

## Silicon Carbide Power Schottky Diode

$V_{RRM}$	=	8000 V
$I_F$	=	50 mA
$Q_C$	=	8 nC

### Features

- 8000 V Silicon Carbide Schottky rectifier
- 175 °C maximum operating temperature
- Positive temperature coefficient of  $V_F$
- Extremely fast switching speeds
- Superior figure of merit  $Q_C/I_F$



Die Size = 2.4 mm x 2.4 mm

### Advantages

- Improved circuit efficiency (Lower overall cost)
- Low switching losses
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance
- Low reverse leakage current at operating temperature

### Applications

- Down Hole Oil Drilling, Geothermal Instrumentation
- High Voltage Multipliers
- Military Power Supplies

## Electrical Specifications

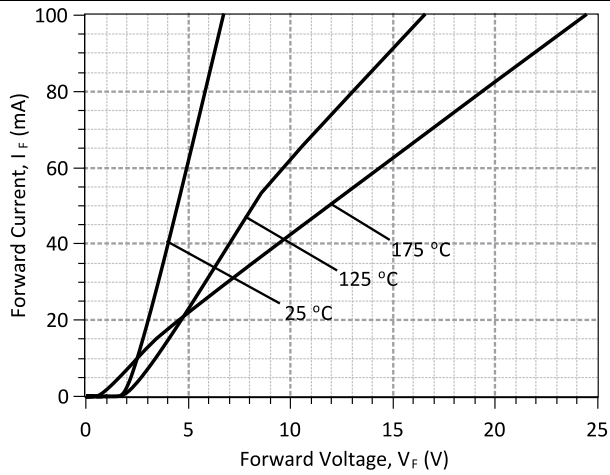
### Absolute Maximum Ratings

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		8000	V
Continuous forward current	$I_F$		50	mA
RMS forward current	$I_{F(RMS)}$		87	mA
Power dissipation	$P_{tot}$	$T_C = 25\text{ °C}$	0.2	W
Operating and storage temperature	$T_j, T_{stg}$		-55 to 175	°C

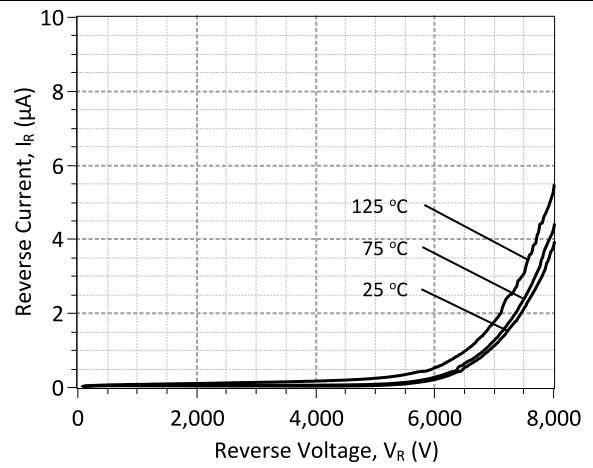
### Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	$V_F$	$I_F = 50\text{ mA}, T_j = 25\text{ °C}$		4.6		V
		$I_F = 50\text{ mA}, T_j = 175\text{ °C}$		12		
Reverse current	$I_R$	$V_R = 8000\text{ V}, T_j = 25\text{ °C}$		3.8		$\mu\text{A}$
		$V_R = 8000\text{ V}, T_j = 125\text{ °C}$		5.3		
Total capacitive charge	$Q_C$	$V_R = 1000\text{ V}$		8		nC
Total capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		25		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		8		
		$V_R = 1000\text{ V}, f = 1\text{ MHz}, T_j = 25\text{ °C}$		6		

