

# C2D05120–silicon Carbide Schottky Diode

## ZERO RECOVERY<sup>®</sup> RECTIFIER

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

### Features

- 1200-Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on  $V_F$

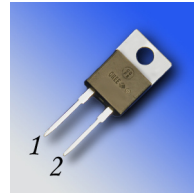
### Benefits

- 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	$T_C=160^\circ\text{C}$ , DC $T_C=125^\circ\text{C}$ , DC	
$I_{F(PEAK)}$	Peak Forward Current	15	A	$T_C=125^\circ\text{C}$ , $T_{REP}<1\text{mS}$ , Duty=0.5	
$I_{FRM}$	Repetitive Peak Forward Surge Current	30	A	$T_C=25^\circ\text{C}$ , $t_p=8.3\text{ ms}$ , Half Sine Wave	
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current	100	A	$T_C=25^\circ\text{C}$ , $t_p=10\text{ }\mu\text{s}$ , Pulse	
$P_{tot}$	Power Dissipation	136 45	W	$T_C=25^\circ\text{C}$ $T_C=125^\circ\text{C}$	
$T_J, T_{stg}$	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		

## Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_F$	Forward Voltage	1.6 2.6	1.8 3.0	V	$I_F = 5\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 5\text{ A}$ $T_J = 175^\circ\text{C}$	
$I_R$	Reverse Current	50 100	200 1000	$\mu\text{A}$	$V_R = 1200\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1200\text{ V}$ $T_J = 175^\circ\text{C}$	
$Q_C$	Total Capacitive Charge	28		nC	$V_R = 1200\text{ V}$ , $I_F = 5\text{ A}$ $di/dt = 500\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$	
C	Total Capacitance	455 45 33		pF	$V_R = 0\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ $V_R = 200\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ $V_R = 400\text{ V}$ , $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$	

