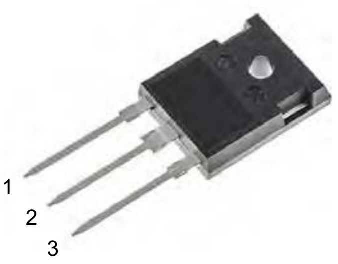
HUAXUANYANG HXY
ELECTRONICS CO.,LTD

HC4D15120D

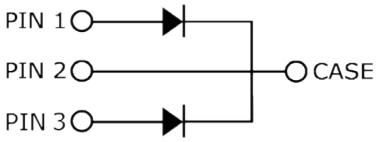
Silicon Carbide Schottky Diode

General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.



TO-247
Package



Features

- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_C
- Highly rugged due to better surge current
- Industrial standard quality and reliability

Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction

Ordering Part Number	Package	Marking
HC4D15120D	TO-247	HC4D15120D

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

Symbol	Parameter	Value		Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_{RSM}	Surge Peak Reverse Voltage	1300	V		
V_{DC}	DC Blocking Voltage	1200	V		
I_F	Continuous Forward Current (Per Leg/Device)	24.5/49 12/24 7.5/15	A	T_C=25˚C T_C=135˚C T_C=157˚C	Fig. 3
I_{FRM}	Repetitive Peak Forward Surge Current	38* 25*	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse T_C-110˚C, t_P=10 ms, Half Sine Pulse	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	66* 49.5*	A	T_C=25˚C, t_P=10 ms, Half Sine Pulse T_C=110˚C, t_P=10 ms, Half Sine Pulse	Fig. 8
$I_{F,Max}$	Non-Repetitive Peak Forward Current	600* 480*	A	T_C=25˚C, t_P=10 ms, Pulse T_C=110˚C, t_P=10 ms, Pulse	Fig. 8
P_{tot}	Power Dissipation(Per Leg/Device)	135/270 58.5/117	W	T_C=25˚C T_C=110˚C	Fig. 4
dV/dt	Diode dV/dt ruggedness	200	V/ns	V_R=0-960V	
$\int i^2 dt$	i^2t value	20.5* 12.25*	A^2s	T_C=25˚C, t_P=10 ms T_C=110˚C, t_P=10 ms	
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	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.2	1.8 3	V	I_F = 8 A T_J=25°C I_F = 8 A T_J=175°C	Fig. 1
I_R	Reverse Current	35 100	250 350	µA	V_R = 1200 V T_J=25°C V_R = 1200 V T_J=175°C	Fig. 2
Q_C	Total Capacitive Charge	37		nC	V_R = 800 V, I_F = 8 A d*i*/d*t* = 200 A/µs T_J = 25°C	Fig. 5
C	Total Capacitance	560 37 27		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz V_R = 800 V, T_J = 25°C, f = 1 MHz	Fig. 6
E_C	Capacitance Stored Energy	10.5		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	Typ.	Max.	Unit	Note
$R_{θJC}$	Thermal Resistance from Junction to Case	1.11* 0.56**		°C/W	Fig. 9

