

## GAP3SLT33-220FP

# Silicon Carbide Power Schottky Diode

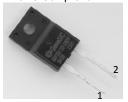
 $V_{RRM}$  = 3300 V  $V_{F}$  = 1.7 V  $I_{F}$  = 0.3 A  $Q_{C}$  = 52 nC

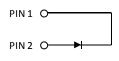
#### **Features**

- 3300 V Schottky rectifier
- 175 °C maximum operating temperature
- Electrically isolated base-plate
- Positive temperature coefficient of V<sub>F</sub>
- · Fast switching speeds
- Superior figure of merit Q<sub>C</sub>/I<sub>F</sub>

### **Package**

RoHS Compliant





#### TO - 220FP (Isolated Base-plate Package)

## **Applications**

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

## **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

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

Parameter	Symbol	Conditions	Values	Unit
Repetitive peak reverse voltage	$V_{RRM}$		3300	V
Continuous forward current	I <sub>F</sub>	T <sub>C</sub> ≤ 125 °C	0.3	Α
RMS forward current	I <sub>F(RMS)</sub>	T <sub>C</sub> ≤ 125 °C	0.35	Α
Surge non-repetitive forward current, Half Sine	1	$T_{\rm C}$ = 25 °C, $t_{\rm P}$ = 10 ms	tbd	۸
Wave	I <sub>F,SM</sub>	$T_C$ = 125 °C, $t_P$ = 10 ms	tbd	Α
Non-repetitive peak forward current	$I_{F,max}$	$T_C$ = 25 °C, $t_P$ = 10 $\mu$ s	tbd	Α
l <sup>2</sup> t value	∫i² dt	$T_C$ = 25 °C, $t_P$ = 10 ms	tbd	$A^2S$
Power dissipation	P <sub>tot</sub>	T <sub>C</sub> = 25 °C	25	W
Operating and storage temperature	$T_j$ , $T_stg$	·	-55 to 175	°C

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

Parameter	Cumbal	Conditions min.		Values		11	
	Symbol			min.	typ.	max.	Unit
Diode forward voltage	V <sub>F</sub>	I <sub>F</sub> = 0.3 A, T <sub>j</sub> = 25 °C		1.7		V	
	٧F	$I_F = 0.3 \text{ A}, T_j = 175 ^{\circ}\text{C}$		3.9			
Reverse current	1	$V_R = 3300 \text{ V}, T_j$	= 25 °C		1.3	5	
	I <sub>R</sub>	$V_R = 3300 \text{ V}, T_j = 175 ^{\circ}\text{C}$		14	20	μA	
Total capacitive charge	$Q_{C}$	$ I_F \le  I_{F,MAX} $	V <sub>R</sub> = 1500 V		52		nC
Switching time	ts	dl <sub>ε</sub> /dt = 35 A/μs Τ <sub>i</sub> = 175 °C	V <sub>R</sub> = 1500 V		< 60		ns
Total capacitance		$V_R = 1 \text{ V, } f = 1 \text{ MHz, } T_j = 25 ^{\circ}\text{C}$		42			
	С	$V_R = 400 \text{ V}, f = 1 \text{ MH}$	lz, T <sub>j</sub> = 25 °C		8		pF
		$V_R = 1000 \text{ V}, f = 1 \text{ MH}$	Hz, T <sub>i</sub> = 25 °C		7		

## **Thermal Characteristics**

The war all was into many in wasting. On least frames

rnermai resistance, junction – Cu lead fra	irrie R <sub>thJC</sub>	1.42	C/VV
Mechanical Properties			
Mounting torque, M3 screw	M	0.6	Nm

