

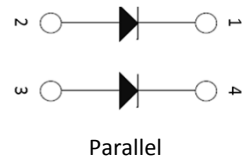
VDC	600 V
$I_F$	30 A
$T_{j,max}$	175 °C

## 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 700V

### Package



### Benefits

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

Part #	Package	Marking
GHXS030A060S-D3	SOT-227	GHXS030A060S-D3

### Applications

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



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

Characteristics	Symbol	Conditions	Value	Unit
Continuous forward current	$I_F^*$	$T_C=25$ °C, $T_j=175$ °C	90	A
		$T_C=149$ °C, $T_j=175$ °C	30	
		$T_C=150$ °C, $T_j=175$ °C	29	
Surge non-repetitive forward current sine halfwave	$I_{FSM}$	$T_C=25$ °C, $T_j=25$ °C, $t_p=8.3$ ms	288	A
		$T_C=110$ °C, $T_j=110$ °C, $t_p=8.3$ ms	210	
Non-repetitive peak forward current	$I_{F,max}$	$T_C=25$ °C, $t_p=10$ $\mu$ s	1500	A
$i^2t$ value	$\int i^2 dt$	$T_C=25$ °C, $t_p=8.3$ ms	344	A <sup>2</sup> s
		$T_C=110$ °C, $t_p=8.3$ ms	183	
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	263	W
Operating junction temperature	$T_j$		-55...175	°C
Storage temperature	$T_{storage}$		-55...150	°C

**Notes:** \* Typical  $R_{thj,c}$  used

Electrical Characteristics, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified (per leg)

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
DC blocking voltage	$V_{DC}$	$I_R=90\mu\text{A}, T_j=25\text{ }^\circ\text{C}$	600	-	-	V
Breakdown voltage	$V_{BR}$	$I_R=1\text{mA}, T_j=25\text{ }^\circ\text{C}$	700			V
Diode forward voltage	$V_F$	$I_F=30\text{A}, T_j=25\text{ }^\circ\text{C}$	-	1.38	1.50	V
		$I_F=30\text{A}, T_j=125\text{ }^\circ\text{C}$	-	1.43	-	
		$I_F=30\text{A}, T_j=175\text{ }^\circ\text{C}$	-	1.52	1.90	
Reverse current	$I_R$	$V_R=600\text{V}, T_j=25\text{ }^\circ\text{C}$	-	1	90	$\mu\text{A}$
		$V_R=700\text{V}, T_j=25\text{ }^\circ\text{C}$	-	9	-	
		$V_R=600\text{V}, T_j=125\text{ }^\circ\text{C}$	-	13	-	
		$V_R=600\text{V}, T_j=175\text{ }^\circ\text{C}$	-	57	900	
Total capacitive charge	$Q_C$	$V_R=400\text{V}, T_j=25\text{ }^\circ\text{C}$	-	107	-	nC
Total capacitance	C	$V_R=1\text{V}, f=1\text{ MHz}$	-	1700	-	pF
		$V_R=200\text{V}, f=1\text{ MHz}$	-	202	-	
		$V_R=400\text{V}, f=1\text{ MHz}$	-	171	-	

Thermal and Package Characteristics, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction-case	$R_{thJC}$	Per leg	-	0.57	0.75	$^\circ\text{C/W}$
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	$V_{ISOL}$	$I_{ISOL} < 1\text{mA}$ , 50/60 Hz, 1 min	2500	-	-	V

## Typical Performance Per Leg

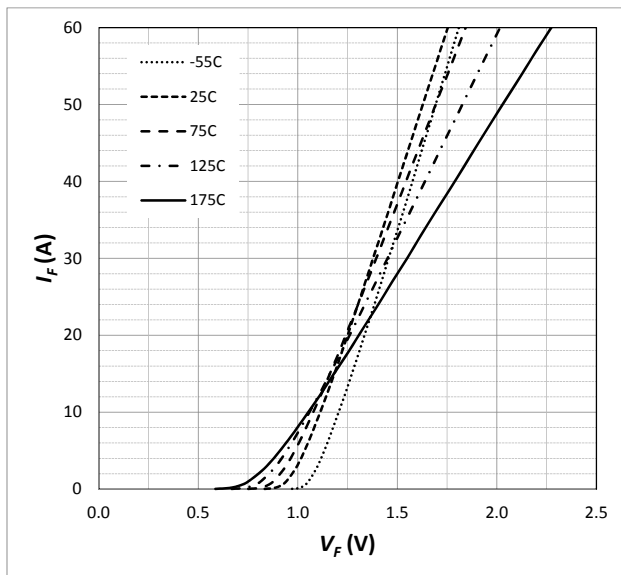


Fig. 1 Forward Characteristics (parameterized on  $T_j$ )

