GeneSiC
SEMICONDUCTOR

Silicon Carbide PiN Diode

V_{RRM}	=	15.0 kV
$I_{F\ (Tc=25°C)}$	=	1 A

Features

- 15 kV blocking
- 175 °C operating temperature
- Fast turn off characteristics
- Soft reverse recovery characteristics
- Ultra-Fast high temperature switching

Package

1

2

DO-201

PIN 1 ○——┐
PIN 2 ○——▷|——┘
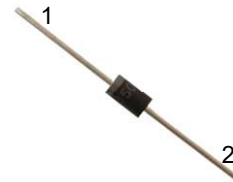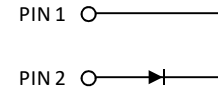
Advantages

- Highest voltage rectifier commercially available
- Reduced stacking
- Reduced system complexity/Increased reliability

Applications

- Voltage Multiplier
- Ignition/Trigger Circuits
- Oil/Downhole
- Lighting
- Defense

Maximum Ratings at T_j = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		15	kV
Continuous forward current	I_F		1	A
RMS forward current	$I_{F(RMS)}$		0.5	A
Operating and storage temperature	T_j , T_{stg}		-55 to 175	°C

Electrical Characteristics at T_j = 175 °C, unless otherwise specified

| Parameter	Symbol	Conditions		Values min.	Values typ.	Values max.	Unit
Diode forward voltage	V_F	I_F = 1 A, T_j = 25 °C			6.4		V
		I_F = 1 A, T_j = 175 °C			4.7		
Reverse current	I_R	V_R = 8 kV, T_j = 25 °C			1	20	μA
		V_R = 8 kV, T_j = 175 °C				100	
Total reverse recovery charge	Q_{rr}	$I_F ≤ I_{F,MAX}$ dI_F/dt = 70 A/μs T_j = 175 °C	V_R = 1000 V I_F = 1.5 A		558		nC
Switching time	t_s		V_R = 1000 V I_F = 1.5 A		< 236		ns
Total capacitance	C	V_R = 1 V, f = 1 MHz, T_j = 25 °C			22		pF
		V_R = 400 V, f = 1 MHz, T_j = 25 °C			4		
		V_R = 1000 V, f = 1 MHz, T_j = 25 °C			3		
Total capacitive charge	Q_C	V_R = 1000 V, f = 1 MHz, T_j = 25 °C			4.5		nC
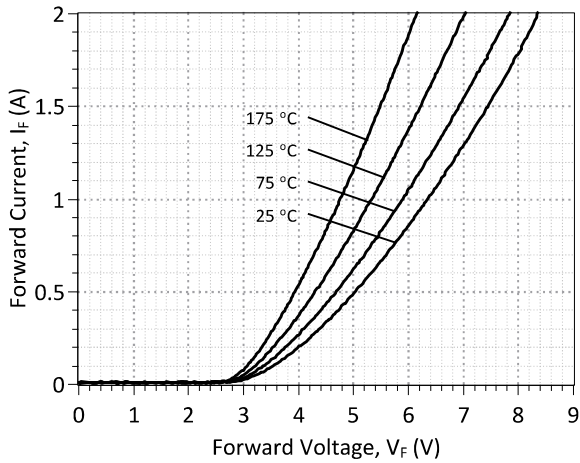
Figure 1: Typical Forward Characteristics
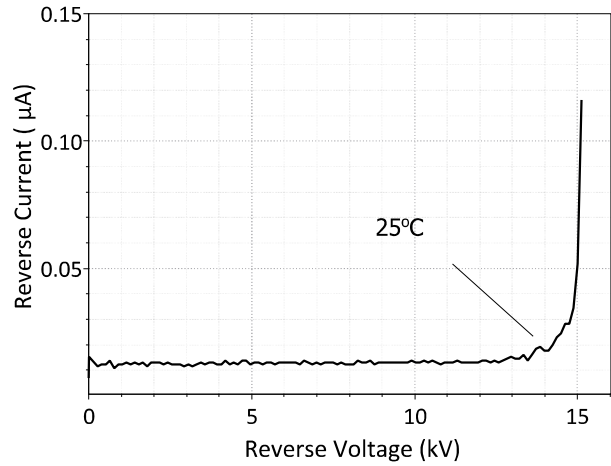
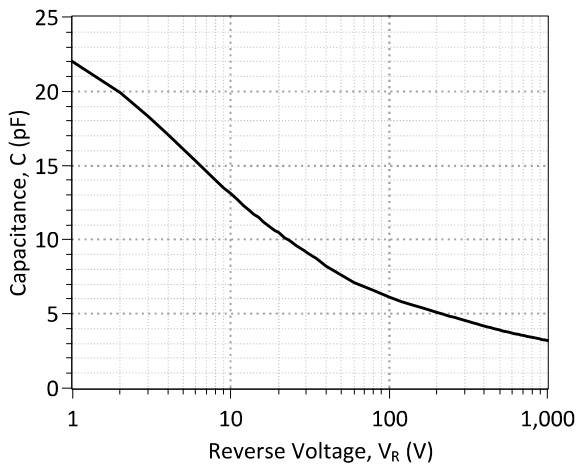Figure 2: Typical Reverse Characteristics at 25°C

