

## GB01SLT12-220

# Silicon Carbide Power Schottky Diode

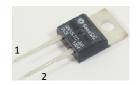
## $V_{RRM}$ = 1200 V $I_{F}$ = 1 A $Q_{C}$ = 13 nC

#### **Features**

- 1200 V Schottky rectifier
- 175 °C maximum operating temperature
- Temperature independent switching behavior
- · Superior surge current capability
- Positive temperature coefficient of V<sub>F</sub>
- Extremely fast switching speeds
- Superior figure of merit Q<sub>C</sub>/I<sub>F</sub>

#### **Package**

RoHS Compliant





TO - 220AC

## **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**

- Power Factor Correction (PFC)
- Switched-Mode Power Supply (SMPS)
- Solar Inverters
- Wind Turbine Inverters
- Motor Drives
- Induction Heating
- Uninterruptible Power Supply (UPS)
- · High Voltage Multipliers

#### Maximum Ratings at T<sub>j</sub> = 175 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values	Unit	
Repetitive peak reverse voltage	$V_{RRM}$		1200	V	
Continuous forward current	l <sub>F</sub>	T <sub>C</sub> ≤ 160 °C	1	Α	
RMS forward current	I <sub>F(RMS)</sub>	T <sub>C</sub> ≤ 160 °C	2	Α	
Surge non-repetitive forward current, Half Sine	1	$T_C$ = 25 °C, $t_P$ = 10 ms	10	٨	
Wave	I <sub>F,SM</sub>	$T_C$ = 160 °C, $t_P$ = 10 ms	8	A	
Non-repetitive peak forward current	$I_{F,max}$	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 $\mu {\rm s}$	65	Α	
l <sup>2</sup> t value	∫i² dt	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 ms	0.5	A <sup>2</sup> s	
		$T_C = 160 ^{\circ}\text{C},  t_P = 10 \text{ms}$	0.3	AS	
Power dissipation	P <sub>tot</sub>	T <sub>C</sub> = 25 °C	42	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 mi			Values		Unit
	Зуньы			min.	typ.	max.	Ollit
Diodo forward voltago	V <sub>F</sub>	$I_F = 1 A, T_j = 2$	5 °C		1.7	2.0	V
Diode forward voltage	VF	I <sub>F</sub> = 1 A, T <sub>j</sub> = 175 °C		2.6	3.0	V	
Reverse current	ı	$V_R = 1200 \text{ V}, T_j =$	25 °C		< 1	2	
Reverse current	I <sub>R</sub>	$V_R = 1200 \text{ V}, T_j = 175 ^{\circ}\text{C}$			2	20	μA
Total capacitive charge	0		V <sub>R</sub> = 400 V		7		nC
Total capacitive charge	$Q_{C}$	$I_F \le I_{F,MAX}$ $dI_F/dt = 200 \text{ A/µs}$	V <sub>R</sub> = 960 V		13		110
Switching time	+	T <sub>i</sub> = 175 °C	V <sub>R</sub> = 400 V		< 17	ns	
	t <sub>s</sub>	V <sub>R</sub> = 960 V		<b>\ 11</b>		115	
		$V_R = 1 V, f = 1 MHz,$	T <sub>j</sub> = 25 °C		69		
Total capacitance	С	$V_R = 400 \text{ V}, f = 1 \text{ MHz}$	, T <sub>j</sub> = 25 °C		10		pF
		$V_R = 1000 \text{ V, f} = 1 \text{ MHz, T}_j = 25 ^{\circ}\text{C}$		8			

#### **Thermal Characteristics**

Thermal resistance, junction - case	$R_{thJC}$	3.6	°C/W
Mechanical Properties			
Mounting torque	M	0.6	Nm

