

## Silicon Carbide PiN Diode

$V_{RRM}$	=	15.0 kV
$I_F (T_c=25^\circ\text{C})$	=	1 A

### Features

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

### Package

- RoHS Compliant



### Advantages

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

### Applications

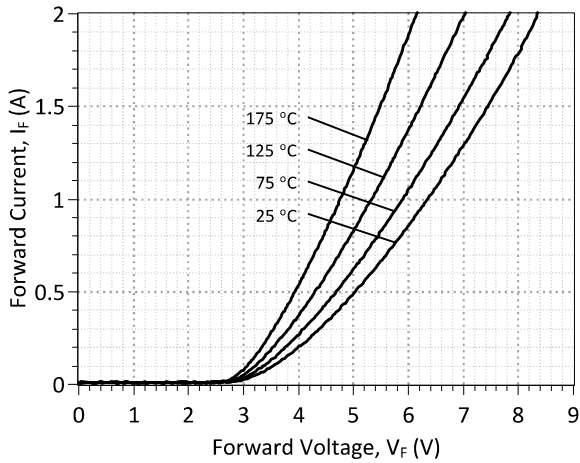
- Voltage Multiplier
- Ignition/Triggering Circuits
- Oil/Downhole
- Lighting
- Defense

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

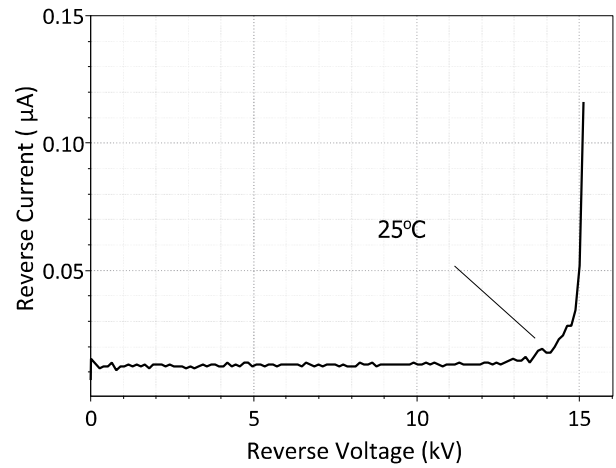
Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		15	kV
Continuous forward current	$I_F$		1	A
RMS forward current	$I_{F(RMS)}$		0.5	A
Operating and storage temperature	$T_j, T_{stg}$		-55 to 175	°C

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

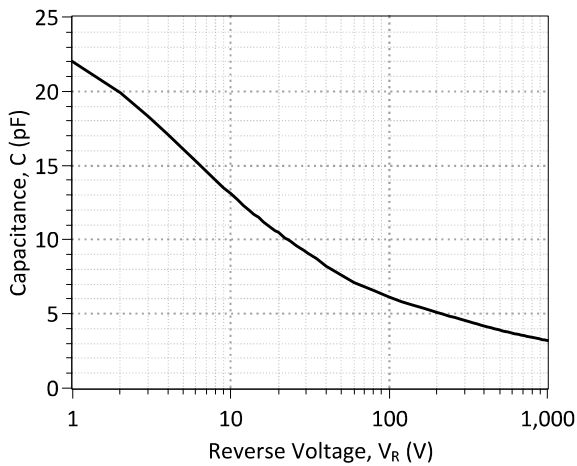
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	$V_F$	$I_F = 1\text{ A}, T_j = 25^\circ\text{C}$		6.4		V
		$I_F = 1\text{ A}, T_j = 175^\circ\text{C}$		4.7		
Reverse current	$I_R$	$V_R = 8\text{ kV}, T_j = 25^\circ\text{C}$ $V_R = 8\text{ kV}, T_j = 175^\circ\text{C}$		1	20 100	$\mu\text{A}$
Total reverse recovery charge	$Q_{rr}$	$I_F \leq I_{F,MAX}$ $di_F/dt = 70\text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$	$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$	558		nC
Switching time	$t_s$	$T_j = 175^\circ\text{C}$	$V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$	< 236		ns
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		22		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		4		
		$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		3		
Total capacitive charge	$Q_C$	$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$		4.5		nC



