HC6D15120A

Silicon Carbide Schottky Diode

Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- 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 (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters

TO-220-2L
Package

Part Number	Package	Marking
HC6D15120A	TO-220-2L	HC6D15120A

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

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V		
DC Blocking Voltage	V_{DC}	1200			
Continuous Forward Current	I_F	43.5	A	T_J = 25 °C	Fig. 3
		21		T_J= 135 °C	
		15		T_J = 152.5 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	68		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	
		44		T_C = 110 °C, t_p = 10 ms, Half Sine Wave	
Non-Repetitive Forward Surge Current	I_{FSM}	100		T_C = 25 °C, t_p = 10 ms, Half Sine Wave	Fig. 8
		85		T_C = 110 °C,t_p = 10 ms, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	900		T_C = 25 °C, t_p = 10 µs, Pulse	
		750		T_C = 110°C, t_p = 10 µs, Pulse	
Power Dissipation	P_{tot}	214	W	T_J = 25 °C	Fig. 4
		93		T_J = 110 °C	
i²t Value	∫i²t	50	A^2s	T_C = 25 °C, t_p = 10 ms	
		36		T_C = 110°C, t_p = 10 ms	

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.6	1.8	V	I_F = 15 A, T_j = 25 °C	Fig. 1
		2.2	3		I_F = 15 A, T_j = 175 °C	
Reverse Current	I_R	35	200	μA	V_R = 1200 V, T_j = 25 °C	Fig. 2
		120	300		V_R = 1200 V, T_j = 175 °C	
Total Capacitive Charge	Q_C	77.5		nC	V_R = 800 V, T_j = 25 °C	Fig. 5
Total Capacitance	C	1200		pF	V_R = 0 V, T_j = 25 °C, f = 1 MHz	Fig. 6
		70			V_R = 400 V, T_j = 25 °C, f = 1 MHz	
		50			V_R = 800 V, T_j = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_C	22		μJ	V_R = 800 V	Fig. 7

Notes:
SiC Schottky Diodes are majority carrier devices, so there is no reverse recovery charge.

Thermal & Mechanical Characteristics

Parameter	Symbol	Value	Unit	Notes
Thermal Resistance, Junction to Case (Typical)	$R_{\theta, JC (TYP)}$	0.7	°C / W	
Junction Temperature	T_j	-55 to +175	°C	
Case & Storage Temperature	T_c	-55 to +175		
TO-220-2L Mounfting Torque	-	1	Nm	M3 Screw
		8.8	lbf-in	6-32 Screw

Electrostatic Discharge (ESD) Classifications

Parameter	Symbol	Notes
Human Body Model	HBM	**Class 3B (≥ 8000 V)**
Charge Device Model	CDM	**Class C3 (≥ 1000 V)**

