



C2D20120–Silicon Carbide Schottky Diode

ZERO RECOVERY® RECTIFIER

$V_{RRM} = 1200\text{ V}$
 $I_F = 20\text{ A}$
 $Q_C = 122\text{ nC}$

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

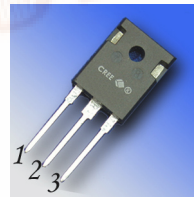
Benefits

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

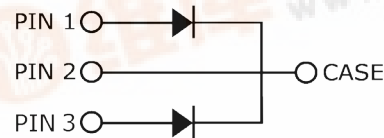
Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives

Package



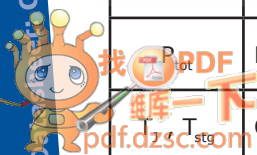
TO-247-3



Part Number	Package	Marking
C2D20120D	TO-247-3	C2D20120

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 (Per Leg/Device)	10/20 22/44	A	$T_C = 160^\circ\text{C}$ $T_C = 125^\circ\text{C}$	
$I_{F(PEAK)}$	Peak Forward Current (Per Leg/Device)	25/50	A	$T_C = 125^\circ\text{C}$, $T_{REP} < 1\text{ mS}$, Duty=0.5	
I_{FRM}	Repetitive Peak Forward Surge Current	50*	A	$T_C = 25^\circ\text{C}$, $t_p = 8.3\text{ ms}$, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	250*	A	$T_C = 25^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$, Pulse	
P_D	Power Dissipation (Per Leg)	312* 104*	W	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	
T_{STG}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		





Electrical Characteristics (Per Leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.6 2.5	1.8 3.0	V	$I_F = 10\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 10\text{ A}$ $T_J = 175^\circ\text{C}$	
I_R	Reverse Current	10 20	200 1000	μA	$V_R = 1200\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1200\text{ V}$ $T_J = 175^\circ\text{C}$	
Q_C	Total Capacitive Charge	61		nC	$V_R = 1200\text{ V}$, $I_F = 10\text{ A}$ $di/dt = 500\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$	
C	Total Capacitance	1000 80 59		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	0.48** 0.24*		$^\circ\text{C}/\text{W}$		

** Per Leg, * Both Legs

Typical Performance (Per Leg)

