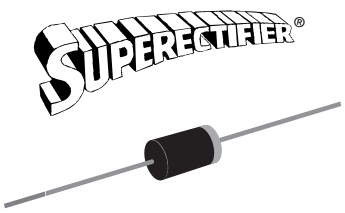
# Glass Passivated Junction Fast Switching Rectifier




Patented*

**Case Style GP20**

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

## FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current, typical $I_R$ less than 0.2 µA
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

## TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2.0 A |
| $V_{RRM}$ | 50 V to 600 V |
| $I_{FSM}$ | 80 A |
| $t_{rr}$ | 150 ns, 250 ns |
| $V_F$ | 1.3 V |
| $I_R$ | 5.0 µA |
| $T_J$ max. | 175 °C |

## MECHANICAL DATA

**Case:** GP20, molded epoxy over glass body

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | SYMBOL | RGP20A | RGP20B | RGP20D | RGP20G | RGP20J | UNIT |
|---|---|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 50 | 100 | 200 | 400 | 600 | V |
| Maximum RMS voltage | $V_{RMS}$ | 35 | 70 | 140 | 280 | 420 | V |
| Maximum DC blocking voltage | $V_{DC}$ | 50 | 100 | 200 | 400 | 600 | V |
| Maximum average forward rectified current 0.375" (9.5 mm) lead length at $T_A$ = 55 °C | $I_{F(AV)}$ | 2.0 | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 80 | | | | | A |
| Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead length at $T_A$ = 55 °C | $I_{R(AV)}$ | 100 | | | | | µA |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | - 65 to + 175 | | | | | °C |

| **ELECTRICAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | **SYMBOL** | **RGP20A** | **RGP20B** | **RGP20D** | **RGP20G** | **RGP20J** | **UNIT** |
| Maximum instantaneous forward voltage | 2.0 A | $V_F$ | 1.3 | | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | $T_A$= 25 °C<br>$T_A$= 125 °C | $I_R$ | 5.0<br>100 | | | | | µA |
| Maximum reverse recovery time | $I_F$ = 0.5 A, $I_R$ = 1.0 A, $I_{rr}$ = 0.25 A | $t_{rr}$ | 150 | | | | 250 | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | $C_J$ | 35 | | | | | pF |

| **THERMAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **RGP20A** | **RGP20B** | **RGP20D** | **RGP20G** | **RGP20J** | **UNIT** |
| Typical thermal resistance (1) | $R_{\theta JA}$ | 22 | | | | | °C/W |

**Note:**

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead leangth, P.C.B. mounted

| **ORDERING INFORMATION** (Example) | | | | |
|---|---|---|---|---|
| **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PREFERRED PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| RGP20J-E3/54 | 1.013 | 54 | 1400 | 13" diameter paper tape and reel |
| RGP20J-E3/73 | 1.013 | 73 | 1000 | Ammo pack packaging |
| RGP20JHE3/54 (1) | 1.013 | 54 | 1400 | 13" diameter paper tape and reel |
| RGP20JHE3/73 (1) | 1.013 | 73 | 1000 | Ammo pack packaging |

