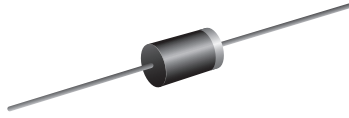




## Glass Passivated Junction Plastic Rectifier

SUPERECTIFIER®



DO-41 (DO-204AL)

### 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  $\mu$ A
- 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

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** DO-41 (DO-204AL), molded epoxy over glass 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, 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 $\mu$ A                                     |
| $V_F$                                | 1.1 V   |
| $T_J$ max.                           | 175 °C  |
| Package                              | DO-41 (DO-204AL)                                |
| Circuit configuration                | Single  |

| 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)                | $I_{FSM}^{(1)}$      | $t_p = 1$ ms |          |          |          |          |          |          | A                |
|   |                      | $t_p = 2$ ms |          |          |          |          |          |          |                  |
|   |                      | $t_p = 5$ ms |          |          |          |          |          |          |                  |
| Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length $T_A = 75$ °C | $I_{R(AV)}^{(1)}$    | 30           |          |          |          |          |          |          | $\mu$ A          |
| Rating for fusing ( $t < 8.3$ ms)   | $I^2t^{(2)}$         | 3.7          |          |          |          |          |          |          | A <sup>2</sup> 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 <sub>A</sub> = 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 <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> <sup>(1)</sup> |          |          |          | 5.0      |          |          |          | μA   |
|  | T <sub>A</sub> = 125 °C  |                               |          |          |          | 50       |          |          |          |      |
| Typical reverse recovery time  | I <sub>F</sub> = 0.5 A,<br>I <sub>R</sub> = 1.0 A,<br>I <sub>rr</sub> = 0.25 A | t <sub>rr</sub>               |          |          |          | 2.0      |          |          |          | μs   |
| Typical junction capacitance   | 4.0 V,<br>1 MHz  | C <sub>J</sub>                |          |          |          | 8.0      |          |          |          | pF   |

**Note**

<sup>(3)</sup> JEDEC® registered values

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |          |          |          |          |          |          |          |          |  |
|---|---------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|--|
| PARAMETER   | SYMBOL                          | 1N4001GP | 1N4002GP | 1N4003GP | 1N4004GP | 1N4005GP | 1N4006GP | 1N4007GP | UNIT     |  |
| Typical thermal resistance  | R <sub>θJA</sub> <sup>(1)</sup> |          |          |          | 55       |          |          |          | °C/<br>W |  |
|   | R <sub>θJL</sub> <sup>(1)</sup> |          |          |          | 25       |          |          |          |          |  |

**Note**

<sup>(1)</sup> 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              |

