CSD02060–Silicon Carbide Schottky Diode

Zero Recovery® Rectifier

V_{RRM}	= 600V
$I_{F(AVG)}$	= 2A
Q_c	= 7nC

Features

- 600-Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Swtitching
- Positive Temperature Coefficient on V_F

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
- Power Factor Correction
  - Typical PFC P_{out} : 200W-400W
- Motor Drives
  - Typical Power : 0.50HP-1.0HP

Package

TO-263-2

TO-220-2

Part Number	Package	Marking
CSD02060A	TO-220-2	CSD02060
CSD02060G	TO-263-2	CSD02060

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	600	V		
V_{RSM}	Surge Peak Reverse Voltage	600	V		
V_{DC}	DC Blocking Voltage	600	V		
$I_{F(AVG)}$	Average Forward Current	2 3.5	A	T_C=150˚C, DC T_C=125˚C, DC	
$I_{F(PEAK)}$	Peak Forward Current	5	A	T_C=125˚, T_{REP}<1mS, Duty=0.5	
I_{FRM}	Repetitive Peak Forward Surge Current	10	A	T_C=25˚C, t_P=8.3ms, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	40	A	T_C=25˚C, t_P=10µs, Pulse	
P_{tot}	Power Dissipation	43 14	W	T_C=25˚C T_C=125˚C	
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +175	˚C		

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.6 2.0	1.8 2.4	V	I_F = 2A T_J=25°C I_F = 2A T_J=175°C	
I_R	Reverse Current	50 100	200 1000	µA	V_R = 600V T_J=25°C V_R = 600V T_J=175°C	
Q_C	Total Capacitive Charge	7		nC	V_R = 600V, I_F = 1A di/dt = 500 A/µs T_J = 25°C	
C	Total Capacitance	120 20 15		pF	V_R = 0V, T_J = 25°C, f = 1MHz V_R = 200V, T_J = 25°C, f = 1MHz V_R = 400V, T_J = 25°C, f = 1MHz	

Note:
1. This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	4.7		°C/W		
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	53		°C/W		

