GC4D30120D

Silicon Carbide Schottky Diode

Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

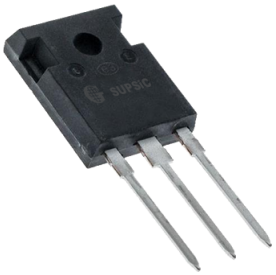
Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- 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

V_{RRM}	=	1200 V
I_F (T_C=135°C)	=	43A**
Q_c	=	155nC**



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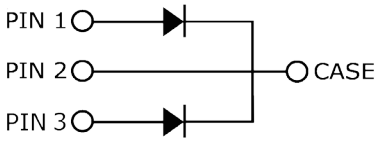
Package



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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 (Per Leg/Device)	44/88 21.5/44 15/30	A	T_C=25°C T_C=135°C T_C=152°C	
I_{FRM}	Repetitive Peak Forward Surge Current	66 45	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 Forward Surge Current	100 86	A	T_C=25°C, t_p=10 ms, Half Sine Pulse T_C=110°C, t_p=10 ms, Half Sine Pulse	
$I_{F,Max}$	Non-Repetitive Peak Forward Current	900 750	A	T_C=25°C, t_p=10 µs, Pulse T_C=110°C, t_p=10 µs, Pulse	
P_{tot}	Power Dissipation (Per Leg/Device)	220/440 95/190	W	T_C=25°C T_C=110°C	
dV/dt	Diode dV/dt ruggedness	200	V/ns	V_R=0-960V	
$\int i^2dt$	i^2t value	52 37	A^2s	T_C=25°C, t_p=10 ms T_C=110°C, t_p=10 ms	
T_J	Operating Junction Range	-55 to +175	°C		
T_{stg}	Storage Temperature Range	-55 to +135	°C		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

Electrical Characteristics (Per Leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.6 2.3	1.8 3	V	I_F = 15 A T_J=25°C I_F = 15 A T_J=175°C	
I_R	Reverse Current	36 120	200 300	μA	V_R = 1200 V T_J=25°C V_R = 1200 V T_J=175°C	
Q_C	Total Capacitive Charge	78		nC	V_R = 800 V, I_F = 15A d*i*/d*t* = 200 A/μs T_J = 25°C	
C	Total Capacitance	1200 70 50		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	
E_C	Capacitance Stored Energy	22.1		μJ	V_R = 800 V	

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.34** 0.68*	°C/W	

Package Dimensions

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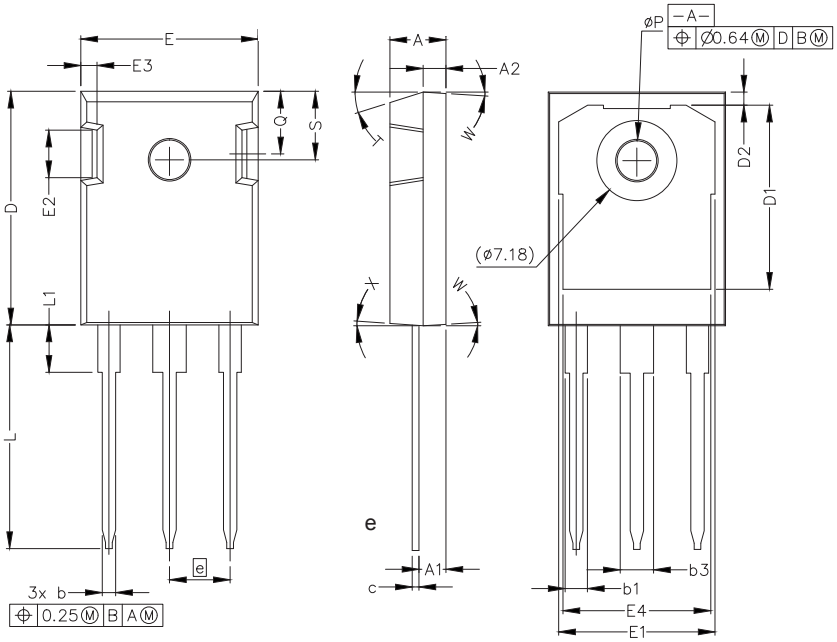
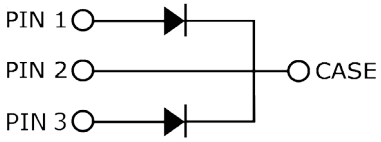
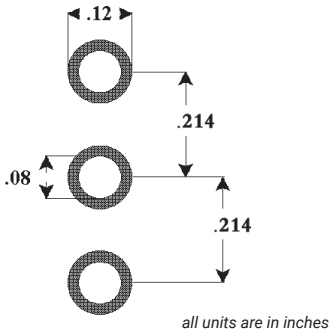


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b3	.113	.133	2.87	3.38
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.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	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
N	3			
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
T	17.5° REF			
W	3.5° REF			
X	4° REF			



Recommended Solder Pad Layout



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