

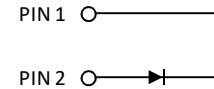
Silicon Carbide PiN Diode

| | | |
|------------------------------|---|---------|
| V_{RRM} | = | 15.0 kV |
| $I_F (T_c=25^\circ\text{C})$ | = | 1 A |

Features

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

Package


DO-201


Advantages

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

Applications

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

Maximum Ratings at $T_j = 175^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Conditions | Values | Unit |
|-----------------------------------|----------------|------------|------------|------|
| Repetitive peak reverse voltage | V_{RRM} | | 15 | kV |
| Continuous forward current | I_F | | 1 | A |
| RMS forward current | $I_{F(RMS)}$ | | 0.5 | A |
| Operating and storage temperature | T_j, T_{stg} | | -55 to 175 | °C |

Electrical Characteristics at $T_j = 175^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Conditions | Values | | | Unit |
|-------------------------------|----------|---|---|-------|-----------|---------------|
| | | | min. | typ. | max. | |
| Diode forward voltage | V_F | $I_F = 1\text{ A}, T_j = 25^\circ\text{C}$ | | 6.4 | | V |
| | | $I_F = 1\text{ A}, T_j = 175^\circ\text{C}$ | | 4.7 | | |
| Reverse current | I_R | $V_R = 8\text{ kV}, T_j = 25^\circ\text{C}$ $V_R = 8\text{ kV}, T_j = 175^\circ\text{C}$ | | 1 | 20 100 | μA |
| Total reverse recovery charge | Q_{rr} | $I_F \leq I_{F,MAX}$ $di_F/dt = 70\text{ A}/\mu\text{s}$ $T_j = 175^\circ\text{C}$ | $V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$ | 558 | | nC |
| Switching time | t_s | | $V_R = 1000\text{ V}$ $I_F = 1.5\text{ A}$ | < 236 | | ns |
| Total capacitance | C | $V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$ | | 22 | | pF |
| | | $V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$ | | 4 | | |
| | | $V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$ | | 3 | | |
| Total capacitive charge | Q_C | $V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$ | | 4.5 | | nC |