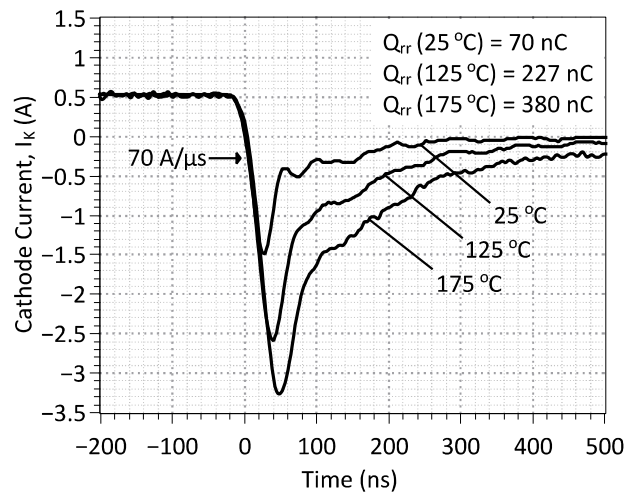Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

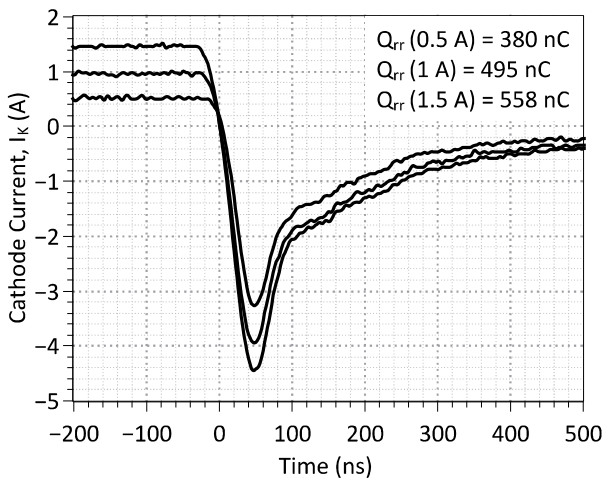Figure 4: Typical Turn Off Characteristics at I_k = 0.5 A and V_R = 1000 V

