

VDC	650 V
I <sub>F</sub>	100 A
T <sub>j,max</sub>	175 °C

## 650V 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<sub>F</sub>
- Low stray inductance
- High junction temperature operation
- All parts tested to greater than 715V

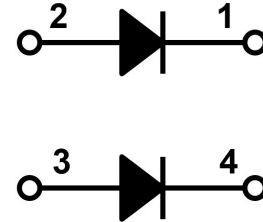
### Benefits

- Outstanding performance at high frequency operation
- Low loss and low EMI noise
- Very rugged and easy mounting
- Internally isolated package (AIN)
- Low junction to case thermal resistance
- Easy paralleling due to positive T<sub>C</sub> of V<sub>F</sub>
- RoHS compliant

### Applications

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

### Package



Parallel

Part #	Package	Marking
GHXS100B065S-D3	SOT-227	GHXS100B065S-D3



**Maximum Ratings**, at T<sub>j</sub>=25 °C, unless otherwise specified (per leg)

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I <sub>F</sub>	T <sub>C</sub> =25 °C, T <sub>J</sub> =175 °C	193	A
		T <sub>C</sub> =122 °C, T <sub>J</sub> =175 °C	100	
		T <sub>C</sub> =150 °C, T <sub>J</sub> =175 °C	59	
Surge non-repetitive forward current sine halfwave	I <sub>F,FSM</sub>	T <sub>C</sub> =25 °C, t <sub>p</sub> =8.3 ms	580	A
		T <sub>C</sub> =110 °C, t <sub>p</sub> =8.3 ms	540	
Non-repetitive peak forward current	I <sub>F,max</sub>	T <sub>C</sub> =25 °C, t <sub>p</sub> =10 μs	2000**	A
i <sup>2</sup> t value	∫i <sup>2</sup> dt	T <sub>C</sub> =25 °C, t <sub>p</sub> =8.3 ms	1396	A <sup>2</sup> s
		T <sub>C</sub> =110 °C, t <sub>p</sub> =8.3 ms	1210	
Repetitive peak reverse voltage	V <sub>RRM</sub>	T <sub>J</sub> =25 °C	650	V
Diode dv/dt ruggedness	dv/dt	Turn-on slew rate, repetitive	200	V/ns
Power dissipation	P <sub>tot</sub> *	T <sub>C</sub> =25 °C	480	W
Operating junction temperature	T <sub>J</sub>		-55... 175	°C
Storage temperature	T <sub>storage</sub>		-55... 150	°C

**Notes:** \*Typical R<sub>thjC</sub> used

\*\*Limited by testing equipment

# 650V SiC Power Module

# GHXS100B065S-D3

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	$V_{DC}$	$I_R=250\mu\text{A}$ , $T_j=25\text{ }^\circ\text{C}$	650	-	-	V
Breakdown voltage	$V_{BR}$	$I_R=3.3\text{mA}$ , $T_j=25\text{ }^\circ\text{C}$	715	-	-	V
Diode forward voltage	$V_F$	$I_F=100\text{A}$ , $T_j=25\text{ }^\circ\text{C}$	-	1.45	1.65	V
		$I_F=100\text{A}$ , $T_j=125\text{ }^\circ\text{C}$	-	1.61	-	
		$I_F=100\text{A}$ , $T_j=175\text{ }^\circ\text{C}$	-	1.77	2.10	
Reverse current	$I_R$	$V_R=650\text{V}$ , $T_j=25\text{ }^\circ\text{C}$	-	11	250	$\mu\text{A}$
		$V_R=715\text{V}$ , $T_j=25\text{ }^\circ\text{C}$	-	45	-	
		$V_R=650\text{V}$ , $T_j=125\text{ }^\circ\text{C}$	-	82	-	
		$V_R=650\text{V}$ , $T_j=175\text{ }^\circ\text{C}$	-	294	1000	
Total capacitive charge	$Q_C$	$V_R=400\text{V}$ , $T_j=25\text{ }^\circ\text{C}$	-	241	-	nC
Total capacitance	C	$V_R=1\text{V}$ , $f=1\text{ MHz}$	-	3891	-	pF
		$V_R=200\text{V}$ , $f=1\text{ MHz}$	-	456	-	
		$V_R=400\text{V}$ , $f=1\text{ MHz}$	-	377	-	

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	-	0.31	0.43	$^\circ\text{C/W}$
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

