

GA01PNS150-220

Silicon Carbide PiN Diode

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

Features

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

Advantages

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

Package

RoHS Compliant





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	А
RMS forward current	I _{F(RMS)}		0.5	А
Operating and storage temperature	T_{j} , T_{stg}		-55 to 175	С°

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

Parameter	Symbol	Conditions		Values		l luit
		Conditions	min.	typ.	max.	Unit
Diode forward voltage	V _F	I _F = 1 A, T _j = 25 °C		6.4		V
5		$I_F = 1 \text{ A}, T_j = 175 \text{ °C}$ $V_R = 8 \text{ kV}, T_i = 25 \text{ °C}$		4.7 1	20	•
Reverse current	I _R	V _R = 8 kV, T _j = 175 °C			100	μA
Total reverse recovery charge	Q _{rr}	$V_{\rm R} = 1000$ $V_{\rm F} \le I_{\rm F,MAX}$ $I_{\rm F} = 1.5 \rm{A}$		558		nC
Switching time	ts	$\begin{array}{c} I_{F} \cong I_{F,MAX} \\ dI_{F}/dt = 70 \text{ A}/\mu \text{s} \\ T_{j} = 175 \ ^{\circ}\text{C} \\ \end{array} \qquad \begin{array}{c} I_{F} = 1.5 \text{ A} \\ V_{R} = 1000 \\ I_{F} = 1.5 \text{ A} \end{array}$	V	< 236		ns
		V _R = 1 V, f = 1 MHz, T _j = 25 °C		22		
Total capacitance	С	$V_R = 400 \text{ V}, \text{ f} = 1 \text{ MHz}, \text{ T}_j = 25 \text{ °C}$		4		pF
		$V_R = 1000 \text{ V}, \text{ f} = 1 \text{ MHz}, \text{ T}_j = 25 ^{\circ}\text{C}$	2	3		
Total capacitive charge	Qc	V _R = 1000 V, f = 1 MHz, T _i = 25 °C	2	4.5		nC

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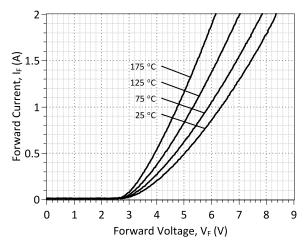


Figure 1: Typical Forward Characteristics

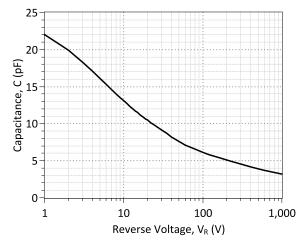


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

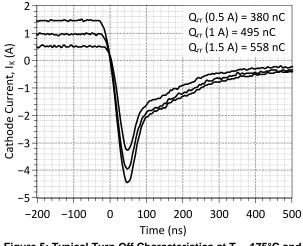


Figure 5: Typical Turn Off Characteristics at T_j = 175°C and V_R = 1000 V

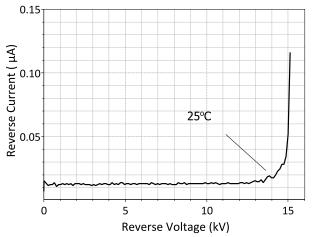


Figure 2: Typical Reverse Characteristics at 25°C

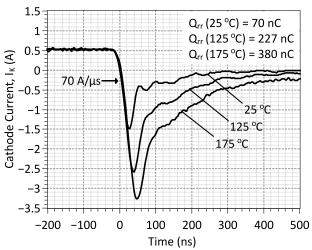


Figure 4: Typical Turn Off Characteristics at $I_k = 0.5$ A and $V_R = 1000$ V

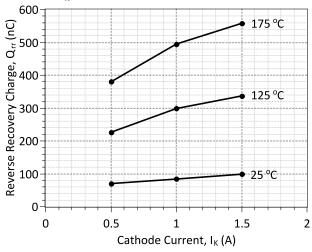
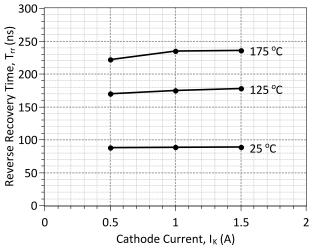


Figure 6: Reverse Recovery Charge vs Cathode Current

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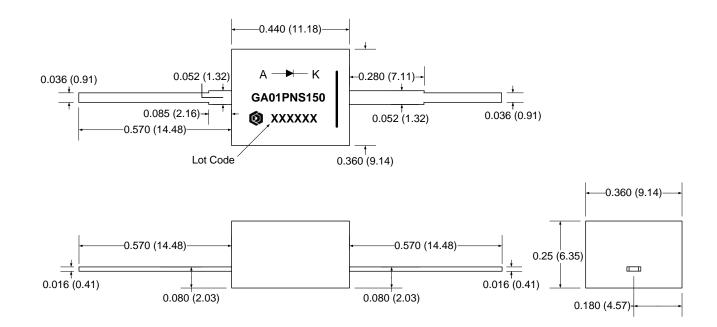
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Figure 7: Reverse Recovery Time vs Cathode Current

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



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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/images/products_sic/thyristor/GA01PNS150-220_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GA01PNS150-220.

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     MODEL OF GeneSiC Semiconductor Inc.
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     $Revision: 1.1
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*
     $Date: 30-APR-2015
                                $
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     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 accurate up to 2 times rated drain current.
 Start of GA01PNS150-220 SPICE Model
.MODEL GA01PNS150 D
     9.2491e-015
+ IS
          2.24770
+ RS
          3.3373
+ N
         0.00011784
+ IKF
+ EG
          3.23
         25
+ XTI
+ TRS1
         -0.0024
          2.28E-11
+ CJO
          2.304
+ VJ
+ M
          0.376
+ FC
         0.5
+ BV
         8000
+ IBV
         1.00E-03
         15000
+ VPK
+ IAVE
         1
        SiC PiN
+ TYPE
+ MFG
         GeneSiC Semi
* End of GA01PNS150-220 SPICE Model
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