

### Miniature Ultrafast Plastic Rectifier



DO-201AD

#### FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- 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

#### 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-201AD

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

|                    |               |
|--------------------|---------------|
| $I_{F(AV)}$        | 4.0 A         |
| $V_{RRM}$          | 50 V to 200 V |
| $I_{FSM}$          | 150 A         |
| $t_{rr}$           | 20 ns         |
| $V_F$              | 0.95 V        |
| $T_J \text{ max.}$ | 150 °C        |

#### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                                                                          | SYMBOL         | UG4A          | UG4B | UG4C | UG4D | 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)                                 | $I_{F(AV)}$    | 4.0           |      |      |      | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 150           |      |      |      | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 55 to + 150 |      |      |      | °C   |

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

| PARAMETER                                               | TEST CONDITIONS                                                                                         | SYMBOL                              | VALUE | UNIT          |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------|-------|---------------|
| Maximum instantaneous forward voltage                   | $I_F = 4.0\text{ A}$                                                                                    | $V_F^{(1)}$                         | 0.95  | V             |
| Maximum DC reverse current at rated DC blocking voltage | $T_A = 25\text{ }^{\circ}\text{C}$                                                                      | $I_R$                               | 5.0   | $\mu\text{A}$ |
|                                                         | $T_A = 100\text{ }^{\circ}\text{C}$                                                                     |                                     | 300   |               |
| Maximum reverse recovery time                           | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$                                  | $t_{rr}$                            | 20    | ns            |
| Typical reverse recovery time                           | $I_F = 4.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 10\% I_{RM}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | 30    | ns            |
|                                                         |                                                                                                         | $T_J = 100\text{ }^{\circ}\text{C}$ | 50    |               |
| Typical stored charge                                   | $I_F = 4.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 10\% I_{RM}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | 15    | nC            |
|                                                         |                                                                                                         | $T_J = 100\text{ }^{\circ}\text{C}$ | 30    |               |
| Typical junction capacitance                            | 4.0 V, 1 MHz                                                                                            | $C_J$                               | 20    | pF            |

**Note**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL                | UG4A | UG4B | UG4C | UG4D | UNIT                        |
|----------------------------|-----------------------|------|------|------|------|-----------------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 25   |      |      |      | $^{\circ}\text{C}/\text{W}$ |

**Note**

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

**ORDERING INFORMATION** (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                    |
|---------------|-----------------|------------------------|---------------|----------------------------------|
| UG4D-E3/54    | 1.138           | 54                     | 1400          | 13" diameter paper tape and reel |
| UG4D-E3/73    | 1.138           | 73                     | 1000          | Ammo pack packaging              |

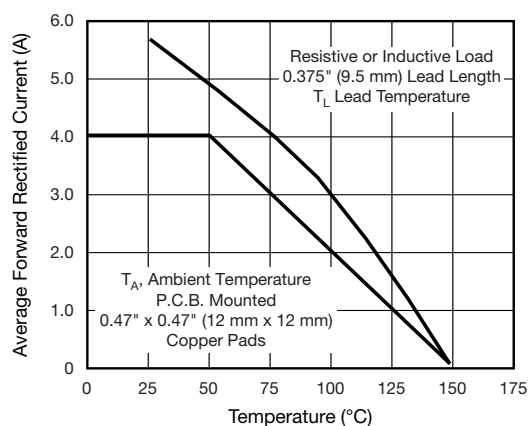
**RATINGS AND CHARACTERISTICS CURVES**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curves

