

C2D20120DSilicon Carbide Schottky Diode

ZERO RECOVERY® RECTIFIER

 V_{RRM} = 1200 V $I_{F}(T_{c}=135^{\circ}C) = 29 A^{**}$ Q_{c} = 122 nC**

Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_E

Benefits

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

PIN 2O O CASE

Package

TO-247-3

Applications

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

Part Number	Package	Marking	
C2D20120D	TO-247-3	C2D20120	

Halogen-Free

Maximum Ratings (T_c=25°C unless otherwise specified)

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	Continuous Forward Current (Per Leg/Device)	31/62 14.5/29 10/20	А	T _c =25°C T _c =135°C T _c =152°C	
$I_{\sf FRM}$	Repetitive Peak Forward Surge Current	50*	А	T_c =25°C, t_p =8.3 ms, Half Sine Wave	
I _{FSM}	Non-Repetitive Peak Forward Surge Current	250*	А	$T_c=25$ °C, $t_p=10$ µs, Pulse	
P _{tot}	Power Dissipation (Per Leg/Device)	312/624 135/270	W	T _c =25°C T _c =110°C	
T _J , T _{stg}	Operating Junction and Storage Temperature	-55 to +175	°C		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

^{*} Per Leg, ** Per Device



Electrical Characteristics (Per Leg)

Symbol	Parameter	Тур.	Max.	Unit	Test Conditions	Note
V _F	Forward Voltage	1.6 2.5	1.8 3.0	V	I _F = 10 A T _J =25°C I _F = 10 A T _J =175°C	
I _R	Reverse Current	10 20	200 1000	μΑ	$V_R = 1200 \text{ V } T_J = 25^{\circ}\text{C}$ $V_R = 1200 \text{ V } T_J = 175^{\circ}\text{C}$	
Q _c	Total Capacitive Charge	61		nC	$V_R = 1200 \text{ V, } I_F = 10\text{A}$ $di/dt = 500 \text{ A/}\mu\text{s}$ $T_J = 25^{\circ}\text{C}$	
С	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:

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Unit	Test Conditions	Note
$R_{_{\thetaJC}}$	Thermal Resistance from Junction to Case	0.48** 0.24*		°C/W		

^{**} Per Leg, * Both Legs

Typical Performance (Per Leg)

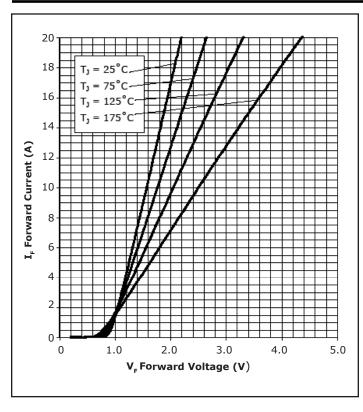


Figure 1. Forward Characteristics

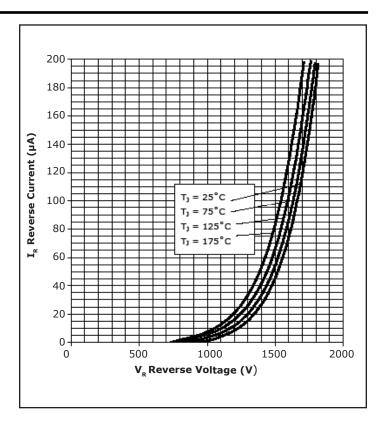
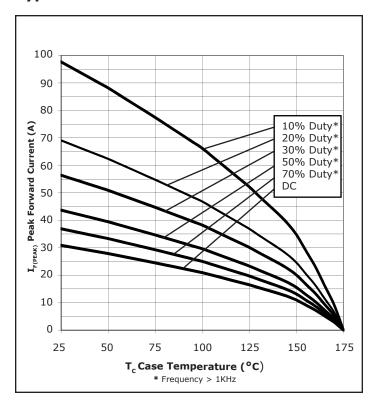


Figure 2. Reverse Characteristics

^{1.} This is a majority carrier diode, so there is no reverse recovery charge.



