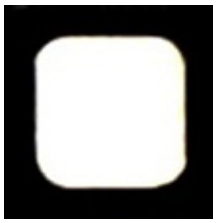
Silicon Carbide Power Schottky Diode Chip

Features

- 1200 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 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		1200	V
Continuous forward current	I_F	$T_C \le 205$ °C	20	A
RMS forward current	$I_{F(RMS)}$	$T_C \le 205$ °C	35	A
Operating and storage temperature	T_j , T_{stg}		-55 to 250	°C

Electrical Characteristics at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions		Values			Unit
				min.	typ.	max.	
Diode forward voltage	V_F	I_F = 20 A, T_j = 25 °C I_F = 20 A, T_j = 210 °C			2.2 3.5		V
Reverse current	I_R	V_R = 1200 V, T_j = 25 °C V_R = 1200 V, T_j = 250 °C			1.2 56	20 300	µA
Total capacitive charge	Q_C	$I_F \le I_{F,MAX}$ dI_F/dt = 200 A/µs T_j = 210 °C	V_R = 400 V V_R = 960 V		58 95		nC
Switching time	t_s		V_R = 400 V V_R = 960 V		< 49		ns
Total capacitance	C	V_R = 1 V, f = 1 MHz, T_j = 25 °C V_R = 400 V, f = 1 MHz, T_j = 25 °C V_R = 1000 V, f = 1 MHz, T_j = 25 °C			884 79 63		pF

Thermal Characteristics

Thermal resistance, junction - case	R_{thJC}	Assuming TO-276 package		0.49	°C/W

***For chip size and metallization, please refer to the mechanical datasheet (must have a non-disclosure agreement with GeneSiC Semiconductor).**

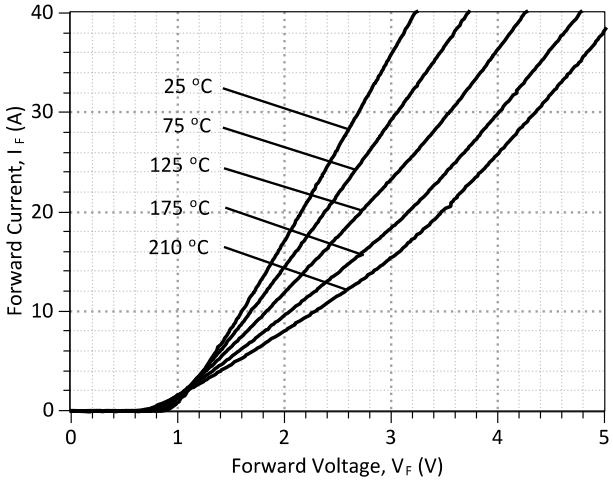


Figure 1: Typical Forward Characteristics

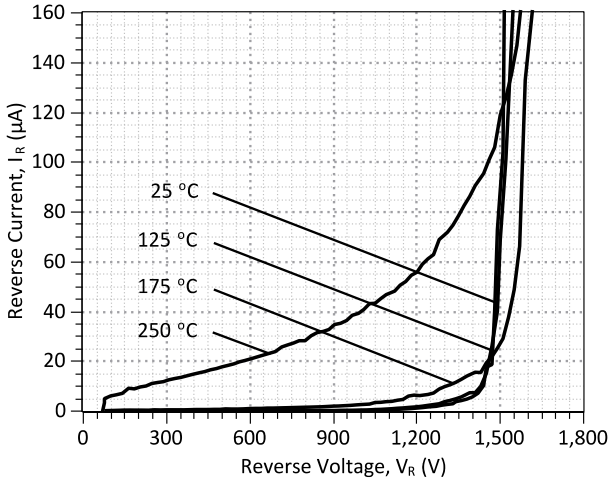


Figure 2: Typical Reverse Characteristics

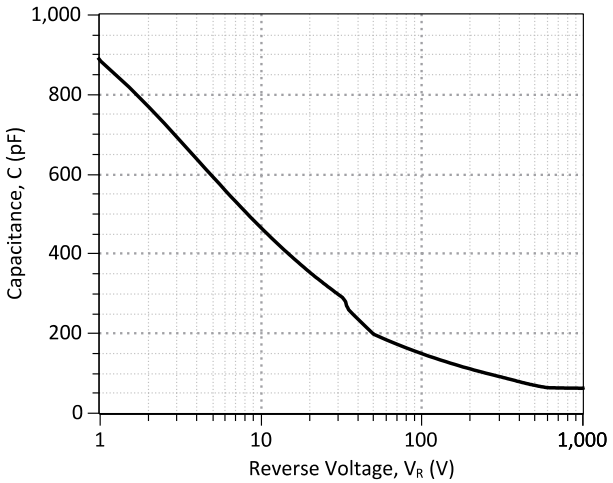


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

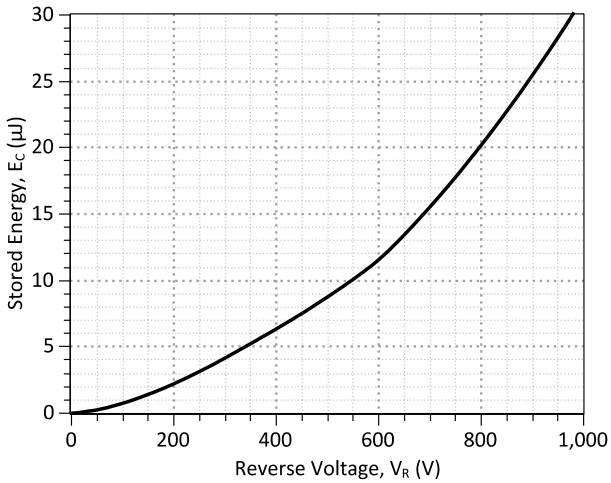


Figure 4: Typical Switching Energy vs Reverse Voltage Characteristics

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

Published by
GeneSiC Semiconductor, Inc.
43670 Trade Center Place Suite 155
Dulles, VA 20166

SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GB20SHT12-CAL 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
*     httphttp://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 GB20SHT12-CAL SPICE Model
*
.SUBCKT GB20SHT12 ANODE KATHODE
D1 ANODE KATHODE GB20SHT12_25C; Call the Schottky Diode Model
D2 ANODE KATHODE GB20SHT12_PIN; Call the PiN Diode Model
.MODEL GB20SHT12_25C D
+ IS       1.74E-13        RS         0.05105
+ TRS1     0.005           TRS2       1.68E-5
+ N        1.2637323       IKF        1.884319
+ EG       1.2             XTI        3
+ CJO      1.15E-09        VJ         0.44
+ M        1.5             FC         0.5
+ TT       1.00E-10        BV         1500
+ IBV      1.00E-03        VPK        1200
+ IAVE     20              TYPE       SiC_Schottky
+ MFG      GeneSiC_Semiconductor
.MODEL GB20SHT12_PIN D
+ IS       5.15E-15        RS         0.2
+ N        3.1605          IKF        0.00055844
+ EG       3.23            XTI        3
+ FC       0.5             TT         0
+ BV       1500            IBV        1.00E-03
+ VPK      1200            IAVE       20
+ TYPE     SiC_PiN
.ENDS
*
* End of GB20SHT12-CAL SPICE Model
```

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GB20SHT12-CAL