

Silicon Carbide PiN Diode Chip

Features

- 15 kV blocking
- 250 °C operating temperature
- Fast turn off characteristics
- Soft reverse recovery characteristics
- Ultra-Fast high temperature switching

Advantages

- Industry's first > 10 kV power rectifier
- Reduced stacking
- · Reduced system complexity/Increased reliability



Applications

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

Maximum Ratings at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V _{RRM}		15	kV
Continuous forward current	I _F	T _C ≤ 150 °C	1	А
RMS forward current	I _{F(RMS)}	T _C ≤ 150 °C	0.5	А
Operating and storage temperature	T _j , T _{stg}		-55 to 250	°C

Electrical Characteristics at T_j = 250 °C, unless otherwise specified

Parameter	Symbol	Conditions -		Values			11
				min.	typ.	max.	Unit
Diode forward voltage	V _F	I _F = 1 A, T _j =	25 °C		6.5	7.0	V
		I _F = 1 A, T _j = 2	I _F = 1 A, T _j = 225 °C		4.4	5.0	v
Reverse current	I _R	V _R = 15 kV, T _j :	= 25 °C		1	20	
		V _R = 15 kV, T _j =	= 225 °C	5 1	100	μA	
Total reverse recovery charge	Q _{rr}	$I_F \leq I_{F,MAX}$	V _R = 1000 V I _F = 1.5 A		558		nC
Switching time	t _s	dI _F /dt = 70 A/μs T _j = 225 °C	$V_{\rm R} = 1000 \text{ V}$ $I_{\rm F} = 1.5 \text{ A}$		< 236		ns
Total capacitance		V _R = 1 V, f = 1 MHz	z, T _j = 25 °C		28		
	С	V _R = 400 V, f = 1 MH	lz, T _i = 25 °C		8		pF
		V _R = 1000 V, f = 1 MI	Hz, T _j = 25 °C		7		
Total capacitive charge	Q _c	V _R = 1000 V, f = 1 MI	Hz, T _j = 25 °C		5.34		nC

*For chip size and metallization, please refer to the mechanical datasheet (must have a non-disclosure agreement with GeneSiC Semiconductor).

Electrical Datasheet*

GA01PNS150-CAU

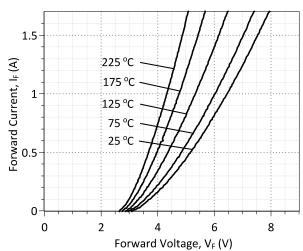


Figure 1: Typical Forward Characteristics

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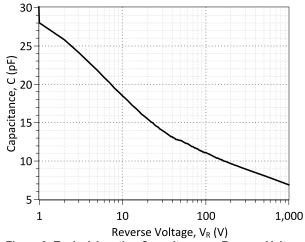
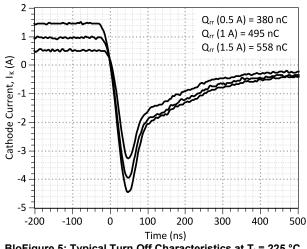


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics



BloFigure 5: Typical Turn Off Characteristics at T_j = 225 °C and \$V_{\rm R}\$ = 1000 V

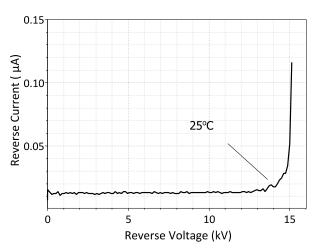
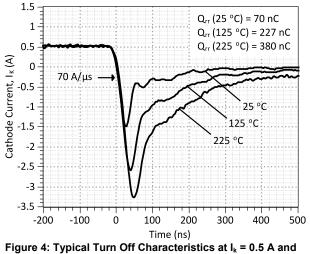


Figure 2: Typical Reverse Characteristics



 $V_{R} = 1000 \text{ V}$

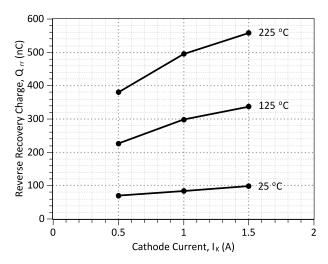


Figure 6: Reverse Recovery Charge vs Cathode Current



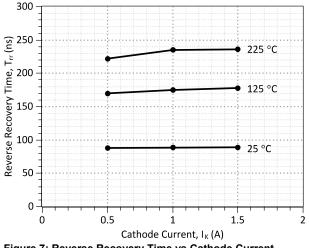


Figure 7: Reverse Recovery Time vs Cathode Current

Revision History							
Date	Revision	Comments	Supersedes				
2014/08/26	0	Initial release					

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SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GA01PNS150-CAU device.

```
*
     MODEL OF GeneSiC Semiconductor Inc.
*
*
     $Revision: 1.0
                                $
*
     $Date: 26-AUG-2014
                                $
*
*
    GeneSiC Semiconductor Inc.
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     43670 Trade Center Place Ste. 155
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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-CAU SPICE Model
.MODEL GA01PNS150 D
       9.71E-12
+ IS
+ RS
          2.07
         5.7869
+ N
+ IKF
         0.039646
+ EG
          3.23
+ XTI
          58
+ TRS1
         -0.0034
+ CJO
         2.28E-11
+ VJ
         2.304
          0.376
+ M
+ FC
         0.5
+ BV
         16000
        1.00E-03
+ IBV
+ VPK
         15000
+ IAVE
          1
+ TYPE
         SiC PiN
+ MFG GeneSiC_Semi
* End of GA01PNS150-CAU SPICE Model
```