GHXS050A060S-D3

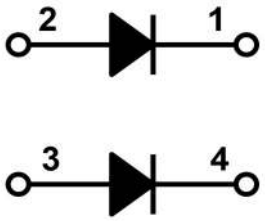
VDC	600 V
I_F	50 A
$T_{j,max}$	175 °C

600V SiC Power Module
Dual Diode Pack

Features

- SiC Schottky Diode
  - Zero reverse recovery
  - Zero forward recovery
  - Temperature independent switching behavior
  - Positive temperature coefficient on V_F
- Low stray inductance
- High junction temperature operation
- All parts tested to greater than 715V

Package



Parallel

Benefits

- Outstanding performance at high frequency operation
- Low loss and low EMI noise
- Very rugged and easy mounting
- Internally isolated package (AlN)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_C of V_F
- RoHS compliant

Part #	Package	Marking
GHXS050A060S-D3	SOT-227	GHXS050A060S-D3

Applications

- Switched-mode power supply
- Induction heater
- Welding equipment
- Charging station

RoHS

Maximum Ratings, at T_j=25 °C, unless otherwise specified (per leg)

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I_{F*}	T_C=25 °C, T_j=175 °C	129	A
		T_C=143 °C, T_j=175 °C	50	
		T_C=150 °C, T_j=175 °C	42	
Surge non-repetitive forward current sine halfwave	I_{FSM}	T_C=25 °C, t_p=8.3 ms	420	A
		T_C=110 °C, t_p=8.3 ms	390	
Non-repetitive peak forward current	$I_{F,max}$	T_C=25 °C, t_p=10 µs	2000**	A
i^2t value	$\int i^2dt$	T_C=25 °C, t_p=8.3 ms	732	A^2s
		T_C=110 °C, t_p=8.3 ms	631	
Repetitive peak reverse voltage	V_{RRM}	T_j=25 °C	600	V
Diode *dv/dt* ruggedness	*dv/dt*	Turn-on slew rate, repetitive	200	V/ns
Power dissipation	P_{tot*}	T_C=25 °C	386	W
Operating junction temperature	T_j		-55…175	°C
Storage temperature	$T_{storage}$		-55…150	°C

Notes: *Typical Rth_{JC} used
**Limited by testing equipment

Electrical Characteristics, at T_j=25 °C, unless otherwise specified (per leg)

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
DC blocking voltage	V_{DC}	I_R=120μA, $_T$j=25 °C	600	-	-	V
Breakdown voltage	V_{BR}	I_R=1.58mA, T_j=25 °C	715	-	-	V
Diode forward voltage	V_F	I_F=50A, T_j=25 °C	-	1.48	1.60	V
		I_F=50A, T_j=125 °C	-	1.58	-	
		I_F=50A, T_j=175 °C	-	1.64	2.00	
Reverse current	I_R	V_R=600V, T_j=25 °C	-	3	120	μA
		V_R=715V, T_j=25 °C	-	27	-	
		V_R=600V, T_j=125 °C	-	26	-	
		V_R=600V, T_j=175 °C	-	104	800	
Total capacitive charge	Q_C	V_R=400V, T_j=25 °C	-	144	-	nC
Total capacitance	C	V_R=1V, f=1 MHz	-	2285	-	pF
		V_R=200V, f=1 MHz	-	272	-	
		V_R=400V, f=1 MHz	-	227	-	

Thermal and Package Characteristics, at T_j=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction-case	R_{thJC}	Per leg	-	0.39	0.50	°C/W
Mounting torque	M_d	M4-0.7 screws	1.1	-	1.5	N-m
Terminal connection torque	M_{dt}	M4-0.7 screws	-	1.1	1.3	N-m
Package weight	W_t		-	32	-	g
Isolation voltage	V_{ISOL}	I_{ISOL} < 1mA, 50/60 Hz, 1 min	2500	-	-	V

Typical Performance Per Leg

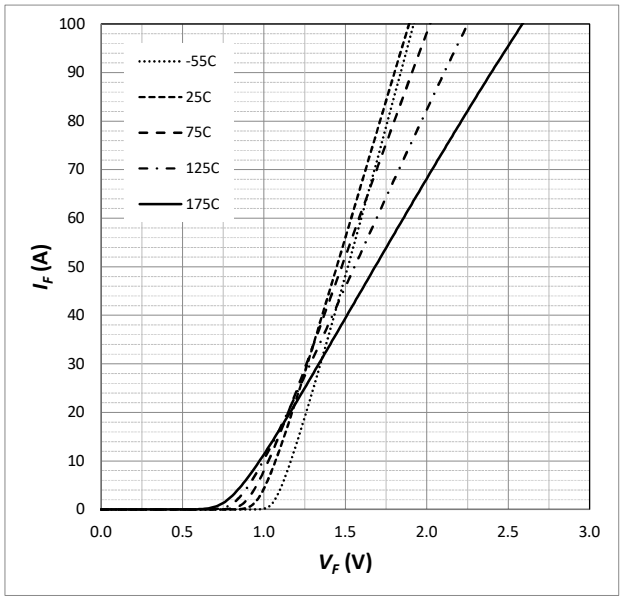


Fig. 1 Forward Characteristics (parameterized on T_j)