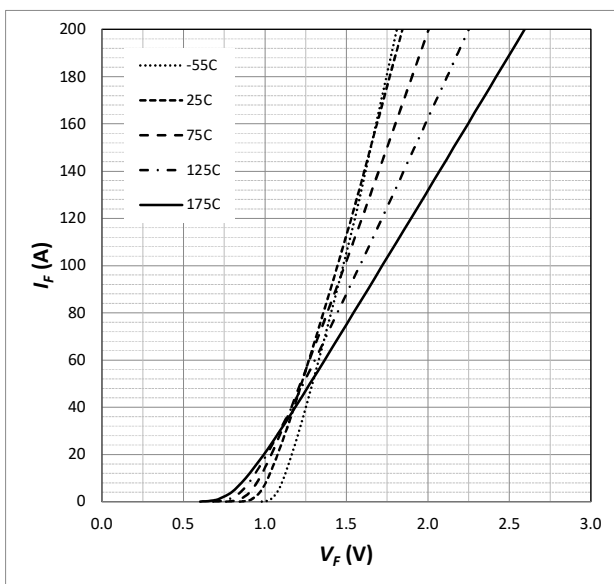


Fig. 1 Forward Characteristics (parameterized on  $T_j$ )

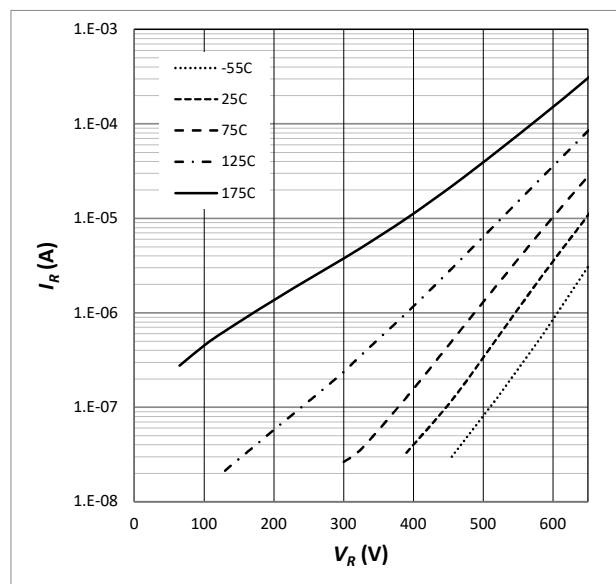


Fig. 2 Reverse Characteristics (parameterized on  $T_j$ )

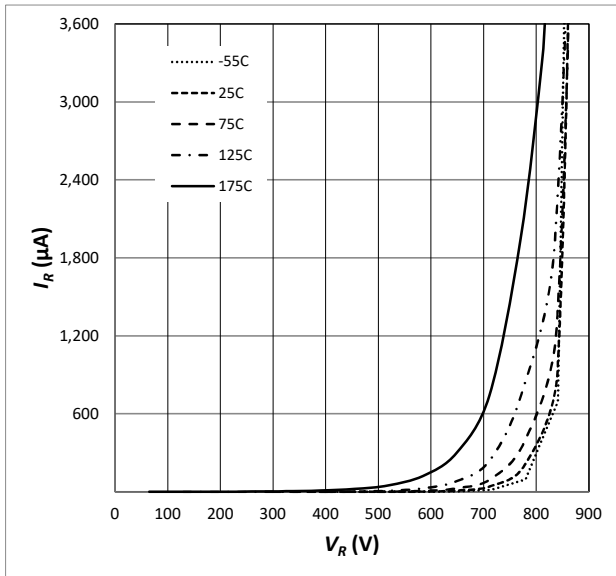


Fig. 3 Reverse Characteristics (parameterized on  $T_j$ )

