

## Glass Passivated Ultrafast Rectifier



\* Glass encapsulation technique is covered by Patent No. 3,996,602, brazed-lead assembly to Patent No. 3,930,306

### FEATURES

- Cavity-free glass-passivated junction
- Ultrafast reverse recovery time
- Low forward voltage drop
- Low leakage current
- Low switching losses, high efficiency
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

### MECHANICAL DATA

**Case:** GP20, molded epoxy over glass body  
Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS compliant, commercial grade  
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102  
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
$V_{RRM}$	100 V to 200 V
$I_{FSM}$	135 A
$t_{rr}$	35 ns
$V_F$	0.95 V
$I_R$	5.0 $\mu$ A
$T_J$ max.	175 °C

MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	V
Maximum RMS voltage	$V_{RMS}$	70	105	140	V
Maximum DC blocking voltage	$V_{DC}$	100	150	200	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	5.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	135			A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 to + 175			°C



# FGP50B thru FGP50D

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Maximum instantaneous forward voltage	5.0 A	V <sub>F</sub> <sup>(1)</sup>		0.95		V
Maximum DC reverse current at rated DC blocking voltage	T <sub>A</sub> = 25 °C	I <sub>R</sub>		5.0		μA
	T <sub>A</sub> = 100 °C			50		
Maximum reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A	t <sub>rr</sub>		35		ns
Typical junction capacitance	4.0 V, 1 MHz	C <sub>J</sub>		100		pF

**Note**

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	FGP50B	FGP50C	FGP50D	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>		60		°C/W
	R <sub>θJL</sub> <sup>(2)</sup>		20		

**Notes**

(1) Thermal resistance from junction to lead at 0.375" (9.5 mm) lead length with both leads attached to heatsinks

(2) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length and mounted on P.C.B.

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
FGP50D-E3/54	1.01	54	1400	13" diameter paper tape and reel
FGP50D-E3/73	1.01	73	2000	Ammo pack packaging
FGP50DHE3/54 <sup>(1)</sup>	1.01	54	1400	13" diameter paper tape and reel
FGP50DHE3/73 <sup>(1)</sup>	1.01	73	2000	Ammo pack packaging

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

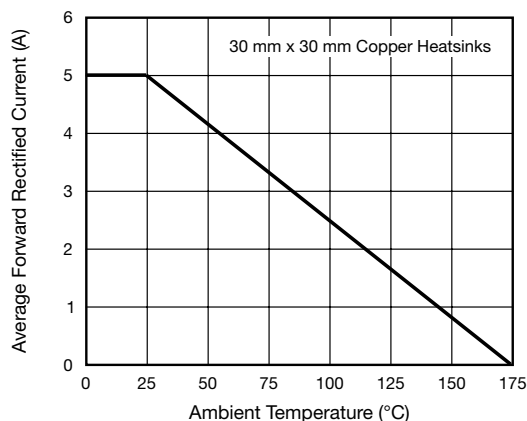


Fig. 1 - Maximum Forward Current Derating Curve

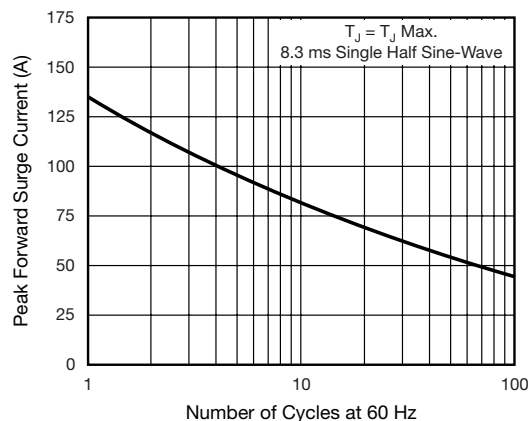


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

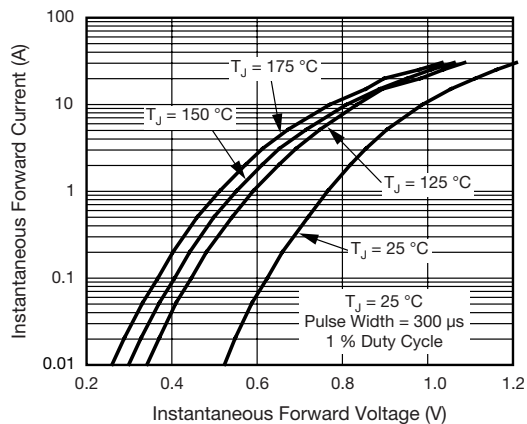


Fig. 3 - Typical Instantaneous Forward Characteristics

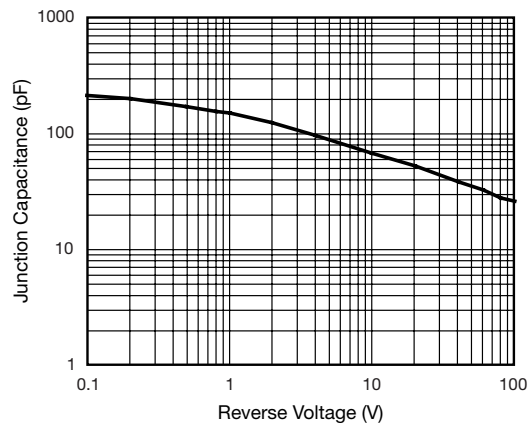


Fig. 5 - Typical Junction Capacitance

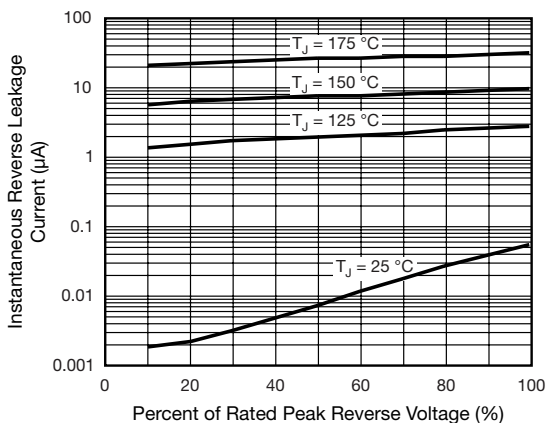
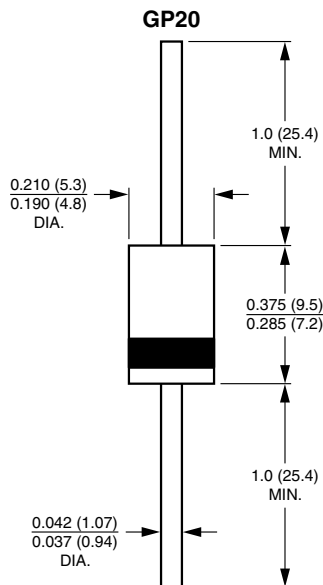


Fig. 4 - Typical Reverse Leakage Characteristics

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



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