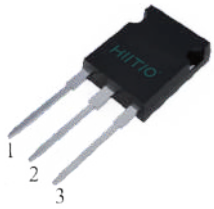
HCD5G20120D Silicon Carbide Schottky Diode

V_{RRM} = 1200V
$I_F(T_C=153℃)$ = 20 A
Q_C = 122 nC

Package



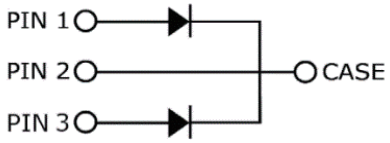
TO-247-3

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

Part Number	Package	Marking
HCD5G20120D	TO-247-3	HCD5G20120D

Maximum Ratings （Tc = 25 ℃ 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	31.5/63 14.5/29 10/20	A	T_C=25 ℃ T_C=135 ℃ T_C=152 ℃	Fig. 3
I_{FSM}	Non-Repetitive Forward Surge Current	80	A	T_C=25 ℃, t_p=10 ms, Half Sine Pulse	
P_{tot}	Power Dissipation	144 62	W	T_C=25 ℃ T_C=110 ℃	Fig. 4
T_J	Operating Junction Range	-55 to +175	℃		
T_{stg}	Storage Temperature Range	-55 to +175	℃		

Electrical Characteristics （Per Leg）

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.45 2.0	1.75 2.6	V	I_F =10 A， T_J = 25 ℃ I_F = 10 A， T_J = 175 ℃	Fig. 1
I_R	Reverse Current	4 30	100 300	μA	V_R = 1200V， T_J = 25 ℃ V_R = 1200V， T_J = 175 ℃	Fig. 2
Q_C	Total Capacitive Charge	61		nC	V_R = 800 V， I_F = 10 A， T_J = 25 ℃	Fig. 6
C	Total Capacitance	800 57 42		pF	V_R = 0 V， T_J = 25 ℃， f = 1 MHz V_R = 400 V， T_J = 25 ℃， f = 1 MHz V_R = 800 V， T_J = 25 ℃， f = 1 MHz	Fig. 5
E_C	Capacitance Stored Energy	15.6		μJ	V_R = 800 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		1.04 0.52		℃/W	Fig.8

