

## High Temperature Silicon Carbide Power Schottky Diode

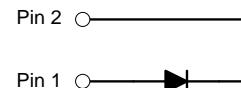
$V_{RRM}$	=	600 V
$I_F(T_c=25^\circ C)$	=	4 A
$Q_C$	=	9 nC

### Features

- 600 V Schottky rectifier
- 225 °C maximum operating temperature
- Zero reverse recovery charge
- Superior surge current capability
- Positive temperature coefficient of  $V_F$
- Temperature independent switching behavior
- Lowest figure of merit  $Q_C/I_F$
- Available screened to Mil-PRF-19500

### Package

- RoHS Compliant



TO - 46

### Advantages

- High temperature operation
- Improved circuit efficiency (Lower overall cost)
- Low switching losses
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Industry's lowest reverse recovery charge
- Industry's lowest device capacitance
- Ideal for output switching of power supplies
- Best in class reverse leakage current at operating temperature

### Applications

- Down Hole Oil Drilling
- Geothermal Instrumentation
- Solenoid Actuators
- General Purpose High-Temperature Switching
- Amplifiers
- Solar Inverters
- Switched-Mode Power Supply (SMPS)
- Power Factor Correction (PFC)

### Maximum Ratings at $T_j = 225^\circ C$ , unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		600	V
Continuous forward current	$I_F$	$T_c = 25^\circ C$	4	A
Continuous forward current	$I_F$	$T_c \leq 225^\circ C$	2	A
RMS forward current	$I_{F(RMS)}$	$T_c \leq 225^\circ C$	4	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_c = 25^\circ C, t_p = 10 \text{ ms}$	10	A
Non-repetitive peak forward current	$I_{F,max}$	$T_c = 25^\circ C, t_p = 10 \mu\text{s}$	65	A
$I^2t$ value	$\int i^2 dt$	$T_c = 25^\circ C, t_p = 10 \text{ ms}$	0.5	$\text{A}^2\text{s}$
Power dissipation	$P_{tot}$	$T_c = 25^\circ C$	64	W
Operating and storage temperature	$T_j, T_{stg}$		-55 to 225	$^\circ C$

### Electrical Characteristics at $T_j = 225^\circ C$ , unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	$V_F$	$I_F = 1 \text{ A}, T_j = 25^\circ C$	1.6			V
		$I_F = 1 \text{ A}, T_j = 225^\circ C$	2.6			
Reverse current	$I_R$	$V_R = 600 \text{ V}, T_j = 25^\circ C$	1			$\mu\text{A}$
		$V_R = 600 \text{ V}, T_j = 225^\circ C$	5		50	
Total capacitive charge	$Q_C$	$I_F \leq I_{F,MAX}$	9			nC
Switching time	$t_s$	$dI_F/dt = 200 \text{ A}/\mu\text{s}$	$V_R = 600 \text{ V}$			
		$T_j = 210^\circ C$	$V_R = 600 \text{ V}$	< 17		ns
Total capacitance	$C$	$V_R = 1 \text{ V}, f = 1 \text{ MHz}, T_j = 25^\circ C$	76			$\text{pF}$
		$V_R = 600 \text{ V}, f = 1 \text{ MHz}, T_j = 25^\circ C$	15			

### Thermal Characteristics

Thermal resistance, junction - case	$R_{thJC}$	5.55	$^\circ C/W$
-------------------------------------	------------	------	--------------

