

**Silicon Carbide
PiN Diode Chip**

V_{RRM}	=	8000 V
$I_F @ 25^\circ C$	=	2 A

Features

- 8 kV blocking
- 210 °C operating temperature
- Fast turn off characteristics
- Soft reverse recovery characteristics
- Ultra-Fast high temperature switching


Die Size = 2.4 mm x 2.4 mm
Advantages

- Reduced stacking
- Reduced system complexity/Increased reliability

Applications

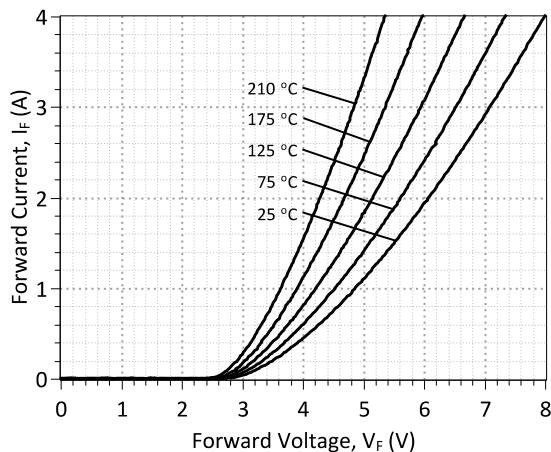
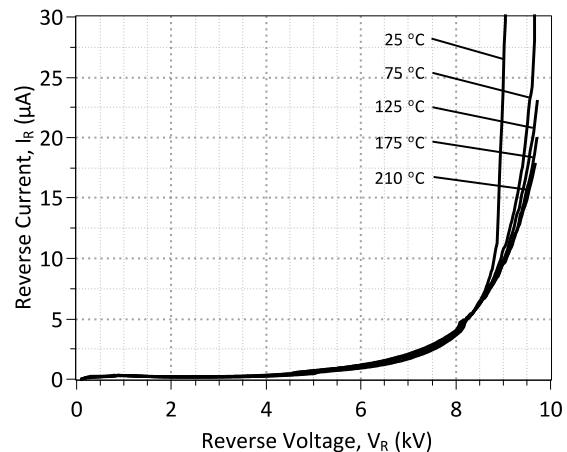
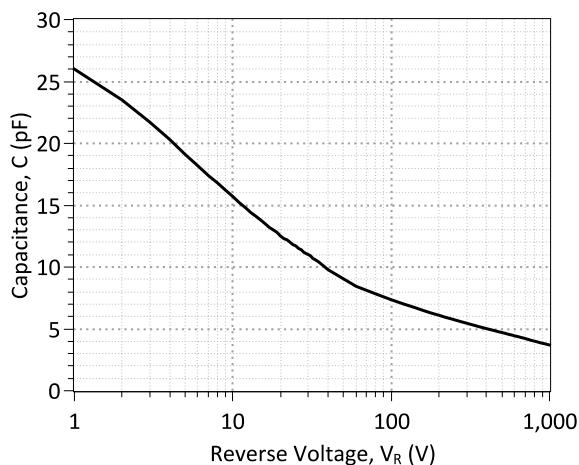
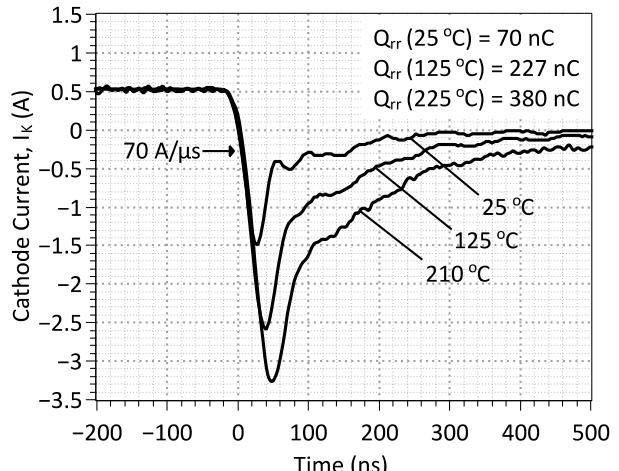
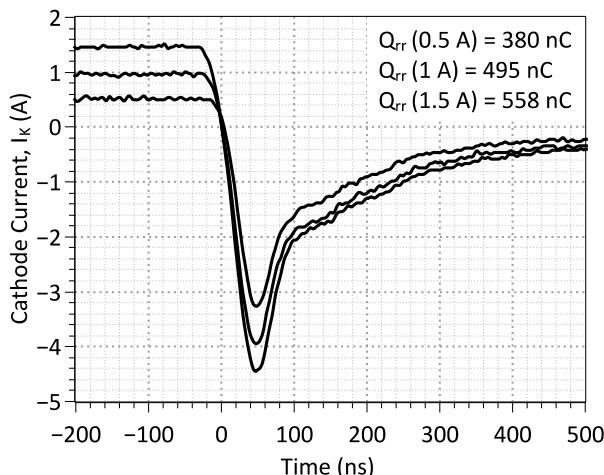
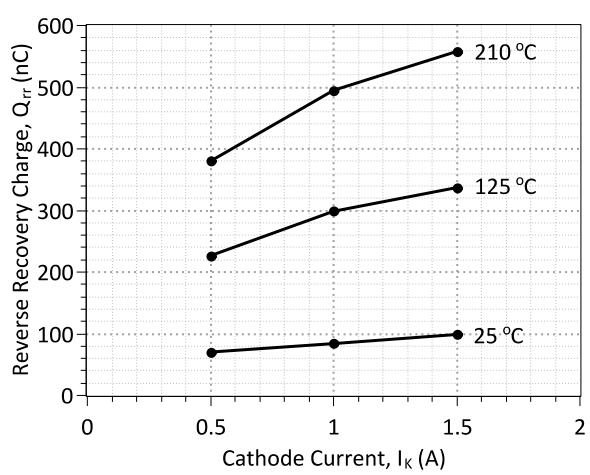
- Voltage Multiplier
- Ignition/Trigger Circuits
- Oil/Downhole
- Lighting
- Defense

