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## UG1A, UG1B, UG1C, UG1D

Vishay General Semiconductor

### 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
- 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, 150 V, 200 V |
| $I_{FSM}$               | 40 A                      |
| $t_{rr}$                | 15 ns                     |
| $V_F$                   | 0.95 V                    |
| $T_J$ max.              | 150 °C                    |
| Package                 | DO-204AL (DO-41)          |
| Diode variations        | Single die                |

#### 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   |



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| 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                    |  | I <sub>R</sub>                | T <sub>A</sub> = 25 °C  | 5.0  |
|  |  |                               | 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>rr</sub>               | T <sub>J</sub> = 25 °C  | 25   |
|  |  |                               | 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> | Q <sub>rr</sub>               | T <sub>J</sub> = 25 °C  | 8.0  |
|  |  |                               | 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 μs 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

| ORDERING INFORMATION (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<sub>A</sub> = 25 °C unless otherwise noted)

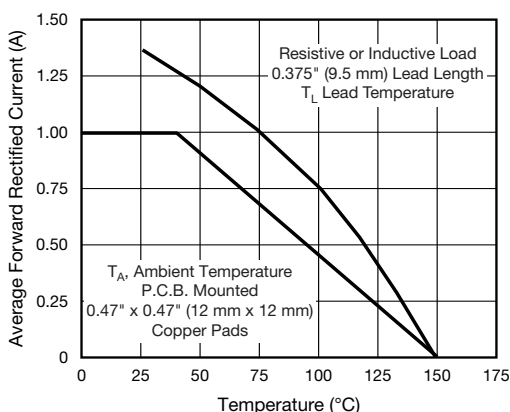


Fig. 1 - Forward Current Derating Curves

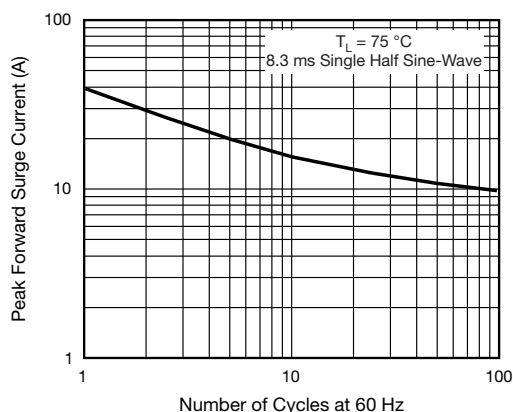


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current



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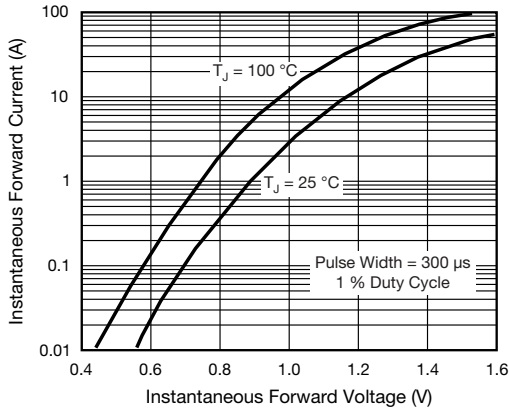


Fig. 3 - Typical Instantaneous Forward Characteristics

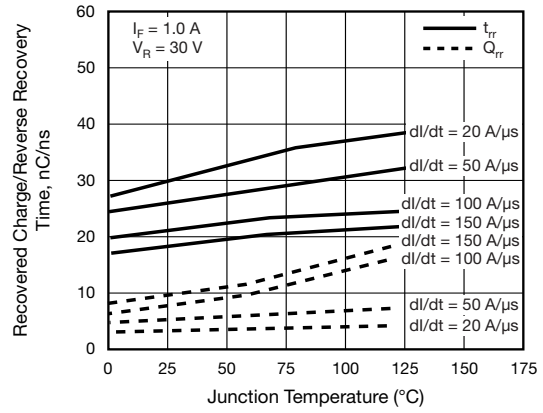


Fig. 5 - Reverse Switching Characteristics

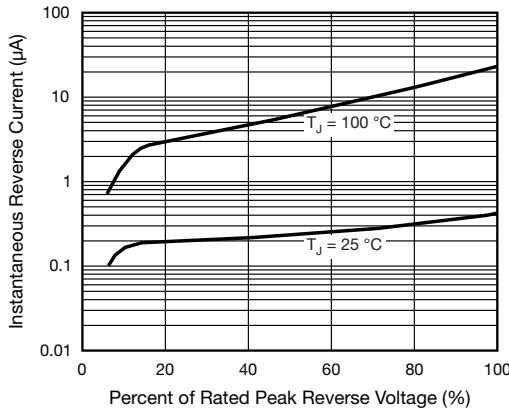


Fig. 4 - Typical Reverse Characteristics

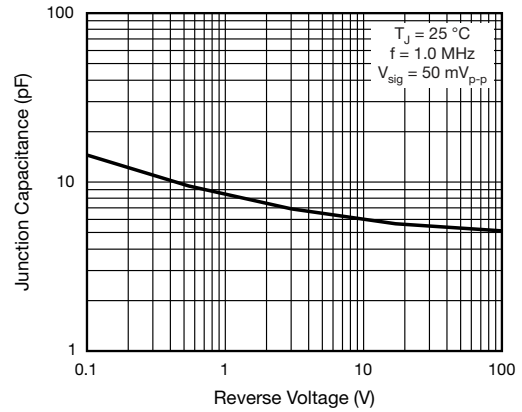
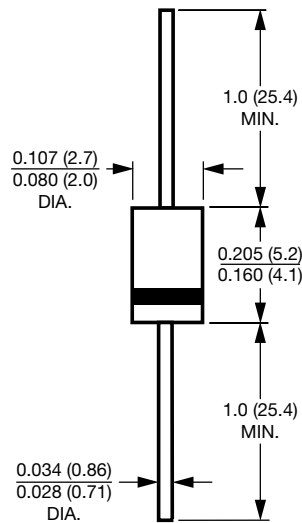


Fig. 6 - Typical Junction Capacitance

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

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





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