MCRK2401200SG2

Silicon Carbide Schottky Diode

Benefits

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

V_{RRM}= 1200 V

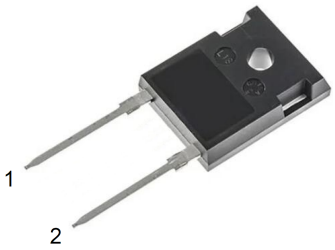
$I_{F;\ T_C<100^\circ C}$ = 88 A

Q_c= 167 nC

General Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- Increased Creepage/Clearance Distance

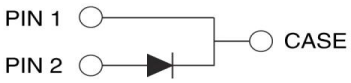
Package TO-247-2



Application

- Switch Mode Power Supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters

Equivalent Circuit



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	1200	V
Surge Peak Reverse Voltage		V_{RSM}	1300	V
DC Blocking Voltage		V_{DC}	1200	V
Forward Current(Fig.3)	$T_C \le 25$ ℃ $T_C \le 100$ ℃ $T_C \le 155$ ℃	I_F	128 88 41	A
Non-Repetitive Forward Surge Current	T_C=25˚C, t_P=10 ms, Half Sine Pulse T_C=110˚C, t_P=10 ms, Half Sine Pulse	I_{FSM}	247 245	A
Repetitive Peak Forward Surge Current	T_C=25˚C, t_P=10 ms, Half Sine Pulse T_C=110˚C, t_P=10 ms, Half Sine Pulse	I_{FRM}	161 91	A
Power Dissipation(Fig.4)	T_C =25 ℃ T_C =110 ℃	P_{tot}	667 289	W
I_2t value	T_C=25˚C, t_P=10 ms T_C=110˚C, t_P=10 ms	$\int i^2dt$	305 300	A^2S
Operating Junction and Storage Temperature(Fig.4)		T_J, T_{stg}	-55 ~+175	℃
Maximum Processing Temperature	10 min. Maximum	T_{PROC}	325	℃

Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_F	Forward Voltage(Fig.1)	I_F = 40A, T_J= 25℃	--	1.5	1.8	V
		I_F = 40A, T_J = 175℃	--	2.2	3.0	V
I_R	Reverse Current(Fig.2)	V_R = 1200V, T_J = 25℃	--	45	300	uA
		V_R = 1200V, T_J = 175℃	--	75	500	uA
Q_C	Total Capacitive Charge(Fig.5)	V_R = 800V, T_J = 25℃	--	167	--	nC
C	Total Capacitance(Fig.6)	V_R = 0V, T_J = 25℃, f = 1MHz	--	2809	--	pF
		V_R = 400V, T_J = 25℃, f = 1MHz	--	174	--	pF
		V_R = 800V, T_J = 25℃, f = 1MHz	--	145	--	pF
$R_{\theta JC}$	Thermal Resistance from Junction to Case (Fig.9)		--	0.225	--	℃/W
E_C	Capacitance Stored Energy(Fig.7)	V_R = 800V	--	36	--	uJ

Electrostatic Discharge (ESD) Classifications

Parameter	Symbol	Value
Human Body Model	**HBM**	Class 3B (≥ 8000 V)
Charge Device Model	**CDM**	Class C3 (≥ 1000 V)

Typical Performance

Figure 1. Forward Characteristics

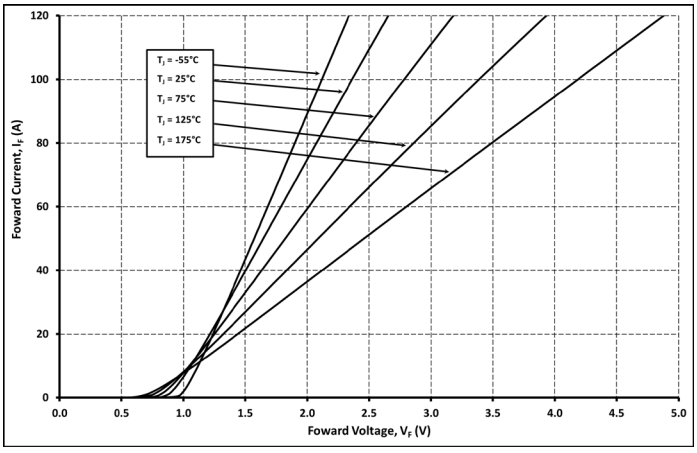
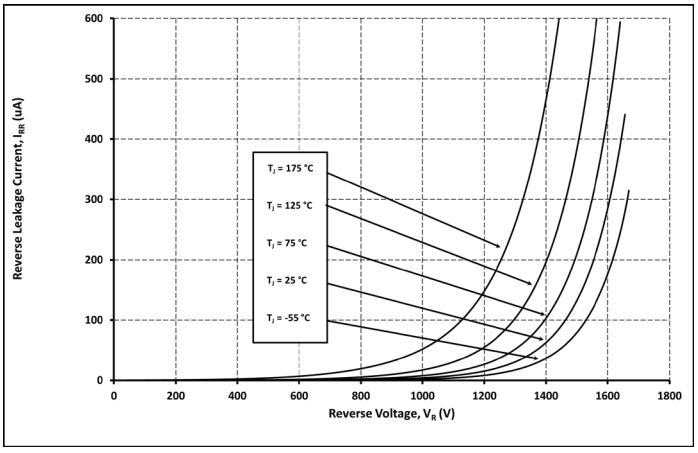