### Mechanical Properties

Mounting torque	M	0.6	Nm
-----------------	---	-----	----

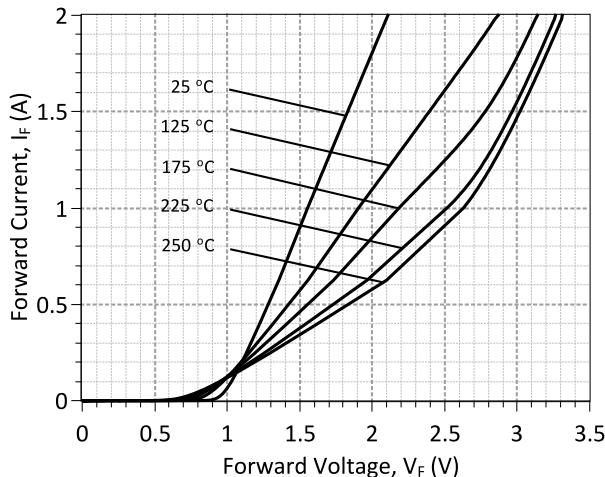


Figure 1: Typical Forward Characteristics

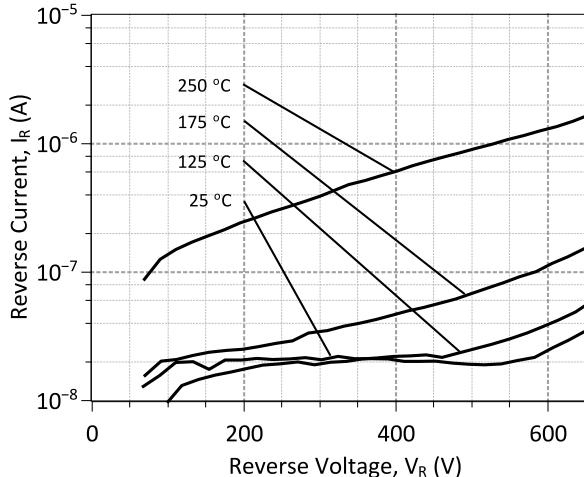


Figure 2: Typical Reverse Characteristics

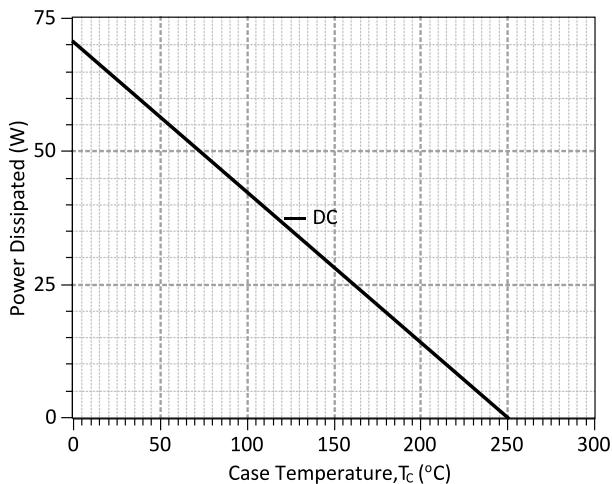


Figure 3: Power Derating Curve

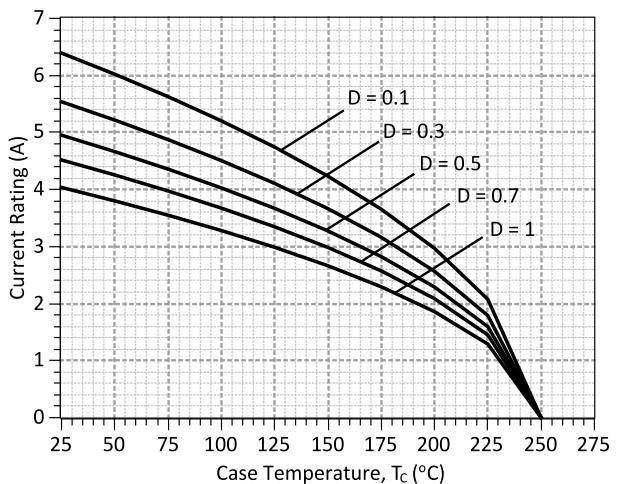


Figure 4: Current Derating Curves ( $D = t_p/T$ ,  $t_p = 400 \mu s$ )  
 (Considering worst case  $Z_{th}$  conditions )