Typical Performance

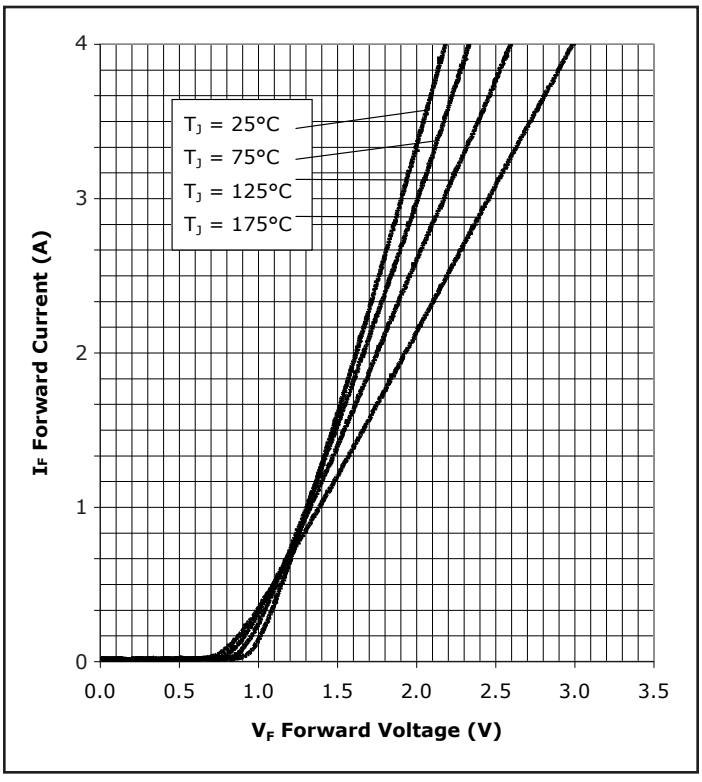


Figure 1. Forward Characteristics

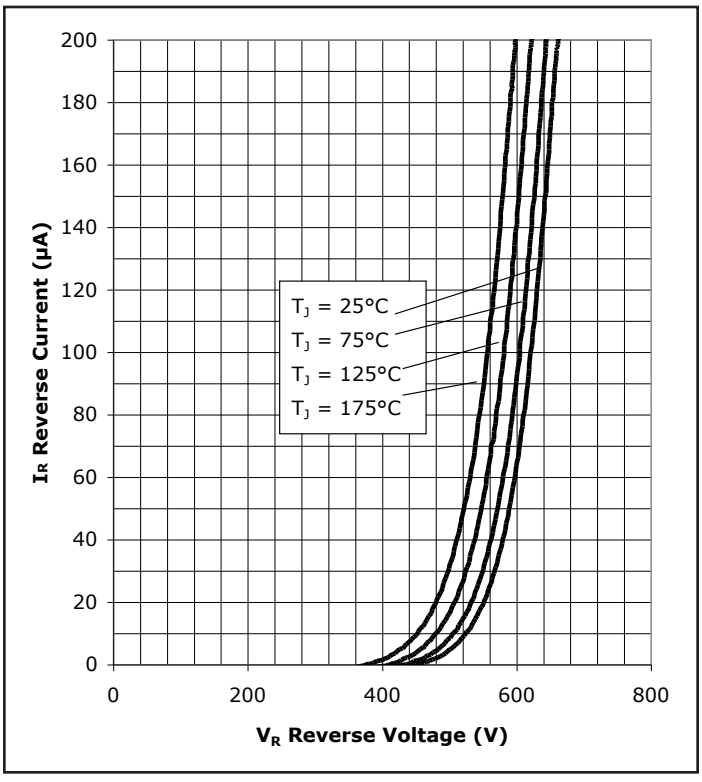


Figure 2. Reverse Characteristics

Typical Performance