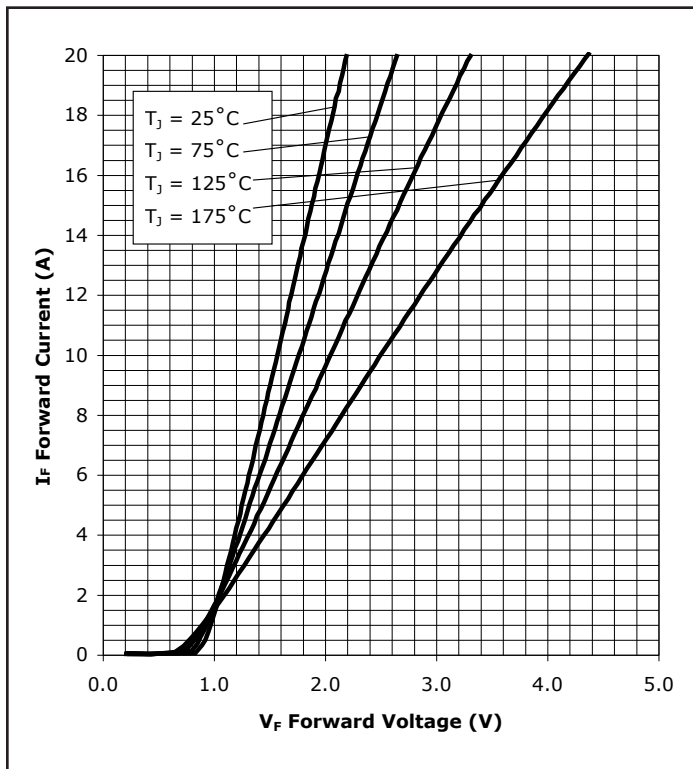


Figure 1. Forward Characteristics

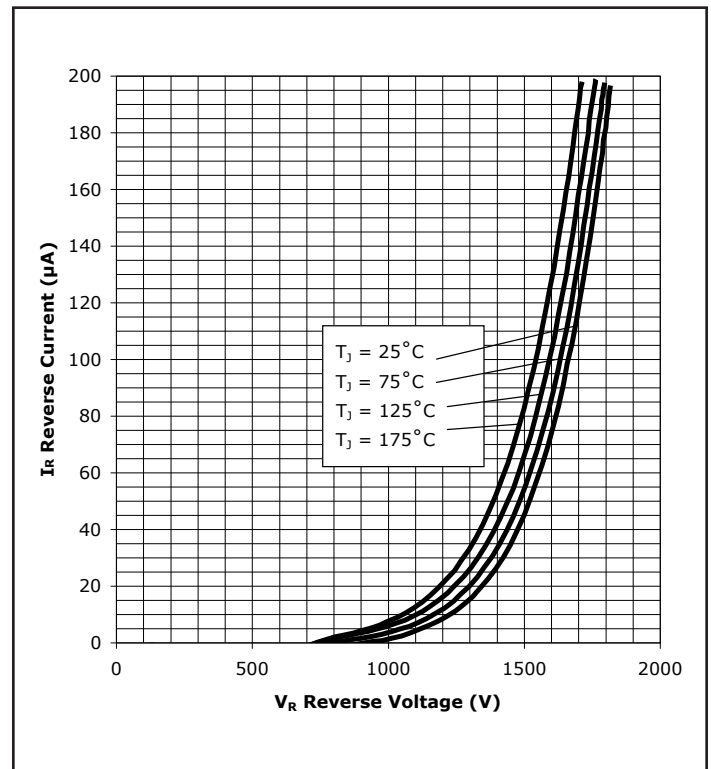


Figure 2. Reverse Characteristics



Typical Performance (Per Leg)