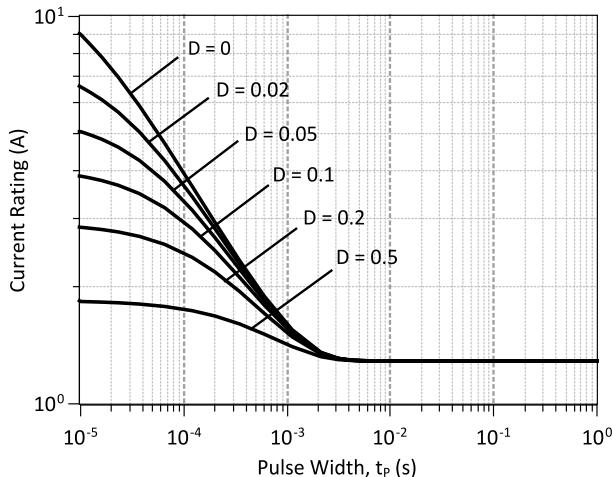


Figure 5: Current vs Pulse Duration Curves at  $T_c = 225$  °C

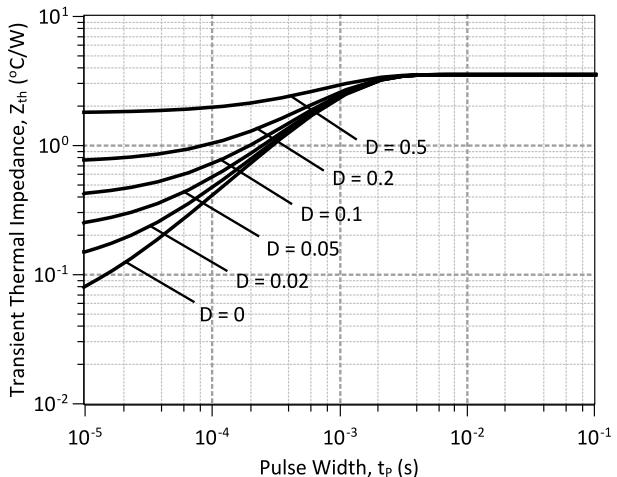
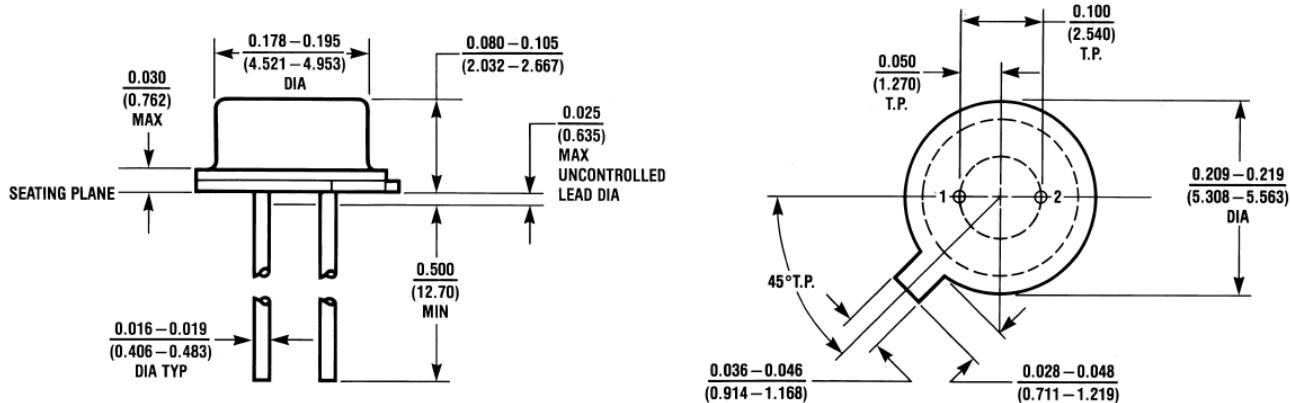


Figure 6: Transient Thermal Impedance

**Package Dimensions:**
**TO-46**
**PACKAGE OUTLINE**

**NOTE**

1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.
2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS

**Revision History**

Date	Revision	Comments	Supersedes
2014/08/29	0	Initial release	

Published by

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

GeneSiC Semiconductor, Inc. reserves right to make changes to the product specifications and data in this document without notice.

GeneSiC disclaims all and any warranty and liability arising out of use or application of any product. No license, express or implied to any intellectual property rights is granted by this document.

Unless otherwise expressly indicated, GeneSiC products are not designed, tested or authorized for use in life-saving, medical, aircraft navigation, communication, air traffic control and weapons systems, nor in applications where their failure may result in death, personal injury and/or property damage.

## SPICE Model Parameters

This is a secure document. Copy this code from the SPICE model PDF file on our website into a SPICE software program for simulation of the GB02SHT06-46.

```

* MODEL OF GeneSiC Semiconductor Inc.
*
* $Revision: 1.0      $
* $Date: 29-AUG-2014      $
*
* GeneSiC Semiconductor Inc.
* 43670 Trade Center Place Ste. 155
* Dulles, VA 20166
*
* COPYRIGHT (C) 2014 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 GB02SHT06-46 SPICE Model
*
.SUBCKT GB02SHT06ANODE KATHODE
D1 ANODE KATHODE GB02SHT06_25C; Call the Schottky Diode Model
D2 ANODE KATHODE GB02SHT06_PIN; Call the PiN Diode Model
.MODEL GB02SHT06_25C D
+ IS      3.57E-18      RS      0.49751
+ TRS1    0.0057      TRS2    2.40E-05
+ N       1      IKF      322
+ EG      1.2      XTI      3
+ CJO     9.12E-11      VJ      0.371817384
+ M       1.527759838      FC      0.5
+ TT      1.00E-10      BV      600
+ IBV     1.00E-03      VPK     600
+ IAVE    2      TYPE    Sic_Schottky
+ MFG     GeneSiC_Semiconductor
.MODEL GB02SHT06_PIN D
+ IS      5.73E-11      RS      0.72994
+ N       5      IKF      800
+ EG      3.23      XTI     -14
+ FC      0.5      TT      0
+ BV      600      IBV     1.00E-03
+ VPK     600      IAVE     2
+ TYPE    Sic_Pin
.ENDS
*
* End of GB02SHT06 SPICE Model

```



**Стандарт  
Электрон  
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литер Н,  
помещение 100-Н Офис 331