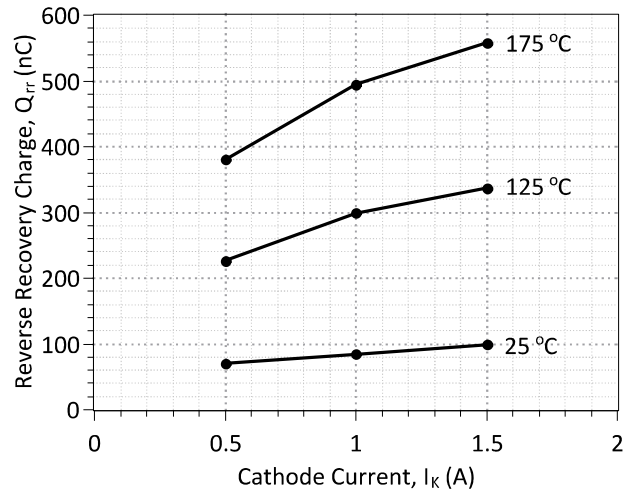Figure 5: Typical Turn Off Characteristics at T_j = 175°C and V_R = 1000 V

Figure 6: Reverse Recovery Charge vs Cathode Current
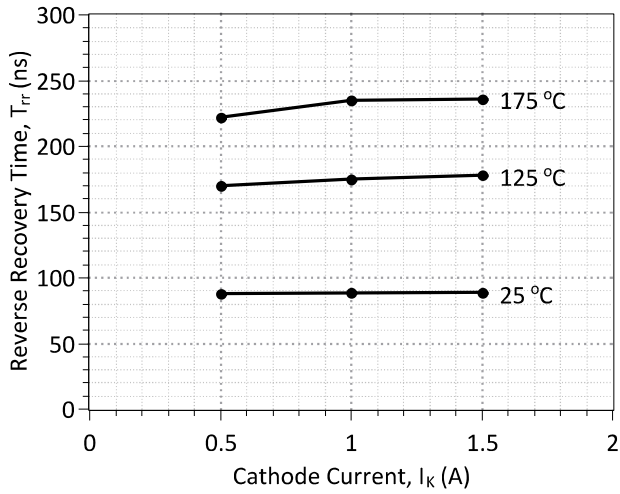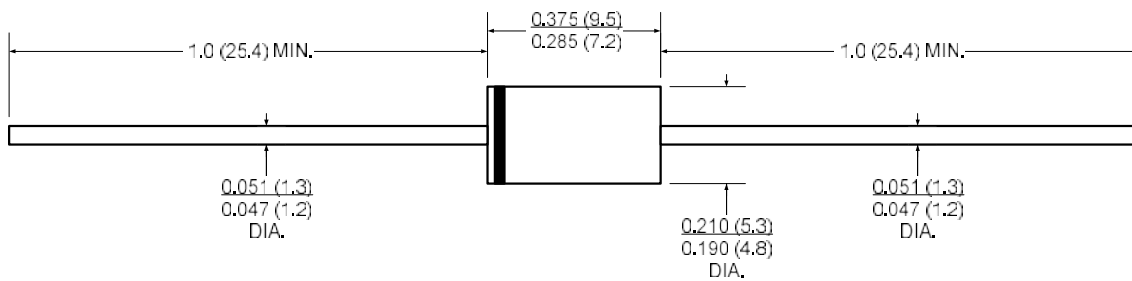
Figure 7: Reverse Recovery Time vs Cathode Current

Package Dimensions:

DO-201   **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
2016/11/10	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_pin/GA01PNS150-201_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GA01PNS150-201.

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*       MODEL OF GeneSiC Semiconductor Inc.
*
*       $Revision:   1.0              $
*       $Date:   10-Nov-2016          $
*
*       GeneSiC Semiconductor Inc.
*       43670 Trade Center Place Ste. 155
*       Dulles, VA 20166
*
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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 accurate up to 2 times rated drain current.
*
* Start of GA01PNS150-201 SPICE Model
*
.MODEL GA01PNS150 D
+ IS       9.2491e-015
+ RS       2.24770
+ N        3.3373
+ IKF      0.00011784
+ EG       3.23
+ XTI      25
+ TRS1     -0.0024
+ CJO      2.28E-11
+ VJ       2.304
+ M        0.376
+ FC       0.5
+ BV       8000
+ IBV      1.00E-03
+ VPK      15000
+ IAVE     1
+ TYPE     SiC_PiN
+ MFG      GeneSiC_Semi
*
* End of GA01PNS150-201 SPICE Model
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