Typical Performance （Per Leg）

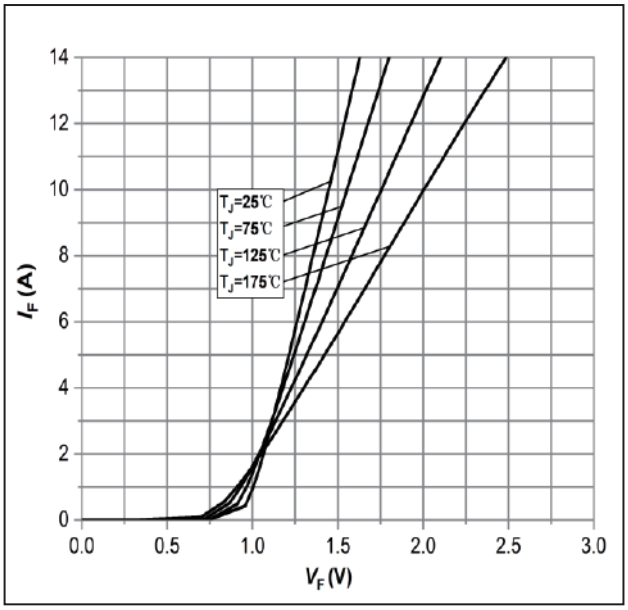


Figure 1: Forward Characteristics

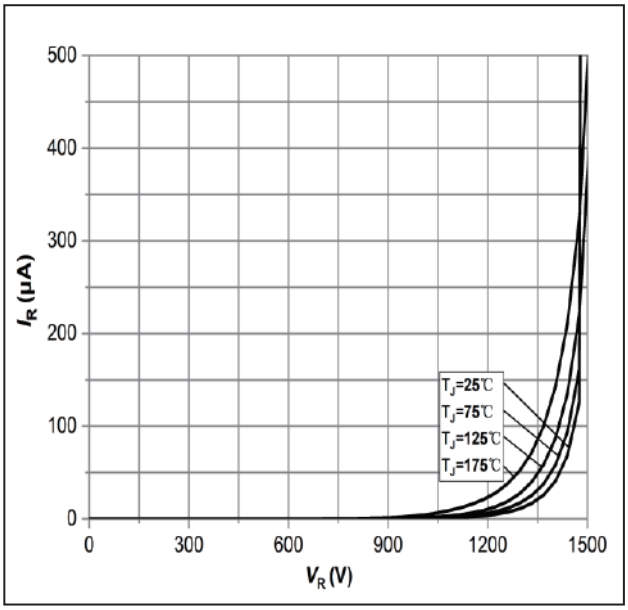


Figure 2: Reverse Characteristics

Typical Performance （Per Leg）

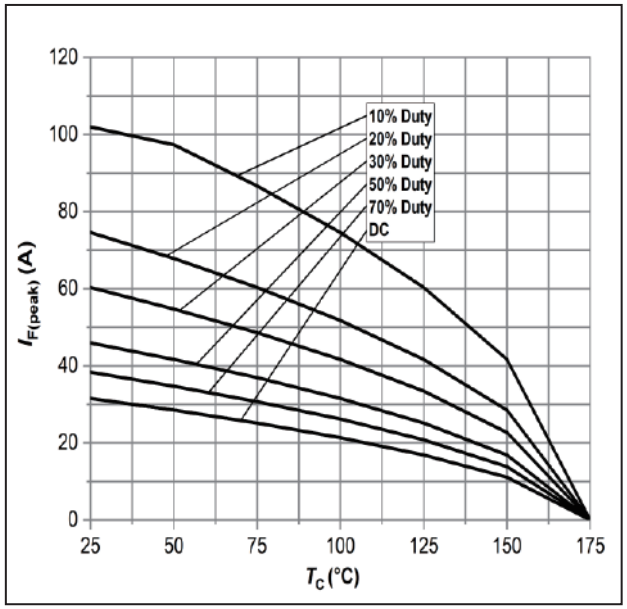


Figure 3: Current Derating

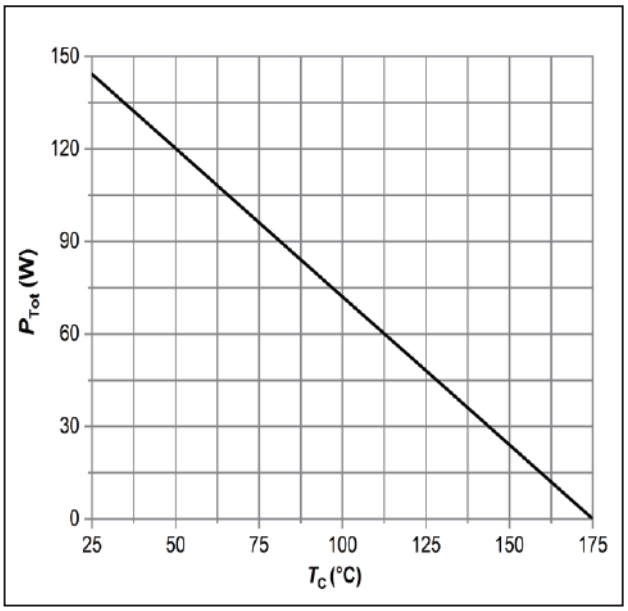


Figure 4: Power Derating

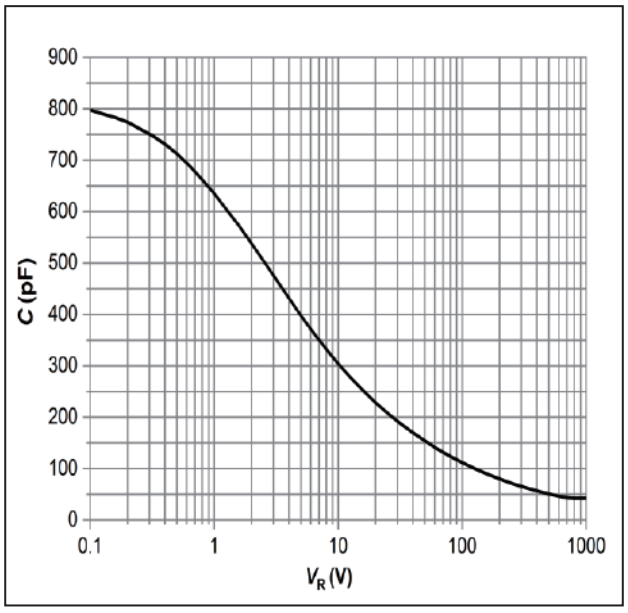


Figure 5: Capacitance vs. Reverse Voltage

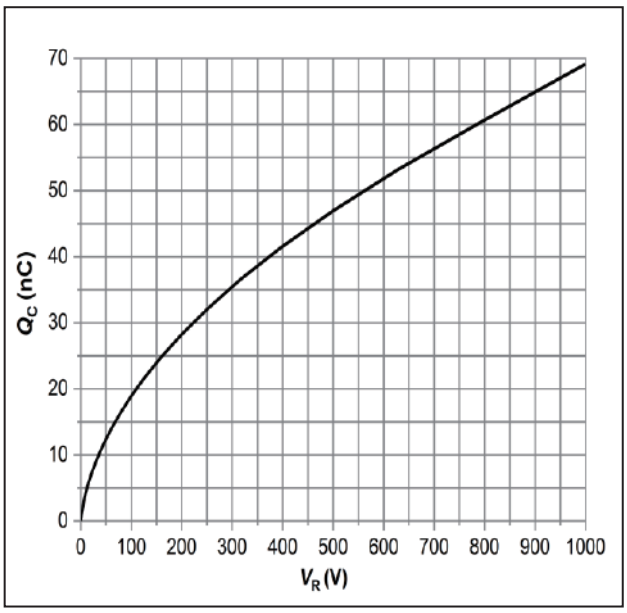


Figure 6: Total Capacitance Charge vs. Reverse Voltage

Typical Performance （Per Leg）

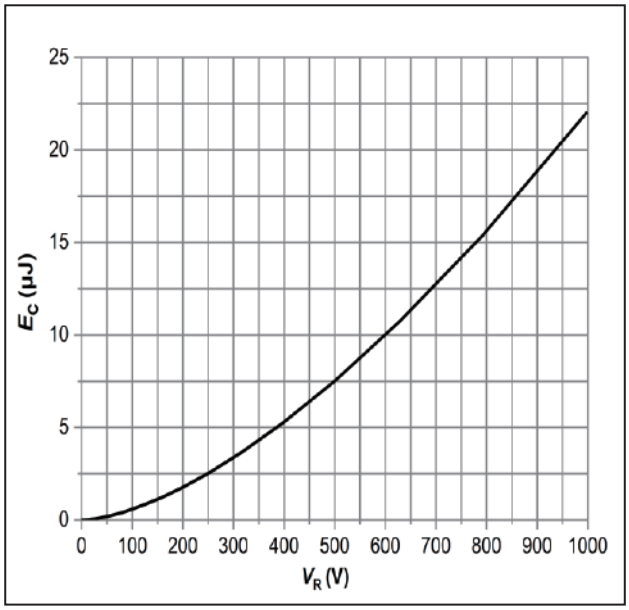


Figure 7:Typical Capacitance Stored Energy

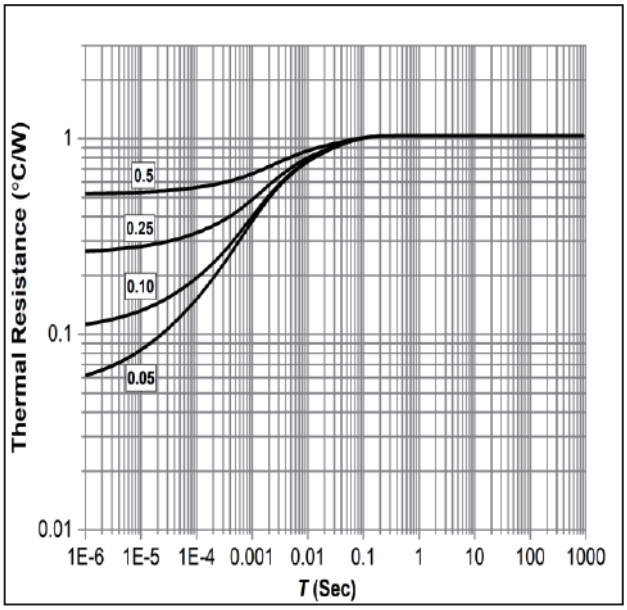


