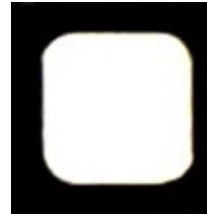


**Silicon Carbide Power
Schottky Diode Chip**

V_{RRM}	=	1200 V
V_F	=	1.6 V
$I_F (T_C = 25^\circ\text{C})$	=	100 A
Q_C	=	158 nC

Features

- 1200 V Schottky rectifier
- 175 °C maximum operating temperature
- Positive temperature coefficient of V_F
- Fast switching speeds
- Superior figure of merit Q_C/I_F


Advantages

- Improved circuit efficiency (Lower overall cost)
- Significantly reduced switching losses compare to Si PiN diodes
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance

Applications

- Down Hole Oil Drilling, Geothermal Instrumentation
- High Voltage Multipliers
- Military Power Supplies

Maximum Ratings at $T_j = 175^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		1200	V
Continuous forward current	I_F	$T_C = 25^\circ\text{C}$	100	A
Continuous forward current	I_F	$T_C \leq 135^\circ\text{C}$	50	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 135^\circ\text{C}$	87	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ ms}$ $T_C = 135^\circ\text{C}, t_p = 10\text{ ms}$	350 313	A
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ }\mu\text{s}$	1625	A
I^2t value	$\int I^2 dt$	$T_C = 25^\circ\text{C}, t_p = 10\text{ ms}$	tbd	A ² S
Power dissipation	P_{tot}	$T_C = 25^\circ\text{C}$	620	W
Operating and storage temperature	T_j, T_{stg}		-55 to 175	°C

Electrical Characteristics at $T_j = 175^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	V_F	$I_F = 50\text{ A}, T_j = 25^\circ\text{C}$	1.35	1.6	1.8	V
		$I_F = 50\text{ A}, T_j = 175^\circ\text{C}$	2.05	2.6	3.0	
Reverse current	I_R	$V_R = 1200\text{ V}, T_j = 25^\circ\text{C}$		200	1000	μA
		$V_R = 1200\text{ V}, T_j = 175^\circ\text{C}$		400	3000	
Total capacitive charge	Q_C	$I_F \leq I_{F,MAX}$ $dI_F/dt = 200\text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$		158		nC
Switching time	t_s	$V_R = 400\text{ V}$		50		ns
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		2940		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		203		
		$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		142		