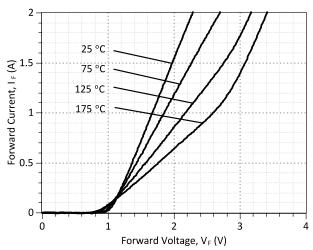


Figure 1: Typical Forward Characteristics

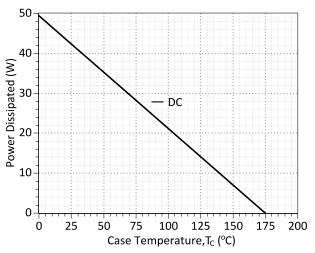


Figure 3: Power Derating Curve

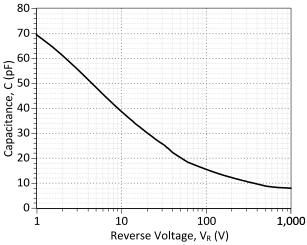


Figure 5: Typical Junction Capacitance vs Reverse Voltage

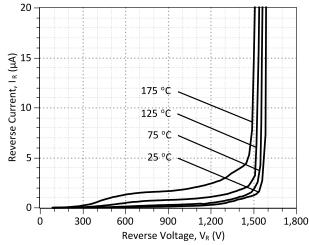


Figure 2: Typical Reverse Characteristics

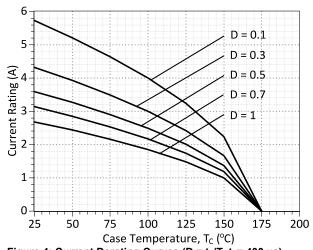


Figure 4: Current Derating Curves (D =  $t_P/T$ ,  $t_P$ = 400  $\mu$ s) (Considering worst case  $Z_{th}$  conditions )

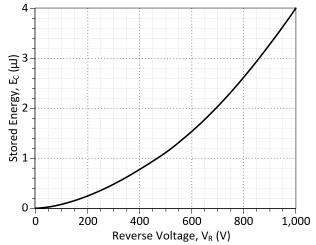


Figure 6: Typical Switching Energy vs Reverse Voltage



#### Characteristics

## 10<sup>1</sup> D = 0D = 0.02Current Rating (A) D = 0.05D = 0.1D = 0.2D = 0.510<sup>0</sup> 10-2 10<sup>-5</sup> 10-4 10<sup>-3</sup> 10<sup>-1</sup> 10<sup>0</sup> Pulse Width, t<sub>P</sub> (s)

Figure 7: Current vs Pulse Duration Curves at T<sub>c</sub> = 160 °C

#### Characteristics

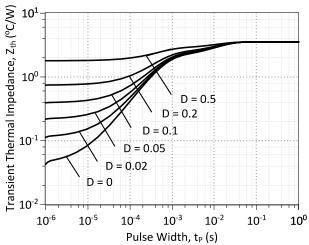
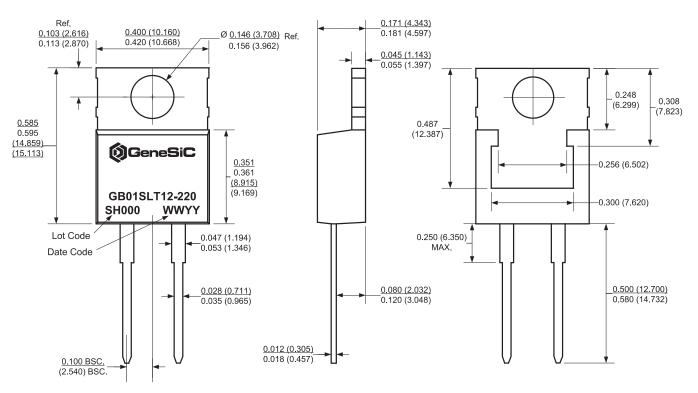


Figure 8: Transient Thermal Impedance

## **Package Dimensions:**

#### **TO-220AC**

#### **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		
2012/12/19	2	Second generation update			
2012/05/22	1	Second generation release			
2010/12/13	0	Initial release			

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