

General Purpose Plastic Rectifier



FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes application.

Note

- These devices are not AEC-Q101 qualified.

MECHANICAL DATA

Case: DO-204AL, molded epoxy body
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|--------------------------------------|----------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 50 V to 1000 V |
| I_{FSM} (8.3 ms sine-wave) | 30 A |
| I_{FSM} (square wave $t_p = 1$ ms) | 45 A |
| V_F | 1.1 V |
| I_R | 5.0 μ A |
| T_J max. | 150 °C |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | | | | | |
|--|----------------|---------------|--------|--------|--------|--------|--------|--------|------------------|
| PARAMETER | SYMBOL | 1N4001 | 1N4002 | 1N4003 | 1N4004 | 1N4005 | 1N4006 | 1N4007 | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 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 | $I_{F(AV)}$ | 1.0 | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 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 $T_L = 75$ °C | $I_{R(AV)}$ | 30 | | | | | | | μ A |
| Rating for fusing ($t < 8.3$ ms) | $I^2t^{(1)}$ | 3.7 | | | | | | | A ² s |
| Operating junction and storage temperature range | T_J, T_{STG} | - 50 to + 150 | | | | | | | °C |

Note

⁽¹⁾ For device using on bridge rectifier application

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | |
|---|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | 1N4001 | 1N4002 | 1N4003 | 1N4004 | 1N4005 | 1N4006 | 1N4007 | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | V_F | 1.1 | | | | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | $T_A = 25\text{ }^\circ\text{C}$ | I_R | 5.0 | | | | | | | μA |
| | $T_A = 125\text{ }^\circ\text{C}$ | | 50 | | | | | | | |
| 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 | 1N4001 | 1N4002 | 1N4003 | 1N4004 | 1N4005 | 1N4006 | 1N4007 | UNIT | |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 50 | | | | | | | $^\circ\text{C/W}$ | |
| | $R_{\theta JL}^{(1)}$ | 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 |
| 1N4004-E3/54 | 0.33 | 54 | 5500 | 13" diameter paper tape and reel |
| 1N4004-E3/73 | 0.33 | 73 | 3000 | Ammo pack packaging |

RATINGS AND CHARACTERISTICS CURVES

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

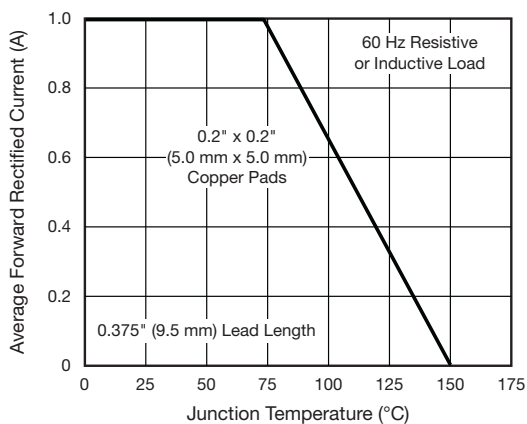


Fig. 1 - Forward Current Derating Curve

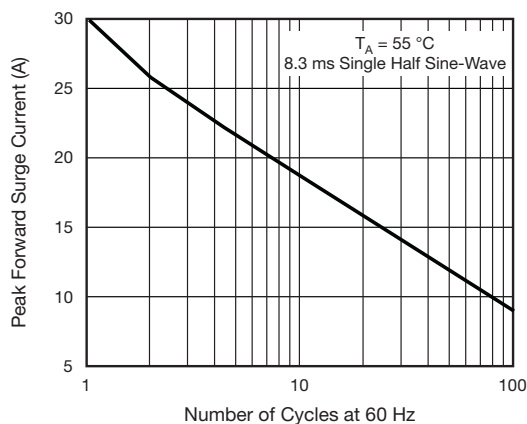


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current



Fig. 3 - Non-Repetitive Peak Forward Surge Current



Fig. 6 - Typical Junction Capacitance



Fig. 4 - Typical Instantaneous Forward Characteristics



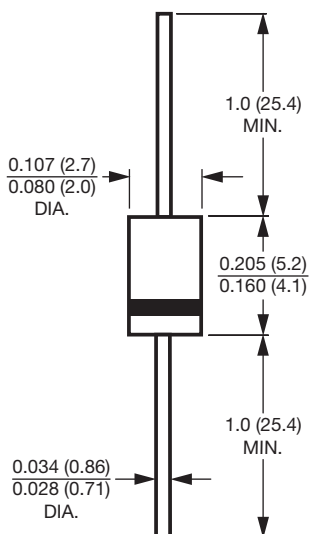
Fig. 7 - Typical Transient Thermal Impedance



Fig. 5 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

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



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