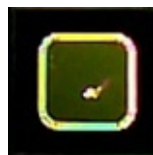


High Temperature Silicon Carbide Power Schottky Diode

V_{RRM}	=	650 V
$I_F @ 25\text{ }^{\circ}\text{C}$	=	30 A
Q_C	=	66 nC

Features

- 650 V Schottky rectifier
- 210 °C maximum operating temperature
- Zero reverse recovery charge
- Superior surge current capability
- Positive temperature coefficient of V_F
- Temperature independent switching behavior
- Lowest figure of merit Q_C/I_F
- Available screened to Mil-PRF-19500



Die Size = 2.95 mm x 2.95 mm

Advantages

- High temperature operation
- Improved circuit efficiency (Lower overall cost)
- Low switching losses
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Industry's lowest reverse recovery charge
- Industry's lowest device capacitance
- Ideal for output switching of power supplies
- Best in class reverse leakage current at operating temperature

Applications

- Down Hole Oil Drilling
- Geothermal Instrumentation
- Solenoid Actuators
- General Purpose High-Temperature Switching
- Amplifiers
- Solar Inverters
- Switched-Mode Power Supply (SMPS)
- Power Factor Correction (PFC)

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

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	V_{RRM}		650	V
Continuous forward current	I_F	$T_C = 25\text{ }^{\circ}\text{C}$, $R_{thJC} = 1.08$	30	A
Continuous forward current	I_F	$T_C \leq 190\text{ }^{\circ}\text{C}$, $R_{thJC} = 1.08$	9.4	A
RMS forward current	$I_{F(RMS)}$	$T_C \leq 190\text{ }^{\circ}\text{C}$, $R_{thJC} = 1.08$	16	A
Surge non-repetitive forward current, Half Sine Wave	$I_{F,SM}$	$T_C = 25\text{ }^{\circ}\text{C}$, $t_p = 10\text{ ms}$	140	A
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25\text{ }^{\circ}\text{C}$, $t_p = 10\text{ }\mu\text{s}$	650	A
I^2t value	$\int i^2 dt$	$T_C = 25\text{ }^{\circ}\text{C}$, $t_p = 10\text{ ms}$	98	A^2S
Power dissipation	P_{tot}	$T_C = 25\text{ }^{\circ}\text{C}$, $R_{thJC} = 1.08$	208	W
Operating and storage temperature	T_j, T_{stg}		-55 to 210	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Diode forward voltage	V_F	$I_F = 10\text{ A}$, $T_j = 25\text{ }^{\circ}\text{C}$		1.3		V
		$I_F = 10\text{ A}$, $T_j = 210\text{ }^{\circ}\text{C}$		1.8		
Reverse current	I_R	$V_R = 650\text{ V}$, $T_j = 25\text{ }^{\circ}\text{C}$		1	5	μA
		$V_R = 650\text{ V}$, $T_j = 210\text{ }^{\circ}\text{C}$		50	200	
Total capacitive charge	Q_C	$I_F \leq I_{F,MAX}$ $dI_F/dt = 200\text{ A}/\mu\text{s}$ $T_j = 210\text{ }^{\circ}\text{C}$		66		nC
Switching time	t_s	$V_R = 400\text{ V}$		< 49		ns
Total capacitance	C	$V_R = 1\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ }^{\circ}\text{C}$		1107		pF
		$V_R = 400\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ }^{\circ}\text{C}$		103		
		$V_R = 650\text{ V}$, $f = 1\text{ MHz}$, $T_j = 25\text{ }^{\circ}\text{C}$		99		

Figures:

