C2D05120–Silicon Carbide Schottky Diode

Zero Recovery® Rectifier

V_{RRM} = 1200 V
I_F = 5 A
Q_c = 28 nC

Features

- 1200-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
- Motor Drives
- High Voltage Multipliers

Package

TO-220-2

Part Number	Package	Marking
C2D05120A	TO-220-2	C2D05120

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_{RSM}	Surge Peak Reverse Voltage	1200	V		
V_{DC}	DC Blocking Voltage	1200	V		
$I_{F(AVG)}$	Average Forward Current	5 10	A	T_C=160˚C, DC T_C=125˚C, DC	
$I_{F(PEAK)}$	Peak Forward Current	15	A	T_C=125˚C, T_{REP}<1mS, Duty=0.5	
I_{FRM}	Repetitive Peak Forward Surge Current	30	A	T_C=25˚C, t_P=8.3 ms, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	100	A	T_C=25˚C, t_P=10 µs, Pulse	
P_{tot}	Power Dissipation	136 45	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 2.6	1.8 3.0	V	I_F = 5 A T_J=25°C I_F = 5 A T_J=175°C	
I_R	Reverse Current	50 100	200 1000	μA	V_R = 1200 V T_J=25°C V_R = 1200 V T_J=175°C	
Q_C	Total Capacitive Charge	28		nC	V_R = 1200 V, I_F = 5 A d*i*/d*t* = 500 A/μs T_J = 25°C	
C	Total Capacitance	455 45 33		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 200 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz	

