

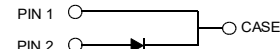
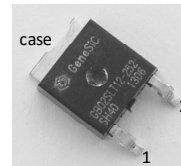
Silicon Carbide Power Schottky Diode

V_{RRM}	=	1200 V
$I_F (T_C = 135^\circ\text{C})$	=	5 A
Q_C	=	13 nC

Features

- High Avalanche (UIS) Capability
- Enhanced Surge Current Capability
- 175 °C Maximum Operating Temperature
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient Of V_F
- Extremely Fast Switching Speeds
- Superior Figure of Merit Q_C/I_F

Package



TO – 252



Advantages

- Low Standby Power Losses
- Improved Circuit Efficiency (Lower Overall Cost)
- Low Switching Losses
- Ease of Paralleling Devices without Thermal Runaway
- Smaller Heat Sink Requirements
- Low Reverse Recovery Current
- Low Device Capacitance
- Low Reverse Leakage Current at Operating Temperature

Applications

- Power Factor Correction (PFC)
- Switched-Mode Power Supply (SMPS)
- Solar Inverters
- Wind Turbine Inverters
- Motor Drives
- Induction Heating
- Uninterruptible Power Supply (UPS)
- High Voltage Multipliers

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Values	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		1200	V
Continuous Forward Current	I_F	$T_C = 25^\circ\text{C}, D = 1$	10	A
		$T_C = 135^\circ\text{C}, D = 1$	5	
		$T_C = 166^\circ\text{C}, D = 1$	2	
Non-Repetitive Peak Forward Surge Current, Half Sine Wave	$I_{F,SM}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ ms}$ $T_C = 110^\circ\text{C}, t_p = 10\text{ ms}$	19 16.5	A
Non-Repetitive Peak Forward Current	$I_{F,max}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ }\mu\text{s}$	200	A
I^2t Value	$\int i^2 dt$	$T_C = 25^\circ\text{C}, t_p = 10\text{ ms}$	1.8	A^2s
		$T_C = 110^\circ\text{C}, t_p = 10\text{ ms}$	1.4	
Non-Repetitive Avalanche Energy	E_{AS}	$I_{AV} = 5\text{ A}, V_{DD} = 60\text{ V}$	30	mJ
Power Dissipation	P_{tot}	$T_C = 25^\circ\text{C}$	78	W
Operating and Storage Temperature	T_j, T_{stg}		-55 to 175	$^\circ\text{C}$

Electrical Characteristics (Per Leg)

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode Forward Voltage	V_F	$I_F = 2\text{ A}, T_j = 25^\circ\text{C}$		1.5	1.8	V
		$I_F = 2\text{ A}, T_j = 175^\circ\text{C}$		2.3	2.7	
Reverse Current	I_R	$V_R = 1200\text{ V}, T_j = 25^\circ\text{C}$		0.2	4	μA
		$V_R = 1200\text{ V}, T_j = 150^\circ\text{C}$		3	40	
Total Capacitive Charge	Q_C	$I_F \leq I_{F,MAX}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$	$V_R = 400\text{ V}$	9		nC
			$V_R = 800\text{ V}$	13		
Switching Time	t_s	$V_R = 400\text{ V}$ $V_R = 800\text{ V}$		< 10		ns
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		136		pF
		$V_R = 800\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		9		

Thermal / Mechanical Characteristics

Thermal Resistance, Junction - Case	R_{thJC}	1.92	$^\circ\text{C}/\text{W}$
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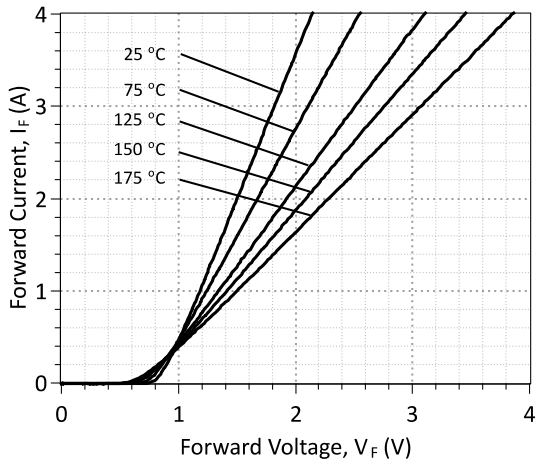


Figure 1: Typical Forward Characteristics (Pulse width = 300 μ s)