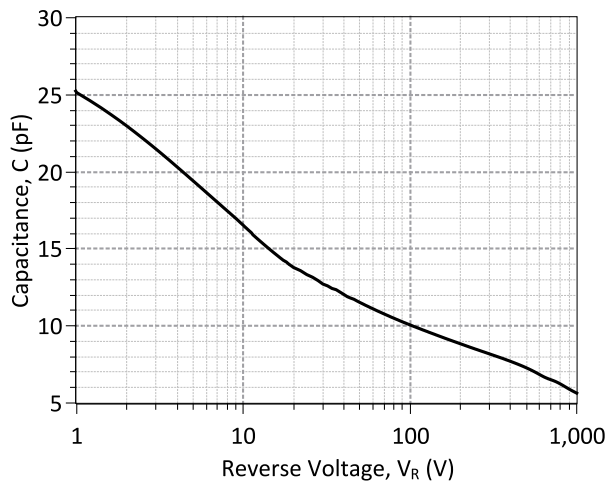
**Figures:**



**Figure 1: Typical Forward Characteristics**



**Figure 2: Typical Reverse Characteristics**

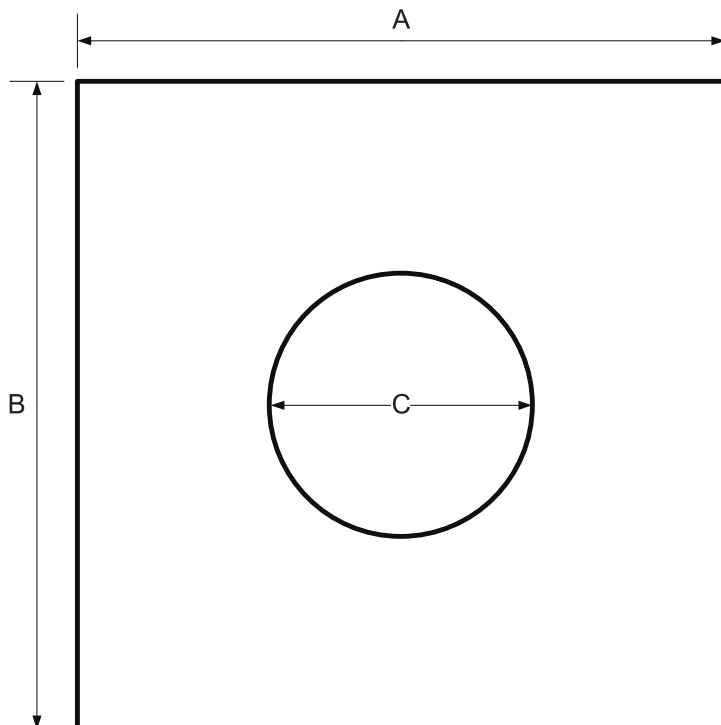


**Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics**

**Mechanical Parameters**

Die Dimensions	2.4 x 2.4	mm <sup>2</sup>
Anode pad size	Φ 0.98	mm
Die Area total / active	5.76/0.75	mm <sup>2</sup>
Die Thickness	450	μm
Wafer Size	76.2	mm
Flat Position	0	deg
Die Frontside Passivation	Polyimide	
Anode Pad Metallization	4000 nm Al	
Backside Cathode Metallization	400 nm Ni + 200 nm Au	
Die Attach	Electrically conductive glue or solder	
Wire Bond	Al ≤ 130 μm	
Reject ink dot size	Φ ≥ 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

**Revision History**

Date	Revision	Comments	Supersedes
2015/02/12	1	Inserted Mechanical Parameters	
2014/09/15	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/schottky/GAP05SLT80-CAL\\_SPICE.pdf](http://www.genesicsemi.com/images/hit_sic/baredie/schottky/GAP05SLT80-CAL_SPICE.pdf)) into LTSPICE (version 4) software for simulation of the GAP05SLT80-CAL.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.1           $
*      $Date:      15-SEP-2014   $
*
*      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 GAP05SLT80-CAL SPICE Model
.SUBCKT GAP05SLT80 ANODE KATHODE
R1 ANODE INT R=((TEMP-24)*0.81); Temperature Dependant Resistor
D1 INT KATHODE GAP05SLT80_25C
.MODEL GAP05SLT80_25C D; Model of GAP05SLT80-220 Device at 25 C
+ IS      14.067E-15
+ N       1.3760
+ RS      42.6
+ IKF     157.39E-6
+ EG      1.2
+ XTI     -85
+ CJO     21.838E-12
+ M       0.258
+ VJ      3.198
+ BV      9000
+ IBV     1E-3
+ TT      1.0000E-10
+ VPK     8000
+ IAVE    3E-2
+ TYPE    SiC_Schottky
+ MFG     GeneSiC_Semiconductor
.ENDS
*
*      End of GAP05SLT80-CAL SPICE Model
```