

## Glass Passivated Ultrafast Plastic Rectifier



### FEATURES

- Superrectifier structure for high reliability condition
- 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
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### PRIMARY CHARACTERISTICS

|                  |                     |
|------------------|---------------------|
| $I_{F(AV)}$      | 5.0 A               |
| $V_{RRM}$        | 100 V, 150 V, 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              |
| Package          | GP20                |
| Diode variations | Single die          |

### 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

### MAXIMUM RATINGS ( $T_A = 25$ °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<br>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<br>superimposed on rated load | $I_{FSM}$      | 135           |        |        | A    |
| Operating junction and storage temperature range                                      | $T_J, T_{STG}$ | - 65 to + 175 |        |        | °C   |



| 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 PCB

| 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)**

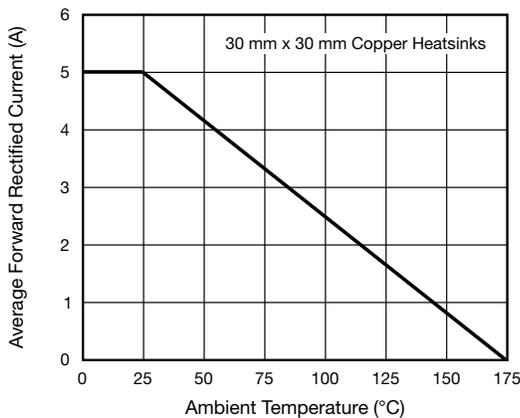


Fig. 1 - Maximum Forward Current Derating Curve

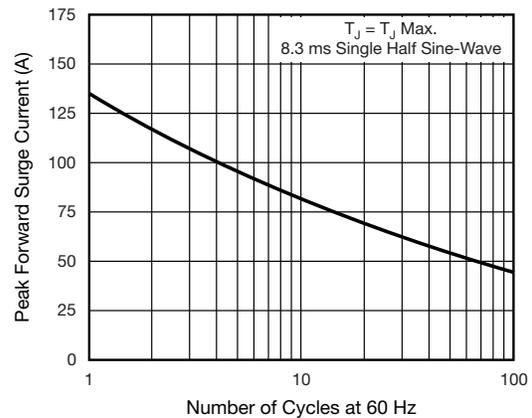


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

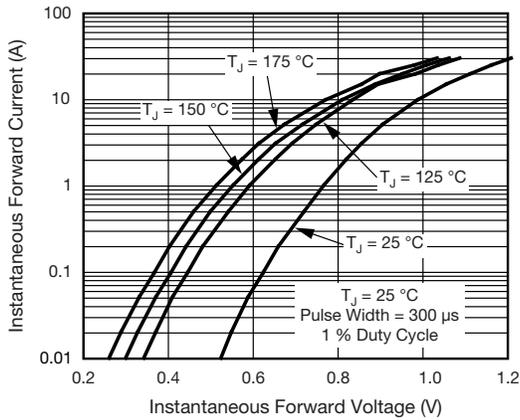


Fig. 3 - Typical Instantaneous Forward Characteristics

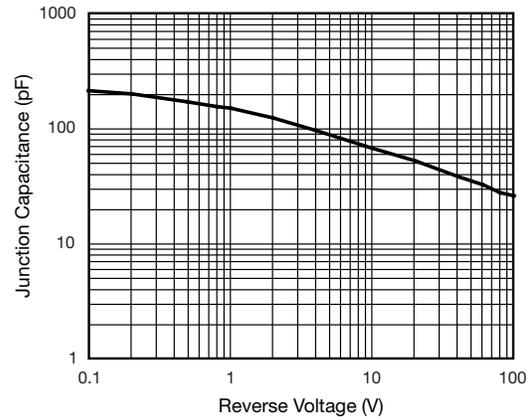


Fig. 5 - Typical Junction Capacitance

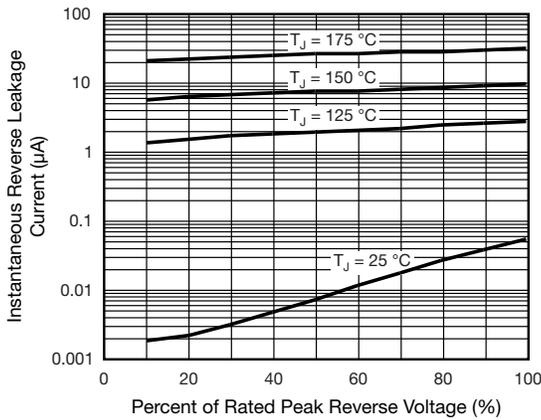
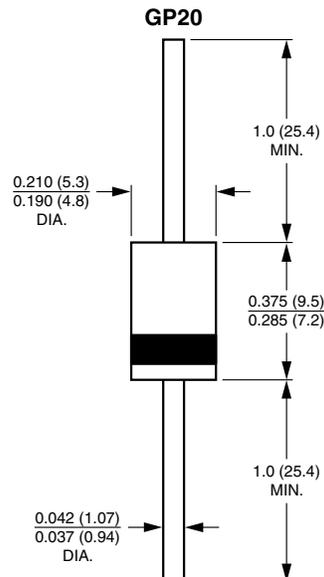


Fig. 4 - Typical Reverse Leakage Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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