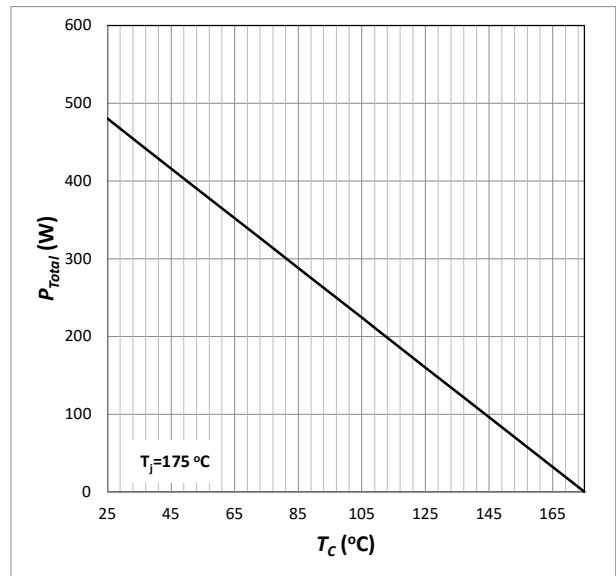


Fig. 4 Power Derating

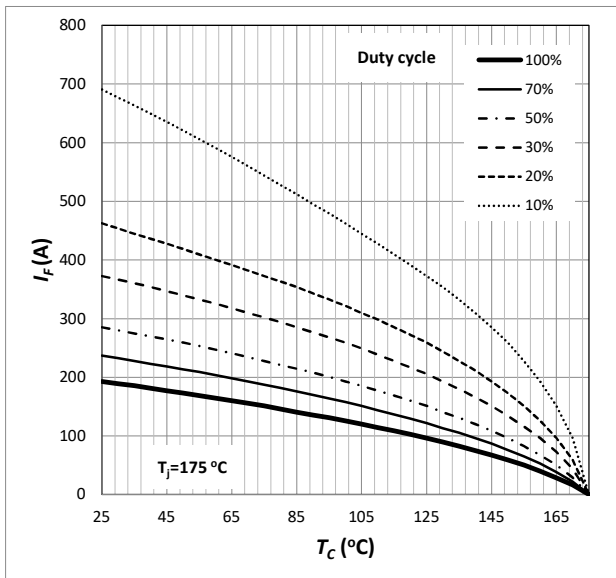


Fig. 5 Current Derating

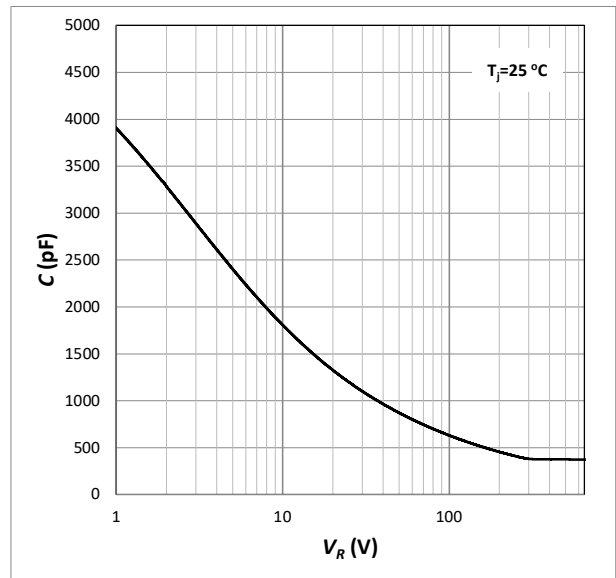


Fig. 6 Capacitance

# 650V SiC Power Module

# GHXS100B065S-D3

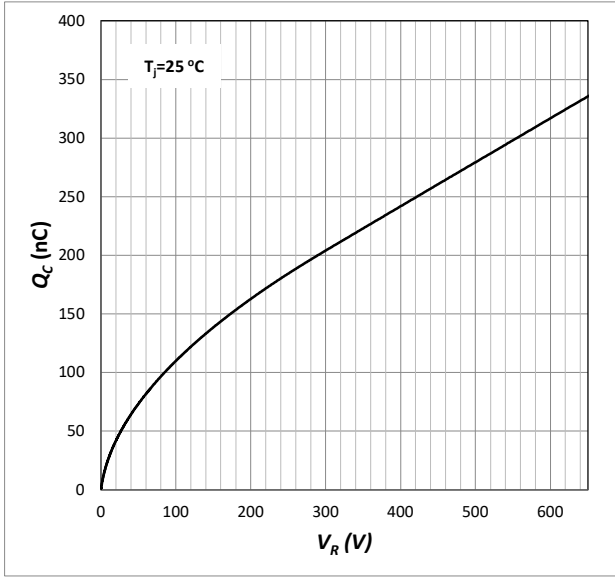


Fig. 7 Capacitive Charge