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		$^\circ\text{C}/\text{W}$		

## Typical Performance

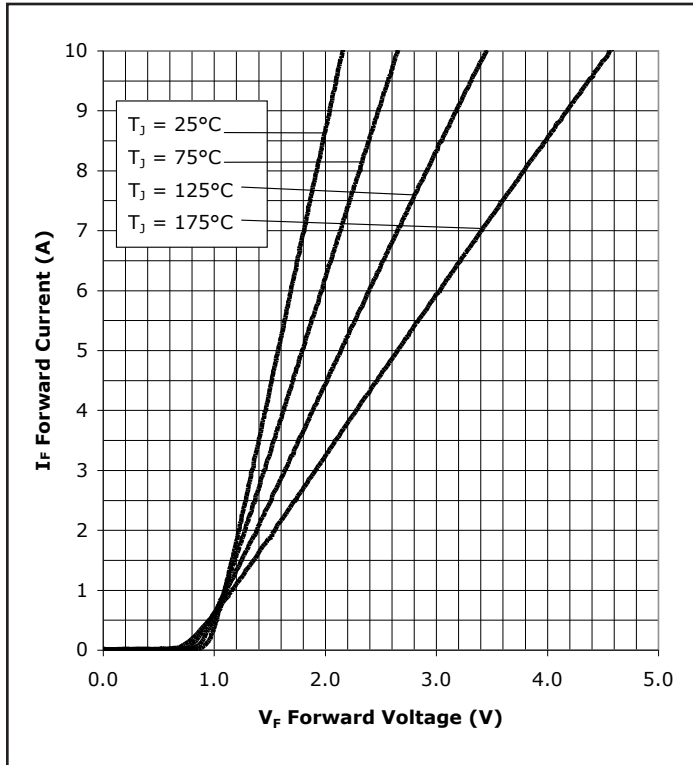


Figure 1. Forward Characteristics

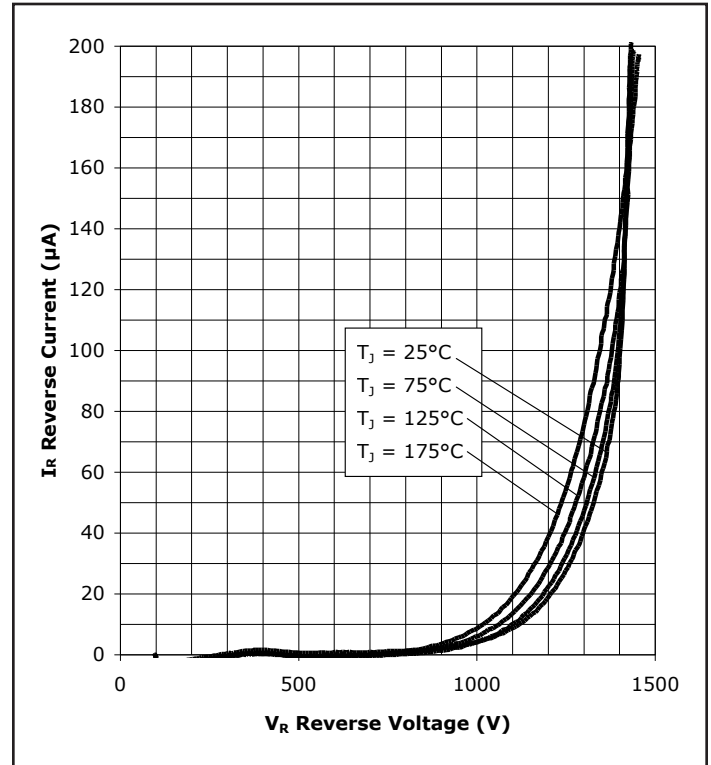


Figure 2. Reverse Characteristics

### Typical Performance

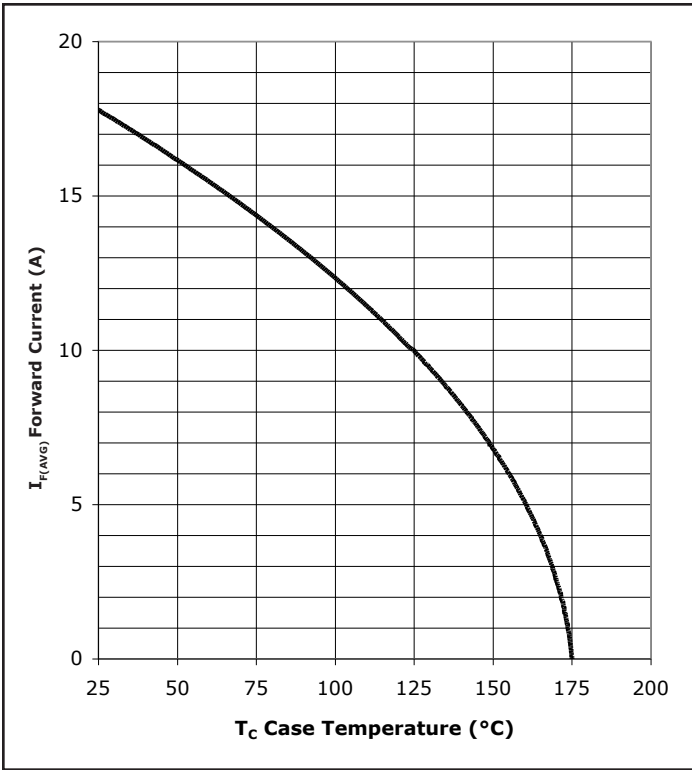


Figure 3. Current Derating

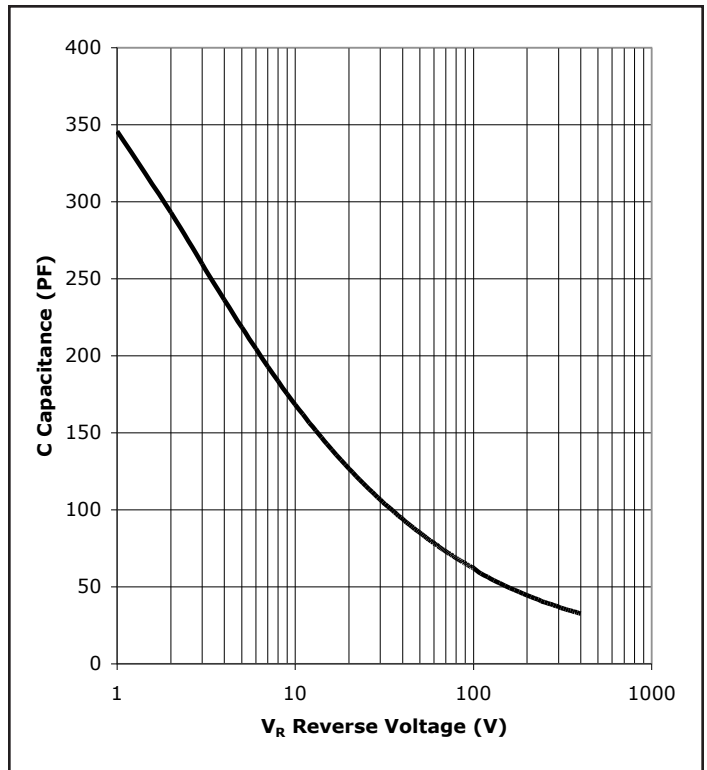


Figure 4. Capacitance vs. Reverse Voltage

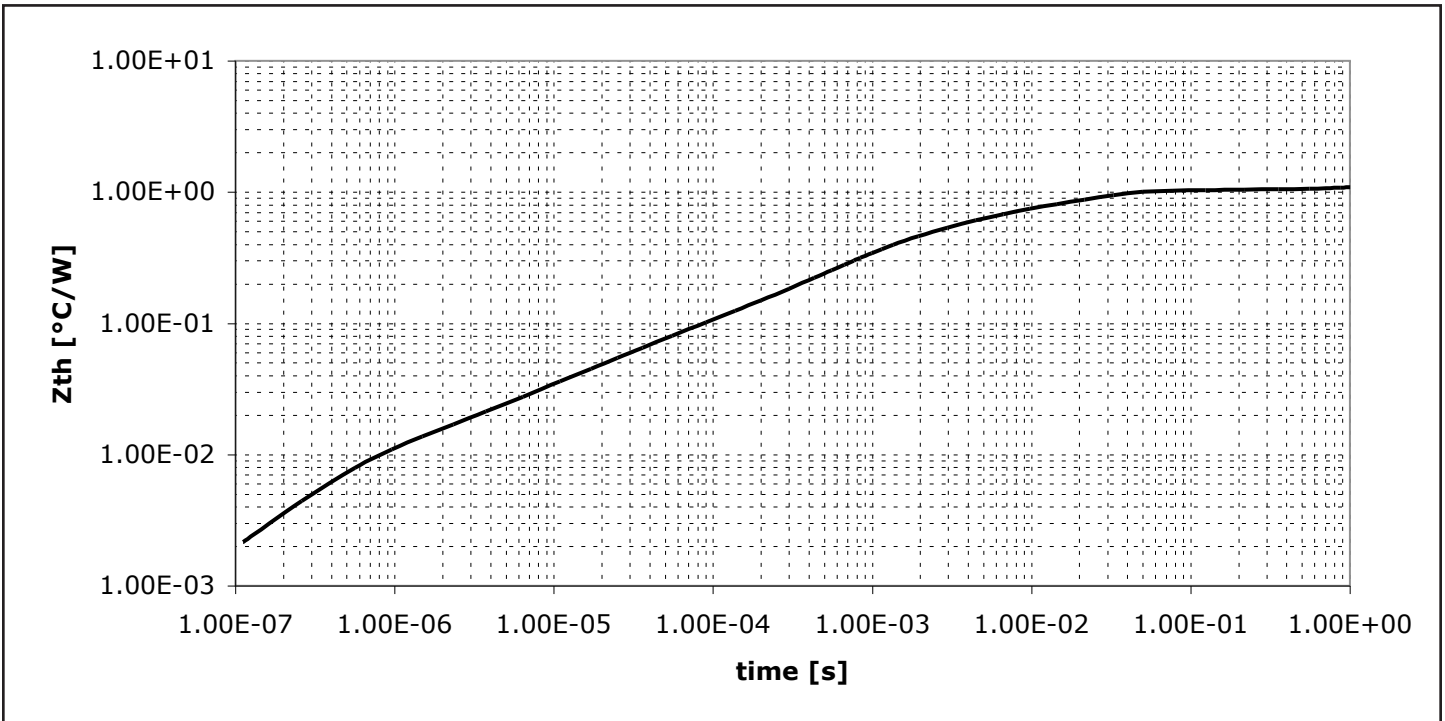
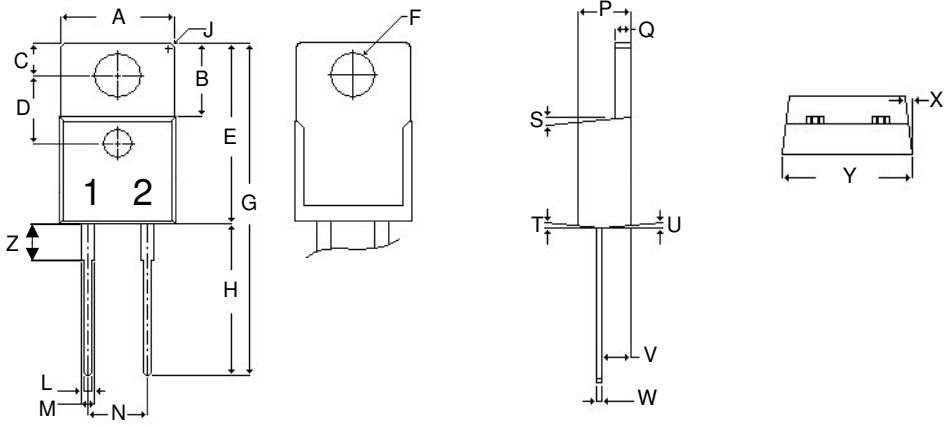


Figure 5. Transient Thermal Impedance

## 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

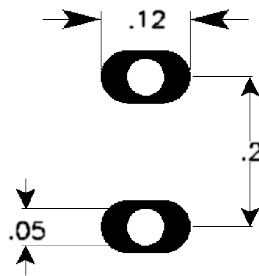
NOTE:

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



## Recommended Solder Pad Layout

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TO-220-2

Part Number	Package	Marking
C2D05120A	TO-220-2	C2D05120

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, air traffic control systems, or weapons systems.

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