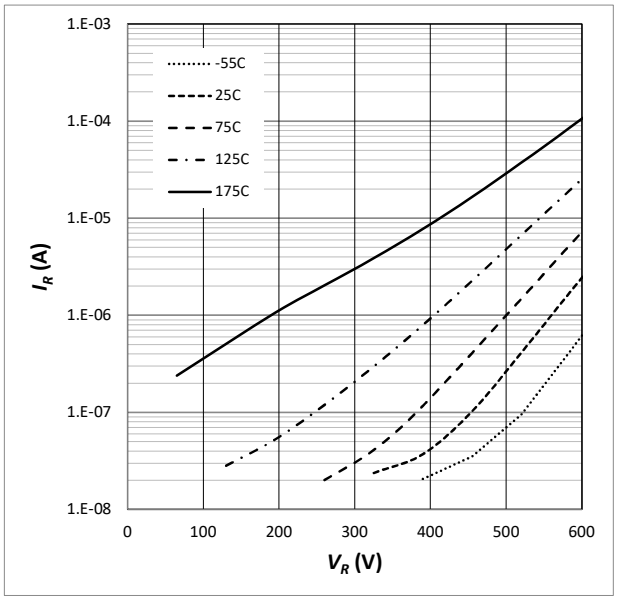


Fig. 2 Reverse Characteristics (parameterized on T_j)

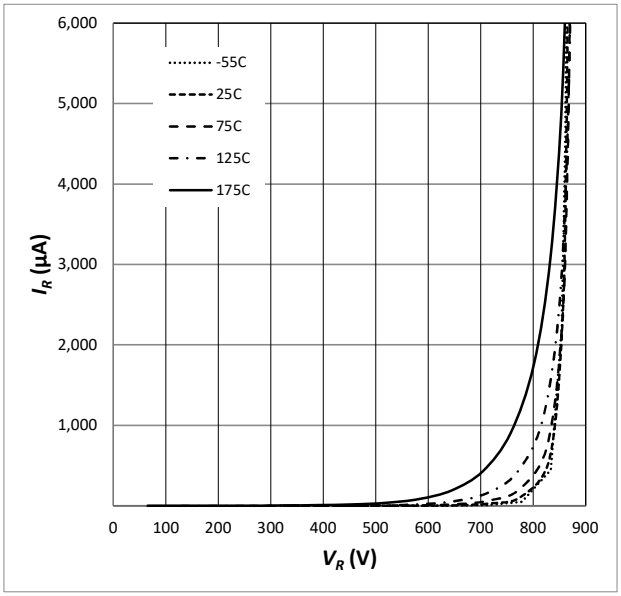


Fig. 3 Reverse Characteristics (parameterized on Tj)