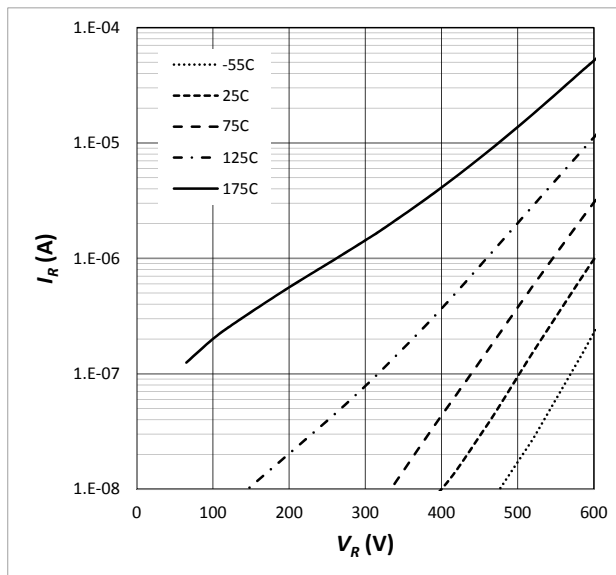


Fig. 2 Reverse Characteristics (parameterized on  $T_j$ )

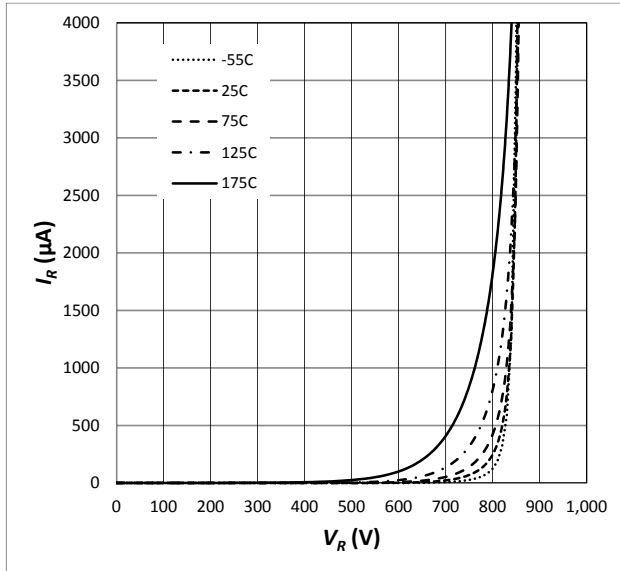


Fig. 3 Reverse Characteristics (parameterized on  $T_j$ )