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	1.1		°C/W		

Typical Performance

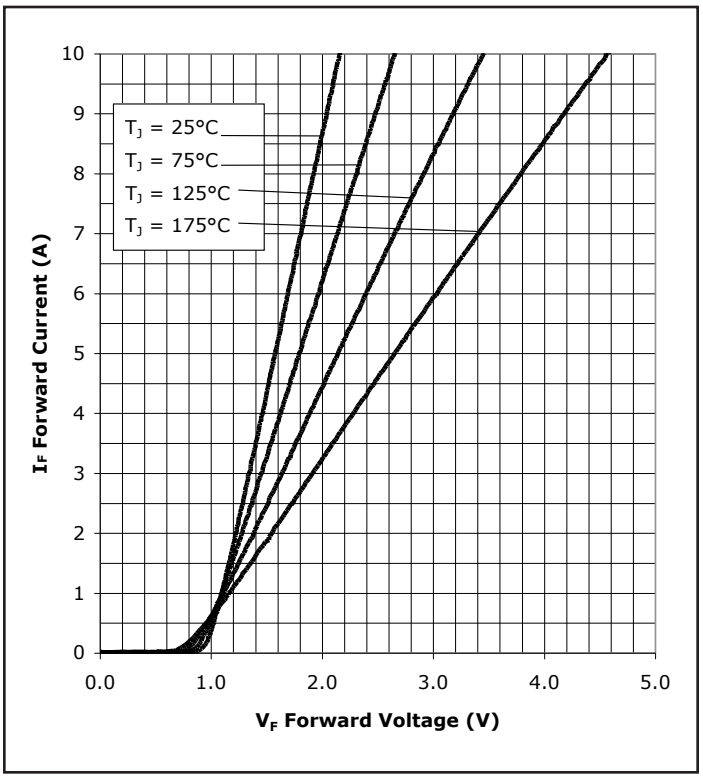


Figure 1. Forward Characteristics

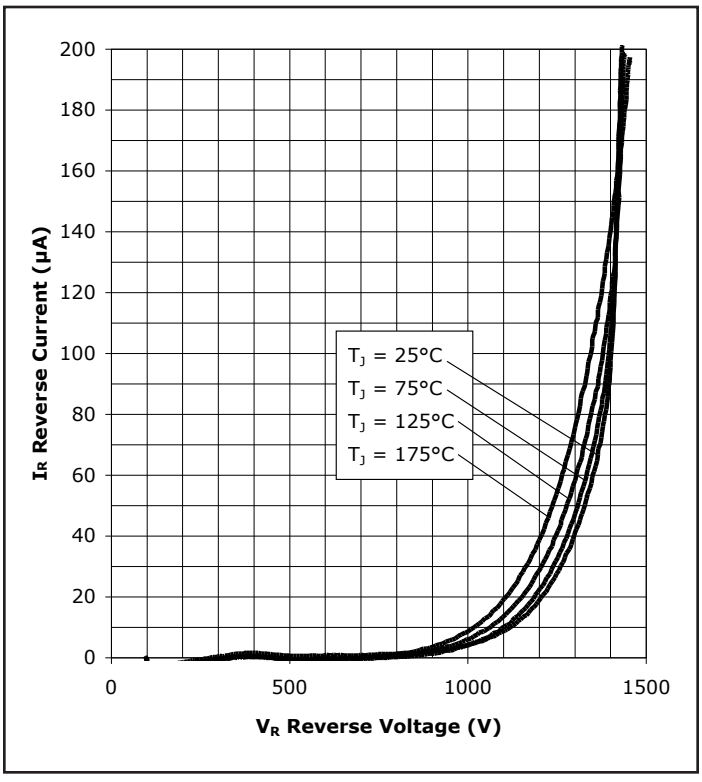


Figure 2. Reverse Characteristics

