

HCD5G20120H Silicon Carbide Schottky Diode

$$V_{RRM} = 1200V$$

$$I_F(T_C=150^{\circ}C) = 20 A$$

$$Q_C = 126 nC$$

Features

- 1200 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

Benefits

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

Applications

- Switching Mode Power Supply
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

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	1300	V		
V _R	DC Peak Reverse Voltage	1200	V		
I _F	Continuous Forward Current	59 27 20	A	T _c =25 °C T _c =135 °C T _c =150 °C	Fig. 3
I _{FSM}	Non- Repetitive Forward Surge Current	160	A	T _c =25 °C, t _p =10 ms, Half Sine Pulse	
P _{tot}	Power Dissipation	250 108	W	T _c =25 °C T _c =110 °C	Fig. 4
T _J	Operating Junction Range	-55 to +175	°C		
T _{stg}	Storage Temperature Range	-55 to +175	°C		

Package



TO-247-2



Part Number	Package	Marking
HCD5G20120H	TO-247-3	HCD5G20120H

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.45 2.0	1.7 2.6	V	$I_F = 20\text{ A}$, $T_J = 25\text{ }^\circ\text{C}$ $I_F = 20\text{ A}$, $T_J = 175\text{ }^\circ\text{C}$	Fig. 1
I_R	Reverse Current	15 50	200 500	μA	$V_R = 1200\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$ $V_R = 1200\text{ V}$, $T_J = 175\text{ }^\circ\text{C}$	Fig. 2
Q_C	Total Capacitive Charge	126		nC	$V_R = 800\text{ V}$, $I_F = 20\text{ A}$ $T_J = 25\text{ }^\circ\text{C}$	Fig. 6
C	Total Capacitance	1702 120 95		pF	$V_R = 0\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 400\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 800\text{ V}$, $T_J = 25\text{ }^\circ\text{C}$, $f = 1\text{ MHz}$	Fig. 5
E_C	Capacitance Stored Energy	32.5		μJ	$V_R = 800\text{ V}$	Fig. 7

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

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case		0.6		$^\circ\text{C/W}$	Fig.8

