



## General Purpose Plastic Rectifier



DO-41 (DO-204AL)

### FEATURES

- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

| PRIMARY CHARACTERISTICS              |   |
|--------------------------------------|---|
| $I_{F(AV)}$                          | 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  |
| $V_F$                                | 1.1 V   |
| $I_R$                                | 5.0 $\mu$ A                                     |
| $T_J$ max.                           | 150 °C  |
| Package                              | DO-41 (DO-204AL)                                |
| Circuit configuration                | Single  |

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** DO-41 (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

| 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          |        |        |        |        |        |        | $\mu$ A          |
| Rating for fusing ( $t < 8.3$ ms)   | $I^2t^{(1)}$   | 3.7         |        |        |        |        |        |        | A <sup>2</sup> 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 <sub>A</sub> = 25 °C unless otherwise noted) |                         |                |        |        |        |        |        |        |        |      |    |
|--|-------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|------|----|
| PARAMETER  | TEST CONDITIONS         | SYMBOL         | 1N4001 | 1N4002 | 1N4003 | 1N4004 | 1N4005 | 1N4006 | 1N4007 | UNIT |    |
| Maximum instantaneous forward voltage                                      | 1.0 A                   | V <sub>F</sub> | 1.1    |        |        |        |        |        |        |      | 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> = 125 °C |                | 50     |        |        |        |        |        |        |      |    |
| Typical junction capacitance   | 4.0 V, 1 MHz            | C <sub>J</sub> | 15     |        |        |        |        |        |        |      | pF |

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |        |        |        |        |        |        |        |      |  |
|---|---------------------------------|--------|--------|--------|--------|--------|--------|--------|------|--|
| PARAMETER   | SYMBOL                          | 1N4001 | 1N4002 | 1N4003 | 1N4004 | 1N4005 | 1N4006 | 1N4007 | UNIT |  |
| Typical thermal resistance  | R <sub>θJA</sub> <sup>(1)</sup> |        |        |        |        | 50     |        |        | °C/W |  |
|   | R <sub>θJL</sub> <sup>(1)</sup> |        |        |        |        | 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<sub>A</sub> = 25 °C unless otherwise noted)**

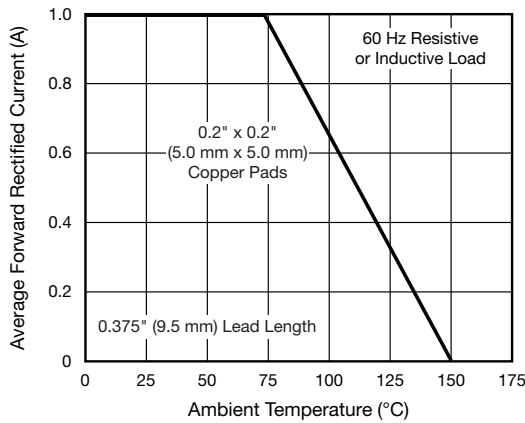


Fig. 1 - Forward Current Derating Curve

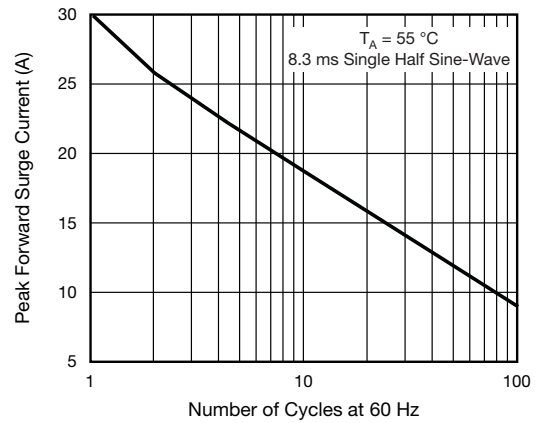


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

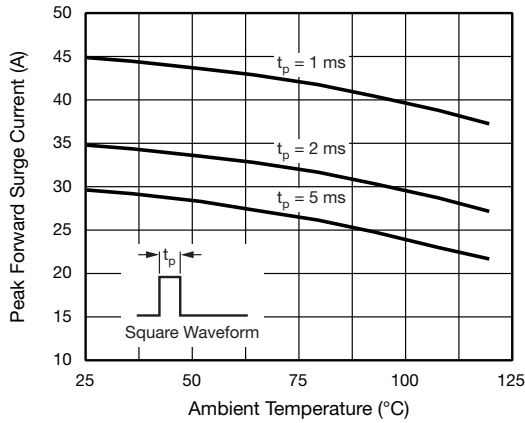


Fig. 3 - Non-Repetitive Peak Forward Surge Current



Fig. 6 - Typical Junction Capacitance

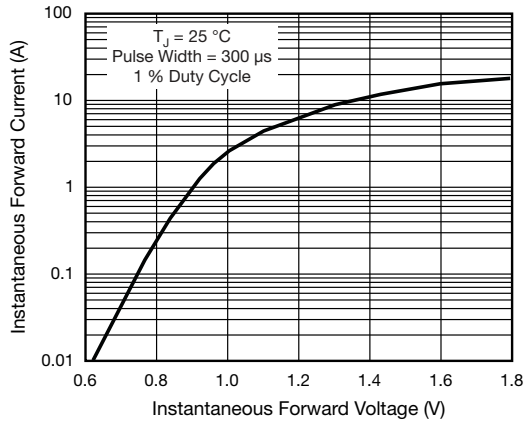


Fig. 4 - Typical Instantaneous Forward Characteristics



Fig. 7 - Typical Transient Thermal Impedance

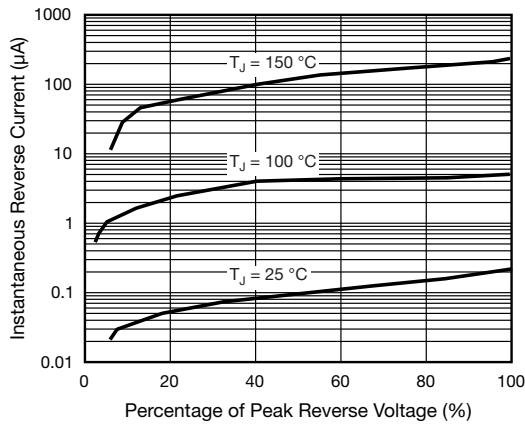
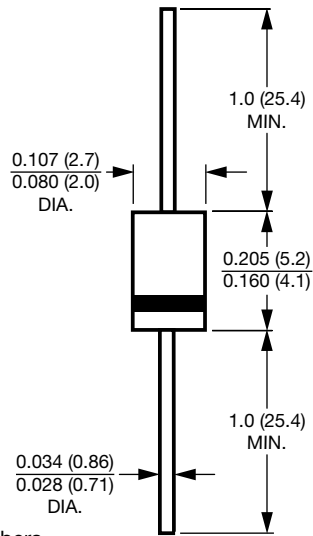


Fig. 5 - Typical Reverse Characteristics



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

DO-41 (DO-204AL)



**Note**

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



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