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

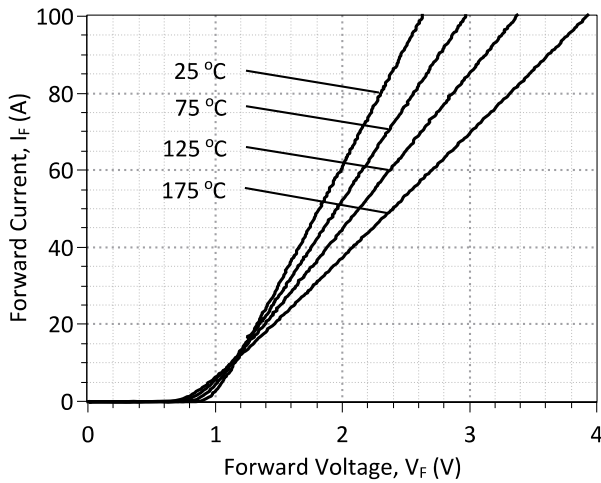


Figure 1: Typical Forward Characteristics

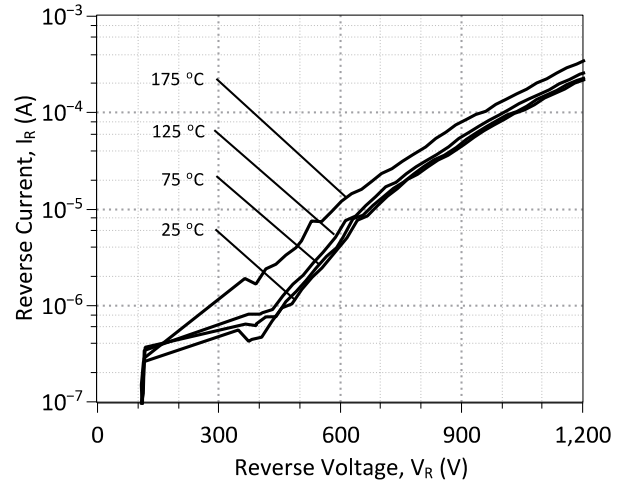


Figure 2: Typical Reverse Characteristics

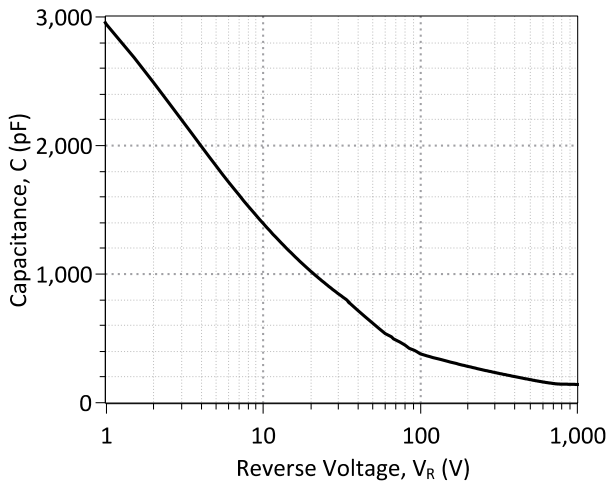


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

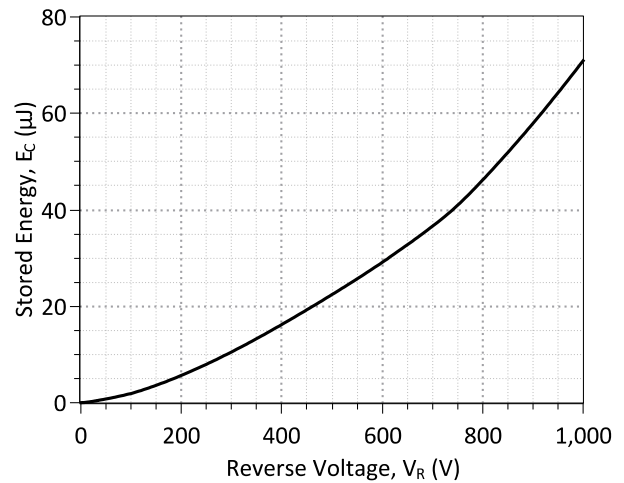


Figure 4: Typical Switching Energy vs Reverse Voltage Characteristics

Revision History

Date	Revision	Comments	Supersedes
2014/09/12	2	Updated Electrical Characteristics	
2013/11/12	1	Updated Electrical Characteristics	
2013/09/18	0	Initial Release	

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SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GB50SLT12-CAL device.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      04-SEP-2013   $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*      http://www.genesicsemi.com/index.php/hit-sic/baredie
*
*      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 GB50SLT12-CAL SPICE Model
*
.SUBCKT GB50SLT12 ANODE KATHODE
R1 ANODE INT R=((TEMP-24)*9.39E-05); Temperature Dependant Resistor
D1 INT KATHODE GB50SLT12_25C; Call the 25C Diode Model
.MODEL GB50SLT12_25C D
+ IS      1.99E-16      RS      0.015652965
+ N       1            IKF     1000
+ EG      1.2          XTI     3
+ CJO     3.86E-09     VJ      1.362328465
+ M       0.48198551   FC      0.5
+ TT      1.00E-10     BV      1200
+ IBV     1.00E-03     VPK     1200
+ IAVE    50          TYPE     SiC_Schottky
+ MFG     GeneSiC_Semiconductor
.ENDS
*
*      End of GB50SLT12-CAL SPICE Model
```