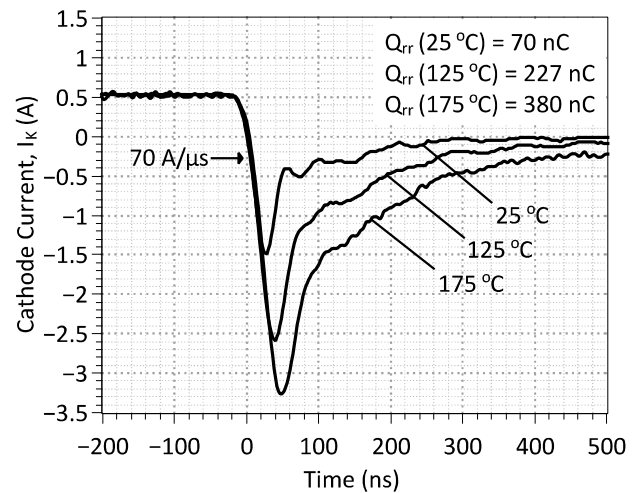
**Figure 1: Typical Forward Characteristics**



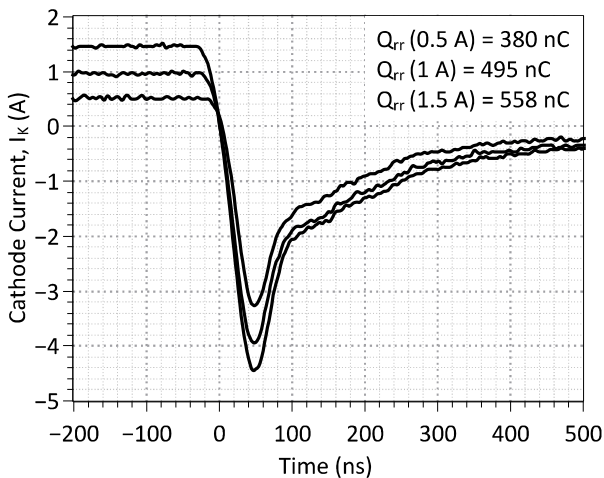
**Figure 2: Typical Reverse Characteristics at 25°C**



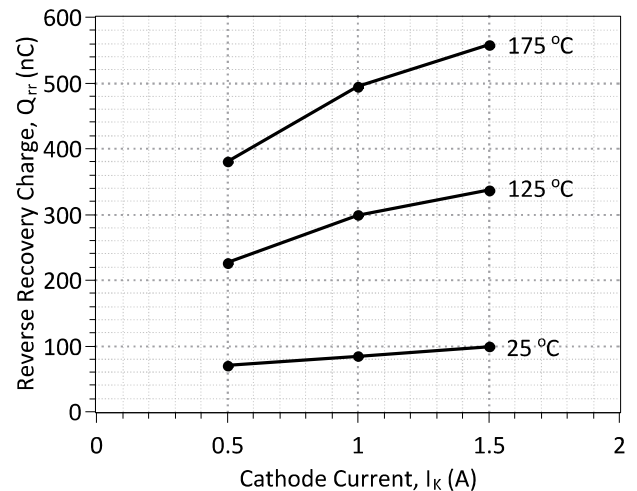
**Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics**



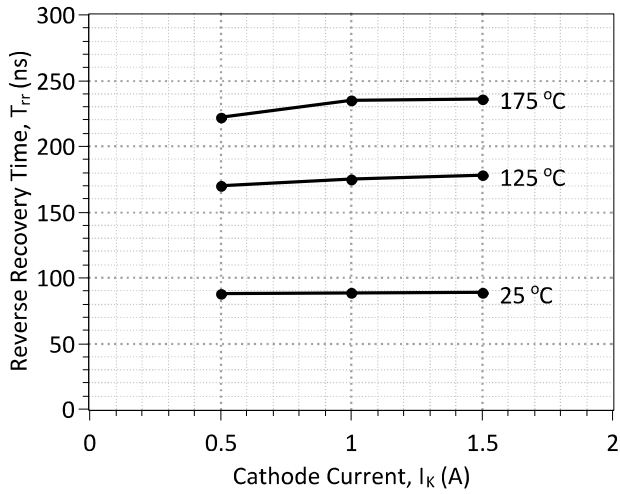
**Figure 4: Typical Turn Off Characteristics at  $I_k = 0.5$  A and  $V_R = 1000$  V**



