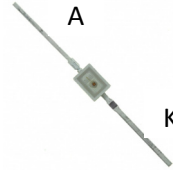


Silicon Carbide PiN Diode

Features

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



Advantages

- Industry's lowest conduction losses
- Reduced stacking
- Reduced system complexity/Increased reliability

Applications

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

Maximum Ratings at $T_j = 250\text{ °C}$, unless otherwise specified

| Parameter | Symbol | Conditions | Values | Unit |
|-----------------------------------|----------------|--------------------------|------------|------|
| Repetitive peak reverse voltage | V_{RRM} | | 8 | kV |
| Continuous forward current | I_F | $T_C \leq 150\text{ °C}$ | 2 | A |
| RMS forward current | $I_{F(RMS)}$ | $T_C \leq 150\text{ °C}$ | 1 | A |
| Operating and storage temperature | T_j, T_{stg} | | -55 to 250 | °C |

Electrical Characteristics at $T_j = 250\text{ °C}$, unless otherwise specified

| Parameter | Symbol | Conditions | Values | | | Unit |
|-------------------------------|----------|--|--------|------|---------|---------------|
| | | | min. | typ. | max. | |
| Diode forward voltage | V_F | $I_F = 2\text{ A}, T_j = 25\text{ °C}$ | | 4.6 | 4.8 | V |
| | | $I_F = 2\text{ A}, T_j = 225\text{ °C}$ | | 3.9 | 4.5 | |
| Reverse current | I_R | $V_R = 8\text{ kV}, T_j = 25\text{ °C}$ $V_R = 8\text{ kV}, T_j = 175\text{ °C}$ | | 0.1 | 3 50 | μA |
| Total reverse recovery charge | Q_{rr} | $I_F \leq I_{F,MAX}$ $di_F/dt = 70\text{ A}/\mu\text{s}$ $T_j = 225\text{ °C}$ | | 558 | | nC |
| Switching time | t_s | | | | | |
| Total capacitance | C | $V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$ | | 20 | | pF |
| | | $V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$ | | 5 | | |
| | | $V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$ | | 4 | | |
| Total capacitive charge | Q_C | $V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$ | | 5.34 | | nC |

