

## 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 <sub>RRM</sub>                  | 50               | 100    | 200    | 400    | 600    | 800    | 1000   | V                |   |
| Maximum RMS voltage                                                                                         | V <sub>RMS</sub>                  | 35               | 70     | 140    | 280    | 420    | 560    | 700    | V                |   |
| Maximum DC blocking voltage                                                                                 | V <sub>DC</sub>                   | 50               | 100    | 200    | 400    | 600    | 800    | 1000   | V                |   |
| Maximum average forward rectified current<br>0.375" (9.5 mm) lead length at T <sub>A</sub> = 75 °C          | I <sub>F(AV)</sub>                | 1.0              |        |        |        |        |        |        | A                |   |
| Peak forward surge current 8.3 ms single half<br>sine-wave superimposed on rated load                       | I <sub>FSM</sub>                  | 30               |        |        |        |        |        |        | A                |   |
| Non-repetitive peak forward<br>surge current square waveform<br>T <sub>A</sub> = 25 °C (fig. 3)             | t <sub>p</sub> = 1 ms             | I <sub>FSM</sub> | 45     |        |        |        |        |        |                  | A |
|                                                                                                             | t <sub>p</sub> = 2 ms             |                  | 35     |        |        |        |        |        |                  |   |
|                                                                                                             | t <sub>p</sub> = 5 ms             |                  | 30     |        |        |        |        |        |                  |   |
| Maximum full load reverse current, full cycle<br>average 0.375" (9.5 mm) lead length T <sub>L</sub> = 75 °C | I <sub>R(AV)</sub>                | 30               |        |        |        |        |        |        | μA               |   |
| Rating for fusing (t < 8.3 ms)                                                                              | I <sup>2</sup> t <sup>(1)</sup>   | 3.7              |        |        |        |        |        |        | A <sup>2</sup> s |   |
| Operating junction and<br>storage temperature range                                                         | T <sub>J</sub> , T <sub>STG</sub> | -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 <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** ( $T_A = 25\text{ }^{\circ}\text{C}$  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** ( $T_A = 25\text{ }^{\circ}\text{C}$  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



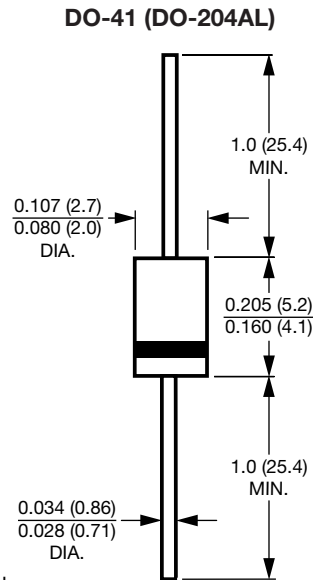
Fig. 7 - Typical Transient Thermal Impedance



Fig. 5 - Typical Reverse Characteristics



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



**Note**

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



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