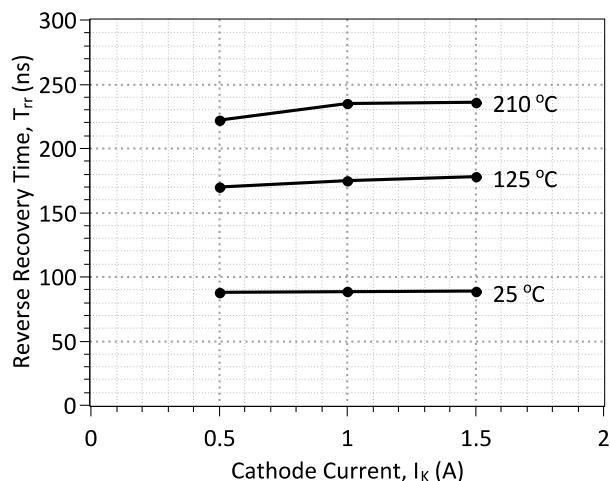
Maximum Ratings at $T_j = 210^\circ C$, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		8	kV
Continuous forward current	I_F		2	A
RMS forward current	$I_{F(RMS)}$		1	A
Operating and storage temperature	T_j, T_{stg}		-55 to 210	°C

Electrical Characteristics at $T_j = 210^\circ C$, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	V_F	$I_F = 2 A, T_j = 25^\circ C$ $I_F = 2 A, T_j = 210^\circ C$	6.1 4.3			V
Reverse current	I_R	$V_R = 8 kV, T_j = 25^\circ C$ $V_R = 8 kV, T_j = 175^\circ C$	4 4			μA
Total reverse recovery charge	Q_{rr}	$I_F \leq I_{F,MAX}$ $dI_F/dt = 70 A/\mu s$	$V_R = 1000 V$ $I_F = 1.5 A$	558		nC
Switching time	t_s	$T_j = 210^\circ C$	$V_R = 1000 V$ $I_F = 1.5 A$	< 236		ns
Total capacitance	C	$V_R = 1 V, f = 1 MHz, T_j = 25^\circ C$ $V_R = 400 V, f = 1 MHz, T_j = 25^\circ C$ $V_R = 1000 V, f = 1 MHz, T_j = 25^\circ C$	26 5 4			pF
Total capacitive charge	Q_C	$V_R = 1000 V, f = 1 MHz, T_j = 25^\circ C$	5.4			nC

