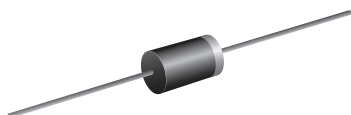


## Miniature Ultrafast Plastic Rectifier



DO-204AL (DO-41)

### FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Soft recovery characteristics
- Low forward voltage drop
- Low switching losses, high efficiency
- 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

### PRIMARY CHARACTERISTICS

|                    |               |
|--------------------|---------------|
| $I_{F(AV)}$        | 1.0 A         |
| $V_{RRM}$          | 50 V to 200 V |
| $I_{FSM}$          | 40 A          |
| $t_{rr}$           | 15 ns         |
| $V_F$              | 0.95 V        |
| $T_J \text{ max.}$ | 150 °C        |

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer and telecommunication.

### MECHANICAL DATA

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

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

| PARAMETER                                                                          | SYMBOL         | UG1A          | UG1B | UG1C | UG1D | UNIT |
|------------------------------------------------------------------------------------|----------------|---------------|------|------|------|------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 50            | 100  | 150  | 200  | V    |
| Maximum RMS voltage                                                                | $V_{RMS}$      | 35            | 70   | 105  | 140  | V    |
| Maximum DC blocking voltage                                                        | $V_{DC}$       | 50            | 100  | 150  | 200  | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 1.0           |      |      |      | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 40            |      |      |      | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 55 to + 150 |      |      |      | °C   |

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                                                                                        |                         |                               |       |      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|-------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                                                        |                         | SYMBOL                        | VALUE | UNIT |
| Maximum instantaneous forward voltage                                      | I <sub>F</sub> = 1.0 A                                                                                 |                         | V <sub>F</sub> <sup>(1)</sup> | 0.95  | 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> = 100 °C |                               | 200   |      |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A                               |                         | t <sub>rr</sub>               | 15    | ns   |
| Maximum reverse recovery time                                              | I <sub>F</sub> = 1.0 A, V <sub>R</sub> = 30 V, dI/dt = 50 A/μs, I <sub>rr</sub> = 10 % I <sub>RM</sub> | T <sub>J</sub> = 25 °C  | t <sub>rr</sub>               | 25    | ns   |
|                                                                            |                                                                                                        | T <sub>J</sub> = 100 °C |                               | 35    |      |
| Maximum stored charge                                                      | I <sub>F</sub> = 1.0 A, V <sub>R</sub> = 30 V, dI/dt = 50 A/μs, I <sub>rr</sub> = 10 % I <sub>RM</sub> | T <sub>J</sub> = 25 °C  | Q <sub>rr</sub>               | 8.0   | nC   |
|                                                                            |                                                                                                        | T <sub>J</sub> = 100 °C |                               | 12    |      |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                                                           |                         | C <sub>J</sub>                | 7     | pF   |

**Note**

<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |      |      |      |      |      |
|-------------------------------------------------------------------------|---------------------------------|------|------|------|------|------|
| PARAMETER                                                               | SYMBOL                          | UG1A | UG1B | UG1C | UG1D | UNIT |
| Typical thermal resistance                                              | R <sub>θJA</sub> <sup>(1)</sup> | 60   |      |      |      | °C/W |
|                                                                         | R <sub>θJL</sub> <sup>(1)</sup> | 20   |      |      |      |      |

**Note**

<sup>(1)</sup> Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                  |
|---------------------------------------|-----------------|------------------------|---------------|----------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                    |
| UG1D-E3/54                            | 0.334           | 54                     | 5500          | 13" diameter paper tape and reel |
| UG1D-E3/73                            | 0.334           | 73                     | 3000          | Ammo pack packaging              |