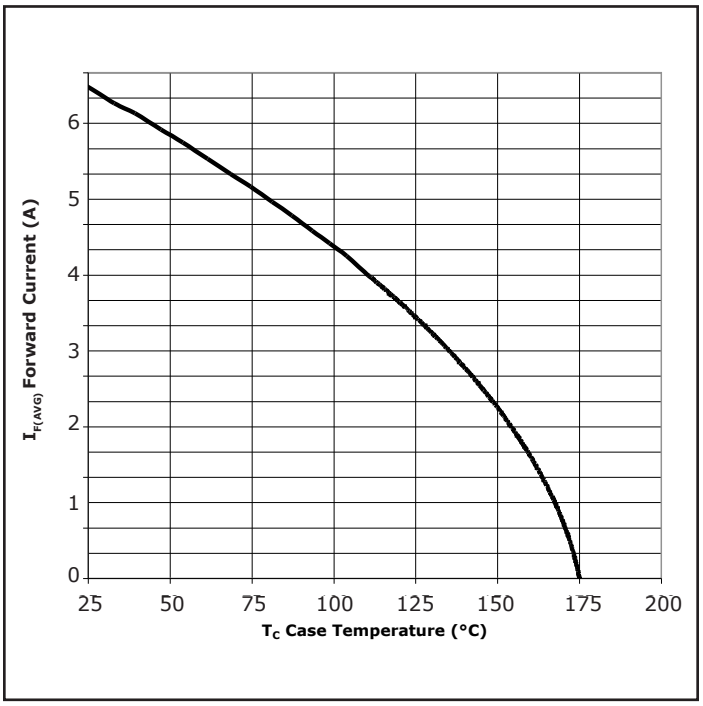


Figure 3. Current Derating

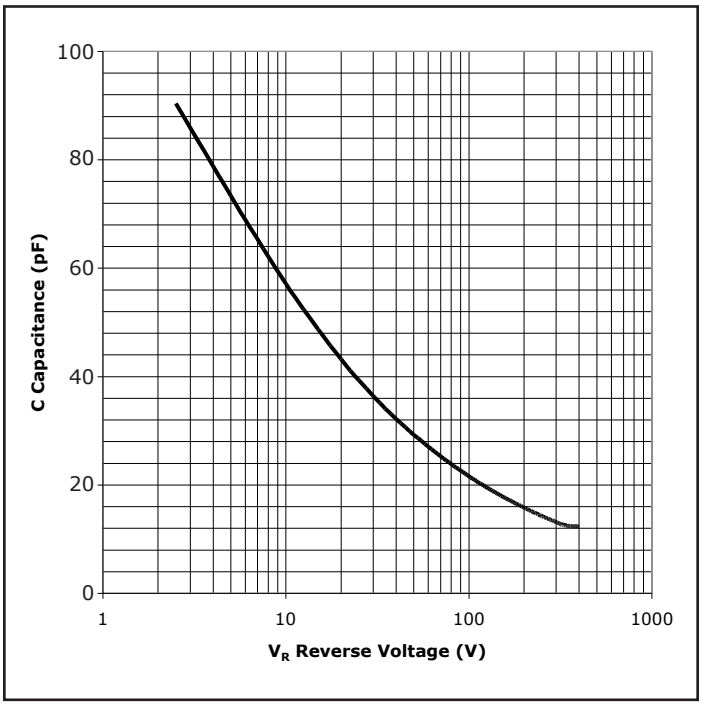


Figure 4. Capacitance vs. Reverse Voltage

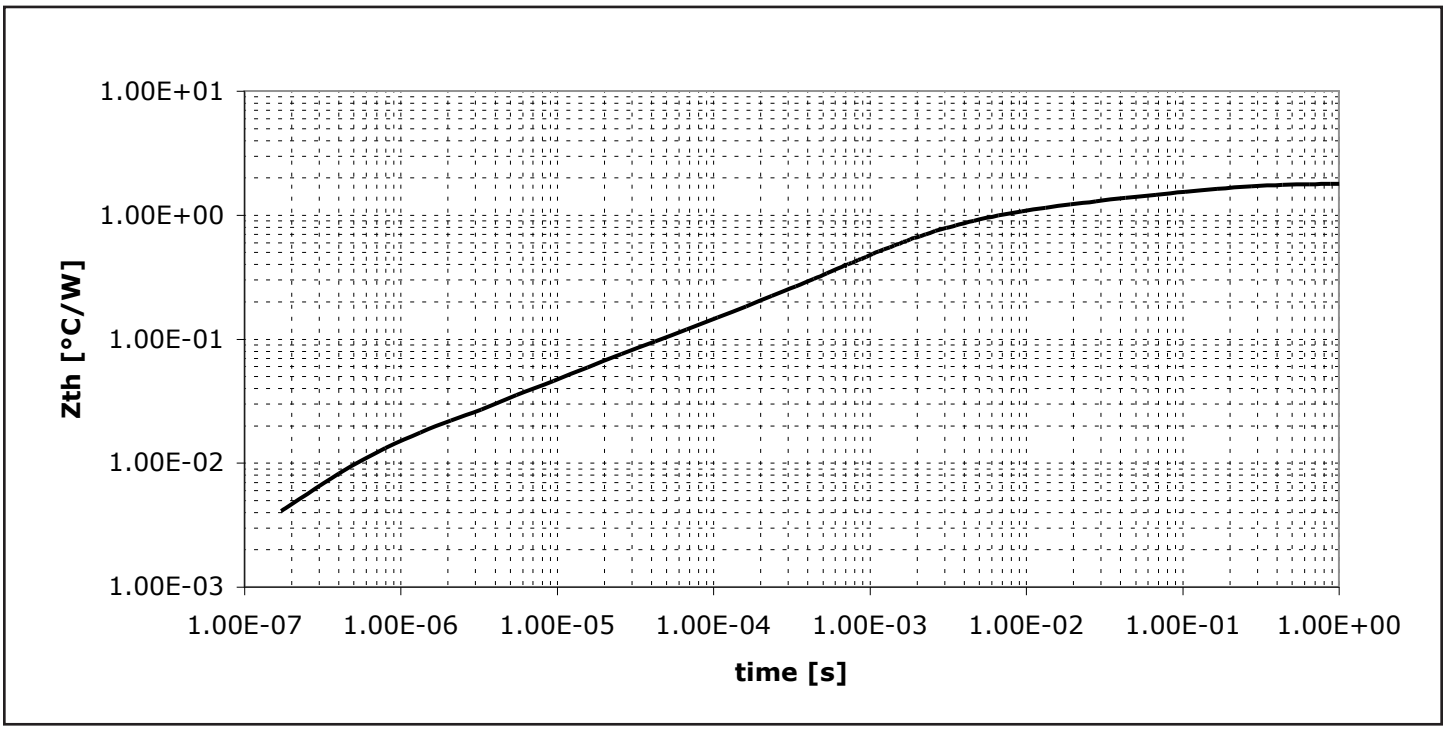
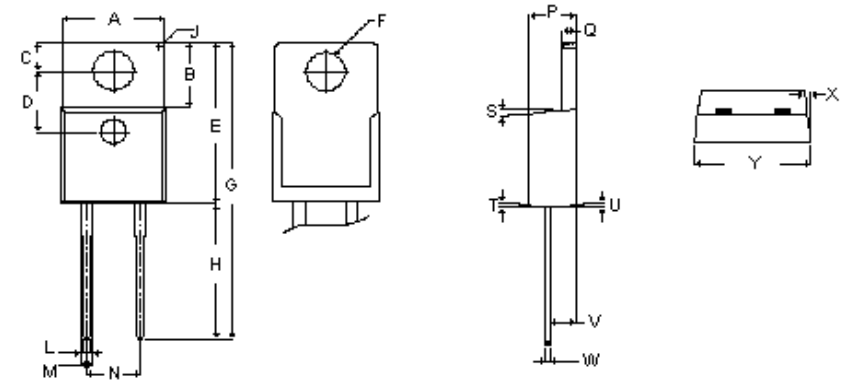