* Per Leg, ** Per Device

Typical Performance

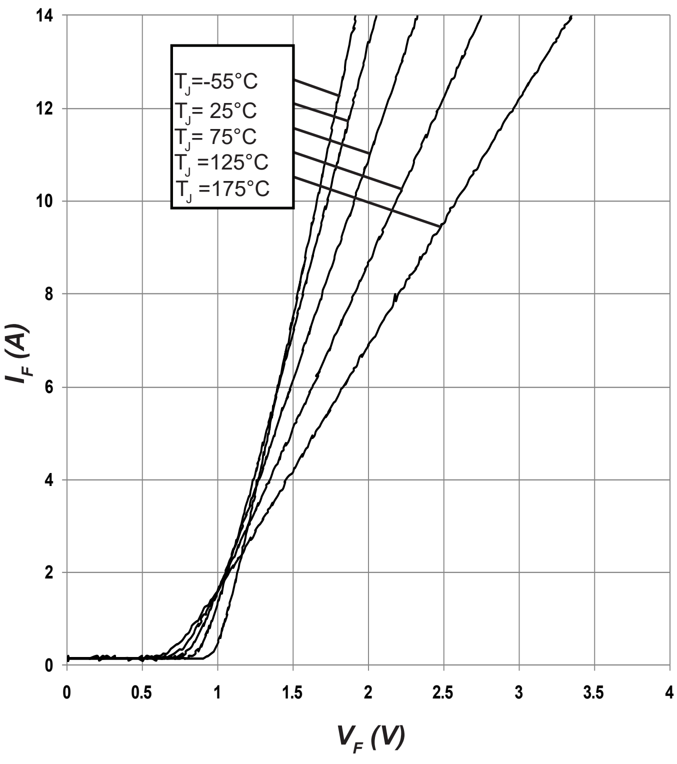


Figure 1. Forward Characteristics

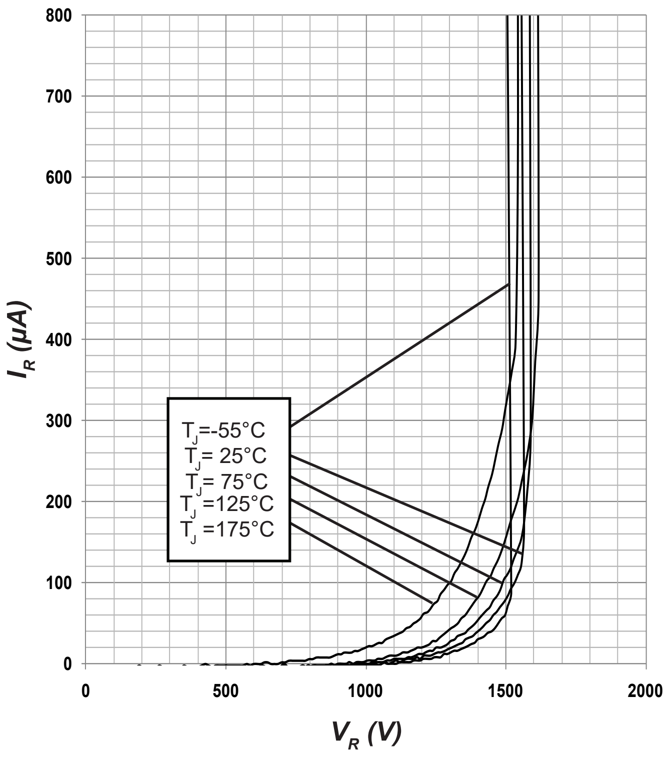


Figure 2. Reverse Characteristics

Typical Performance (Per Leg)