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

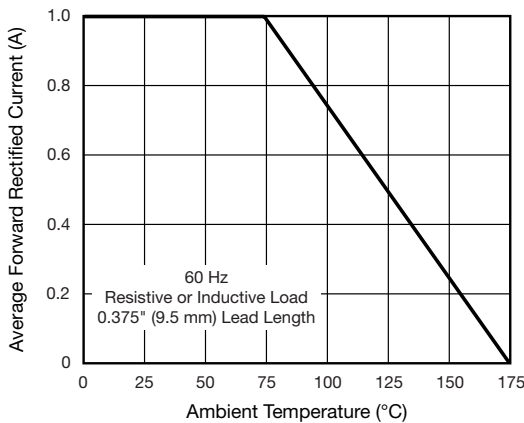


Fig. 1 - Forward Current Derating Curve

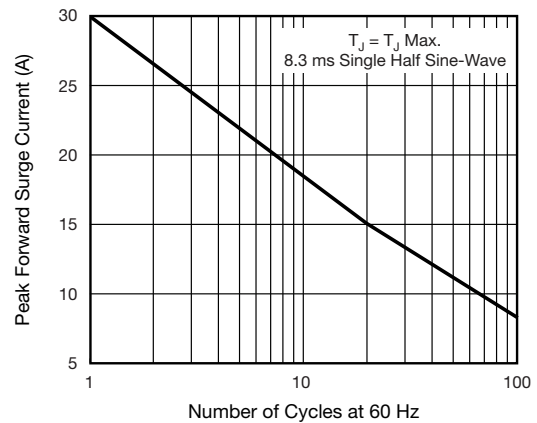


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

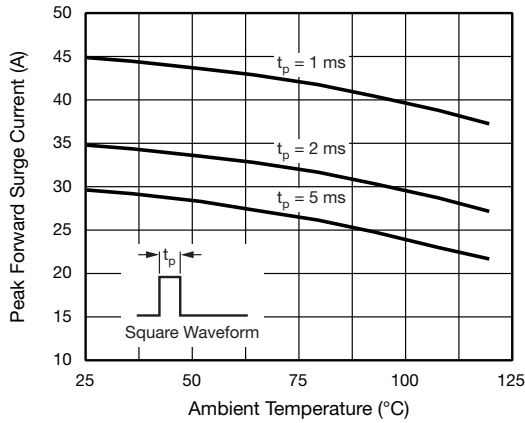


Fig. 3 - Non-Repetitive Peak Forward Surge Current

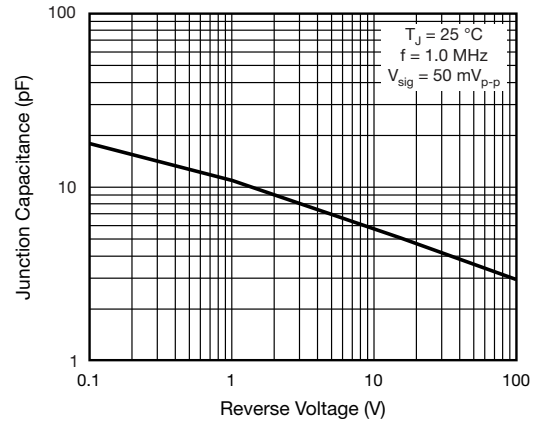


Fig. 6 - Typical Junction Capacitance

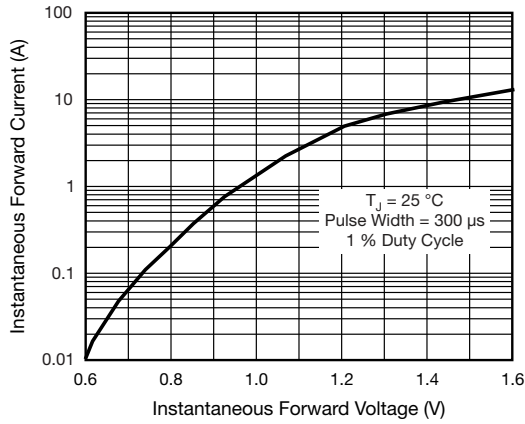


Fig. 4 - Typical Instantaneous Forward Characteristics

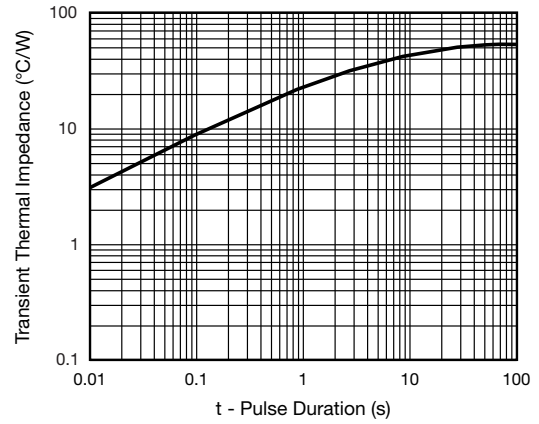


Fig. 7 - Typical Transient Thermal Impedance

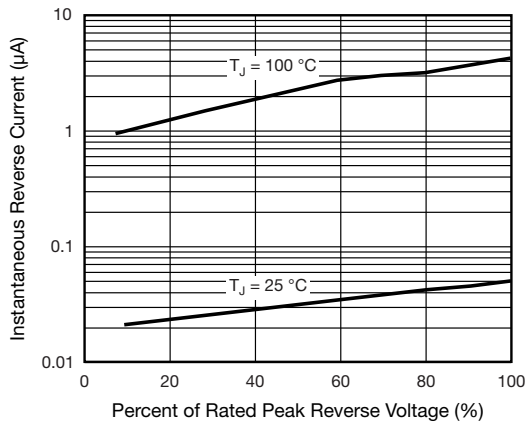
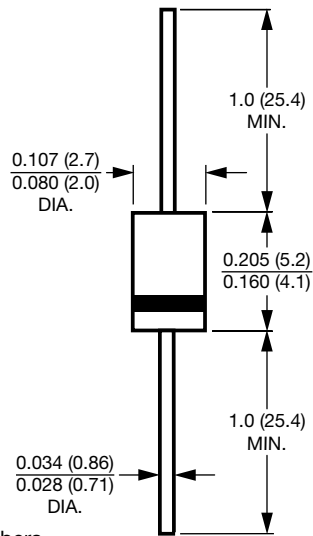


Fig. 5 - Typical Reverse Characteristics



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

DO-41 (DO-204AL)



**Note**

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



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