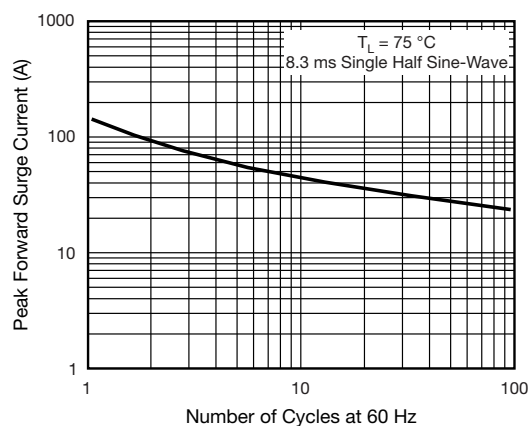


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

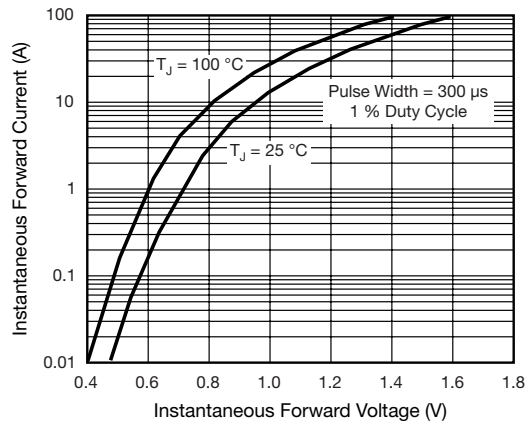


Fig. 3 - Typical Instantaneous Forward Characteristics

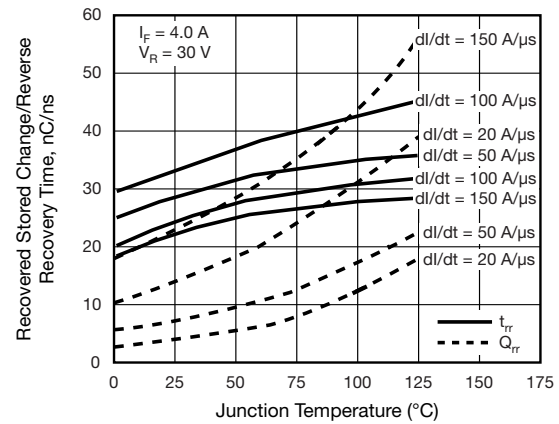


Fig. 5 - Reverse Switching Characteristics

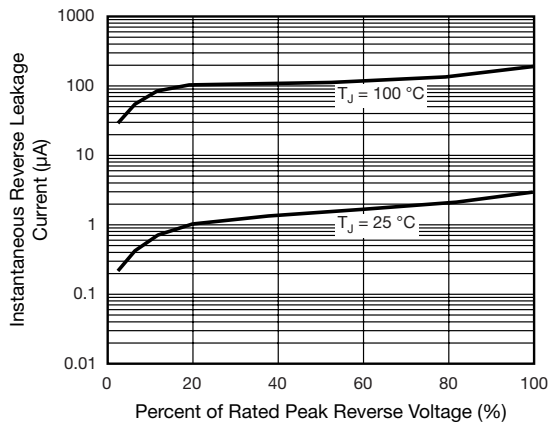


Fig. 4 - Typical Reverse Leakage Characteristics

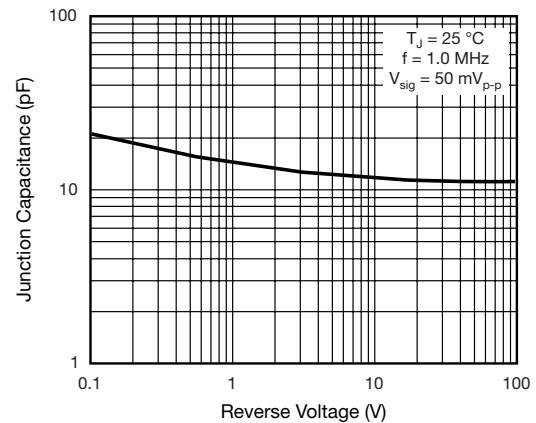
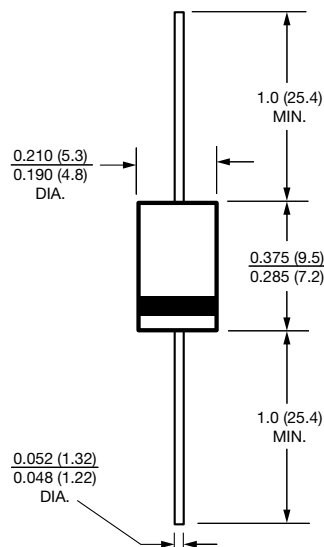


Fig. 6 - Typical Junction Capacitance

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-201AD





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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9