Typical Performance

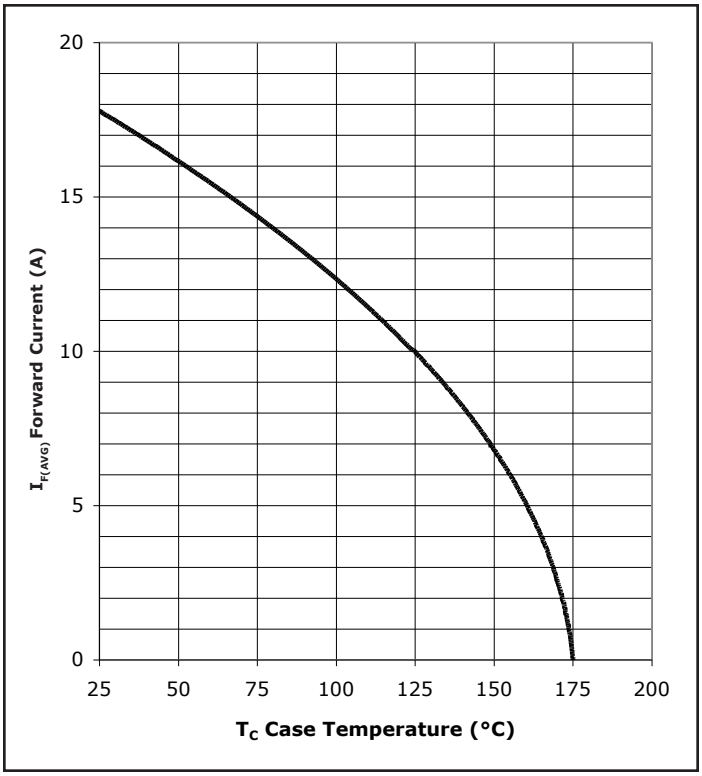


Figure 3. Current Derating

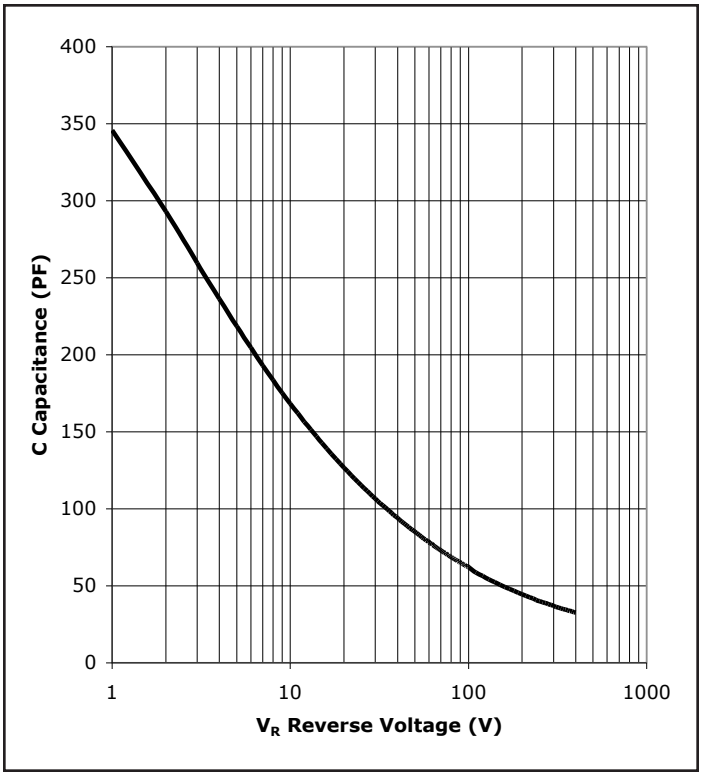


Figure 4. Capacitance vs. Reverse Voltage

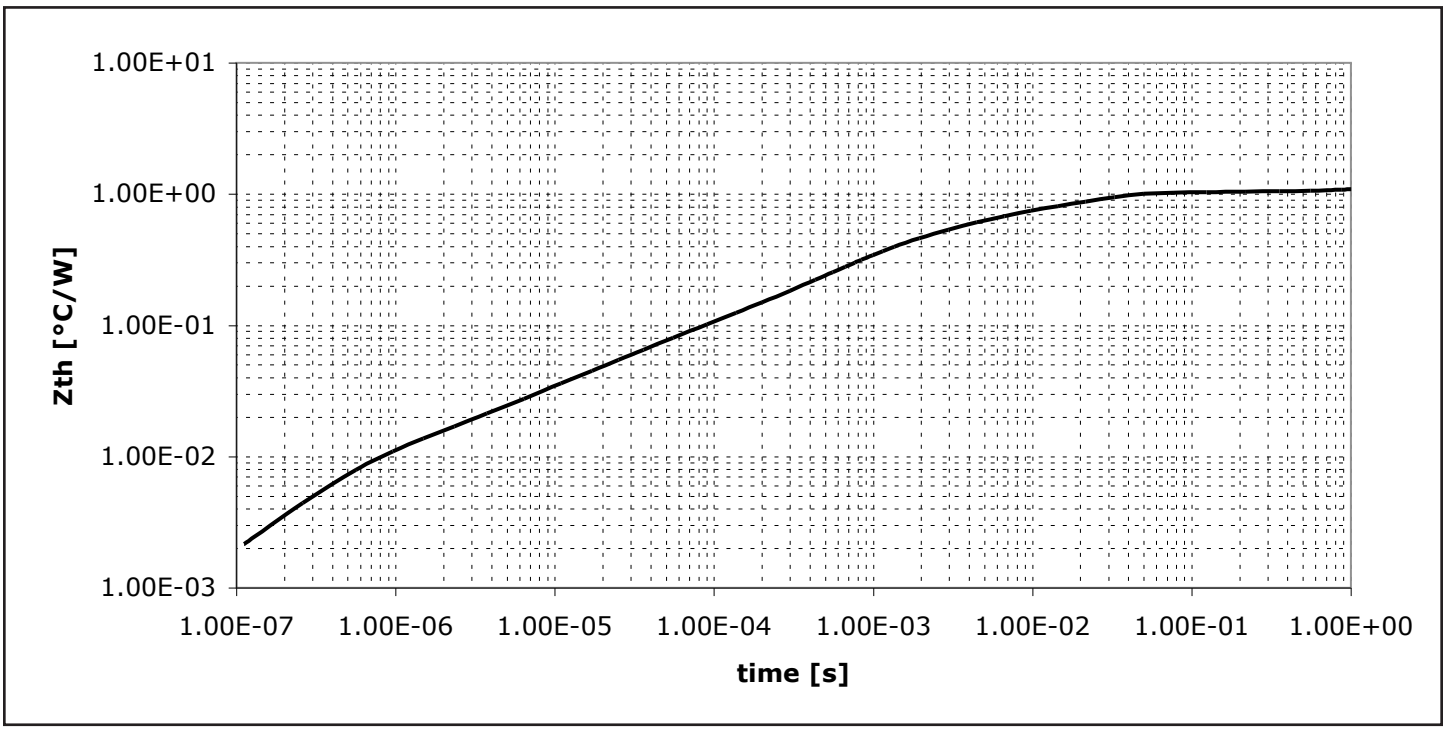
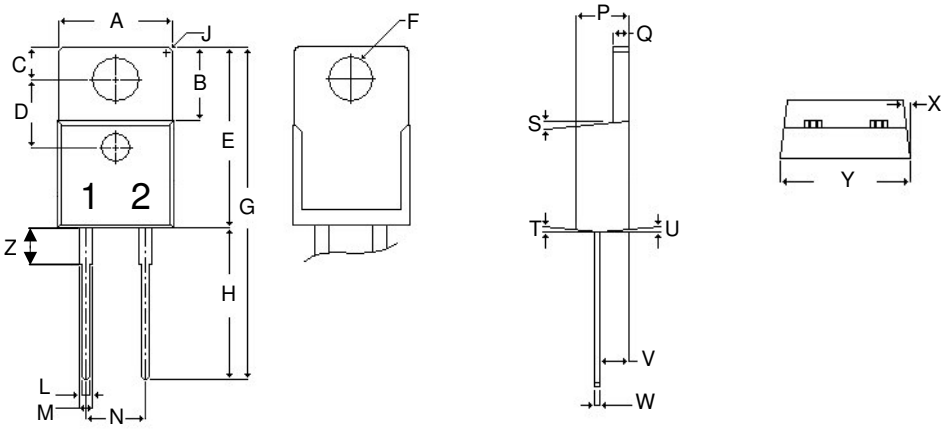


