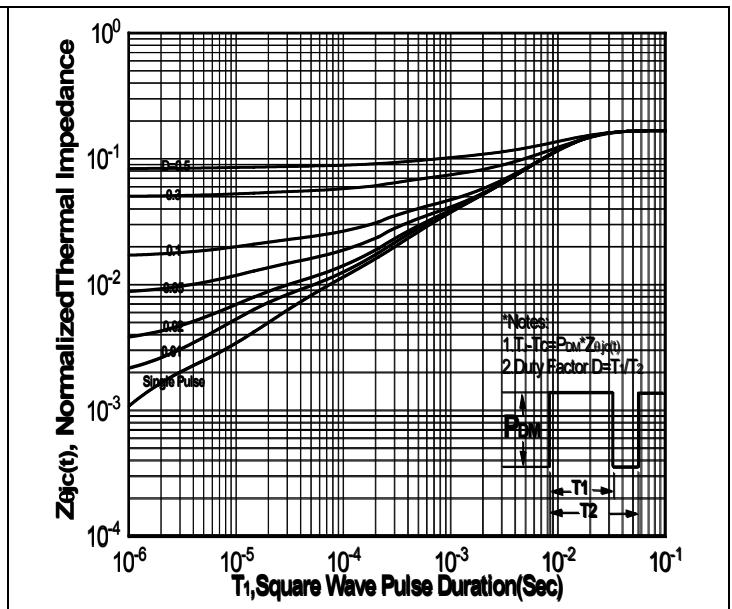
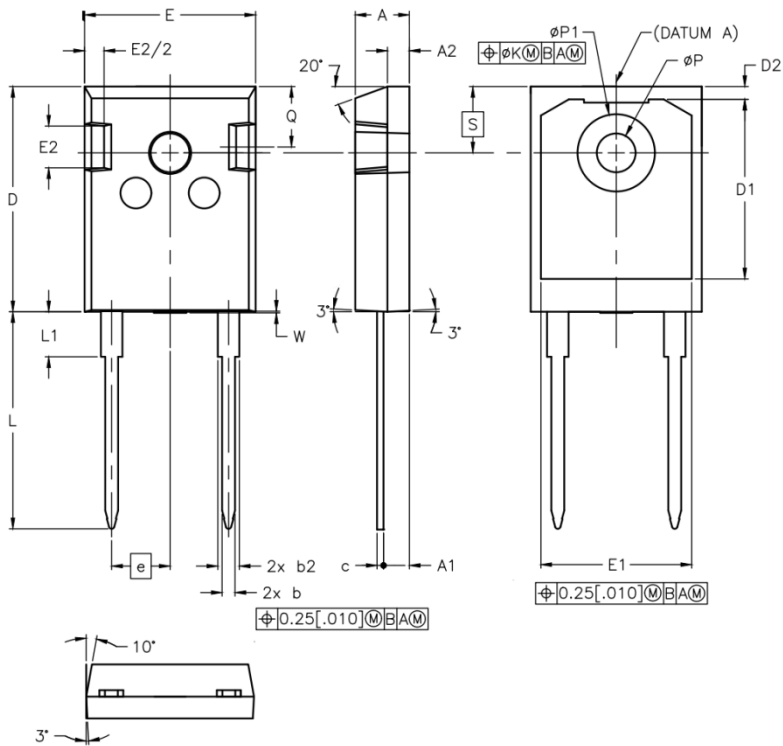


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

Package Dimensions

Package TO-247-2L



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	
ϕK	.010		0.25	
L	.780	.800	19.81	20.32
L1	-	.177	-	4.50
ϕP	.140	.144	3.56	3.66
$\phi P1$	.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