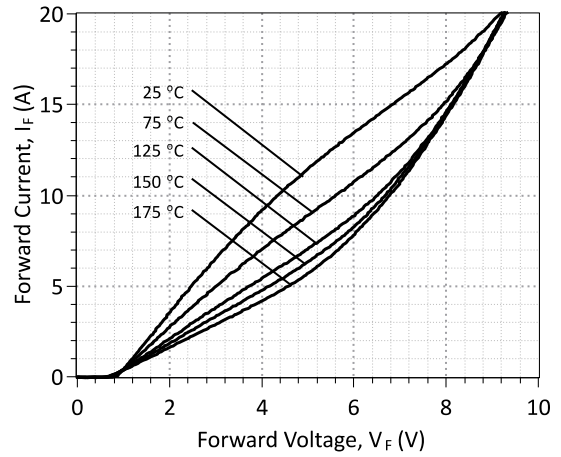


Figure 2: Typical High Current Forward Characteristics (Pulse width = 300 μ s)

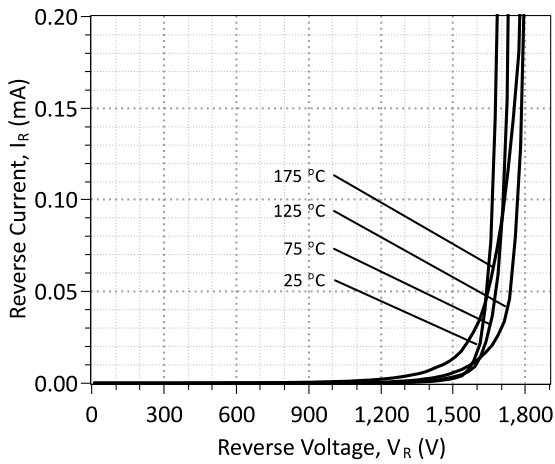


Figure 3: Typical Reverse Characteristics

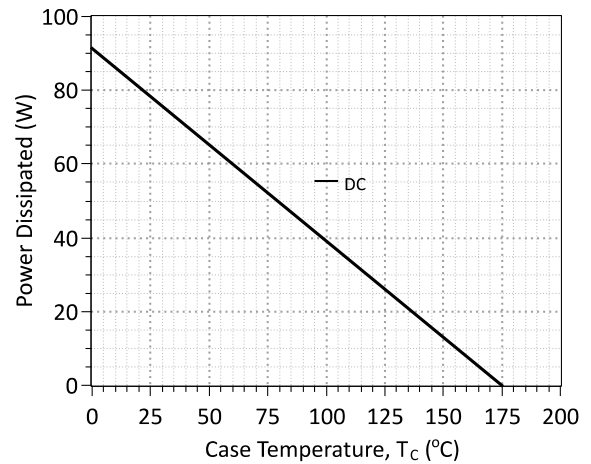


Figure 4: Power Derating Curve

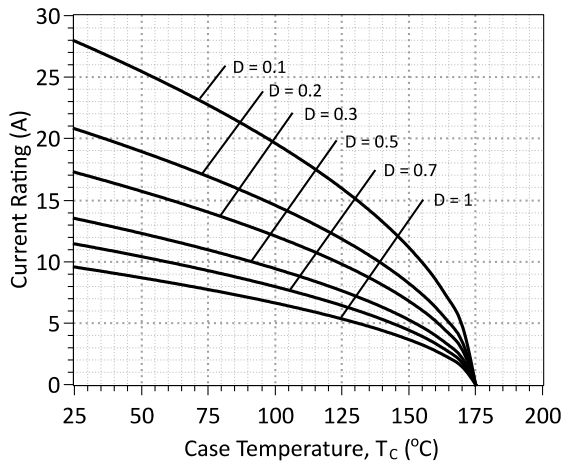


Figure 5: Current Derating Curves ($D = t_p/T$, $t_p = 10 \mu$ s) (Considering worst case Z_{th} conditions)