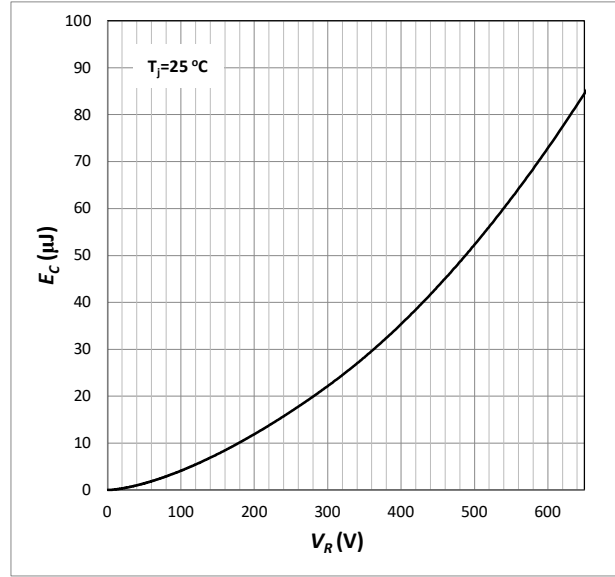


Fig. 8 Typical Capacitance Stored Energy

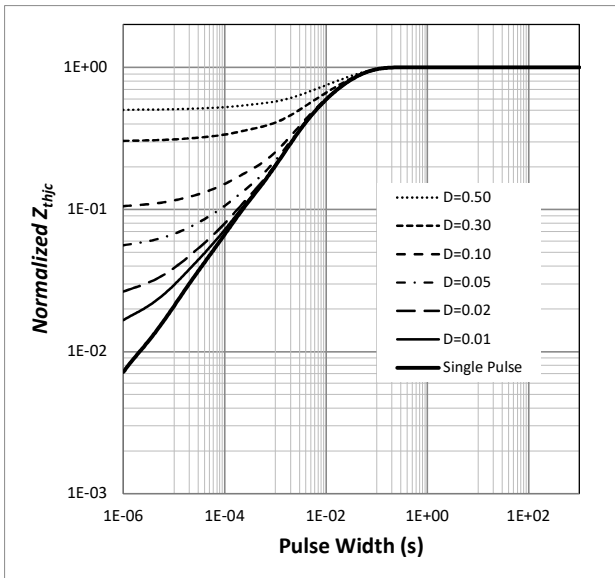
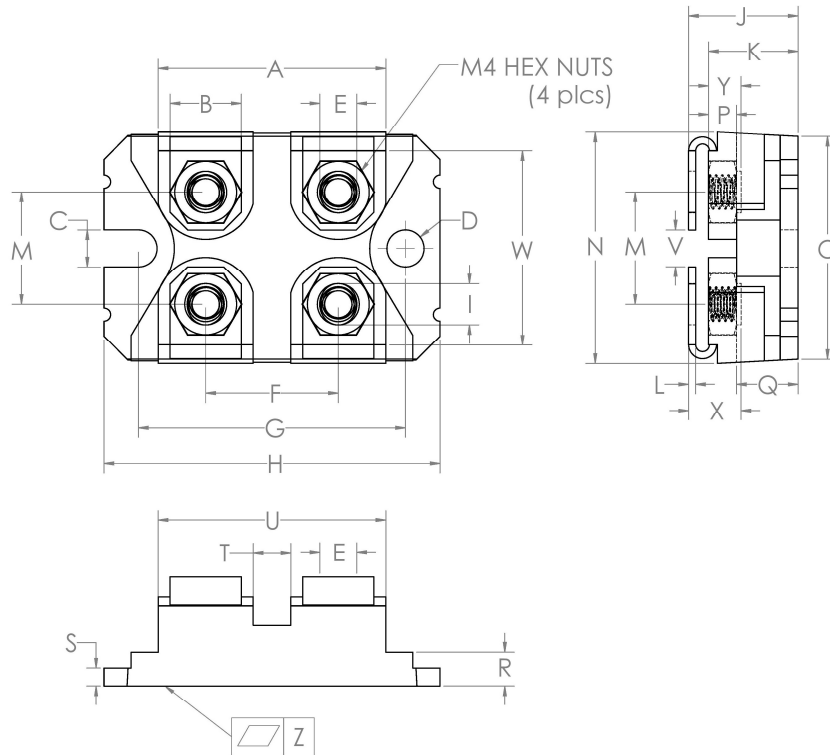


Fig. 9 Transient Thermal Impedance

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## 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