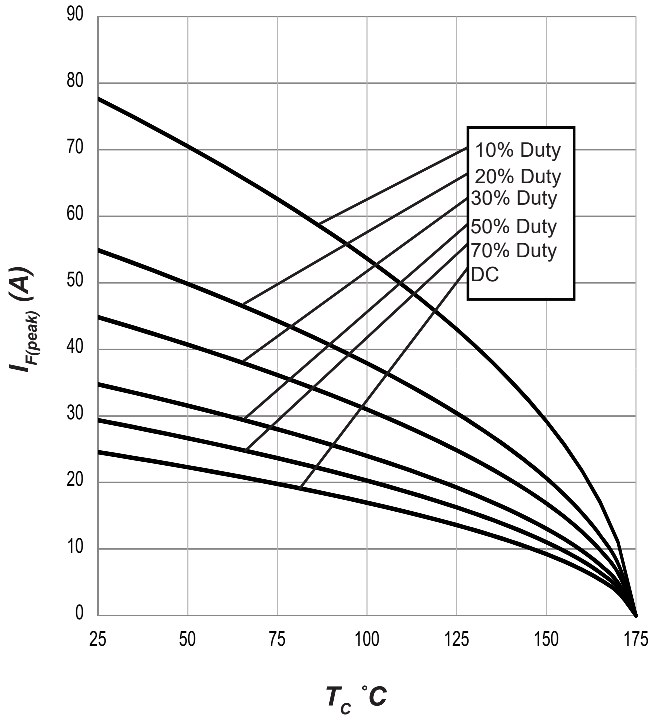


Figure 3. Current Derating

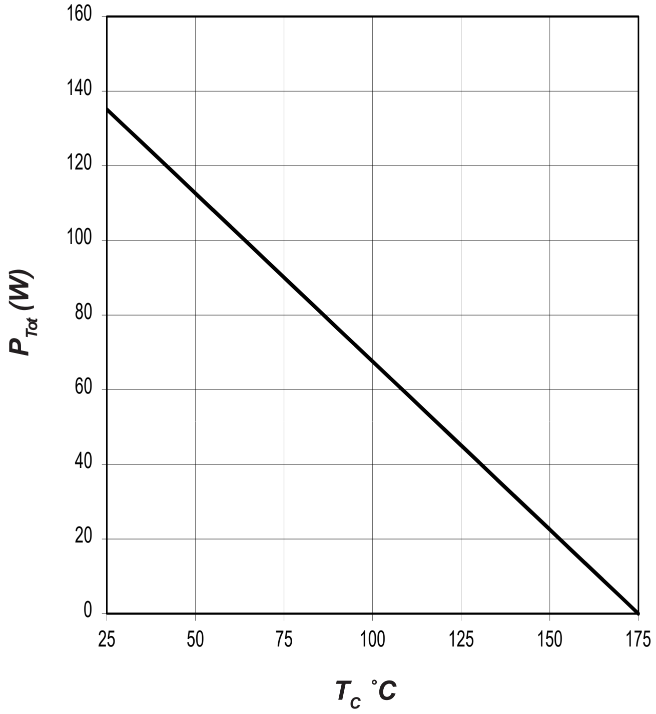


Figure 4. Power Derating

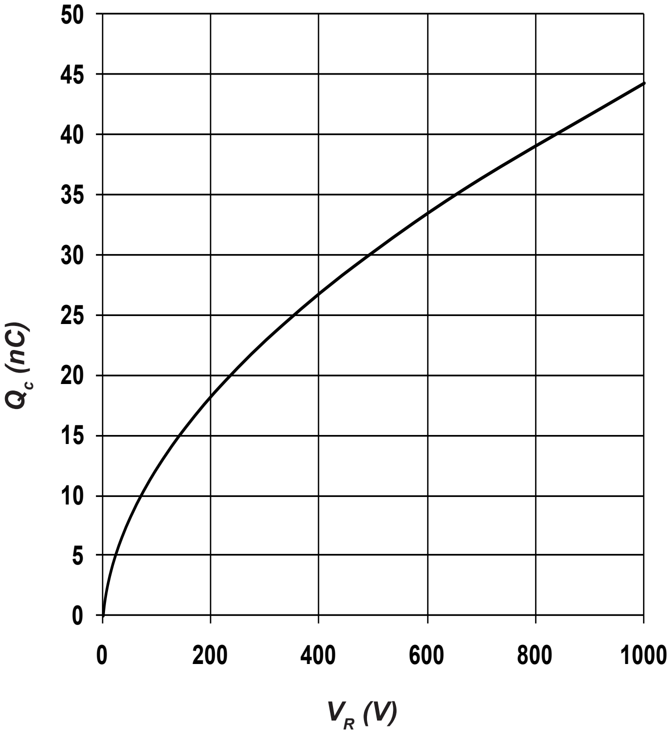


Figure 5. Recovery Charge vs. Reverse Voltage

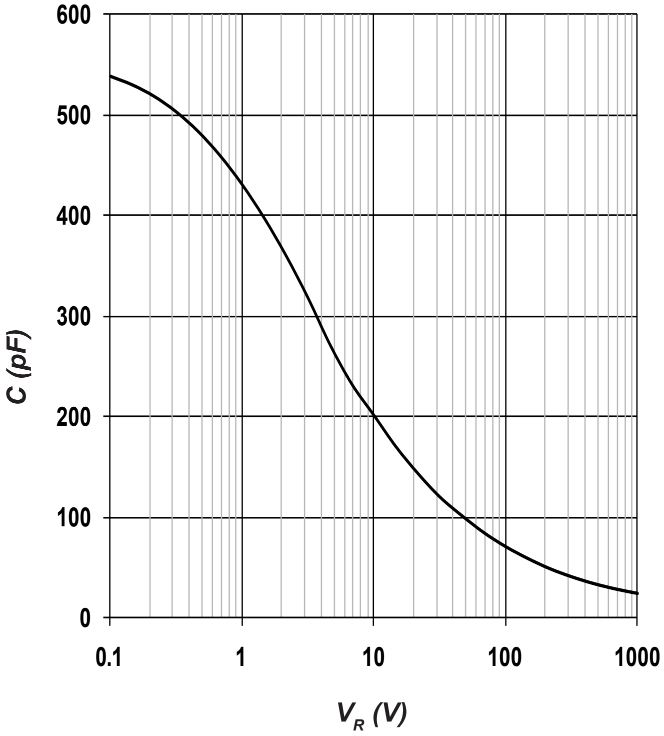