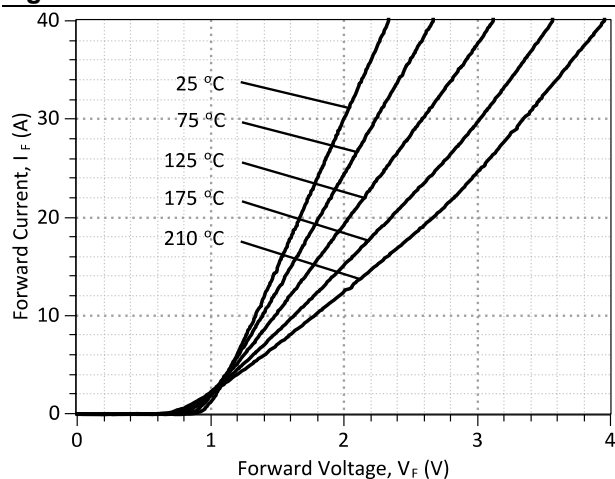


Figure 1: Typical Forward Characteristics

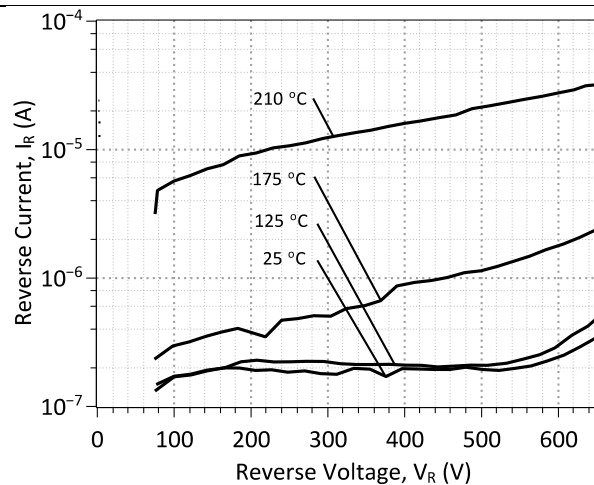


Figure 2: Typical Reverse Characteristics

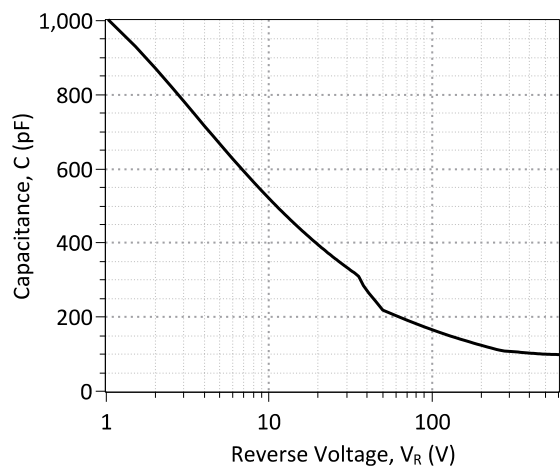


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

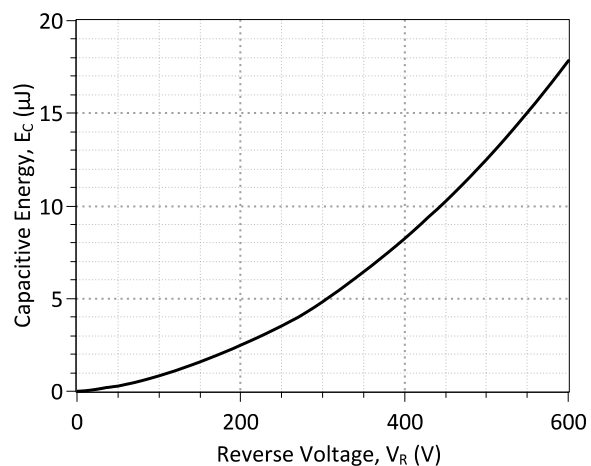
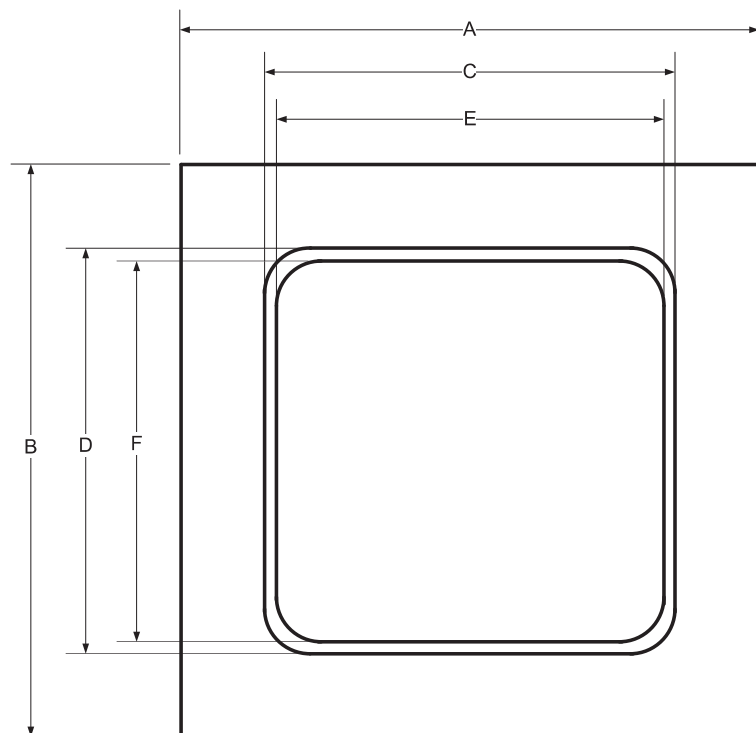


