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 °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 mA, T_j = 25 °C		4.6		V
		I_F = 50 mA, T_j = 175 °C		12		
Reverse current	I_R	V_R = 8000 V, T_j = 25 °C		3.8		µA
		V_R = 8000 V, T_j = 125 °C		5.3		
Total capacitive charge	Q_C	V_R = 1000 V		8		nC
Total capacitance	C	V_R = 1 V, f = 1 MHz, T_j = 25 °C		25		pF
		V_R = 400 V, f = 1 MHz, T_j = 25 °C		8		
		V_R = 1000 V, f = 1 MHz, T_j = 25 °C		6		

Figures:

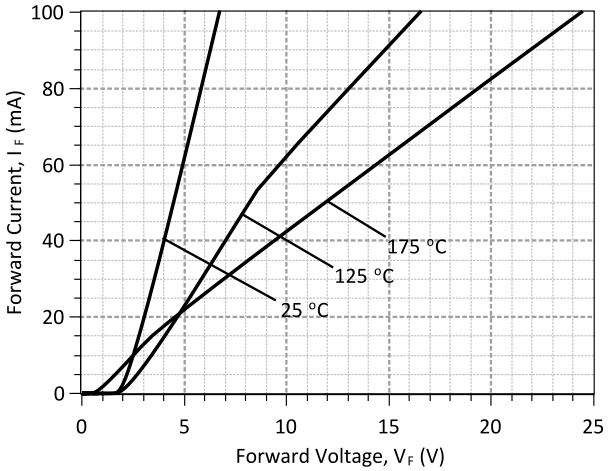


Figure 1: Typical Forward Characteristics

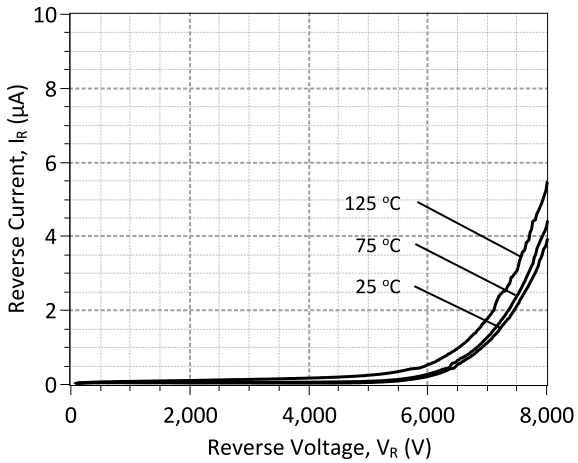


Figure 2: Typical Reverse Characteristics

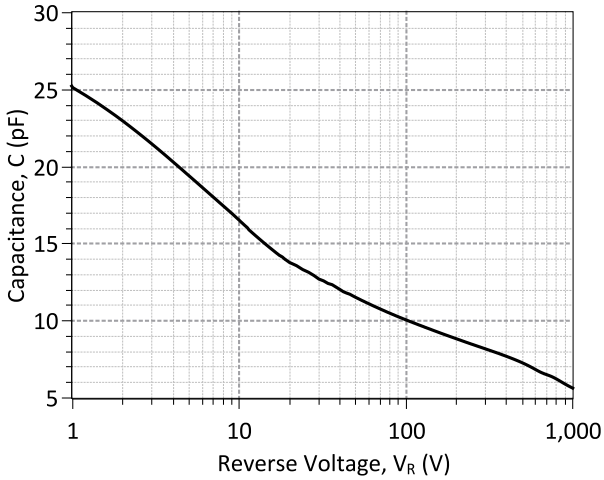
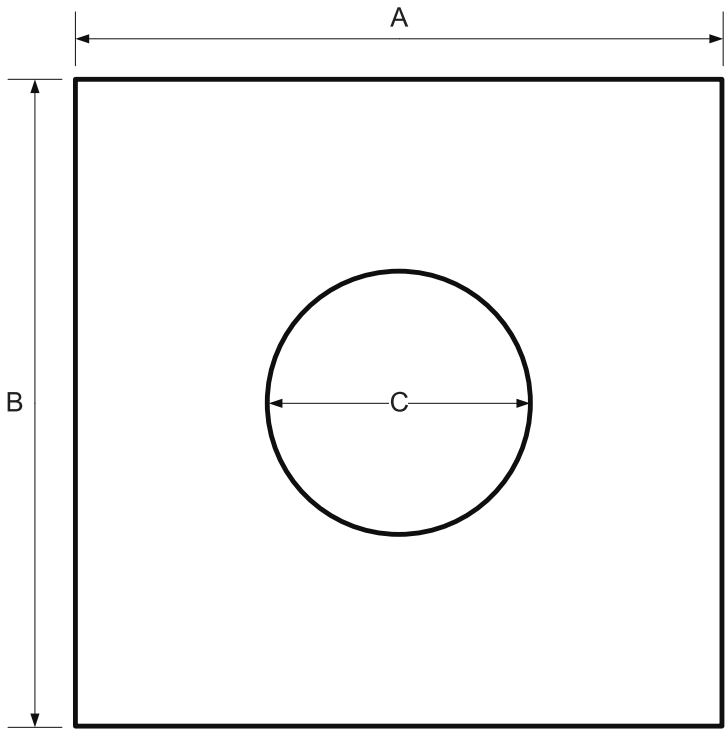


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

Mechanical Parameters

Die Dimensions	2.4 x 2.4	mm^2
Anode pad size	Φ 0.98	mm
Die 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	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) into LTSPICE (version 4) software for simulation of the GAP05SLT80-CAL.

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*     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
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