

## Silicon Carbide Power Schottky Diode Chip

### Features

- 650 V Schottky rectifier
- 250 °C maximum operating temperature
- Temperature independent switching behavior
- Superior surge current capability
- Positive temperature coefficient of  $V_F$
- Extremely fast switching speeds
- Superior figure of merit  $Q_C/I_F$



### Maximum Ratings at $T_j = 250\text{ °C}$ , unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		650	V
Continuous forward current	$I_F$	$T_C \leq 215\text{ °C}$	5	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 215\text{ °C}$	8	A
Operating and storage temperature	$T_j, T_{stg}$		-55 to 250	°C

### Electrical Characteristics at $T_j = 250\text{ °C}$ , unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	$V_F$	$I_F = 5\text{ A}, T_j = 25\text{ °C}$		1.65		V
		$I_F = 5\text{ A}, T_j = 210\text{ °C}$		2.5		
Reverse current	$I_R$	$V_R = 650\text{ V}, T_j = 25\text{ °C}$		0.12	5	$\mu\text{A}$
		$V_R = 650\text{ V}, T_j = 250\text{ °C}$		7.5	30	
Total capacitive charge	$Q_C$	$I_F \leq I_{F,MAX}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $T_j = 210\text{ °C}$	$V_R = 400\text{ V}$		20	nC
Switching time	$t_s$			$V_R = 400\text{ V}$		< 25
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$			274	pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$			31	
		$V_R = 800\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$			29	

### Thermal Characteristics

Thermal resistance, junction - case	$R_{thJC}$	Assuming TO-276 package	1.38	°C/W
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\*For chip size and metallization, please refer to the mechanical datasheet (must have a non-disclosure agreement with GeneSiC Semiconductor).