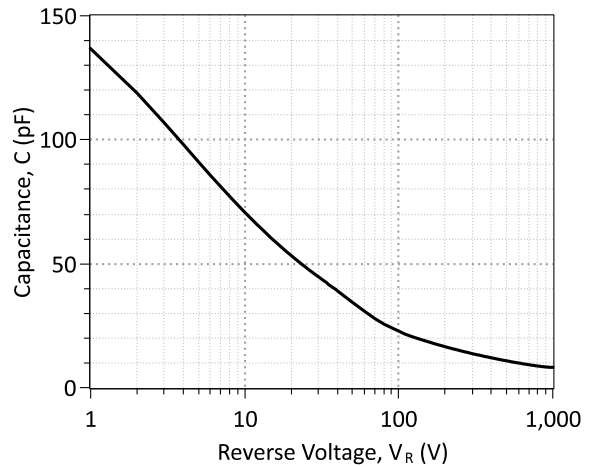


Figure 6: Typical Junction Capacitance vs Reverse Voltage Characteristics

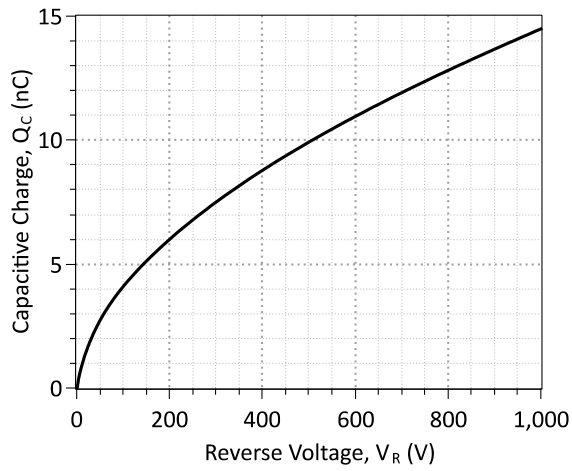


Figure 7: Typical Capacitive Charge vs. Reverse Voltage Characteristics

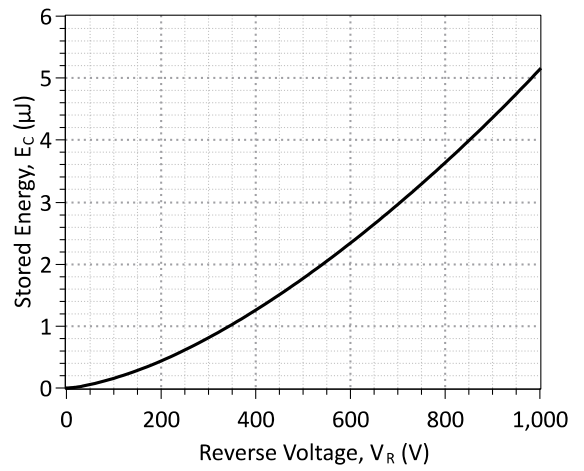


Figure 8: Typical Capacitive Energy vs. Reverse Voltage Characteristics

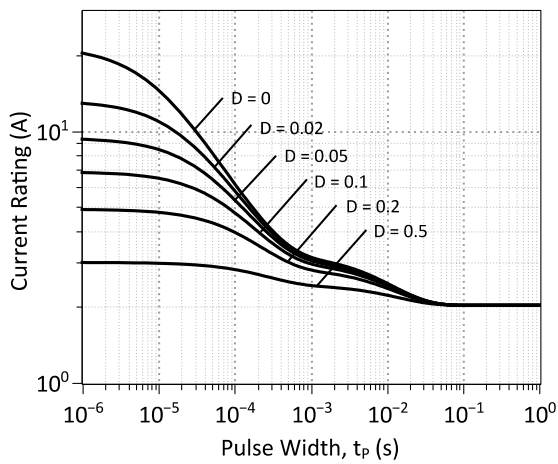


Figure 9: Current vs. Pulse Duration Curves at $T_c = 166\text{ }^\circ\text{C}$

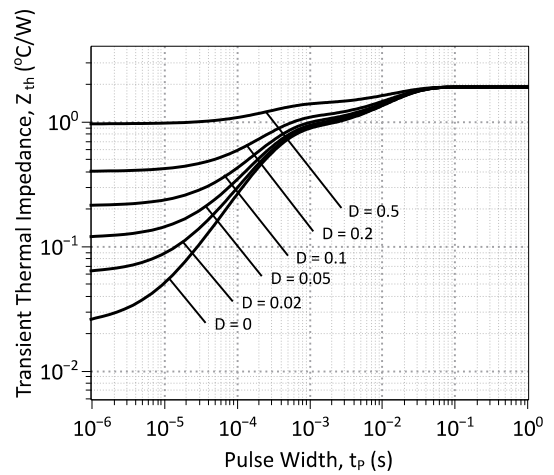
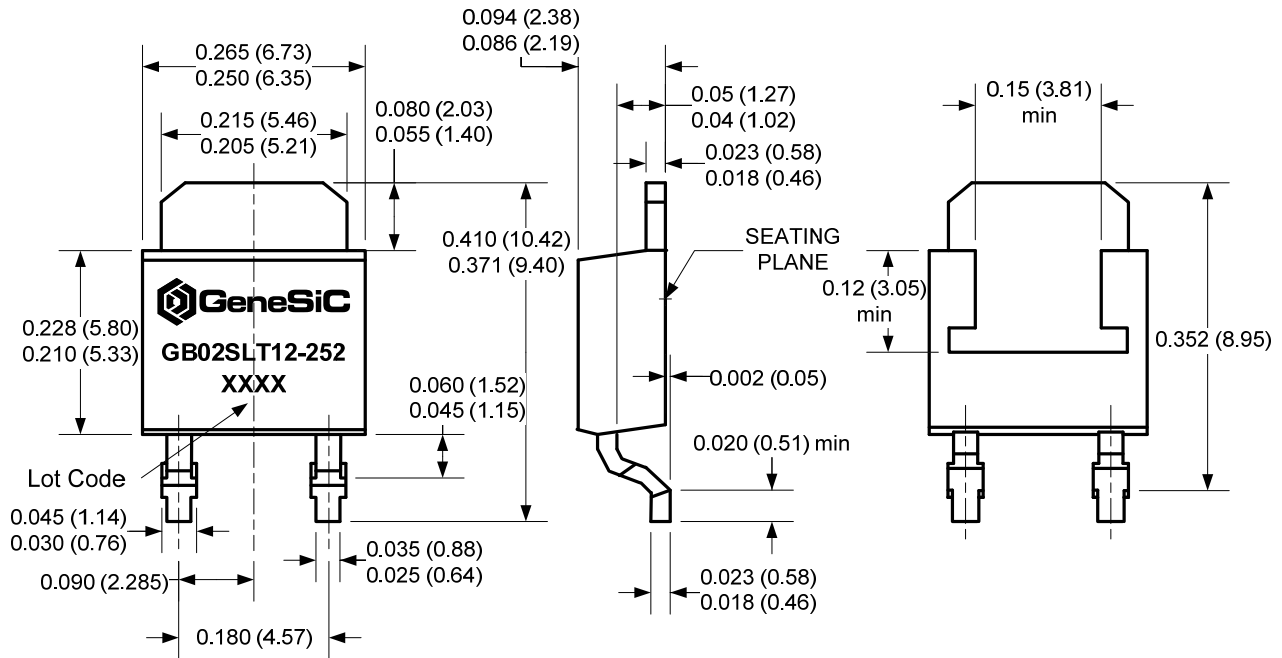
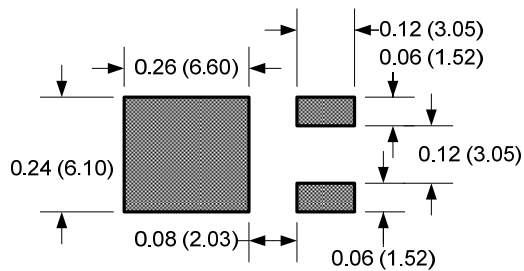


Figure 10: Transient Thermal Impedance

Package Dimensions:
TO-252
PACKAGE OUTLINE

Suggested Solder Pad Layout

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
2017/08/22	5	Updated Electrical Characteristics	
2010/12/13	0	Initial release	

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SPICE Model Parameters

This is a secure document. Please copy this code from the SPICE model PDF file on our website (http://www.genesicsemi.com/sic_rectifiers_diodes/merged_pin_schottky/GB02SLT12-252_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GB02SLT12-252.