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

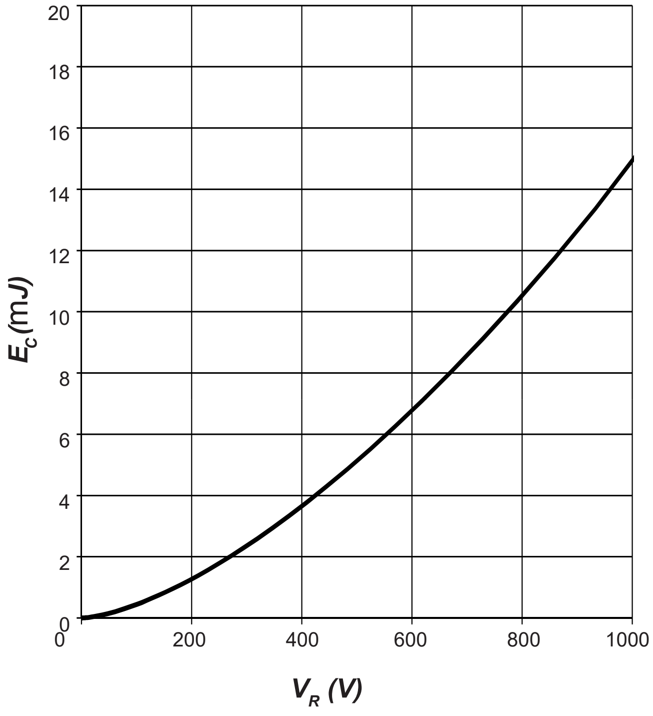


Figure 7. Typical Capacitance Stored Energy, per leg

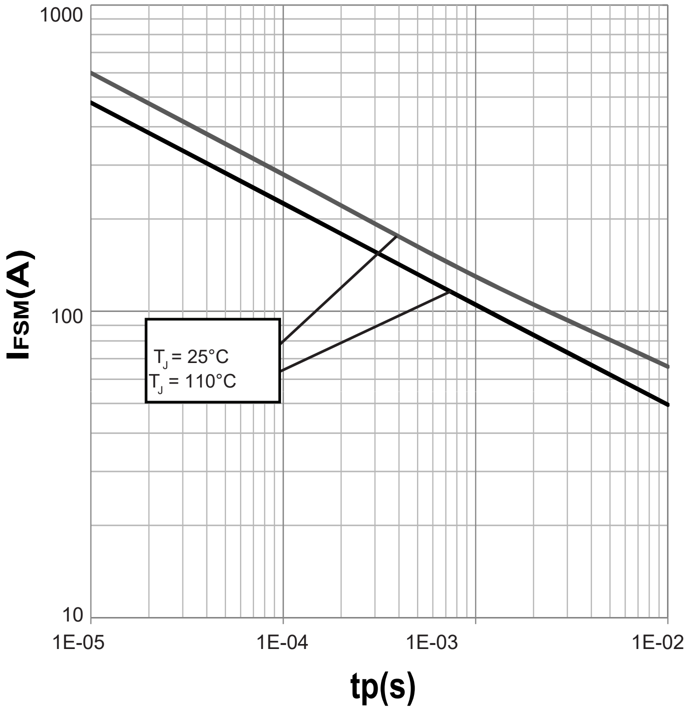


Figure 8. Non-repetitive Peak Forward Surge Current vs. Pulse Duration (sinusoidal waveform), per leg

