

Glass Passivated Junction Fast Switching Rectifier



FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Fast switching for high efficiency
- Low leakage current
- 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 fast switching rectification of power supply, inverters, converters and freewheeling diodes for consumer, automotive and telecommunication.

MECHANICAL DATA

Case: DO-204AL, 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 | |
|-------------------------|------------------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 200 V to 1000 V |
| I_{FSM} | 25 A |
| t_{rr} | 150 ns, 250 ns, 500 ns |
| I_R | 1.0 μ A |
| V_F | 1.3 V |
| T_J max. | 175 °C |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | | | |
|---|----------------|---------------|----------|----------|----------|----------|------|
| PARAMETER | SYMBOL | 1N4942GP | 1N4944GP | 1N4946GP | 1N4947GP | 1N4948GP | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current 0.375" (9.5 mm) lead length at $T_A = 55$ °C | $I_{F(AV)}$ | 1.0 | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 25 | | | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | - 65 to + 175 | | | | | °C |

1N4942GP thru 1N4948GP

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | |
|---|---|----------|----------|----------|----------|----------|----------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | 1N4942GP | 1N4944GP | 1N4946GP | 1N4947GP | 1N4948GP | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | V_F | 1.3 | | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | $T_A = 25\text{ }^\circ\text{C}$ | I_R | 1.0 | | | | | μA |
| | $T_A = 150\text{ }^\circ\text{C}$ | | 200 | | | | | |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$ | t_{rr} | 150 | | 250 | | 500 | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 15 | | | | | pF |

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | |
|--|-----------------------|----------|----------|----------|----------|----------|------|--------------------|
| PARAMETER | SYMBOL | 1N4942GP | 1N4944GP | 1N4946GP | 1N4947GP | 1N4948GP | UNIT | |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 55 | | | | | | $^\circ\text{C/W}$ |

Note

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

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|----------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| 1N4946GP-E3/54 | 0.336 | 54 | 5500 | 13" diameter paper tape and reel |
| 1N4946GP-E3/73 | 0.336 | 73 | 3000 | Ammo pack packaging |
| 1N4946GPHE3/54 (1) | 0.336 | 54 | 5500 | 13" diameter paper tape and reel |
| 1N4946GPHE3/73 (1) | 0.336 | 73 | 3000 | Ammo pack packaging |

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

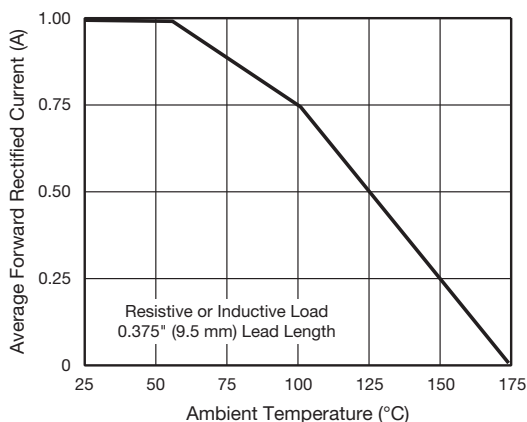


Fig. 1 - Forward Current Derating Curve

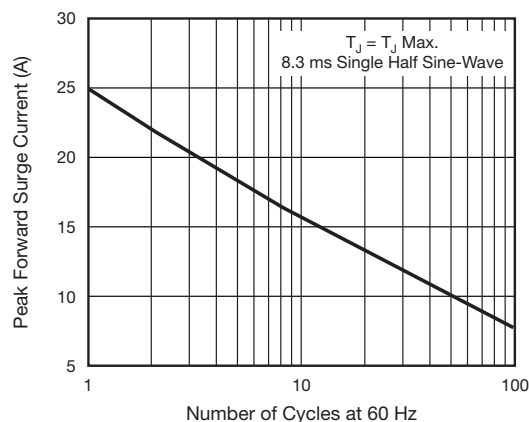


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

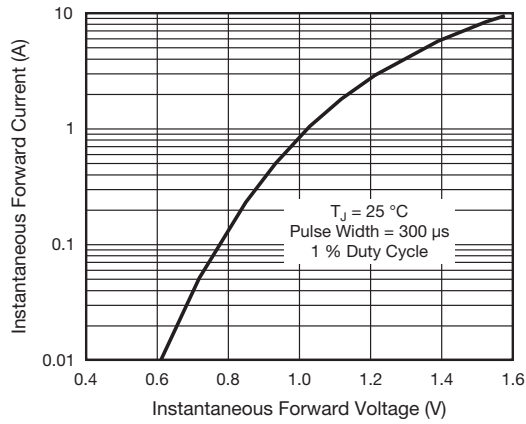


Fig. 3 - Typical Instantaneous Forward Characteristics

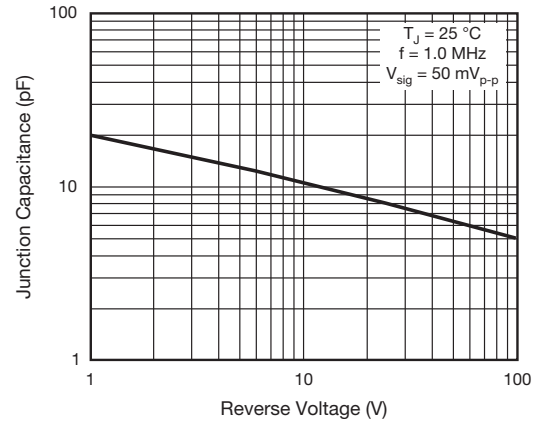


Fig. 5 - Typical Junction Capacitance

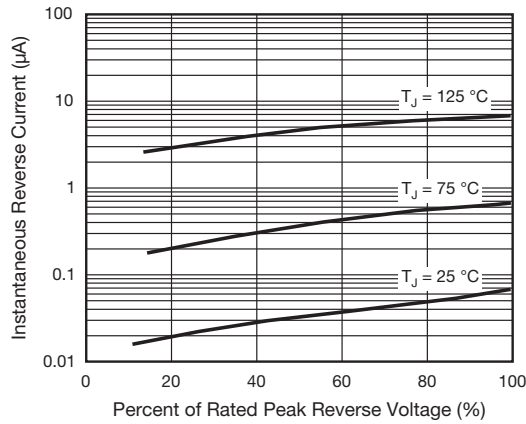


Fig. 4 - Typical Reverse Characteristics

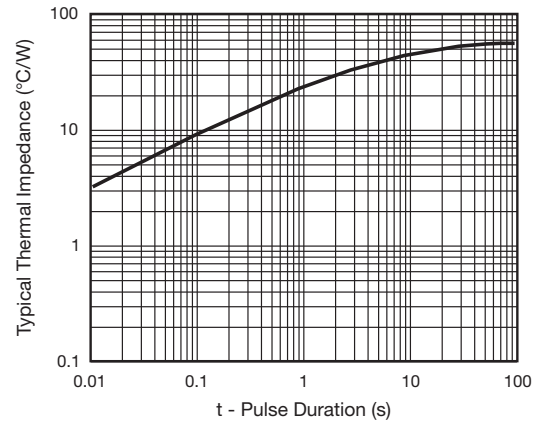


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

- Lead diameter is $\frac{0.026 (0.66)}{0.023 (0.58)}$ for suffix "E" part numbers



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