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*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      15-MAR-2017   $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*
*      COPYRIGHT (C) 2017 GeneSiC Semiconductor Inc.
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*
*      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 rated up to 2 times rated diode current.
*
*      Start of GB02SLT12-252 SPICE Model
*
.SUBCKT GB02SLT12 ANODE KATHODE
D1 ANODE KATHODE GB02SLT12_SCHOTTKY
D2 ANODE KATHODE GB02SLT12_PIN
.MODEL GB02SLT12_SCHOTTKY D
+ IS      4.55E-15      RS      0.053
+ N       1            IKF     1000
+ EG      1.2          XTI     -2
+ TRS1    0.005434782  TRS2    2.71739E-05
+ CJO     6.40E-10     VJ      0.469
+ M       1.508        FC      0.5
+ TT      1.00E-10     BV      1200
+ IBV     1.00E-03     VPK     1200
+ IAVE    10          TYPE    SiC_Schottky
+ MFG     GeneSiC_Semi
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+ IS      1.54E-19     RS      0.19
+ TRS1    -0.004      N       3.941
+ EG      3.23        IKF     19
+ XTI     0           FC      0.5
+ TT      0           BV      1200
+ IBV     1.00E-03     VPK     1200
+ IAVE    10          TYPE    SiC_PiN
.ENDS
*      End of GB02SLT12-252 SPICE Model

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