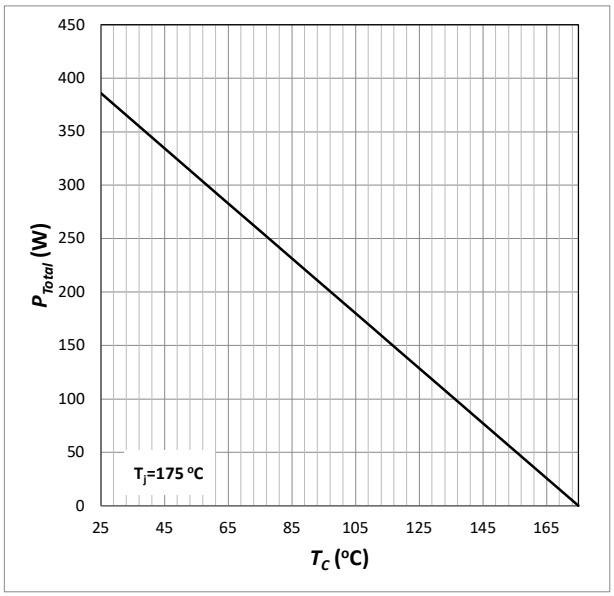


Fig. 4 Power Derating

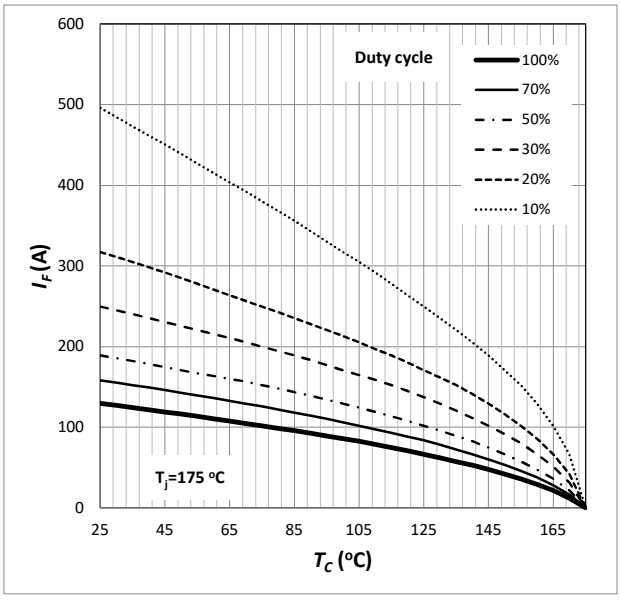


Fig. 5 Current Derating

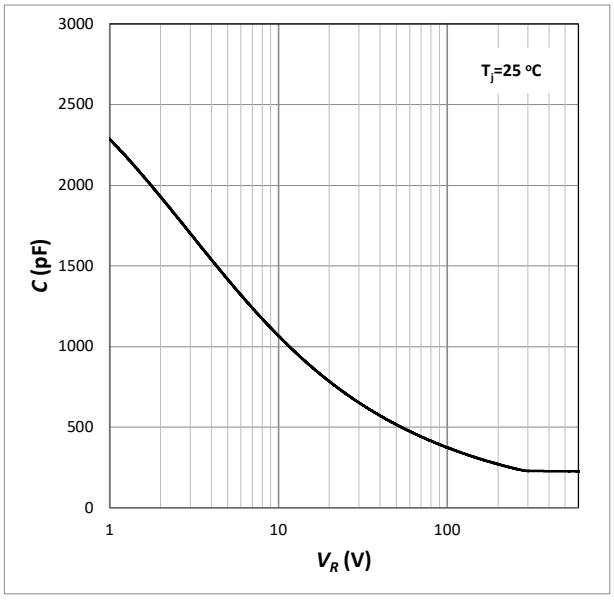


Fig. 6 Capacitance

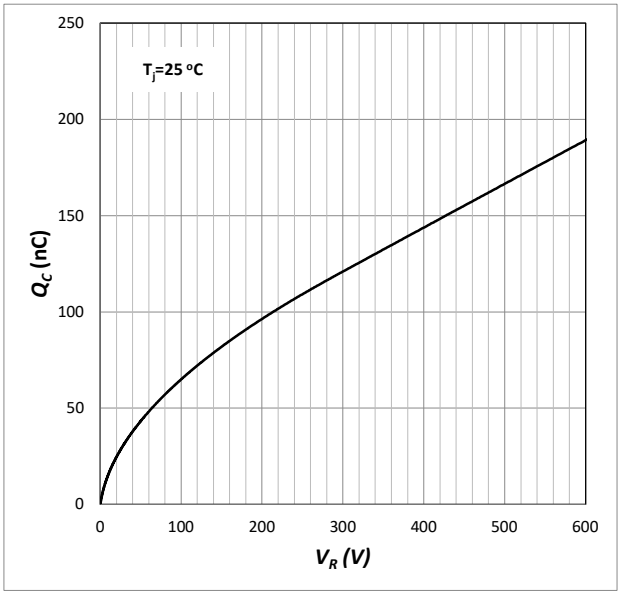


Fig. 7 Capacitive Charge

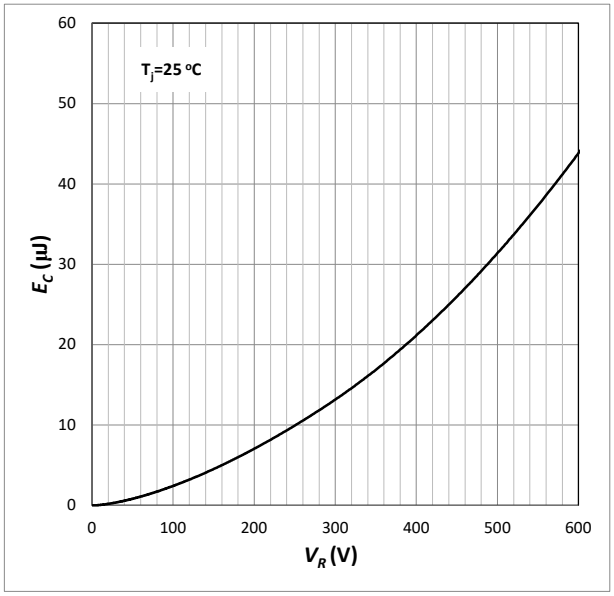


Fig. 8 Typical Capacitance Stored Energy

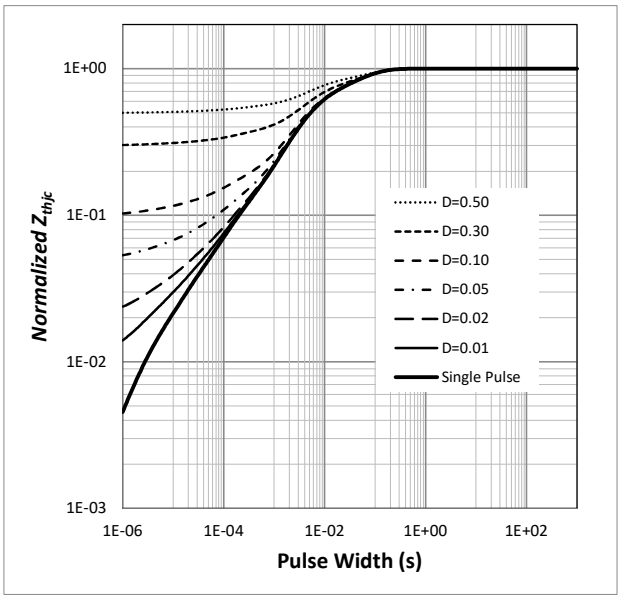
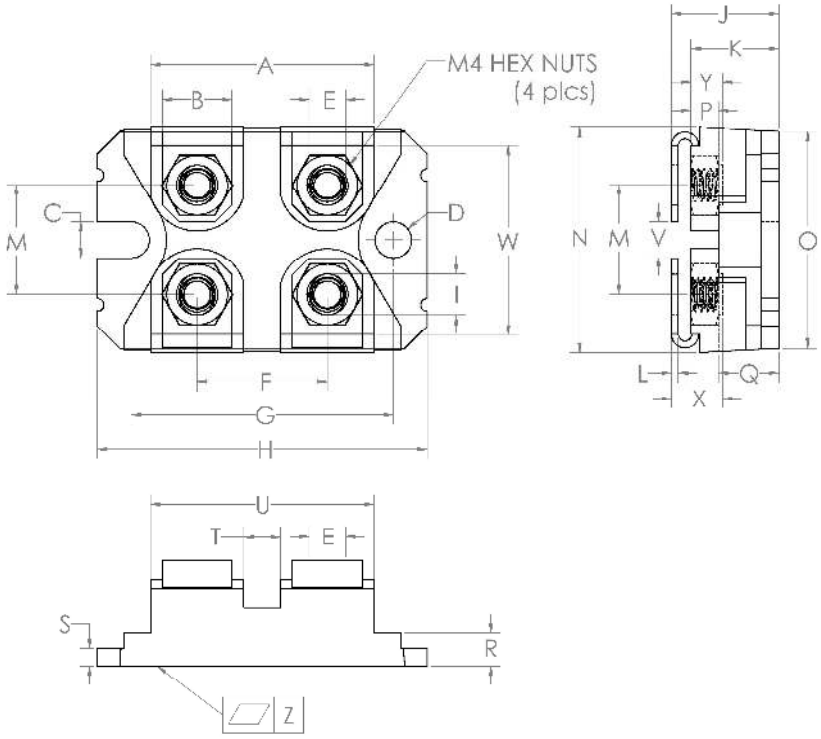


Fig. 9 Transient Thermal Impedance

Package Dimensions SOT-227



Sym	Millimeters		Inches	
	Min	Max	Min	Max
A	31.67	31.90	1.247	1.256
B	7.95	8.18	0.313	0.322
C	4.14	4.24	0.163	0.167
D	4.14	4.24	0.163	0.167
E	4.14	4.24	0.163	0.167
F	14.94	15.09	0.588	0.594
G	30.15	30.25	1.187	1.191
H	38.00	38.10	1.496	1.500
I	4.75	4.83	0.187	0.190
J	11.68	12.19	0.460	0.480
K	9.45	9.60	0.372	0.378
L	0.76	0.84	0.030	0.033
M	12.62	12.88	0.497	0.507
N	25.15	25.30	0.990	0.996
O	24.79	25.04	0.976	0.986
P	3.02	3.15	0.119	0.124
Q	6.71	6.96	0.264	0.274
R	4.17	4.42	0.164	0.174
S	2.08	2.13	0.082	0.084
T	3.28	3.63	0.129	0.143
U	26.75	26.90	1.053	1.059
V	3.86	4.24	0.152	0.167
W	20.55	26.90	0.809	0.814
X	5.45	5.85	0.215	0.230
Y	3.15	3.66	0.124	0.144
Z	0.00	0.13	0.000	0.005

Revision History

Date	Revision	Notes
9/6/2011	1.0	Initial release
6/4/2014	1.1	Add the part number, pin assignment table.
1/3/2020	1.2	Applied company name change.
12/4/2020	1.3	Updated parameters.

Notes

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of www.SemiQ.com.

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