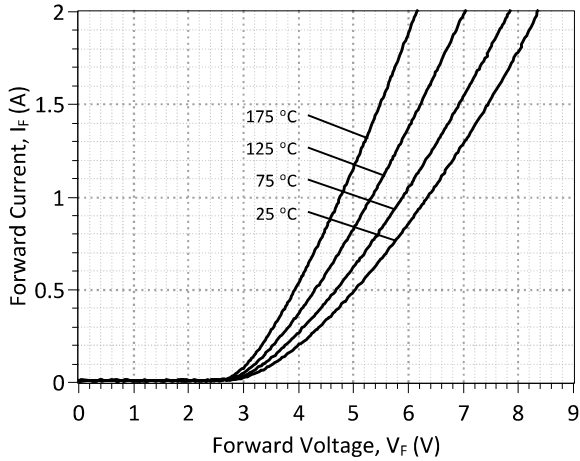


Figure 1: Typical Forward Characteristics

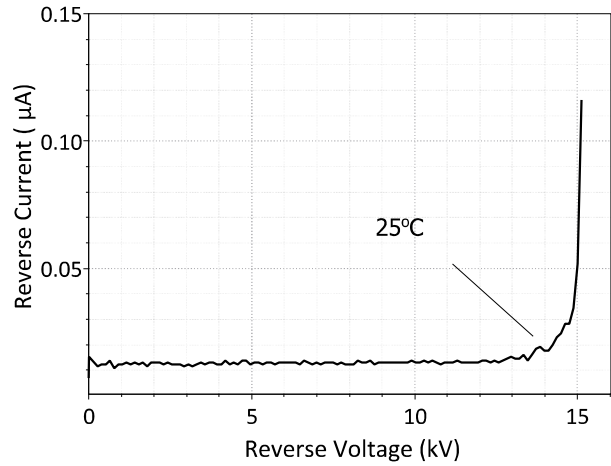


Figure 2: Typical Reverse Characteristics at 25 °C

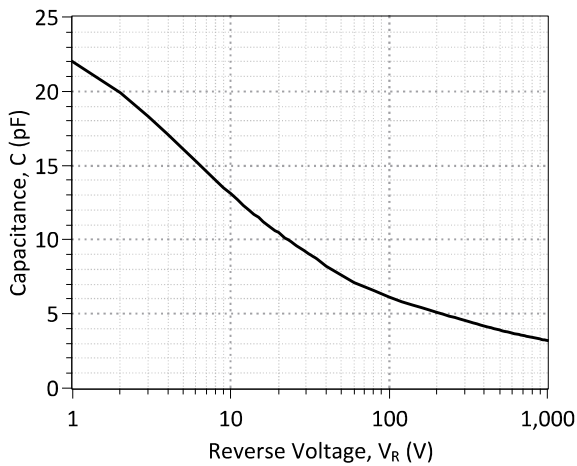


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

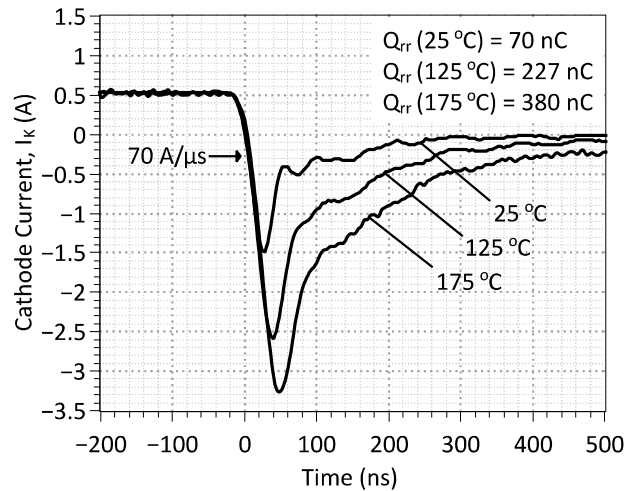


Figure 4: Typical Turn Off Characteristics at $I_k = 0.5$ A and $V_R = 1000$ V

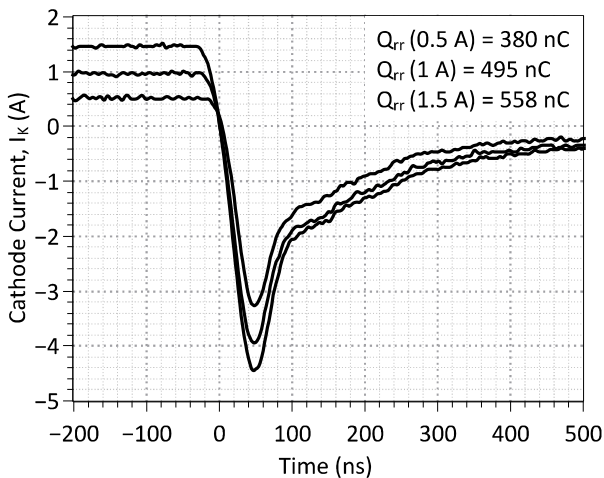


Figure 5: Typical Turn Off Characteristics at $T_j = 175$ °C and $V_R = 1000$ V

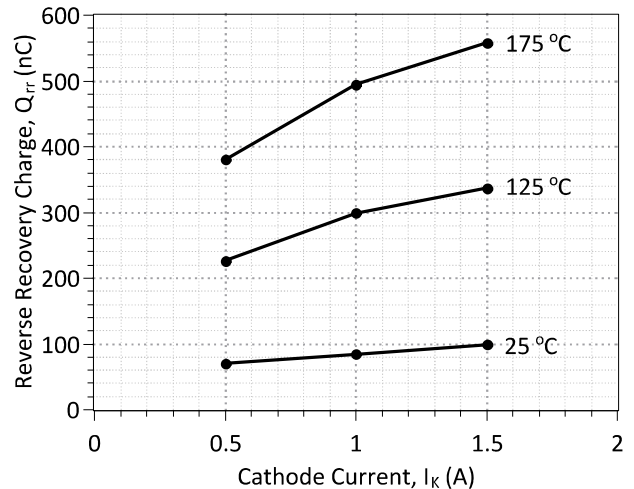


Figure 6: Reverse Recovery Charge vs Cathode Current

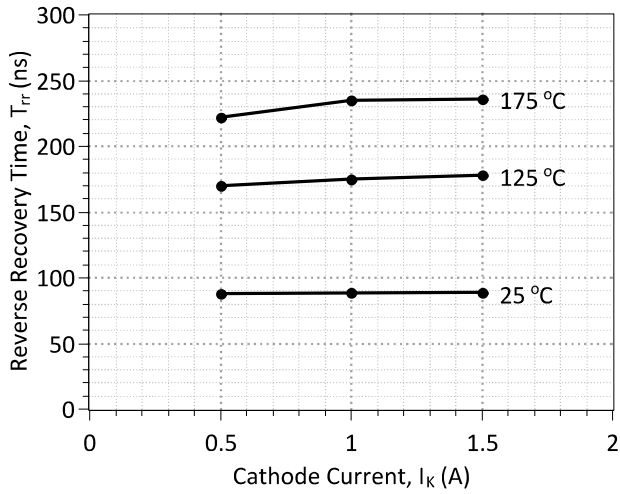
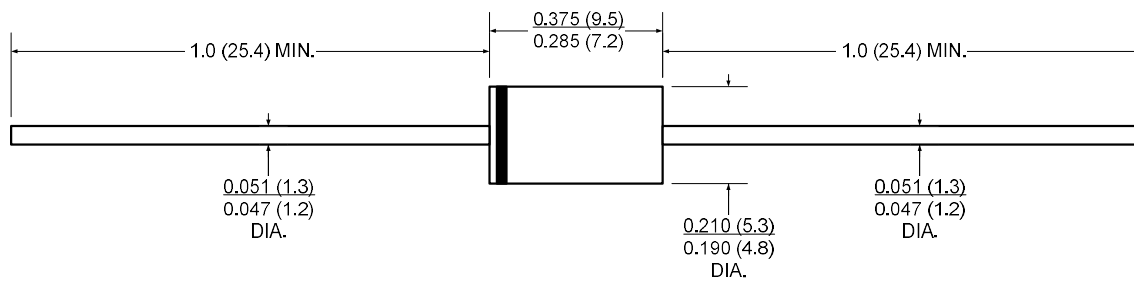


Figure 7: Reverse Recovery Time vs Cathode Current

Package Dimensions:

DO-201

PACKAGE OUTLINE



NOTE

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 |
|------------|----------|-----------------|------------|
| 2016/11/10 | 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/sic_pin/GA01PNS150-201_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GA01PNS150-201.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      10-Nov-2016   $
*
*      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 GA01PNS150-201 SPICE Model
*
. MODEL GA01PNS150 D
+ IS      9.2491e-015
+ RS      2.24770
+ 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     15000
+ IAVE    1
+ TYPE    SiC_PiN
+ MFG     GeneSiC_Semi
*
*      End of GA01PNS150-201 SPICE Model
```

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