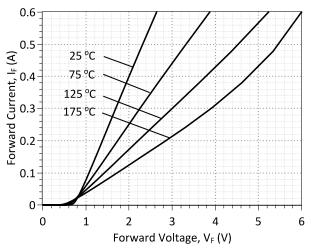


Figure 1: Typical Forward Characteristics

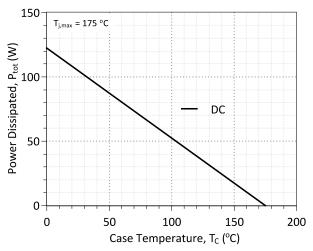


Figure 3: Power Derating Curve

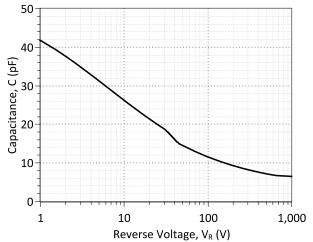


Figure 5: Typical Junction Capacitance vs Reverse Voltage Characteristics

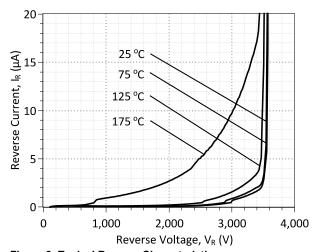


Figure 2: Typical Reverse Characteristics

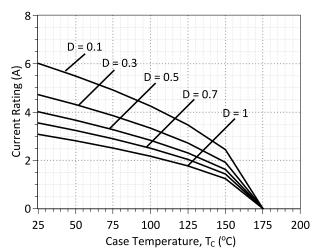


Figure 4: Current Derating Curves (D =  $t_p/T$ ,  $t_p$  = 400  $\mu$ s) (Considering worst case Zth conditions)

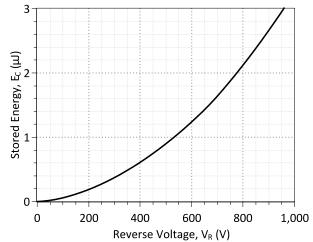
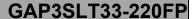


Figure 6: Typical Switching Energy vs Reverse Voltage Characteristics





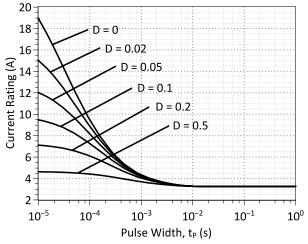


Figure 7: Current vs Pulse Duration Curves at  $T_C$  = 150 °C

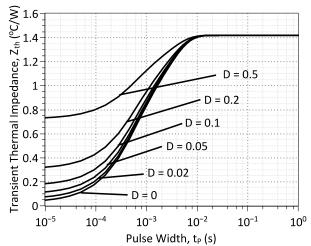
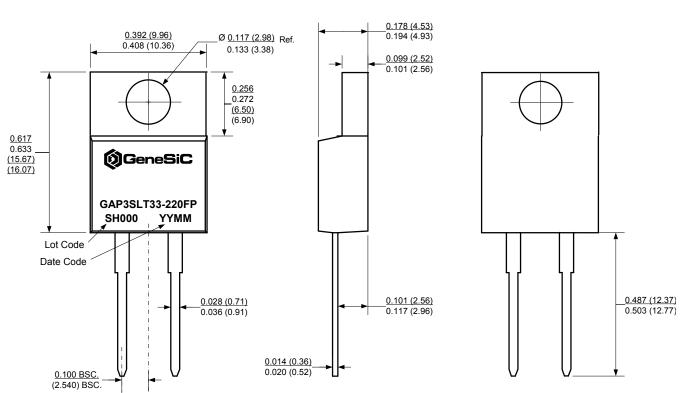


Figure 8: Transient Thermal Impedance

#### **Package Dimensions:**

#### TO-220FP

#### **PACKAGE OUTLINE**



#### NOTE

1. CONTROLLED DIMENSION IS INCH. DIMENSION IN BRACKET IS MILLIMETER.

## GAP3SLT33-220FP



- 2. DIMENSIONS DO NOT INCLUDE END FLASH, MOLD FLASH, MATERIAL PROTRUSIONS 3. CONTROLLED LEAD COPLANARITY <D>  $0.004\ \mbox{INCH}$  MAXIMUM

Revision History					
Date	Revision	Comments	Supersedes		
2013/03/22	1	Added Thermal Characteristics			
2013/01/23	0	Initial Release			

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