

Electrical Datasheet*

GB10SLT12-CAL

Silicon Carbide Power Schottky Diode

 V_{RRM} = 1200 V V_{F} = 1.55 V I_{F} = 10 A Q_{C} = 52 nC

Features

- 1200 V Schottky rectifier
- 175 °C maximum operating temperature
- Positive temperature coefficient of V_F
- Fast switching speeds
- Superior figure of merit Q_C/I_F



Advantages

- Improved circuit efficiency (Lower overall cost)
- Significantly reduced switching losses compare to Si PiN diodes
- Ease of paralleling devices without thermal runaway
- Smaller heat sink requirements
- Low reverse recovery current
- Low device capacitance

Applications

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

Maximum Ratings at T_j = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit	
Repetitive peak reverse voltage	V_{RRM}		1200	V	
Continuous forward current	I _F	T _C ≤ 150 °C	10	Α	
RMS forward current	I _{F(RMS)}	T _C ≤ 150 °C	17	Α	
Surge non-repetitive forward current, Half Sine	1	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 ms	65	^	
Wave	I _{F,SM}	$T_C = 150 ^{\circ}\text{C}, t_P = 10 \text{ms}$	55	Α	
Non-repetitive peak forward current	$I_{F,max}$	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 μs	280	Α	
l ² t value	∫i² dt	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 ms	21	A^2s	
i t value	ji dt	$T_{\rm C}$ = 150 °C, $t_{\rm P}$ = 10 ms	15		
Power dissipation	P _{tot}	T _C = 25 °C	190	W	
Operating and storage temperature	T _j , T _{stg}		-55 to 175	°C	

Electrical Characteristics at T_j = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions -		Values		Unit	
Parameter	Syllibol			min.	typ.	max.	Unit
Diode forward voltage	V _F	$I_F = 10 \text{ A}, T_j = 2$	I _F = 10 A, T _j = 25 °C		1.55	1.7	V
		$I_F = 10 \text{ A}, T_j = 175 ^{\circ}\text{C}$			2.6	3.0	
Payaraa aurrant	I _R	$V_R = 1200 \text{ V}, T_j =$	V _R = 1200 V, T _j = 25 °C 0.5		5.0	40	μΑ
Reverse current		$V_R = 1200 \text{ V}, T_j =$	= 175 °C		13	100	
Total capacitive charge	Q _C		V _R = 400 V		31		nC
Total capacitive charge		$I_F \le I_{F,MAX}$ $dI_F/dt = 200 A/\mu s$	V _R = 960 V		52		110
Switching time	t _s	T _i = 175 °C	V _R = 400 V		< 25	no	ne
Switching time		.,	V _R = 960 V		\ 23		ns
	С	$V_R = 1 \text{ V, } f = 1 \text{ MHz, } T_j = 25 ^{\circ}\text{C}$		490			
Total capacitance		$V_R = 400 \text{ V}, f = 1 \text{ MHz}, T_j = 25 ^{\circ}\text{C}$		45		pF	
		V _R = 1000 V, f = 1 MH	z, T _j = 25 °C		33		

^{*}For chip size and metallization, please refer to the mechanical datasheet (must have a non-disclosure agreement with GeneSiC Semiconductor).

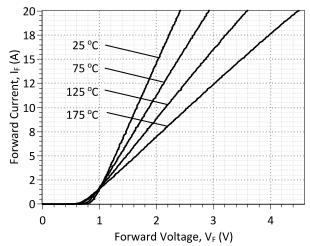


Figure 1: Typical Forward Characteristics

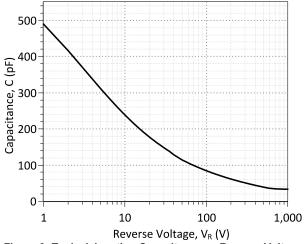


Figure 3: Typical Junction Capacitance vs Reverse Voltage Characteristics

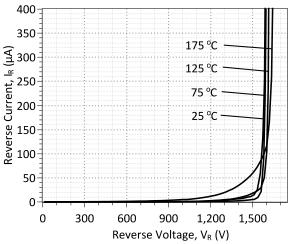


Figure 2: Typical Reverse Characteristics

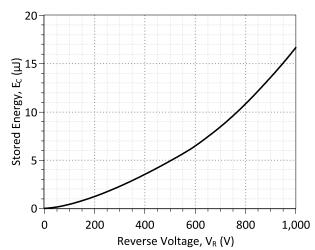


Figure 4: Typical Switching Energy vs Reverse Voltage Characteristics

Revision History							
Date	Revision	Comments	Supersedes				
2013/10/15	0	Initial release					

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SPICE Model Parameters

Copy the following code into a SPICE software program for simulation of the GB10SLT12-CAL device.

```
MODEL OF GeneSiC Semiconductor Inc.
     $Revision: 1.0
     $Date: 20-SEP-2013
                              $
   GeneSiC Semiconductor Inc.
    43670 Trade Center Place Ste. 155
    Dulles, VA 20166
    http://www.genesicsemi.com/index.php/sic-products/schottky
    COPYRIGHT (C) 2013 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 GB10SLT12-CAL SPICE Model
.SUBCKT GB10SLT12 ANODE KATHODE
D1 ANODE KATHODE GB10SLT12 SCHOTTKY
D2 ANODE KATHODE GB10SLT12 PIN
.MODEL GB10SLT12 SCHOTTKY D
     4.55E-15
+ IS
                         RS
                                  0.0736
+ N
         1
                        IKF
                                  1000
+ EG
         1.2
                        XTI
                                  -2
+ TRS1 0.0054347826 TRS2
                                 2.71739E-05
+ CJO
         6.40E-10
                       VJ
                                  0.469
+ M
                       FC
         1.508
                                  0.5
+ TT
        1.00E-10
                        BV
                                   1500
+ IBV
        1.00E-03
                        VPK
                                  1200
+ IAVE 10
+ MFG GeneSiC Semi
                         TYPE
                                 SiC Schottky
.MODEL GB10SLT12 PIN D
+ IS 1.54E-22
                                  0.19
                         RS
+ TRS1 -0.004
                                  3.941
                        N
+ EG
         3.23
                        IKF
                                  19
+ XTI
         0
                        FC
                                   0.5
+ TT
         0
                        BV
                                  1500
+ IBV
        1.00E-03
                       VPK
                                  1200
+ IAVE
         10
                         TYPE
                                  SiC PiN
.ENDS
```

^{*} End of GB10SLT12-CAL SPICE Model