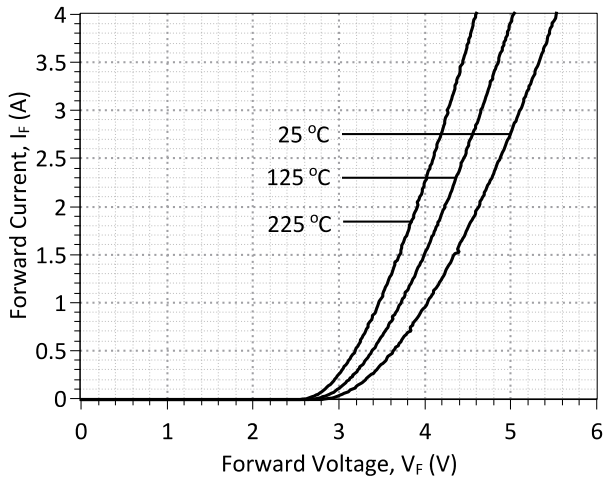


Figure 1: Typical Forward Characteristics

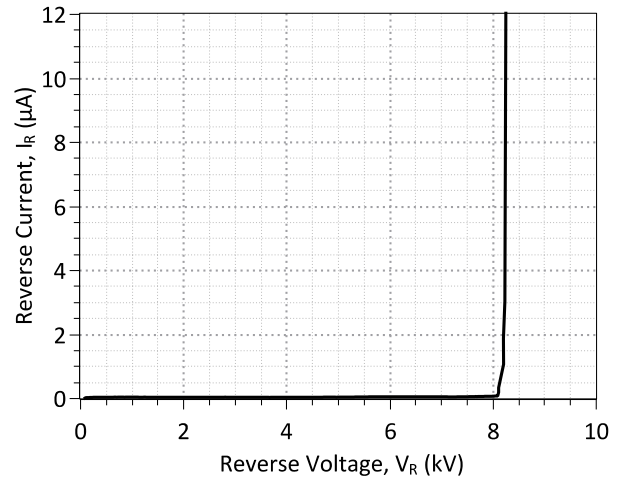


Figure 2: Typical Reverse Characteristics at 25 °C

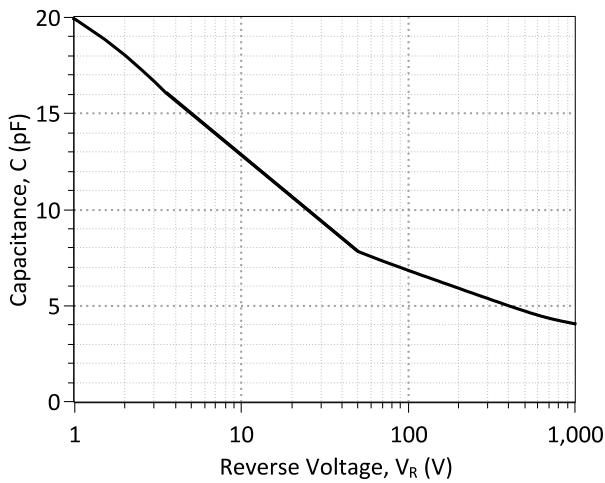


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

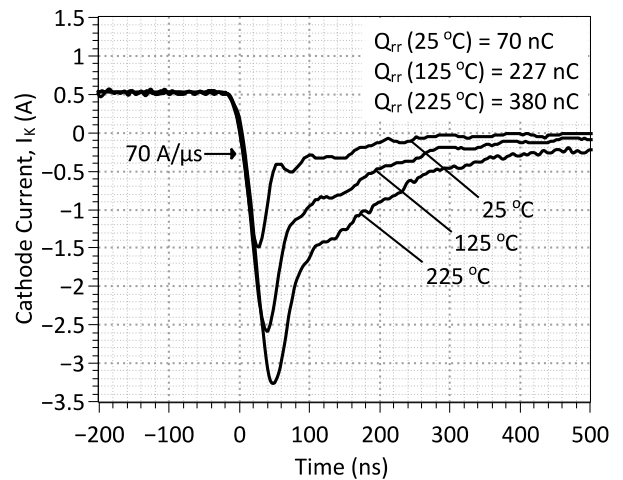


Figure 4: Typical Turn Off Characteristics at $I_k = 0.5$ A and $V_R = 1000$ V

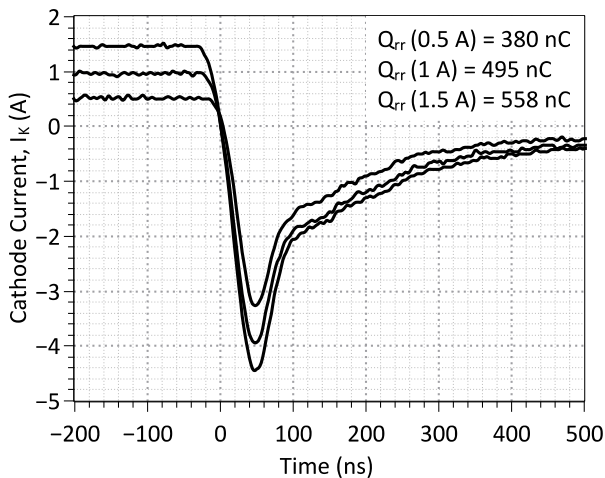


Figure 5: Typical Turn Off Characteristics at $T_j = 225$ °C and $V_R = 1000$ V

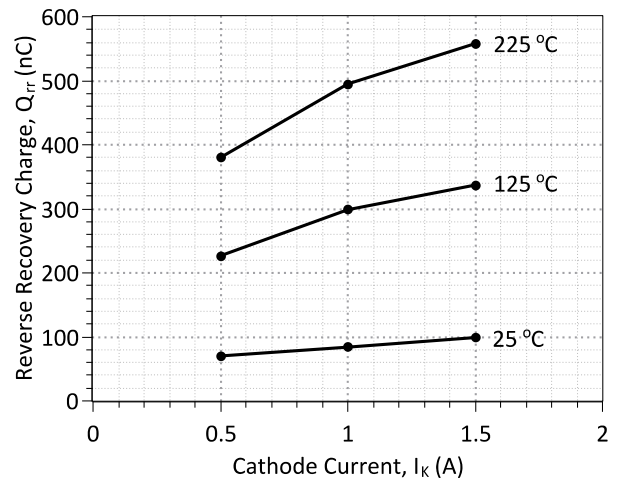


Figure 6: Reverse Recovery Charge vs Cathode Current

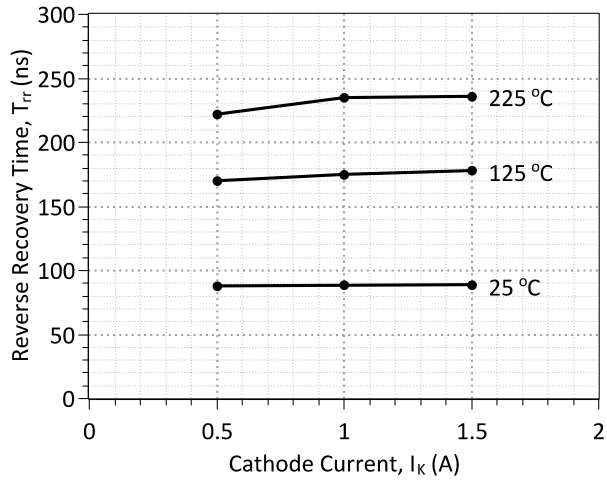


Figure 7: Reverse Recovery Time vs Cathode Current

| Revision History | | | |
|------------------|----------|-----------------|------------|
| Date | Revision | Comments | Supersedes |
| 2014/09/15 | 0 | Initial release | |
| | | | |

Published by
 GeneSiC Semiconductor, Inc.
 43670 Trade Center Place Suite 155
 Dulles, VA 20166

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SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GA01PNS80-CAL device.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      15-SEP-2014   $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*      http://www.genesicsemi.com/index.php/hit-sic/baredie
*
*      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 GA01PNS80-220 SPICE Model
*
. MODEL GA01PNS80 D
+ IS      9.2491e-015
+ RS      0.44573
+ 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     8000
+ IAVE    1
+ TYPE    SiC_PiN
+ MFG     GeneSiC_Semi
*
*      End of GA01PNS80-220 SPICE Model
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