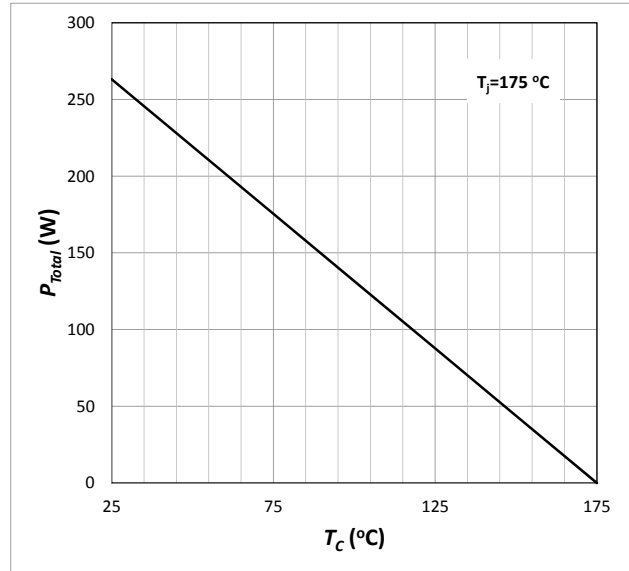


Fig. 4 Power Derating

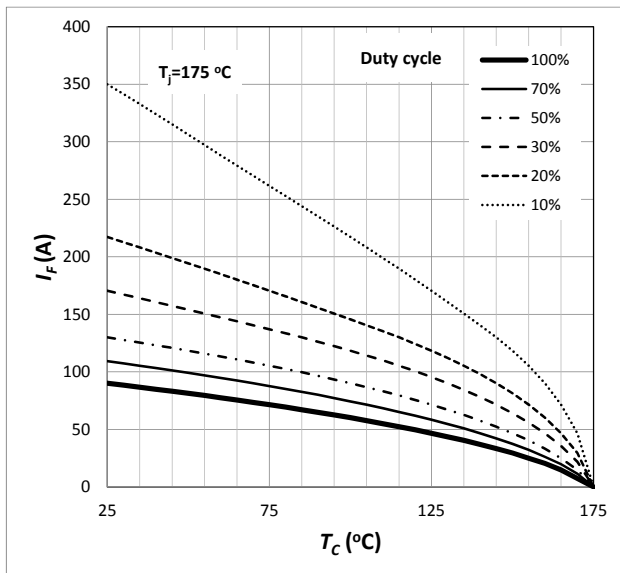


Fig. 5 Current Derating

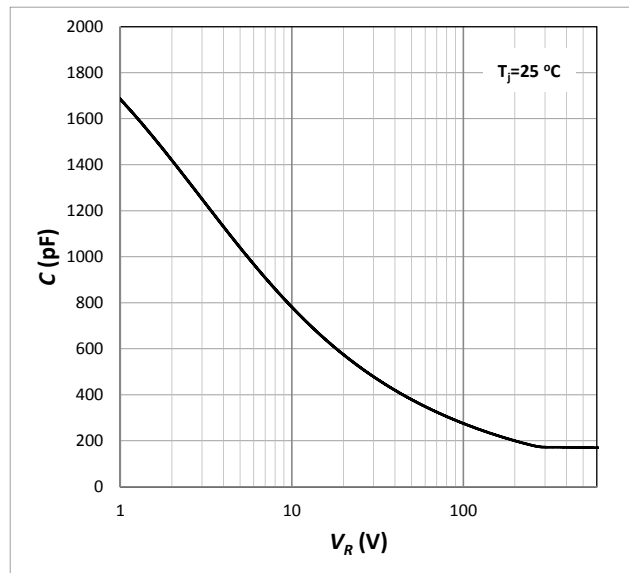


Fig. 6 Capacitance

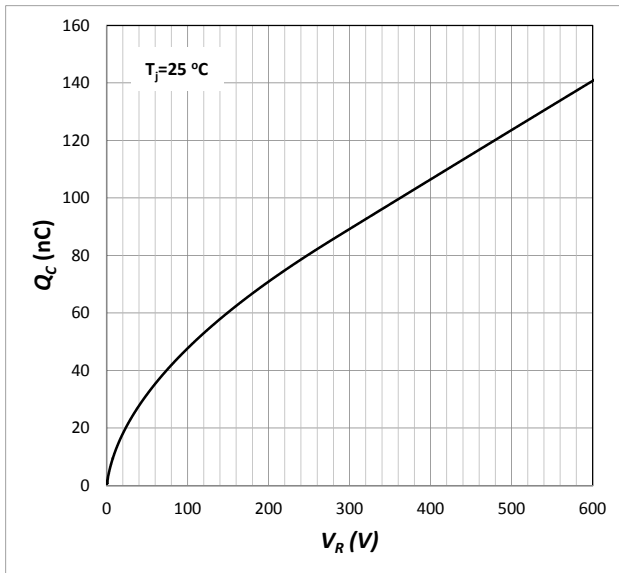


Fig. 7 Capacitive Charge

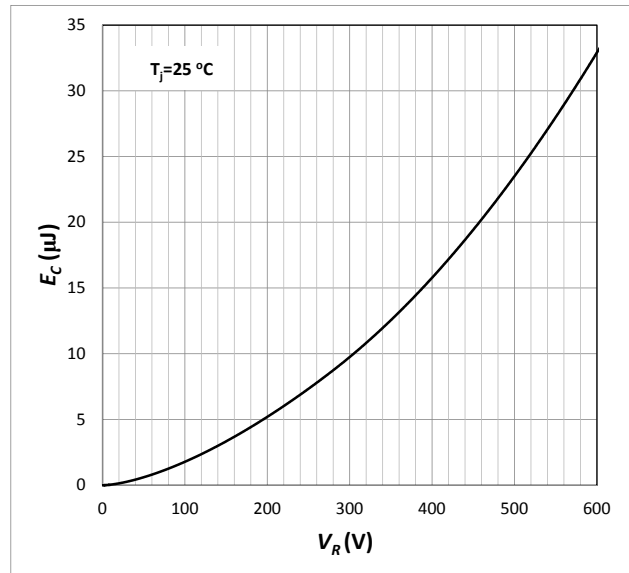


Fig. 8 Typical Capacitance Stored Energy

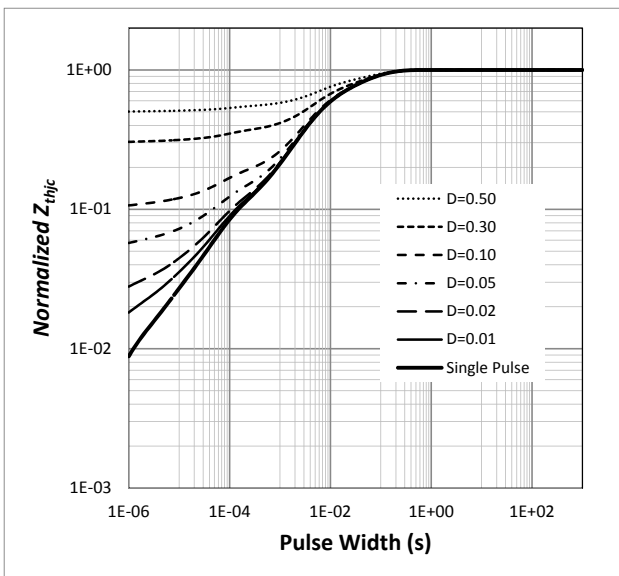