Figure 8:Transient Thermal Impedance

Package Dimensions

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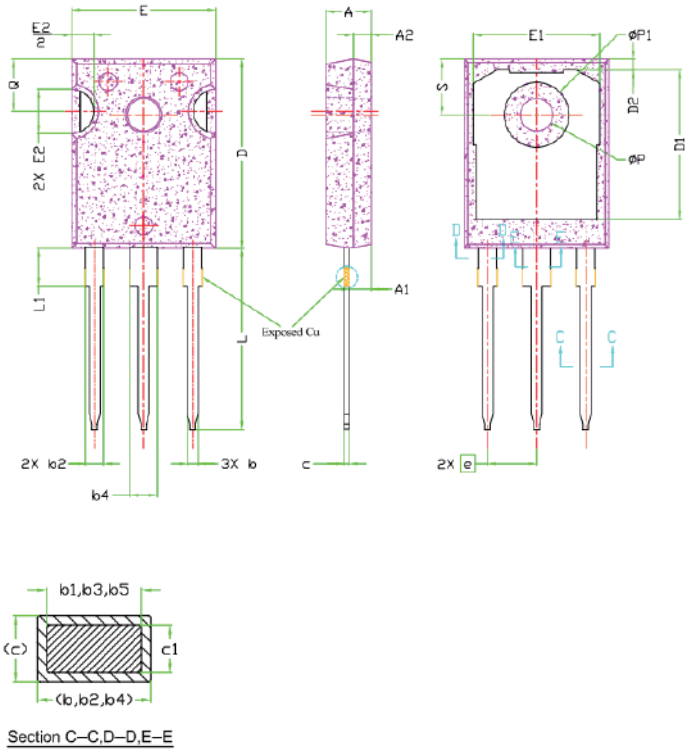

SYMBOL	DIMENSIONS			NOTES
	Min.	NOM	Max.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6,8
b5	2.87	3.00	3.18	
C	0.55	0.60	0.65	6
c1	0.55	0.60	0.65	
D	20.88	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	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	

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

Revision History

Document Version	Description of Changes
RevX.0.1	Released

Zhejiang HIITIO New Energy Co., Ltd
ADD : NO.1125 Zhixing Road,Qiaonan District, Xiaoshan Economic and Technological Development Zone,Hangzhou,Zhejiang
TEL :400-667-9977