Typical Performance



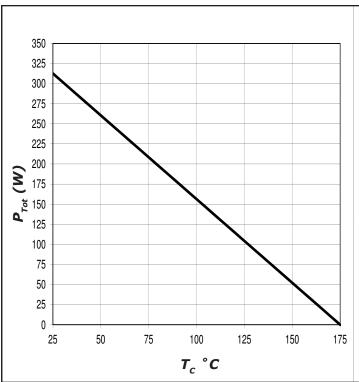


Figure 3. Current Derating

Figure 4. Power Derating

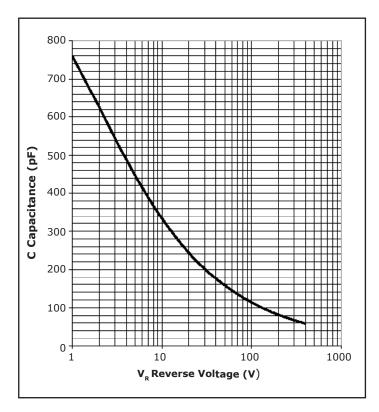


Figure 5. Capacitance vs. Reverse Voltage



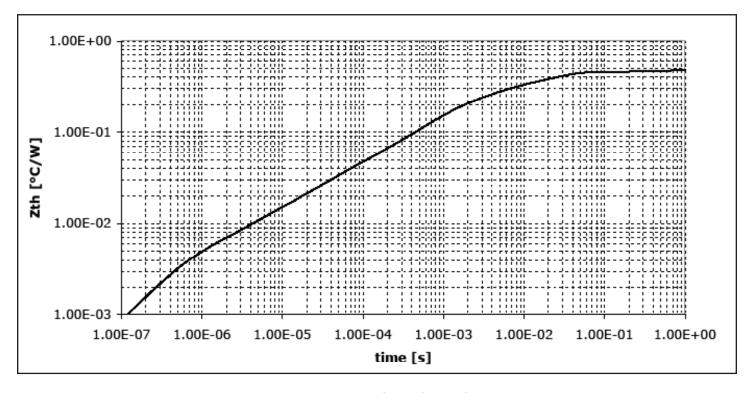
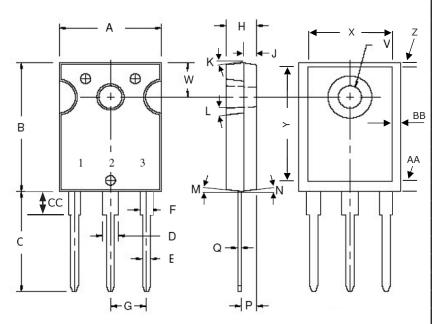


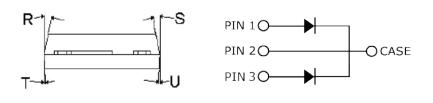
Figure 6. Transient Thermal Impedance



Package Dimensions

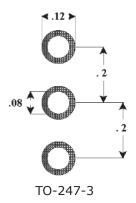
Package TO-247-3





DOS	Inc	hes	Millimeters		
POS	Min	Max	Min	Max	
А	.605	.635	15.367	16.130	
В	.800	.831	20.320	21.10	
С	.780	.800	19.810	20.320	
D	.095	.133	2.413	3.380	
E	.046	.052	1.168	1.321	
F	.060	.095	1.524	2.410	
G	.215	TYP	5.460) TYP	
Н	.175	.205	4.450	5.210	
J	.075	.085	1.910	2.160	
K	6°	21°	6°	21°	
L	4°	6°	4°	6°	
М	2°	4°	2°	4°	
N	2°	4°	2°	4°	
Р	.090	.100	2.286	2.540	
Q	.020	.030	.508	.762	
R	9°	11°	9°	11°	
S	9°	11°	9°	11°	
Т	2°	8°	2°	8°	
U	2°	8°	2°	8°	
V	.137	.144	3.487	3.658	
W	.210	.248	5.334	6.300	
Х	.502	.557	12.751	14.150	
Y	.637	.695	16.180	17.653	
Z	.038	.052	0.964	1.321	
AA	.110	.140	2.794	3.556	
BB	.030	.046	0.766	1.168	
CC	.161	.176	4.100	4.472	

Recommended Solder Pad Layout



Part Number	Package	Marking	
C2D20120D	TO-247-3	C2D20120	

Note: Recommended soldering profiles can be found in the applications note here: http://www.cree.com/power_app_notes/soldering





Notes

• RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from your Cree representative or from the Product Documentation sections of www.cree.com.

REACh Compliance

REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Cree representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

• 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.