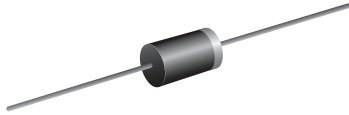




Glass Passivated Junction Plastic Rectifier

SUPERECTIFIER®



DO-204AL (DO-41)

| PRIMARY CHARACTERISTICS | |
|--------------------------------------|---|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V |
| I_{FSM} (8.3 ms sine-wave) | 30 A |
| I_{FSM} (square wave $t_p = 1$ ms) | 45 A |
| I_R | 5.0 μ A |
| V_F | 1.1 V |
| T_J max. | 175 °C |
| Package | DO-204AL (DO-41) |
| Diode variations | Single die |

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer, and automotive applications.

FEATURES

- Superectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 μ A
- 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

RoHS
COMPLIANT

MECHANICAL DATA

Case: DO-204AL (DO-41), 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

Note

- For part numbers with "E" suffix, they are "-E3" commercial grade only

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | | | | | |
|---|----------------------|---------------|----------|----------|----------|----------|----------|----------|------------------|
| PARAMETER | SYMBOL | 1N4001GP | 1N4002GP | 1N4003GP | 1N4004GP | 1N4005GP | 1N4006GP | 1N4007GP | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | $V_{RMS}^{(1)}$ | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | $V_{DC}^{(1)}$ | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current 0.375" (9.5 mm) lead length at $T_A = 75$ °C | $I_{F(AV)}^{(1)}$ | 1.0 | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}^{(1)}$ | 30 | | | | | | | A |
| Non-repetitive peak forward surge current square waveform $T_A = 25$ °C (fig. 3) | $t_p = 1$ ms | 45 | | | | | | | A |
| | $t_p = 2$ ms | 35 | | | | | | | |
| | $t_p = 5$ ms | 30 | | | | | | | |
| Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length $T_A = 75$ °C | $I_{R(AV)}^{(1)}$ | 30 | | | | | | | μ A |
| Rating for fusing ($t < 8.3$ ms) | $I^2t^{(2)}$ | 3.7 | | | | | | | A ² s |
| Operating junction and storage temperature range | $T_J, T_{STG}^{(1)}$ | - 65 to + 175 | | | | | | | °C |

Notes

(1) JEDEC® registered values

(2) For device using on bridge rectifier application



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | | |
|--|--|-------------------------------|----------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER | TEST CONDITIONS | SYMBOL | 1N4001GP | 1N4002GP | 1N4003GP | 1N4004GP | 1N4005GP | 1N4006GP | 1N4007GP | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | V _F | | | | 1.1 | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | T _A = 25 °C | I _R ⁽¹⁾ | | | | 5.0 | | | | μA |
| | T _A = 125 °C | | | | | 50 | | | | |
| Typical reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | t _{rr} | | | | 2.0 | | | | μs |
| Typical junction capacitance | 4.0 V, 1 MHz | C _J | | | | 8.0 | | | | pF |

Note

⁽³⁾ JEDEC® registered values

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | |
|---|---------------------------------|----------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER | SYMBOL | 1N4001GP | 1N4002GP | 1N4003GP | 1N4004GP | 1N4005GP | 1N4006GP | 1N4007GP | UNIT |
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | | | | 55 | | | | °C/W |
| | R _{θJL} ⁽¹⁾ | | | | 25 | | | | |

Note

⁽¹⁾ Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|----------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| 1N4004GP-E3/54 | 0.335 | 54 | 5500 | 13" diameter paper tape and reel |
| 1N4004GP-E3/73 | 0.335 | 73 | 3000 | Ammo pack packaging |
| 1N4004GPHE3/54 ⁽¹⁾ | 0.335 | 54 | 5500 | 13" diameter paper tape and reel |
| 1N4004GPHE3/73 ⁽¹⁾ | 0.335 | 73 | 3000 | Ammo pack packaging |

Note

⁽¹⁾ AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)