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

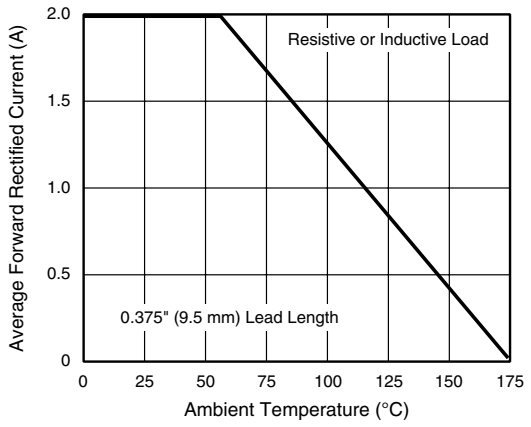



Figure 1. Forward Current Derating Curve

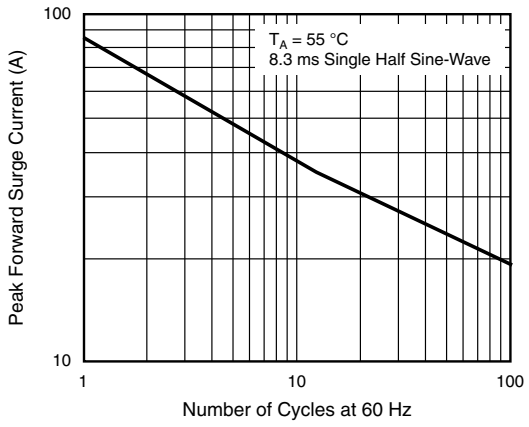



Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

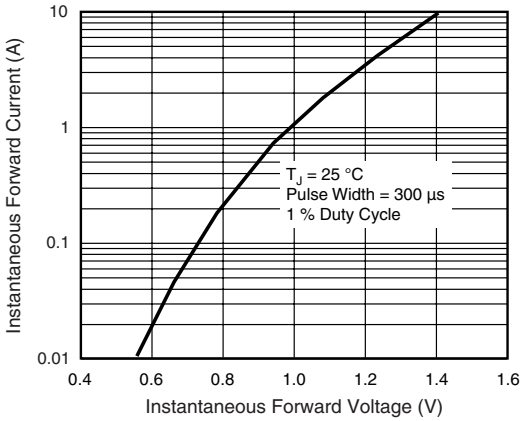



Figure 3. Typical Instantaneous Forward Characteristics

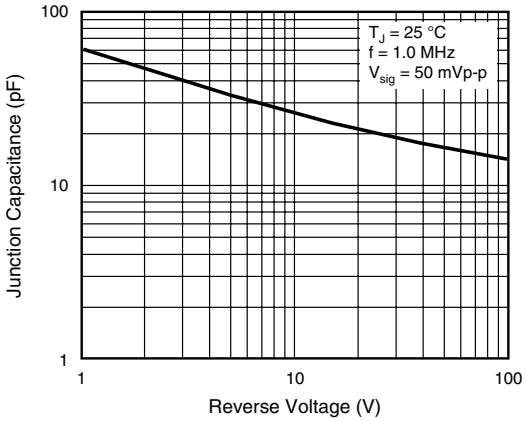



Figure 5. Typical Junction Capacitance

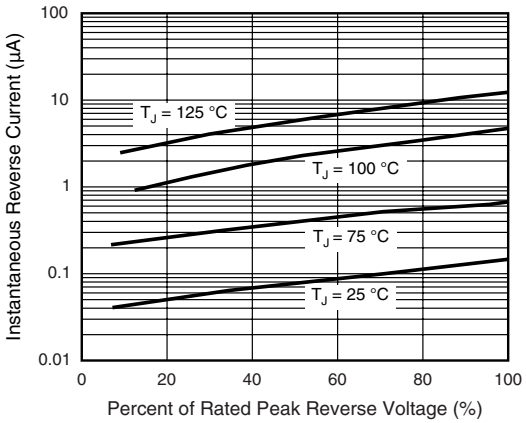



Figure 4. Typical Reverse Characteristics

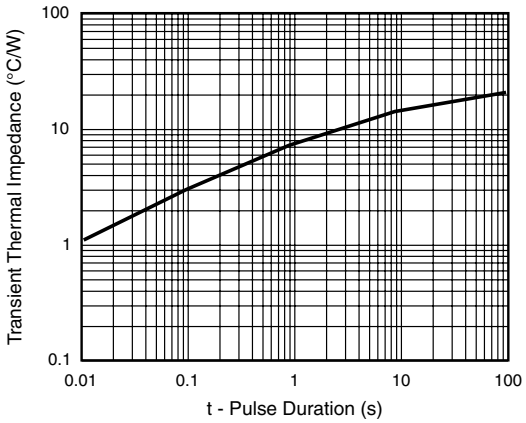
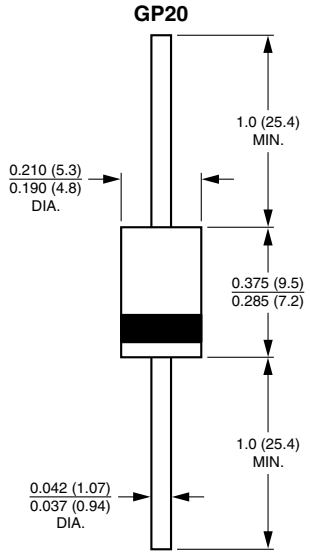



Figure 6. Typical Transient Thermal Impedance

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



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