Typical Performance

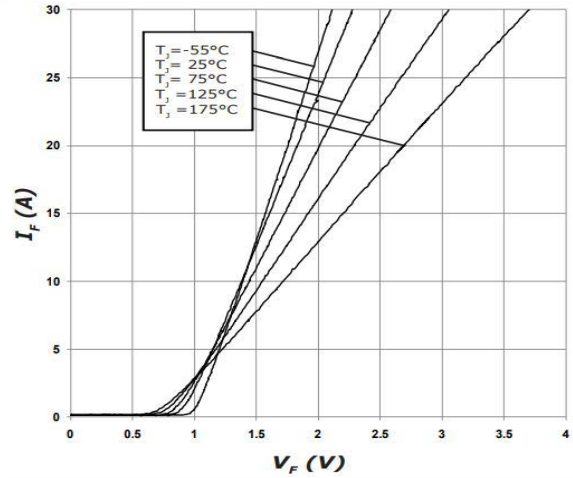


Figure 1

Forward Characteristics

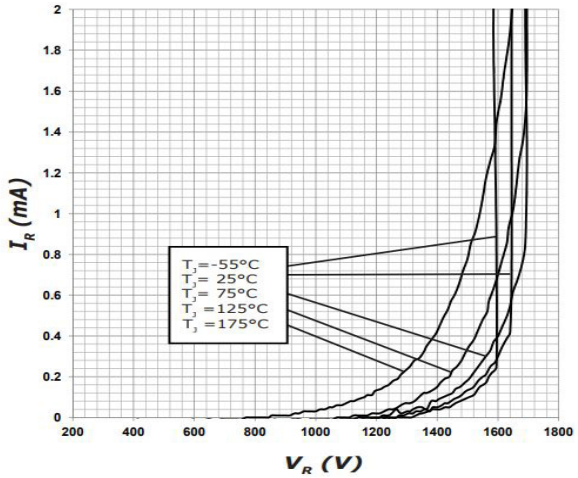


Figure 2

Reverse Characteristics

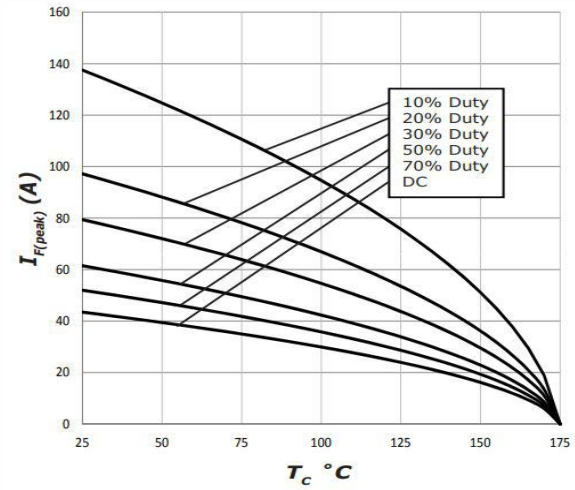


Figure 3

Current Derating

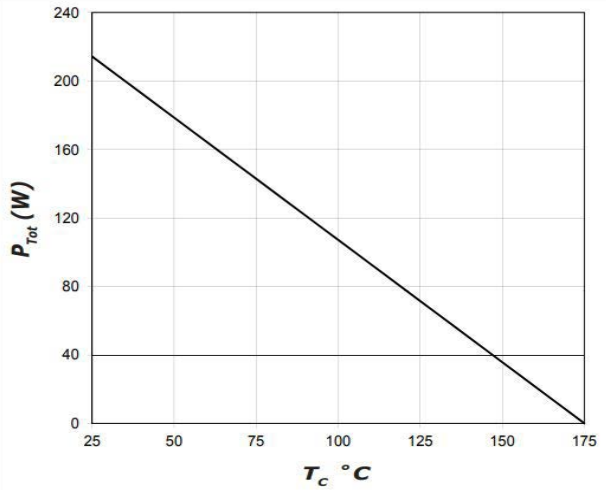


Figure 4

Power Derating

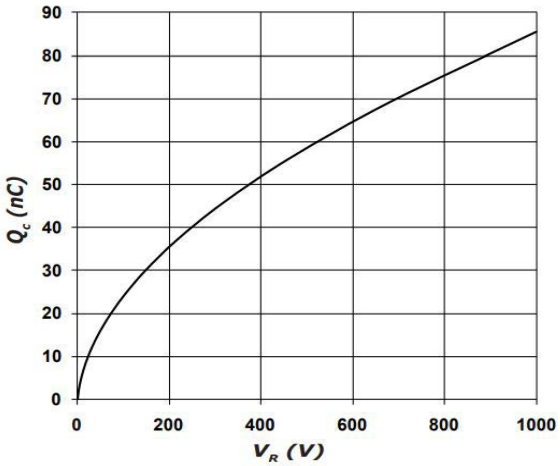


Figure 5

Total Capacitance vs. Reverse Voltage

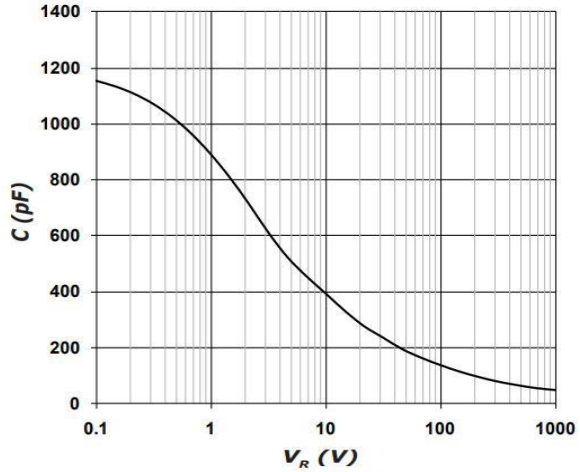


Figure 6

Capacitace vs. Reverse Voltage

Typical Performance

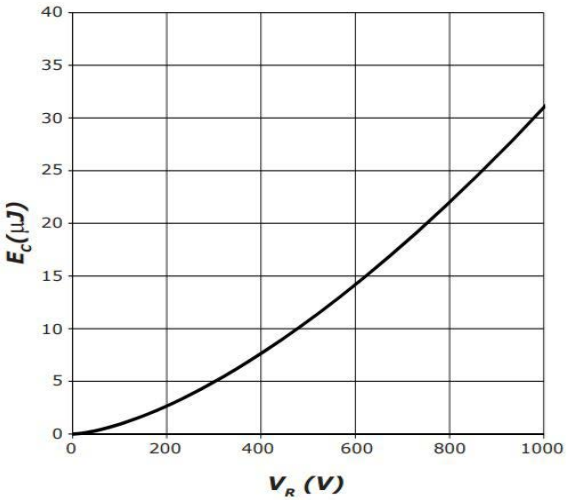


Figure 7

Capacitance Stored Energy

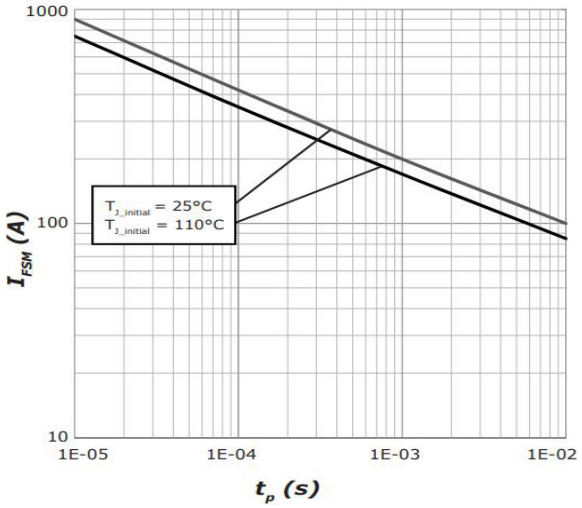


Figure 8

Non-Repetitive Peak Forward Surge Current versus Pulse Duration (sinusoidal waveform)

