

# GA01PNS80-220

### Silicon Carbide PiN Diode

$V_{RRM}$	=	8.0 kV
I <sub>F (Tc=25°C)</sub>	=	2 A

#### **Features**

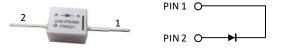
- 8 kV blocking
- 175 °C operating temperature
- · Fast turn off characteristics
- Soft reverse recovery characteristics
- Ultra-Fast high temperature switching

# **Advantages**

- Reduced stacking
- · Reduced system complexity/Increased reliability

#### **Package**

RoHS Compliant



## **Applications**

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

#### Maximum Ratings at T<sub>j</sub> = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		8	kV
Continuous forward current	l <sub>F</sub>		2	Α
RMS forward current	I <sub>F(RMS)</sub>		1	Α
Operating and storage temperature	$T_{j}$ , $T_{stg}$		-55 to 175	°C

#### Electrical Characteristics at T<sub>j</sub> = 175 °C, unless otherwise specified

Parameter	Cumhal	Conditions -		Values		I Imia	
	Symbol			min.	typ.	max.	Unit
Diode forward voltage	V <sub>F</sub>	$I_F = 2 A, T_j = 2$	25 °C		6.1		V
Diode forward voltage	VF	$I_F = 2 A, T_j = 1$	I <sub>F</sub> = 2 A, T <sub>j</sub> = 175 °C		4.7		V
Reverse current	I_	$V_R = 8 \text{ kV}, T_j = 25 ^{\circ}\text{C}$		4		^	
	I <sub>R</sub>	$V_{R} = 8 \text{ kV}, T_{j} =$	175 °C		4		μA
Total reverse recovery charge	$Q_{rr}$	I <sub>F</sub> ≤ I <sub>F,MAX</sub>	V <sub>R</sub> = 1000 V I <sub>F</sub> = 1.5 A		558		nC
Switching time	t <sub>s</sub>	dI <sub>F</sub> /dt = 70 A/μs Τ <sub>j</sub> = 175 °C	V <sub>R</sub> = 1000 V I <sub>F</sub> = 1.5 A		< 236		ns
		V <sub>R</sub> = 1 V, f = 1 MHz	T <sub>j</sub> = 25 °C		26		
Total capacitance	С	$V_R = 400 \text{ V}, f = 1 \text{ MHz}, T_j = 25 ^{\circ}\text{C}$		5		pF	
		V <sub>R</sub> = 1000 V, f = 1 MH	Iz, T <sub>j</sub> = 25 °C		4		
Total capacitive charge	$Q_{C}$	V <sub>R</sub> = 1000 V, f = 1 MH	Iz, T <sub>j</sub> = 25 °C		5.4		nC

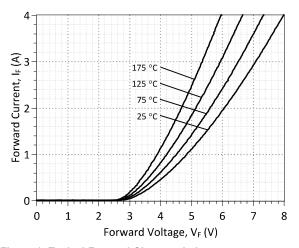


Figure 1: Typical Forward Characteristics

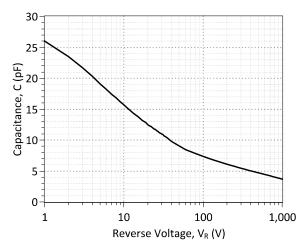


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

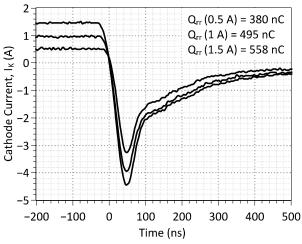


Figure 5: Typical Turn Off Characteristics at  $T_{j}$  = 175°C and  $V_{R}$  = 1000 V

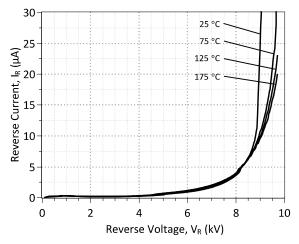


Figure 2: Typical Reverse Characteristics at 25°C

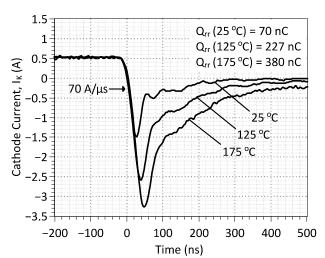


Figure 4: Typical Turn Off Characteristics at  $I_{k}$  = 0.5 A and  $V_{R}$  = 1000 V

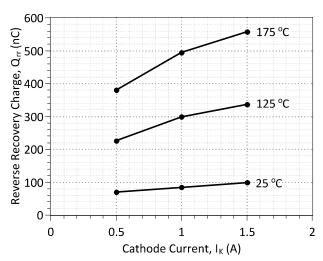


Figure 6: Reverse Recovery Charge vs Cathode Current



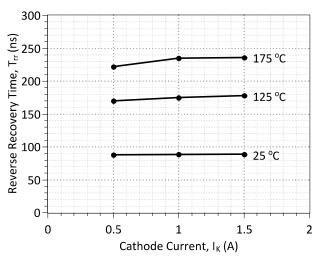
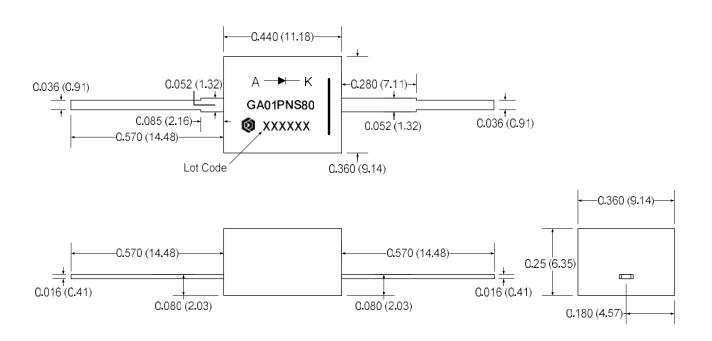


Figure 7: Reverse Recovery Time vs Cathode Current

### **Package Dimensions:**

#### **PACKAGE OUTLINE**



- 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/images/products\_sic/thyristor/GA01PNS80-220\_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GA01PNS80-220.

```
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.
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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 GA01PNS80-220 SPICE Model
.MODEL GA01PNS80 D
+ IS 9.2491e-015
         1.02512
+ RS
+ N
          3.3373
+ IKF
         0.00011784
          3.23
+ EG
         25
+ XTI
+ TRS1
         -0.0024
         2.7E-11
+ CJO
          2.304
+ VJ
         0.376
+ M
         0.5
+ FC
+ BV
         8000
+ IBV
         1.00E-03
+ VPK
          8000
+ IAVE
+ TYPE
         SiC PiN
+ MFG
         GeneSiC Semi
* End of GA01PNS80-220 SPICE Model
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