Fig. 1 - Forward Current Derating Curve



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

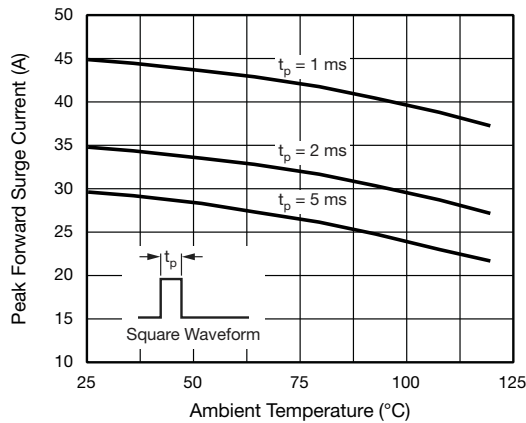


Fig. 3 - Non-Repetitive Peak Forward Surge Current

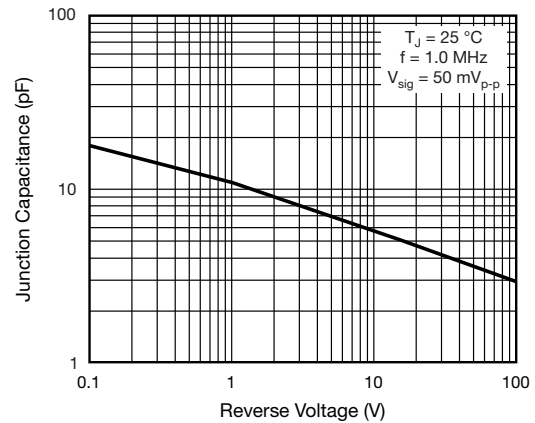


Fig. 6 - Typical Junction Capacitance

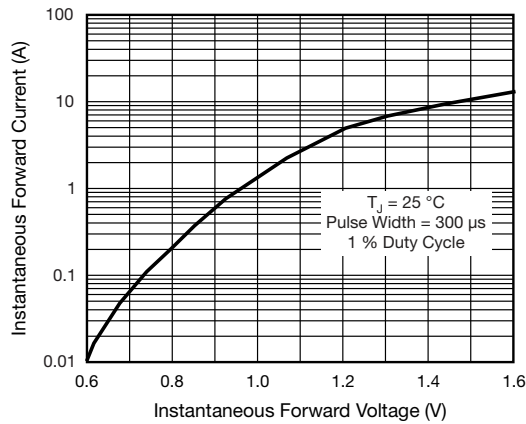


Fig. 4 - Typical Instantaneous Forward Characteristics

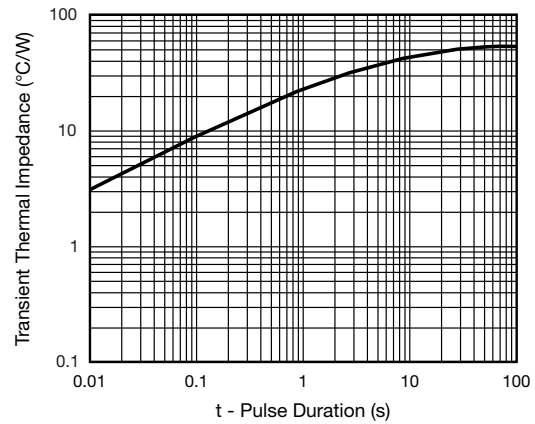


Fig. 7 - Typical Transient Thermal Impedance

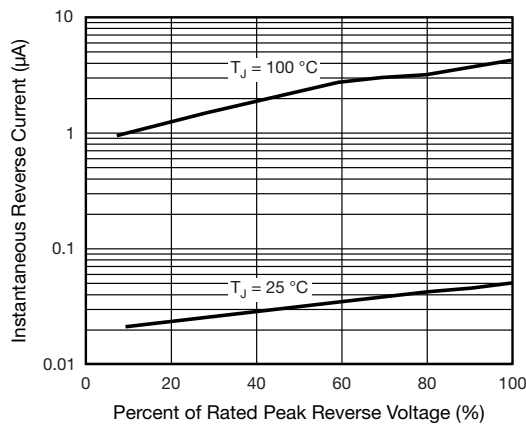
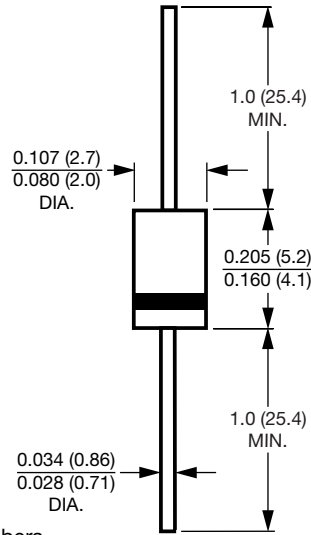


Fig. 5 - Typical Reverse Characteristics



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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