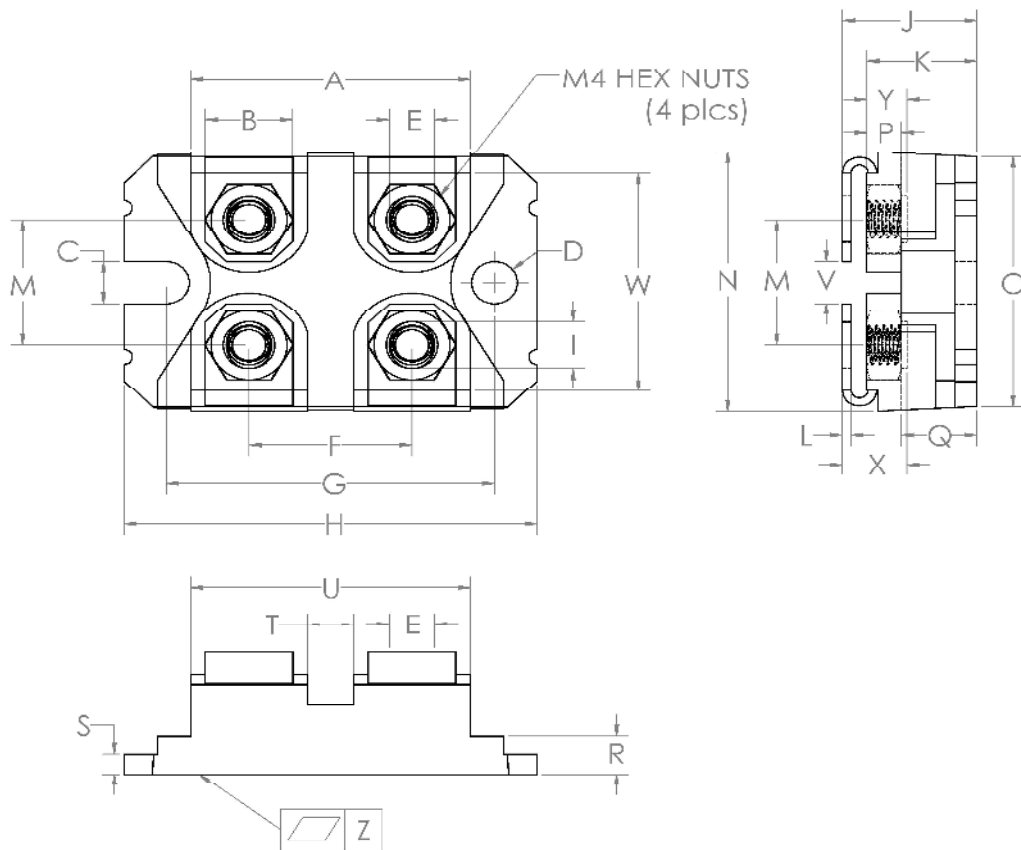


Fig. 9 Transient Thermal Impedance

# 600V SiC Power Module

# GHXS030A060S-D3

## 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
9/6/2013	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
5/15/2020	1.3	Updated data

## 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](http://www.SemiQ.com).

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