Figure 4: Typical Capacitive Energy vs Reverse Voltage Characteristics

Mechanical Parameters

Die Dimensions	2.95 x 2.95	mm ²
Anode pad size	2.69 x 2.69	
Die Area total / active	8.70/7.02	
Die Thickness	360	μm
Wafer Size	100	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 ≤ 76 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]	2.95
	B [mm]	2.95
METAL	C [mm]	2.69
	D [mm]	2.69
WIRE BONDABLE	E [mm]	2.65
	F [mm]	2.65

Revision History

Date	Revision	Comments	Supersedes
2015/02/09	1	Inserted Mechanical Parameters	
2012/04/03	0	Initial release	

Published by

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

GeneSiC Semiconductor, Inc. reserves right to make changes to the product specifications and data in this document without notice.

GeneSiC disclaims all and any warranty and liability arising out of use or application of any product. No license, express or implied to any intellectual property rights is granted by this document.

Unless otherwise expressly indicated, GeneSiC products are not designed, tested or authorized for use in life-saving, medical, aircraft navigation, communication, air traffic control and weapons systems, nor in applications where their failure may result in death, personal injury and/or property damage.

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/GB20SHT06-CAU_SPICE.pdf) into LTSPICE (version 4) software for simulation of the GB20SHT06-CAU.

```
*      MODEL OF GeneSiC Semiconductor Inc.
*
*      $Revision:   1.0           $
*      $Date:      05-SEP-2013    $
*
*      GeneSiC Semiconductor Inc.
*      43670 Trade Center Place Ste. 155
*      Dulles, VA 20166
*
*      COPYRIGHT (C) 2013 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 GB20SHT06-CAU SPICE Model
*
.SUBCKT GB20SHT06 ANODE KATHODE
D1 ANODE KATHODE GB20SHT06_25C; Call the Schottky Diode Model
D2 ANODE KATHODE GB20SHT06_PIN; Call the PiN Diode Model
.MODEL GB20SHT06_25C D
+ IS      8.46E-17          RS      0.0319
+ N       1                IKF     1000
+ EG      1.2              XTI     3
+ TRS1    0.0038           TRS2    3.00E-05
+ CJO     1.26E-09         VJ      0.438
+ M       1.5278           FC      0.5
+ TT      1.00E-10         BV      650
+ IBV     1.00E-03         VPK     650
+ IAVE    20              TYPE    SiC_Schottky
+ MFG     GeneSiC_Semiconductor
.MODEL GB20SHT06_PIN D
+ IS      2.77E-10          RS      0.086693
+ N       3.3505           IKF     3.67E-06
+ EG      3.23             XTI     -10
+ FC      0.5              TT      0
+ BV      650              IBV     1.00E-03
+ VPK     650              IAVE    20
+ TYPE    SiC_PiN
.ENDS
*
*      End of GB20SHT06-CAU SPICE Model
```

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[GeneSiC Semiconductor:](#)

[GB20SHT06-CAU](#)