Typical Performance

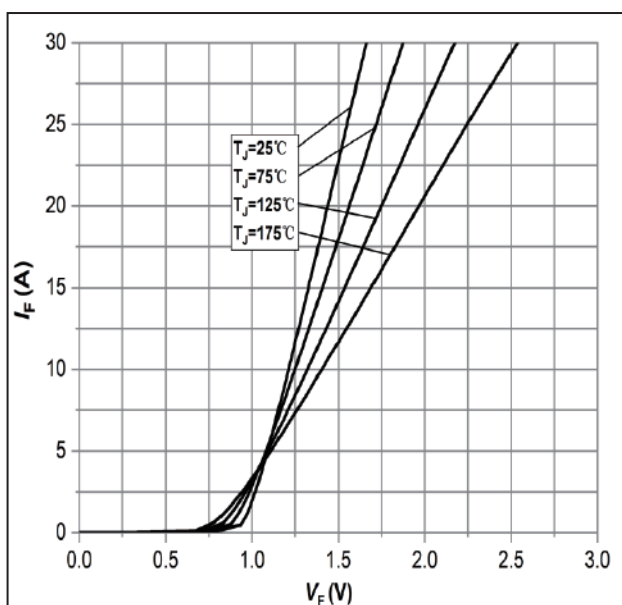


Figure 1: Forward Characteristics

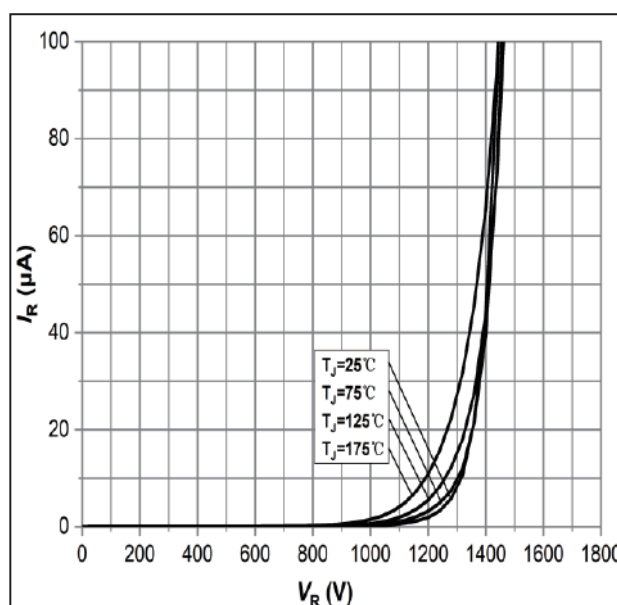


Figure 2: Reverse Characteristics

Typical Performance

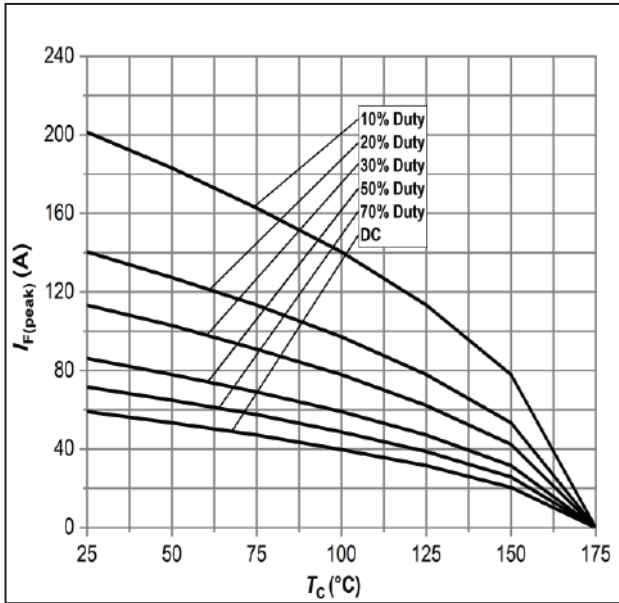


Figure 3: Current Derating

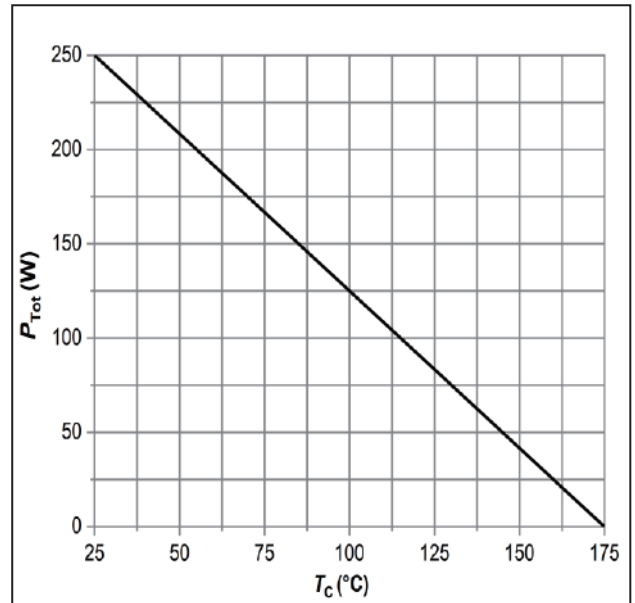


Figure 4: Power Derating

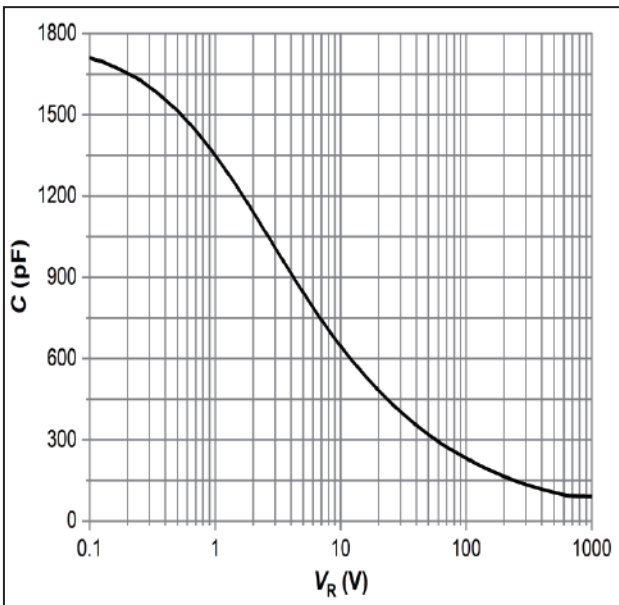


Figure 5: Capacitance vs. Reverse Voltage

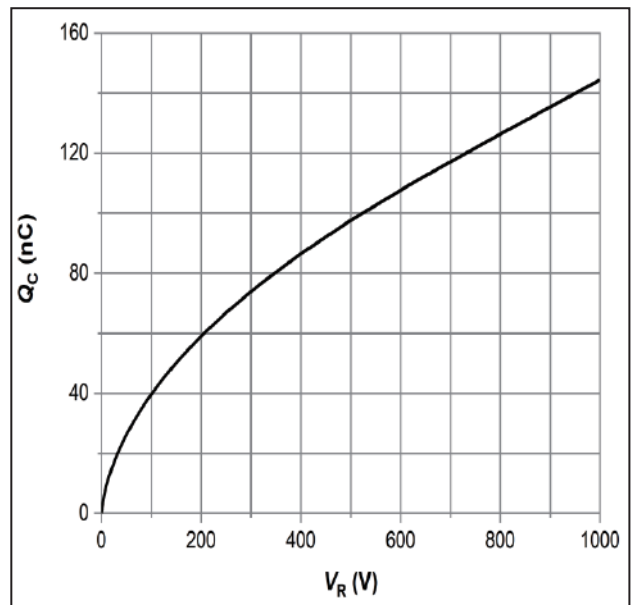


Figure 6: Total Capacitance Charge vs. Reverse Voltage

Typical Performance

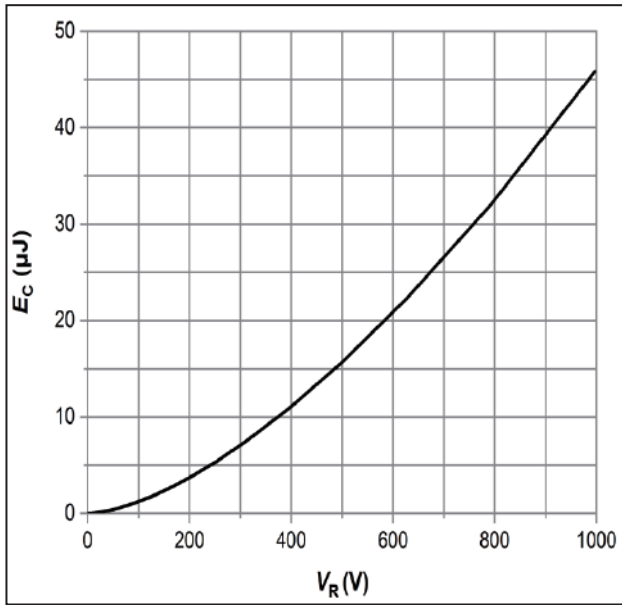