**Figure 5: Typical Turn Off Characteristics at  $T_j = 175^\circ\text{C}$  and  $V_R = 1000$  V**



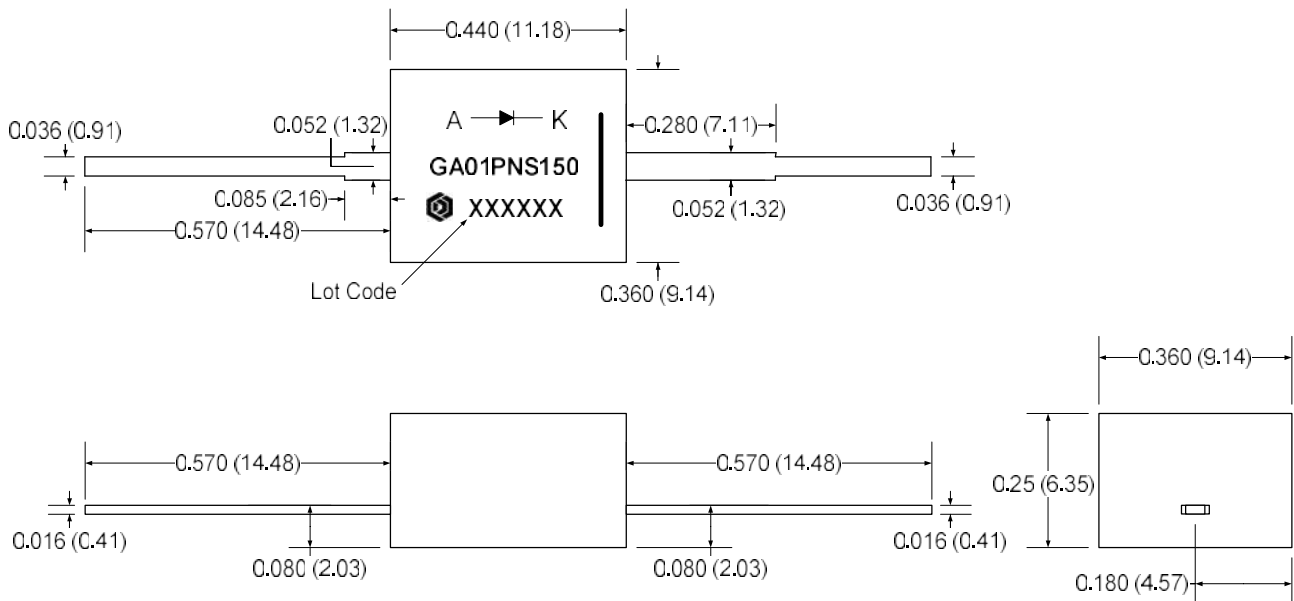
**Figure 6: Reverse Recovery Charge vs Cathode Current**



**Figure 7: Reverse Recovery Time vs Cathode Current**

**Package Dimensions:**

**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
2015/04/30	1	Updated Electrical Characteristics	
2014/11/07	0	Initial release	

## Published by

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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/GA01PNS150-220\\_SPICE.pdf](http://www.genesicsemi.com/sic_pin/GA01PNS150-220_SPICE.pdf)) into LTSPICE (version 4) software for simulation of the GA01PNS150-220.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.1           $
*      $Date:      30-APR-2015   $
*
*      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
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*      PARTICULAR PURPOSE."
*      Models accurate up to 2 times rated drain current.
*
*      Start of GA01PNS150-220 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 GA01PNS150-220 SPICE Model
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