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

- RoHS Compliant

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			Unit
				min.	typ.	max.	
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}	$I_F \le I_{F,MAX}$ 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

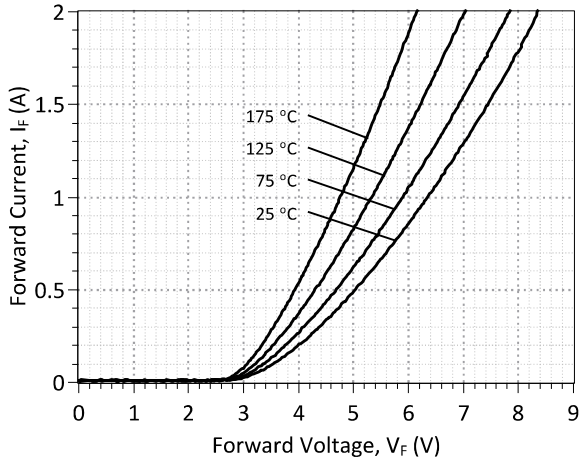


Figure 1: Typical Forward Characteristics

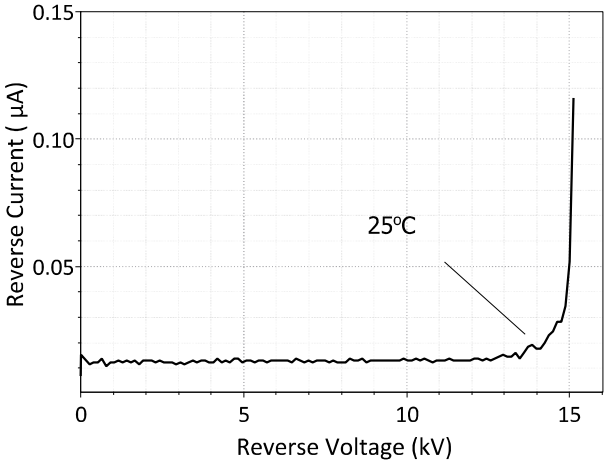


Figure 2: Typical Reverse Characteristics at 25°C

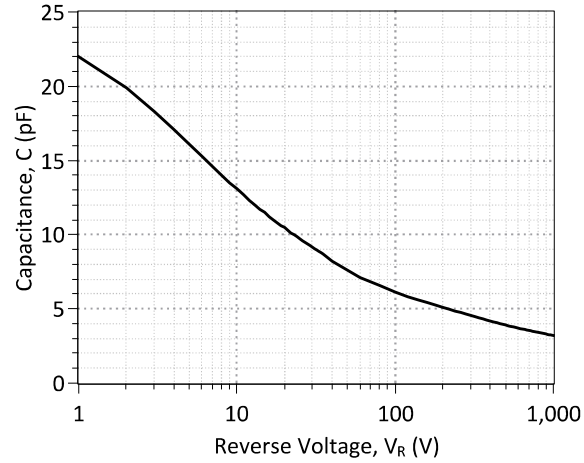


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

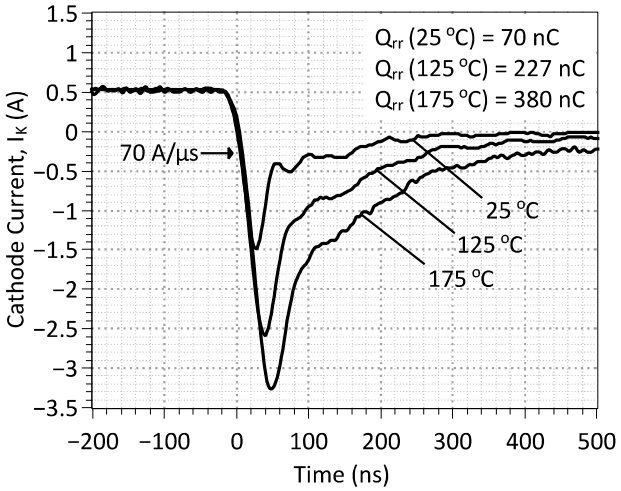


Figure 4: Typical Turn Off Characteristics at I_k = 0.5 A and V_R = 1000 V