Figure 7: Typical Capacitance Stored Energy

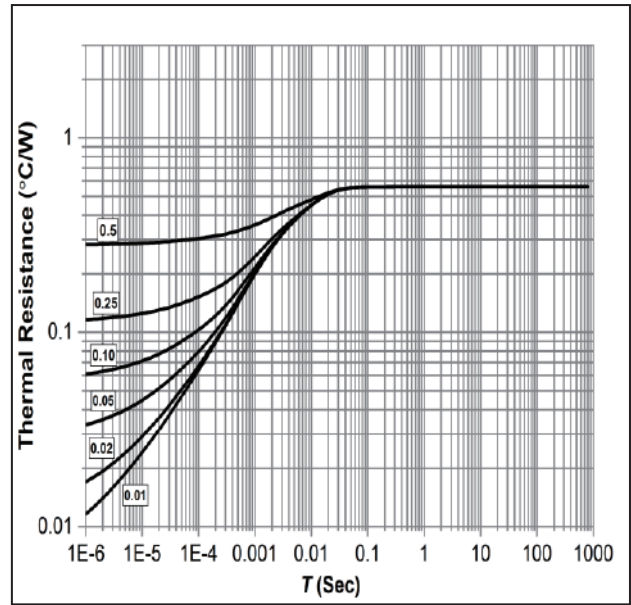
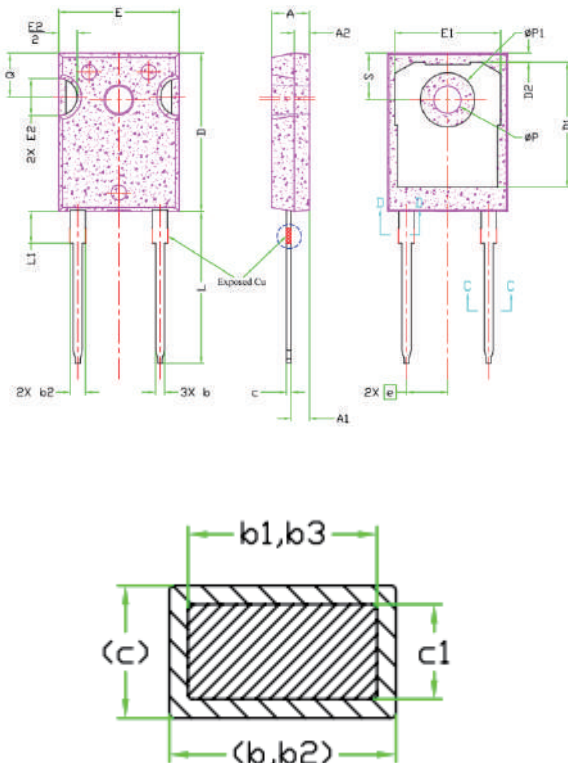


Figure 8: Transient Thermal Impedance

Package Dimensions

TO-247-2



SYMBOL	DIMENSIONS			NOTES
	Min.	NOM	Max.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
C	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.88	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
ØP	3.56	3.61	3.65	7
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	

Revision History

Document Version	Description of Changes
RevX.0.1	Released

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