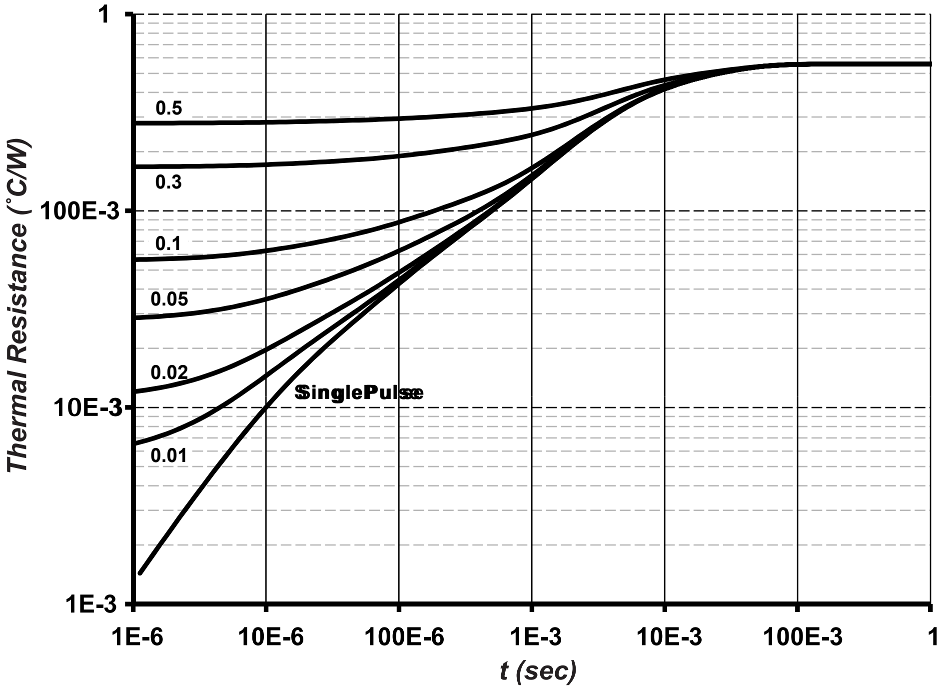
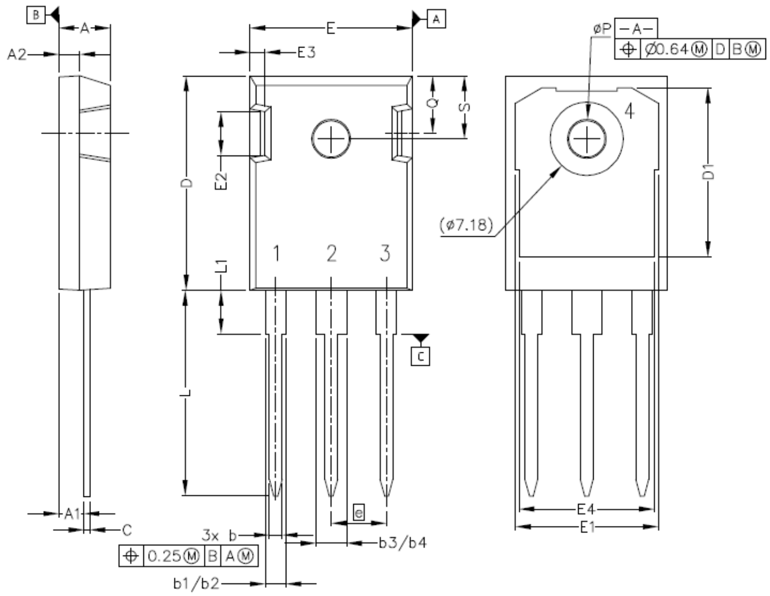


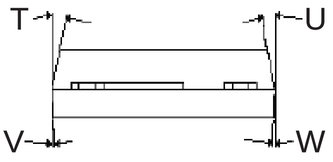
Figure 9. Device Transient Thermal Impedance

Package Dimensions

Package TO-247



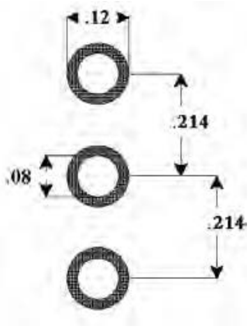
POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b2	.075	.085	1.91	2.16
b3	.113	.133	2.87	3.38
b4	.113	.123	2.87	3.13
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.557	13.10	14.15
E2	.145	.201	3.68	5.10
E3	.039	.075	1.00	1.90
E4	.487	.529	12.38	13.43
e	.214 BSC		5.44 BSC	
N	3		3	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
T	9°	11°	9°	11°
U	9°	11°	9°	11°
V	2°	8°	2°	8°
W	2°	8°	2°	8°



Pinout Information:

- Pin 1 = Gate
- Pin 2, 4 = Drain
- Pin 3 = Source

Recommended Solder Pad Layout



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