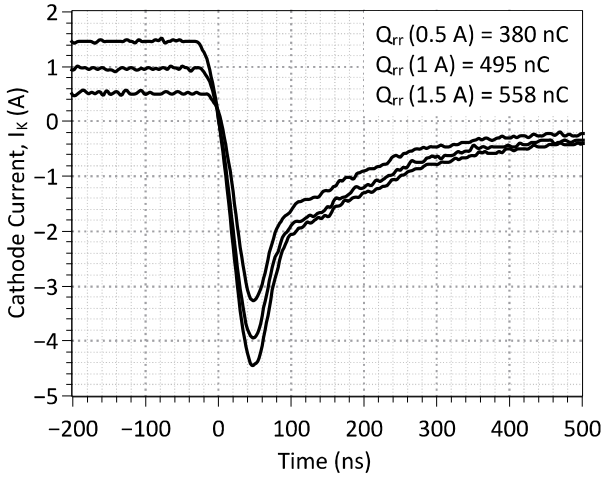


Figure 5: Typical Turn Off Characteristics at T_j = 175°C and V_R = 1000 V

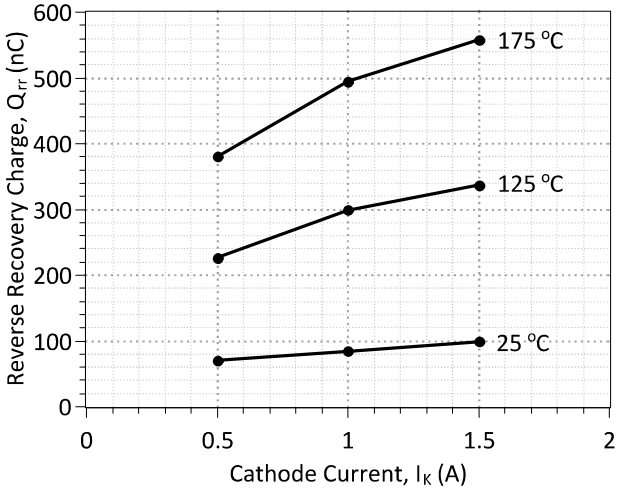


Figure 6: Reverse Recovery Charge vs Cathode Current

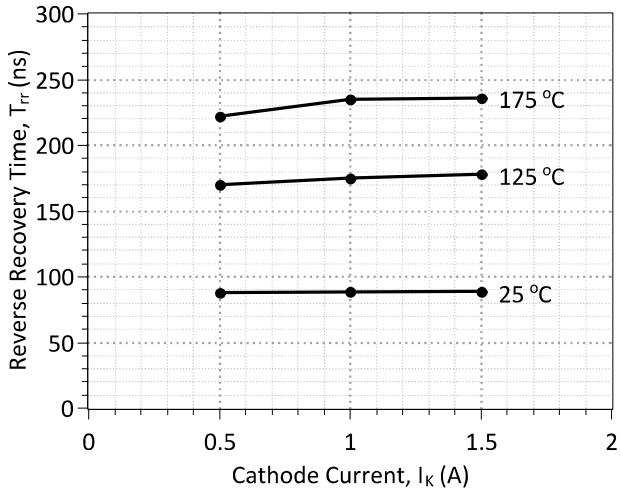
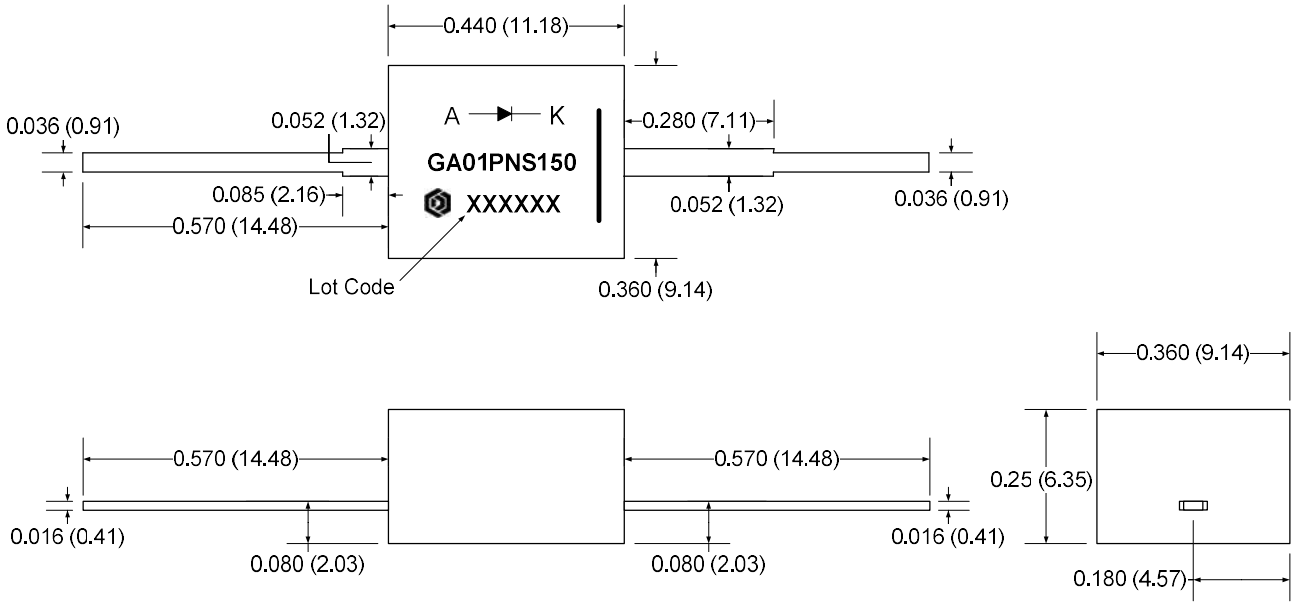


Figure 7: Reverse Recovery Time vs Cathode Current

Package Dimensions:

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	

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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) 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
*
*     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 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
```