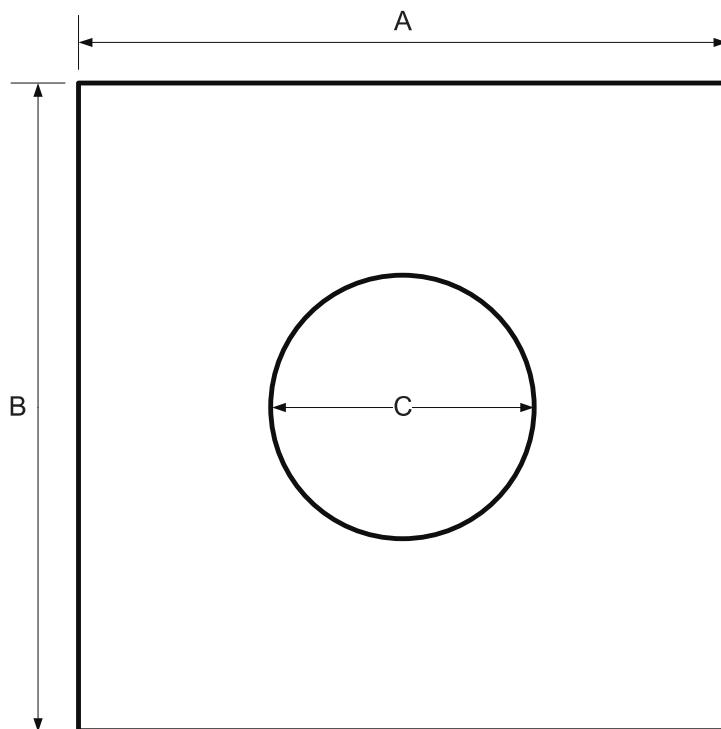
Figures:

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 $T_j = 210$ °C and $V_R = 1000$ V

Figure 6: Reverse Recovery Charge vs Cathode Current

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

Mechanical Parameters

Die Dimensions	2.4 x 2.4	mm ²
Anode pad size	Φ 0.98	mm
Area total / active	5.76/0.75	mm ²
Die Thickness	450	μm
Wafer Size	76.2	mm
Flat Position	0	deg
Die Frontside Passivation	Polyimide	
Anode Pad Metallization	400 nm Ni + 200 nm Au	
Backside Cathode Metallization	400 nm Ni + 200 nm Au	
Die Attach	Electrically conductive glue or solder	
Wire Bond	Au \leq 26 μm	
Reject ink dot size	$\Phi \geq 0.3$ mm	
Recommended storage environment	Store in original container, in dry nitrogen, < 6 months at an ambient temperature of 23 °C	

Chip Dimensions:



DIE	A [mm]	2.4
	B [mm]	2.4
METAL	C [mm]	0.98



Die Datasheet

GA01PNS80-CAU

Revision History			
Date	Revision	Comments	Supersedes
2015/04/30	2	Updated Electrical Characteristics	
2015/02/25	1	Inserted Mechanical Parameters	
2013/11/27	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/hit_sic/baredie/pin/GA01PNS80-CAU_SPICE.pdf) into LTSpice (version 4) software for simulation of the GA01PNS80-CAU device.

```
*      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) 2013 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-CAU SPICE Model  
*. MODEL GA01PNS80 D  
+ IS      9.2491e-015  
+ RS      1.02512  
+ N       3.3373  
+ IKF     0.00011784  
+ EG      3.23  
+ XTI     25  
+ TRS1    -0.0024  
+ CJO     2.7E-11  
+ VJ      2.304  
+ M       0.376  
+ FC      0.5  
+ BV      8000  
+ IBV     1.00E-03  
+ VPK     8000  
+ IAVE    1  
+ TYPE    SiC_PiN  
+ MFG     GeneSiC_Semi  
*  
* End of GA01PNS80-CAU SPICE Model
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