Figure 5. Transient Thermal Impedance

Package Dimensions

Package TO-220-2

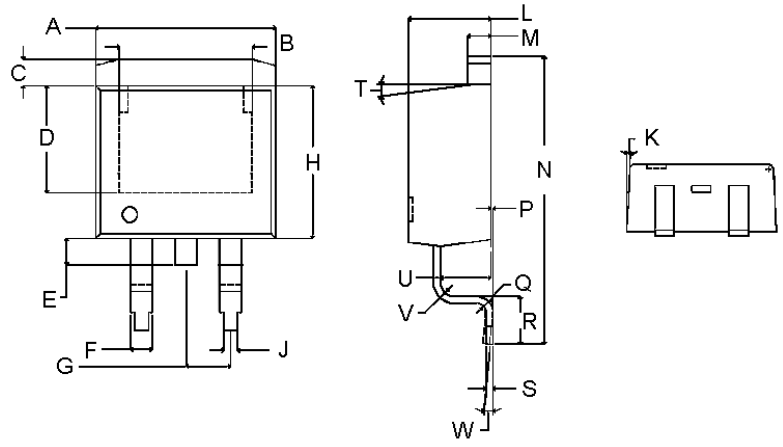


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.402	.408	10.211	10.364
B	.120	.124	3.048	3.150
C	.106	.110	2.692	2.794
D	.245	.251	6.223	6.375
E	.335	.345	8.509	8.763
F	.149	.153	3.784	3.886
G	.220	.240	5.588	6.096
H	.540	.550	13.716	13.970
J	.100 REF		2.540 REF	
K		.080		2.032
L	.050	.056	1.270	1.422
M	.032	.038	.813	.956
N	.197	.203	5.004	5.156
P	.170	.180	4.318	4.572
Q	.048	.052	1.219	1.321
R	.583	.593	14.808	15.062
S	6.5°	8.5°	6.5°	8.5°
T	6.5°	8.5°	6.5°	8.5°
U	6.5°	8.5°	6.5°	8.5°
V	.103	.107	2.616	2.718
W	.015	.021	.381	.533
X	2.0°	4.0°	2.0°	4.0°
Y	.396	.406	10.058	10.312

NOTE:
1. Dimension L, M, W apply for Solder Dip Finish.

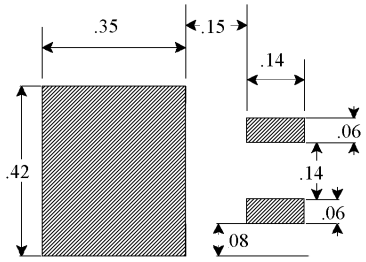
Package Dimensions

Package TO-263-2

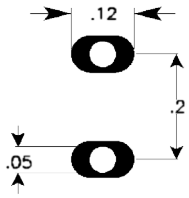


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.396	.406	10.058	10.312
B	.297	.303	7.544	7.696
C	.057	.063	1.448	1.600
D	.237	.243	6.015	6.167
E	.050	.070	1.270	1.778
F	.048	.052	1.219	1.321
G	.100 TYP		2.540 TYP	
H	.335	.345	8.509	8.763
J	.028	.032	.711	.813
K	2°	4°	2°	4°
L	.170	.180	4.318	4.572
M	.048	.052	1.219	1.321
N	.595	.615	15.113	15.621
P	0.00	0.10	0.00	.254
Q	R0.018 TYP	R0.022 TYP	R0.457 TYP	R0.559 TYP
R	.090	.110	2.286	2.794
S	.013	.017	.330	.432
T	6.5°	8.5°	6.5°	8.5°
U	.103	.107	2.616	2.718
V	R0.028 TYP	R0.032 TYP	R0.711 TYP	R0.813 TYP
W	—	5.0°	—	5.0°

Recommended Solder Pad Layout



TO-263-2



TO-220-2

Part Number	Package	Marking
CSD02060A	TO-220-2	CSD02060
CSD02060G	TO-263-2	CSD02060

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