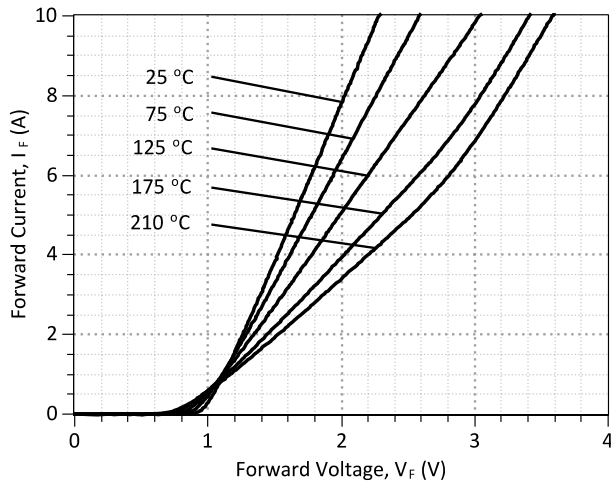


Figure 1: Typical Forward Characteristics

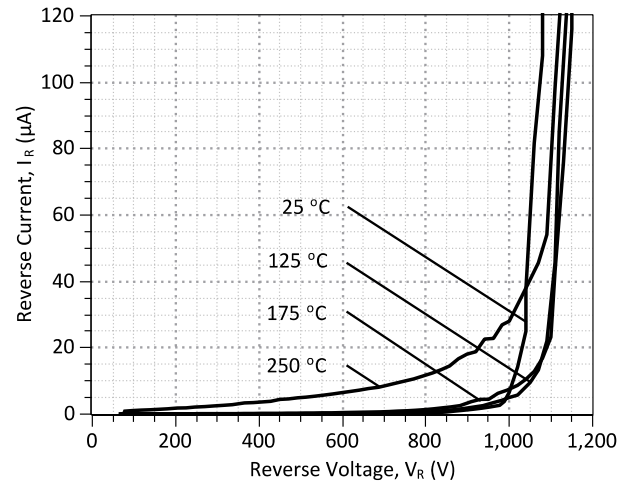


Figure 2: Typical Reverse Characteristics

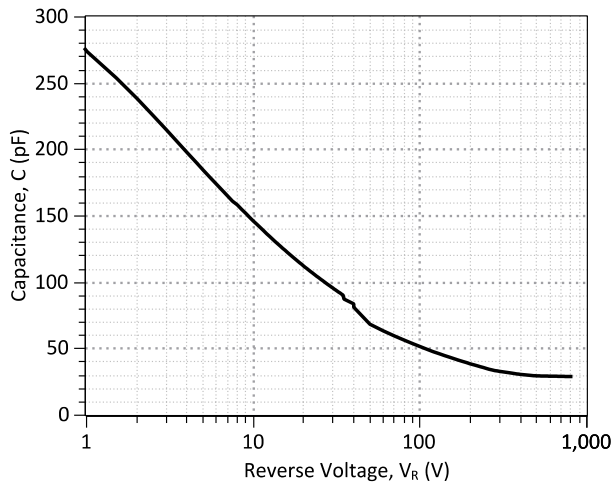


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

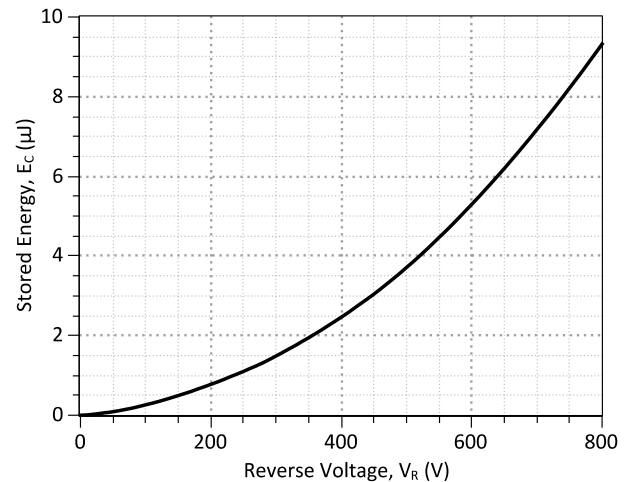


Figure 4: Typical Switching Energy vs Reverse Voltage Characteristics

**Revision History**

Date	Revision	Comments	Supersedes
2012/04/03	0	Initial release	

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## SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GB05SHT06-CAU device.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      05-SEP-2013   $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*      http://www.genesicsemi.com/index.php/sic-products/schottky
*
*      COPYRIGHT (C) 2013 GeneSiC Semiconductor Inc.
*      ALL RIGHTS RESERVED
*
*      These models are provided "AS IS, WHERE IS, AND WITH NO WARRANTY
*      OF ANY KIND EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED
*      TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A
*      PARTICULAR PURPOSE."
*      Models accurate up to 2 times rated drain current.
*
*      Start of GB05SHT06-CAU SPICE Model
*
.SUBCKT GB05SHT06 ANODE KATHODE
D1 ANODE KATHODE GB05SHT06_25C; Call the Schottky Diode Model
D2 ANODE KATHODE GB05SHT06_PIN; Call the PiN Diode Model
.MODEL GB05SHT06_25C D
+ IS      1.99E-17      RS      0.12463
+ N       1            IKF     569.082
+ EG      1.2          XTI     3
+ TRS1    0.0035       TRS2    3.87E-05
+ CJO     3.38E-10     VJ      0.41772
+ M       1.5479       FC      0.5
+ TT      1.00E-10     BV      800
+ IBV     1.00E-03     VPK     650
+ IAVE    5            TYPE    SiC_Schottky
+ MFG     GeneSiC_Semiconductor
.MODEL GB05SHT06_PIN D
+ IS      1.33E-10     RS      0.31147
+ N       5            IKF     0
+ EG      3.23         XTI     -10
+ FC      0.5          TT      0
+ BV      800          IBV     1.00E-03
+ VPK     650          IAVE    5
+ TYPE    SiC_PiN
.ENDS
*
*      End of GB05SHT06-CAU SPICE Model
```