**RATINGS AND CHARACTERISTICS CURVES**

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

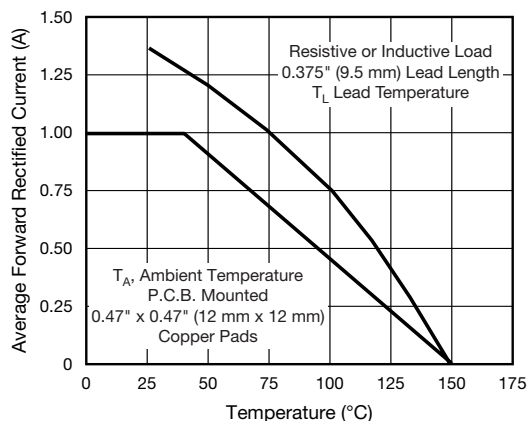


Fig. 1 - Forward Current Derating Curves

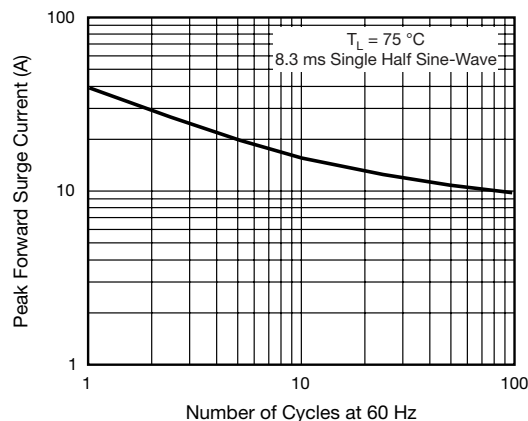


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

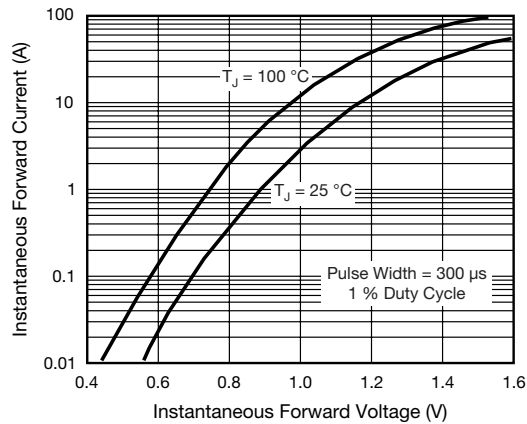


Fig. 3 - Typical Instantaneous Forward Characteristics

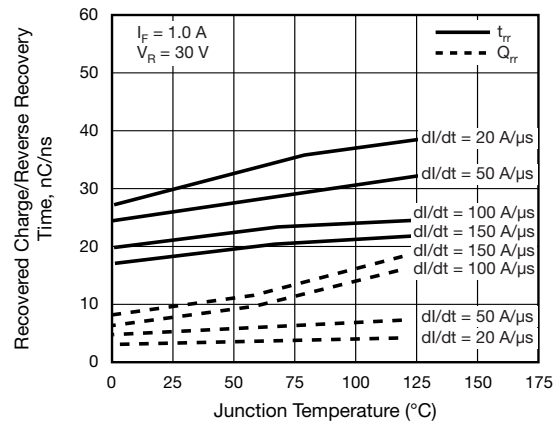


Fig. 5 - Reverse Switching Characteristics

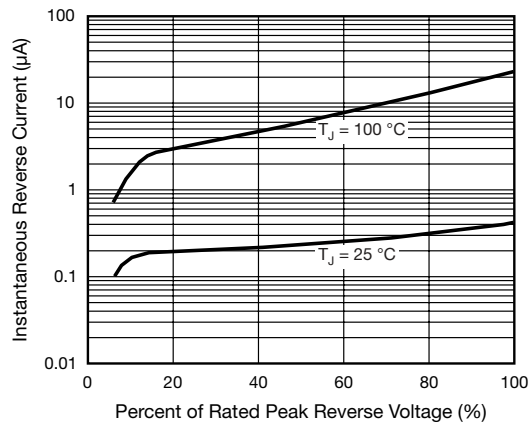


Fig. 4 - Typical Reverse Characteristics

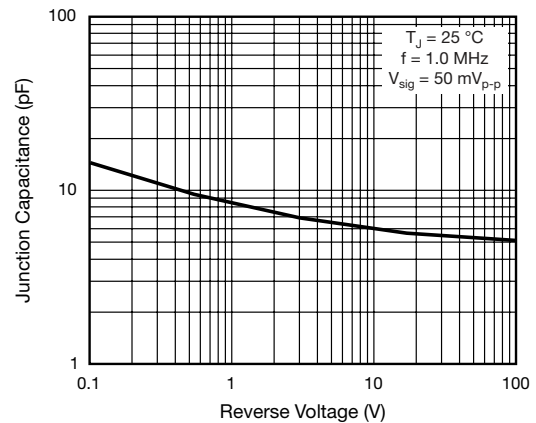
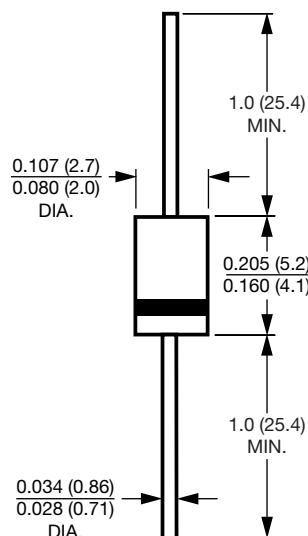


Fig. 6 - Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-204AL (DO-41)





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