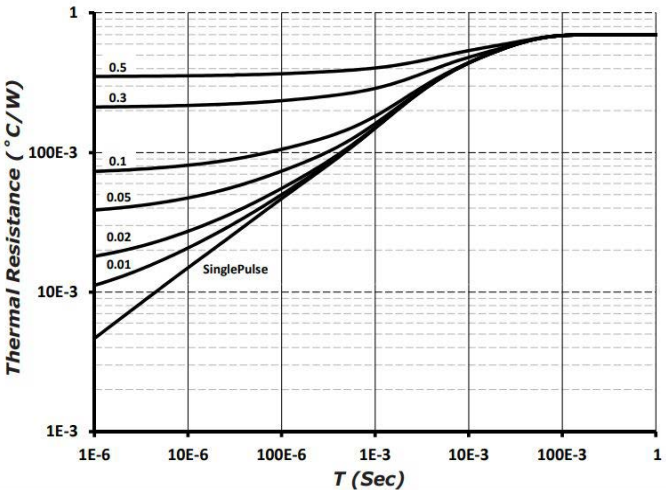
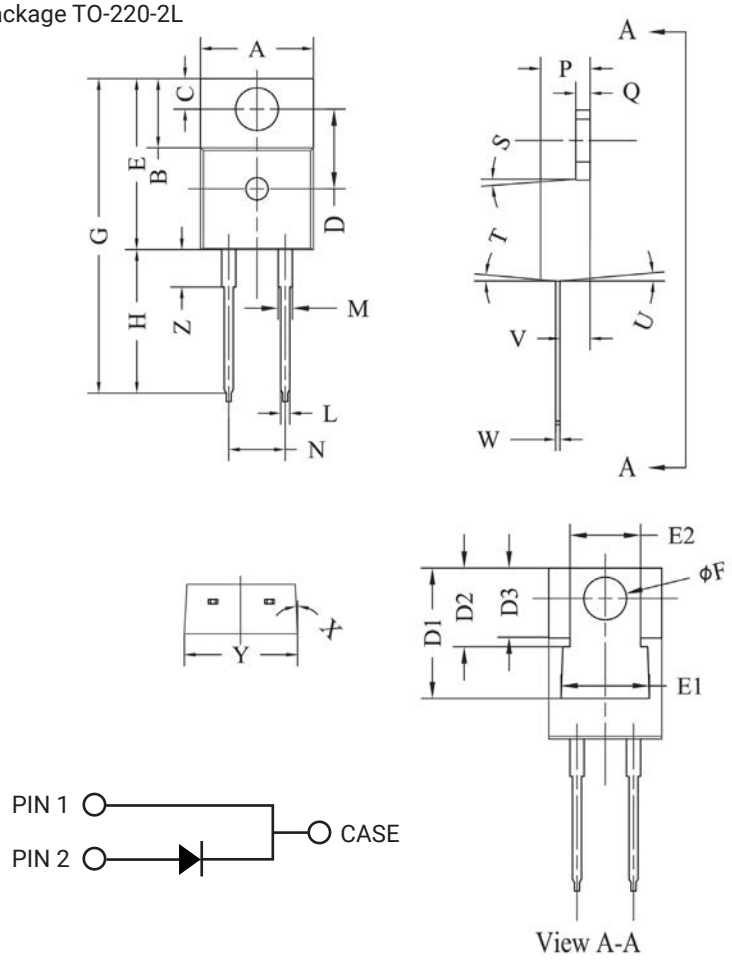


Figure 9

Transient Thermal Impedance

Package Dimensions

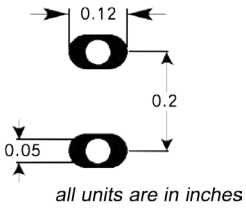
Package TO-220-2L



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
D1	.457-.490		11.60-12.45 typ	
D2	.277-.303 typ		7.04-7.70 typ	
D3	.244-.252 typ		6.22-6.4 typ	
E	.590	.615	14.986	15.621
E1	.302	.326	7.68	8.28
E2	.227	251	5.77	6.37
F	.143	.153	3.632	3.886
G	1.105	1.147	28.067	29.134
H	.500	.550	12.700	13.970
L	.025	.036	.635	.914
M	.045	.055	1.143	1.550
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



all units are in inches

TO-220-2L

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