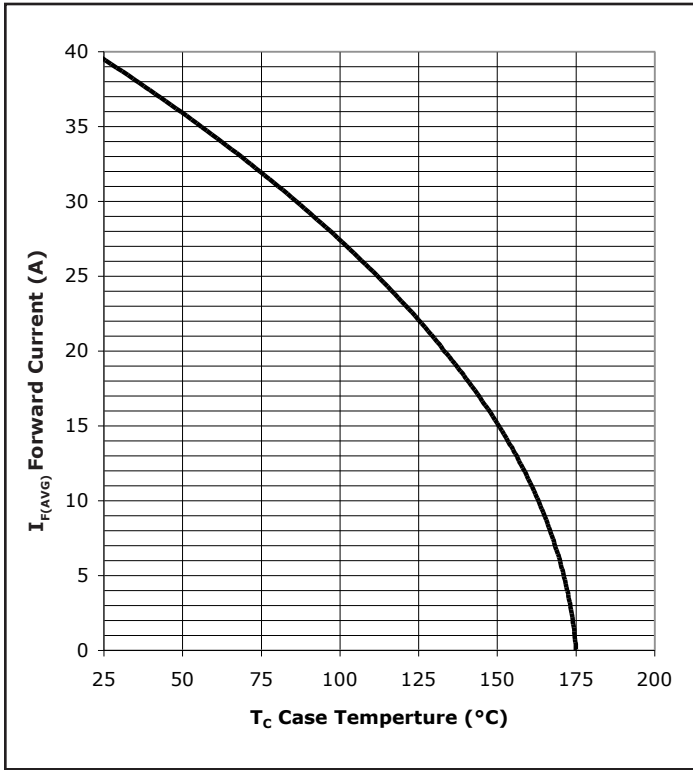


Figure 3. Current Derating

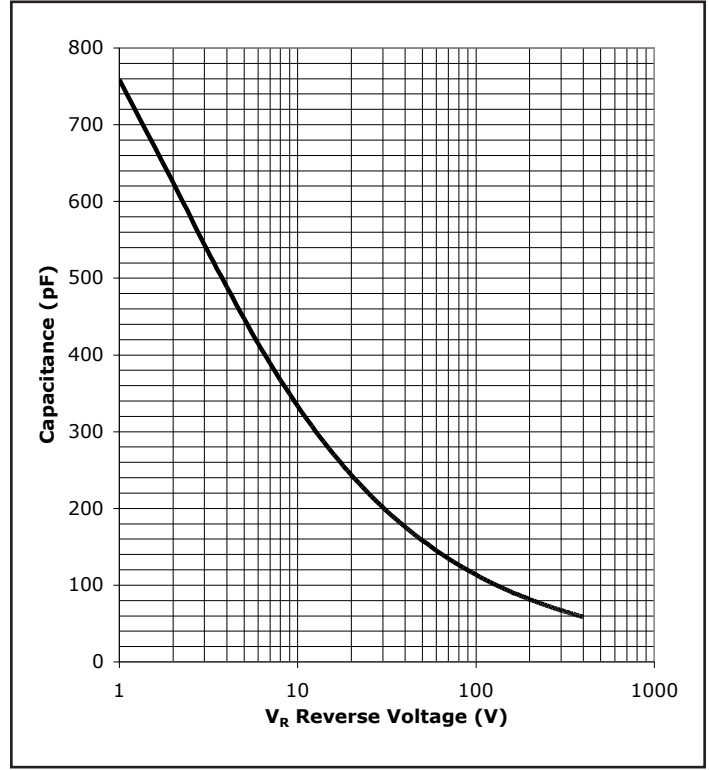


Figure 4. Capacitance vs. Reverse Voltage

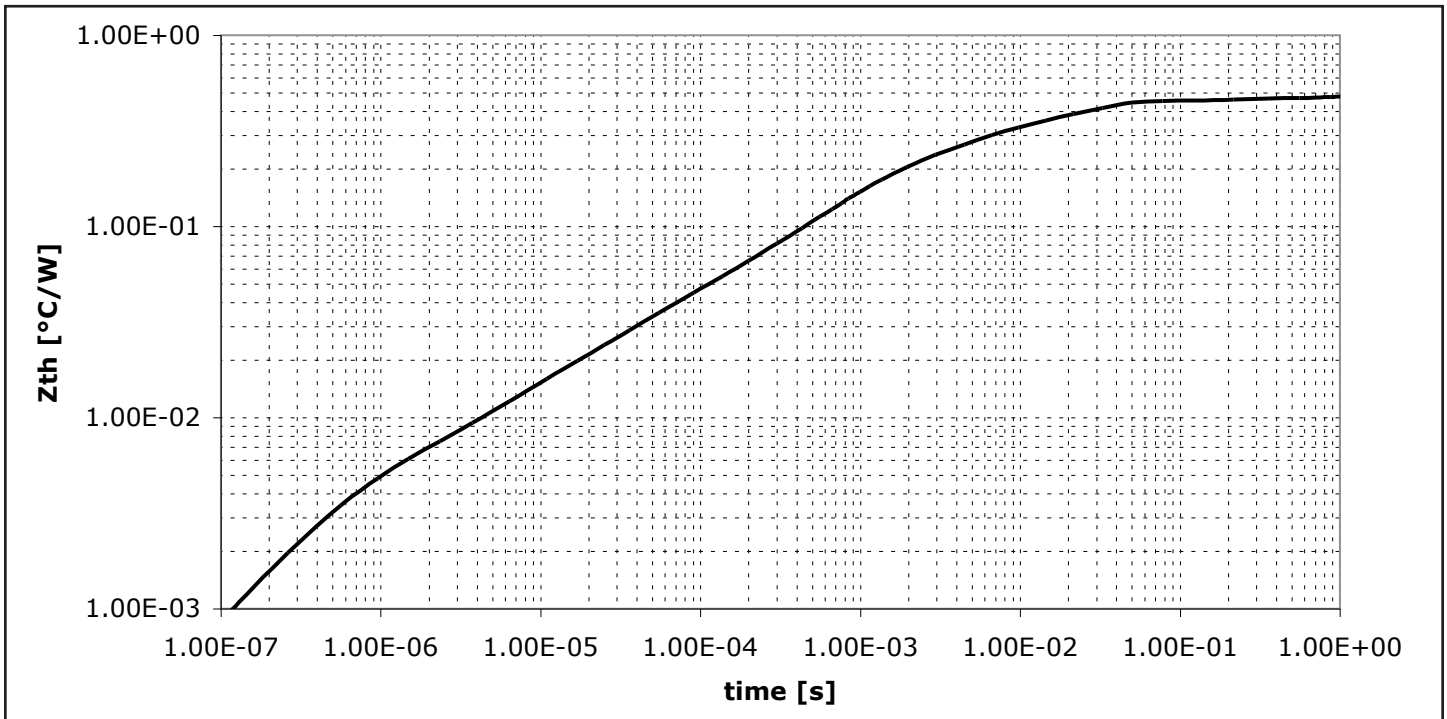
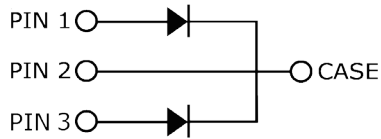
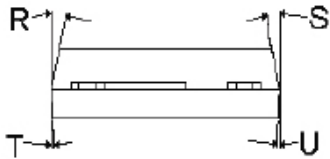
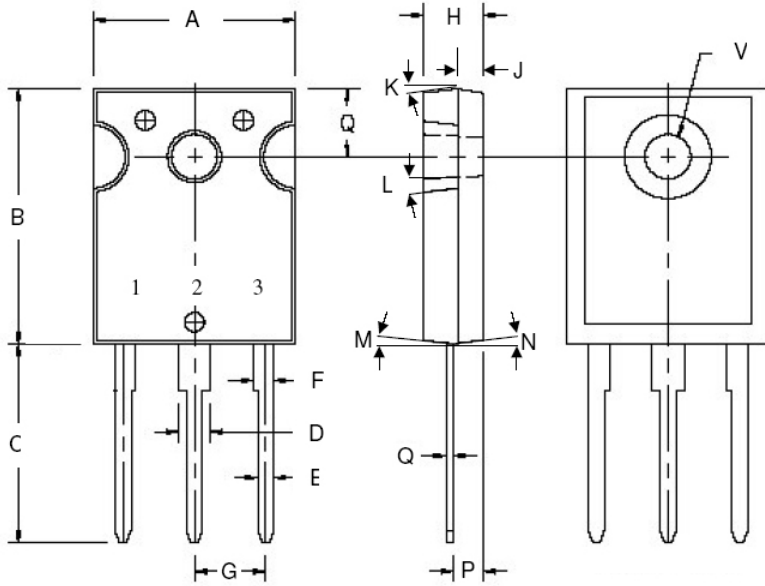


Figure 5. Transient Thermal Impedance



Package Dimensions

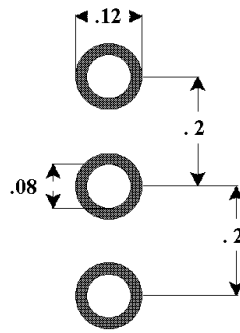
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POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.605	.631	15.367	16.027
B	.800	.830	20.320	21.082
C	.620	.799	15.748	20.295
D	.095	.126	2.413	3.200
E	.046	.052	1.168	1.321
F	.060	.084	1.524	2.134
G	.215 TYP		.215 TYP	
H	.180	.203	4.572	5.156
J	.078	.081	1.982	2.057
K	6°	21°	6°	21°
L	4°	6°	4°	6°
M	2°	4°	2°	4°
N	2°	4°	2°	4°
P	.090	.097	2.286	2.464
Q	.020	.030	.508	.762
R	9°	11°	9°	11°
S	9°	11°	9°	11°
T	2°	8°	2°	8°
U	2°	8°	2°	8°
V	.138	.144	3.505	3.658



Recommended Solder Pad Layout



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Part Number	Package	Marking
C2D20120D	TO-247-3	C2D20120