Figure 2. Reverse Characteristics



■ Typical Performance

Figure 3. Current Derating

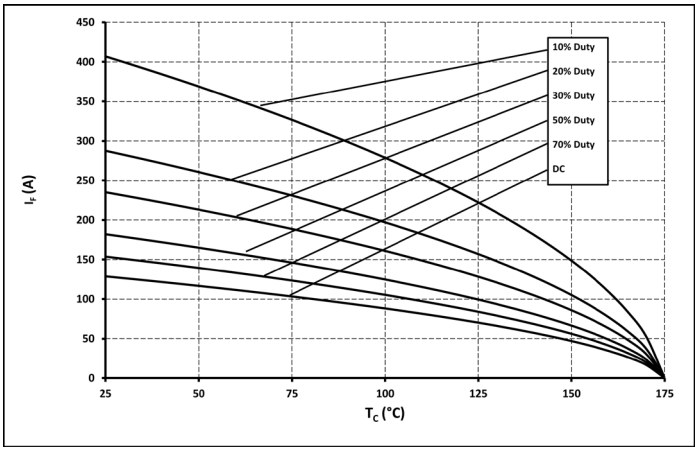


Figure 4. Power Derating

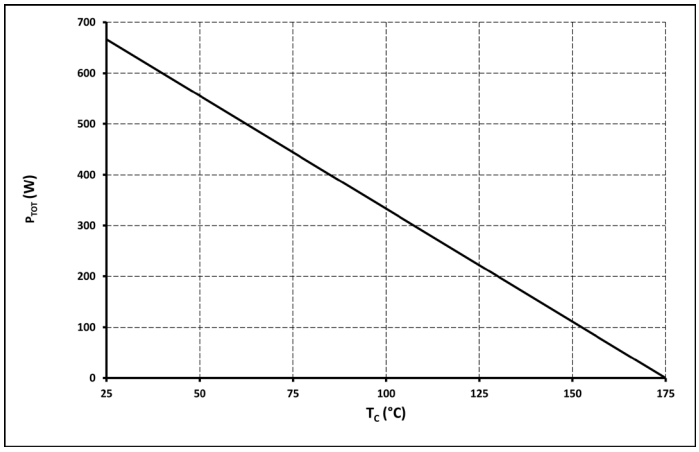


Figure 5. Total Capacitance Charge vs. Reverse Voltage

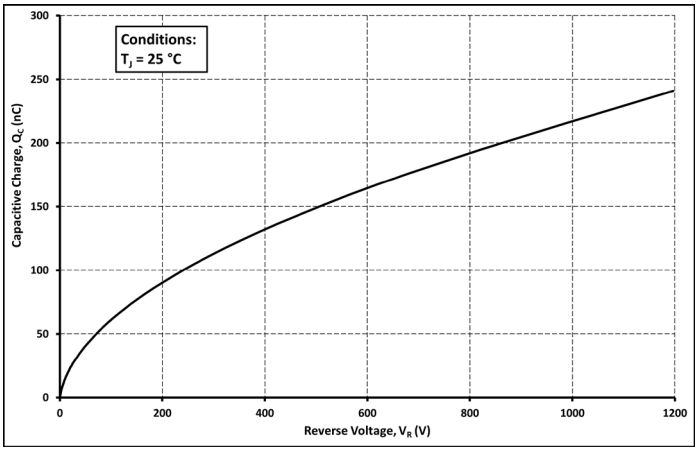


Figure 6. Capacitance vs. Reverse Voltage

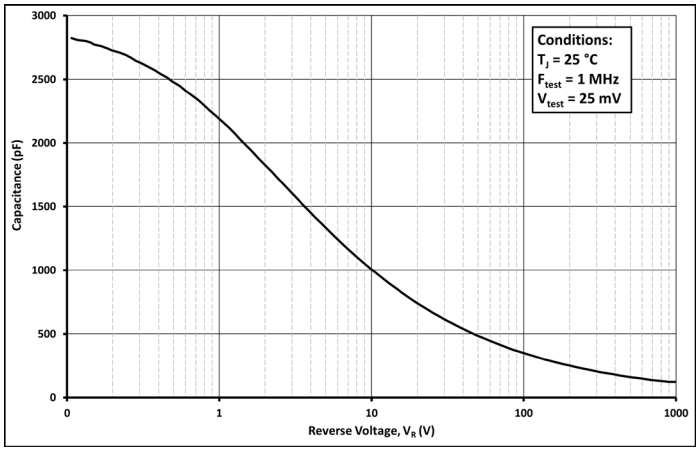