Figure 5. Transient Thermal Impedance

Package Dimensions

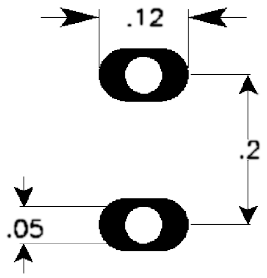
Package TO-220-2



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.381	.410	9.677	10.414
B	.235	.255	5.969	6.477
C	.100	.120	2.540	3.048
D	.223	.337	5.664	8.560
E	.590	.615	14.986	15.621
F	.143	.153	3.632	3.886
G	1.105	1.147	28.067	29.134
H	.500	.550	12.700	13.970
J	R 0.197		R 0.197	
L	.025	.036	.635	.914
M	.045	.055	1.143	1.397
N	.195	.205	4.953	5.207
P	.165	.185	4.191	4.699
Q	.048	.054	1.219	1.372
S	3°	6°	3°	6°
T	3°	6°	3°	6°
U	3°	6°	3°	6°
V	.094	.110	2.388	2.794
W	.014	.025	.356	.635
X	3°	5.5°	3°	5.5°
Y	.385	.410	9.779	10.414
z	.130	.150	3.302	3.810

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

Recommended Solder Pad Layout



TO-220-2

Part Number	Package	Marking
C2D05120A	TO-220-2	C2D05120

Cree, Inc.
4600 Silicon Drive
Durham, NC 27703
USA Tel: +1.919.313.5300
Fax: +1.919.313.5451
www.cree.com/power