Figure 7. Capacitance Stored Energy

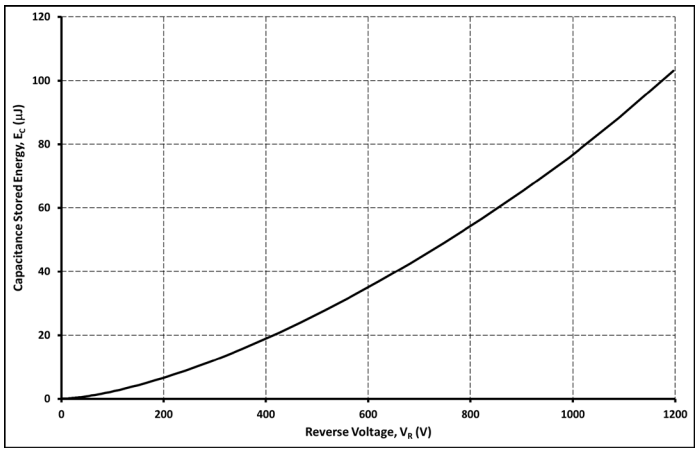
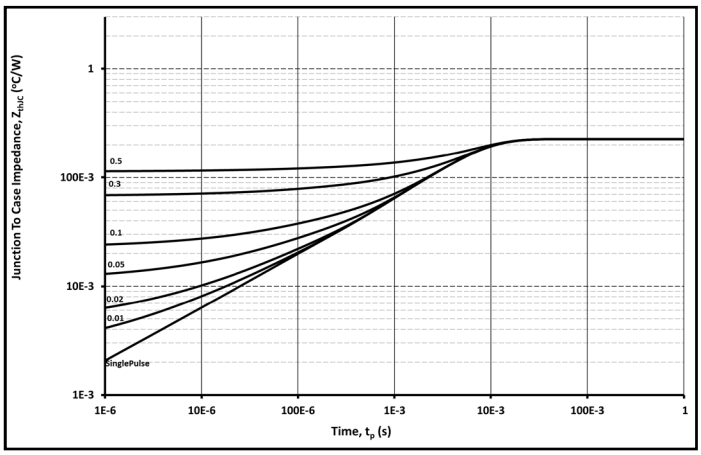
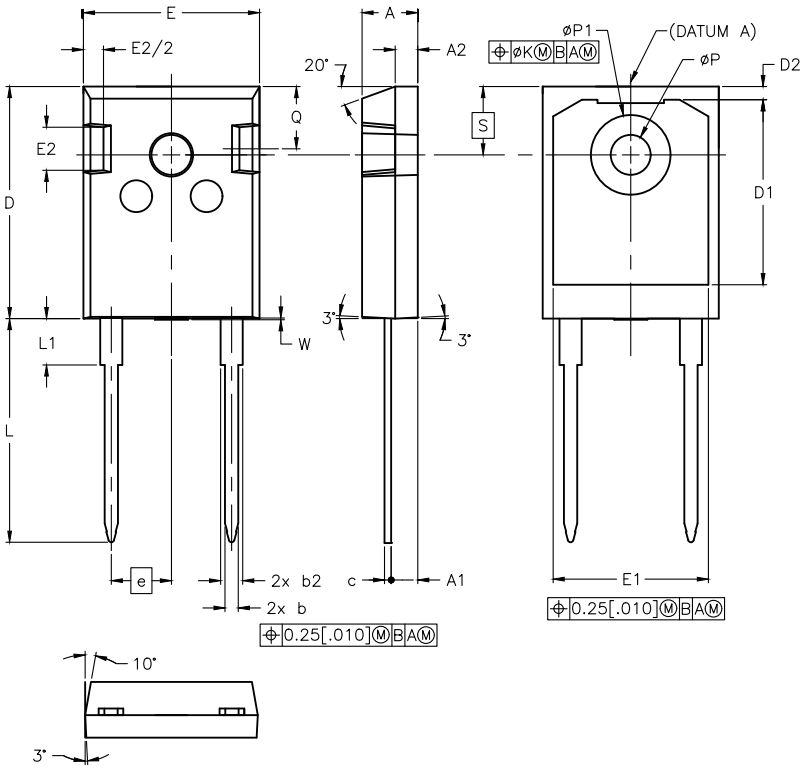


Figure 8. Transient Thermal Impedance



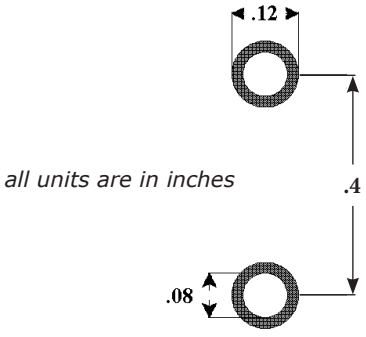
Outlitne Drawing

TO-247-2 Package Outline Dimensions



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



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