

## 1A, 50V - 1000V Glass Passivated Fast Recovery Rectifier

### FEATURES

- Glass passivated chip junction
- High current capability, Low  $V_F$
- High reliability
- High surge current capability
- Low power loss, high efficiency
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- TV
- Monitor

### MECHANICAL DATA

- Case: DO-204AL (DO-41)
- Molding compound meets UL 94V-0 flammability rating
- Packing code with suffix "G" means green compound (halogen-free)
- Terminal: Pure tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: As marked
- Weight: 0.33 g (approximately)

| KEY PARAMETERS |                  |      |
|----------------|------------------|------|
| PARAMETER      | VALUE            | UNIT |
| $I_{F(AV)}$    | 1                | A    |
| $V_{RRM}$      | 50 - 1000        | V    |
| $I_{FSM}$      | 30               | A    |
| $T_{J\ MAX}$   | 150              | °C   |
| Package        | DO-204AL (DO-41) |      |
| Configuration  | Single Die       |      |



DO-204AL (DO-41)

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

| PARAMETER                                                                                     | SYMBOL       | FR101<br>G-K | FR102<br>G-K | FR103<br>G-K | FR104<br>G-K | FR105<br>G-K | FR106<br>G-K | FR107<br>G-K | UNIT |
|-----------------------------------------------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| Marking code on the device                                                                    |              | FR101G       | FR102G       | FR103G       | FR104G       | FR105G       | FR106G       | FR107G       |      |
| Repetitive peak reverse voltage                                                               | $V_{RRM}$    | 50           | 100          | 200          | 400          | 600          | 800          | 1000         | V    |
| Reverse voltage, total rms value                                                              | $V_{R(RMS)}$ | 35           | 70           | 140          | 280          | 420          | 560          | 700          | V    |
| Maximum DC blocking voltage                                                                   | $V_{DC}$     | 50           | 100          | 200          | 400          | 600          | 800          | 1000         | V    |
| Forward current                                                                               | $I_{F(AV)}$  | 1            |              |              |              |              |              |              | A    |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$    | 30           |              |              |              |              |              |              | A    |
| Junction temperature                                                                          | $T_J$        | - 55 to +150 |              |              |              |              |              |              | °C   |
| Storage temperature                                                                           | $T_{STG}$    | - 55 to +150 |              |              |              |              |              |              | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                              | SYMBOL          | LIMIT | UNIT |
|----------------------------------------|-----------------|-------|------|
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 70    | °C/W |

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

| PARAMETER                                              | CONDITIONS                                                        | SYMBOL   | TYP | MAX | UNIT          |
|--------------------------------------------------------|-------------------------------------------------------------------|----------|-----|-----|---------------|
| Forward voltage per diode <sup>(1)</sup>               | $I_F = 1\text{A}, T_J = 25^\circ\text{C}$                         | $V_F$    | -   | 1.3 | V             |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | $T_J = 25^\circ\text{C}$                                          | $I_R$    | -   | 5   | $\mu\text{A}$ |
|                                                        | $T_J = 125^\circ\text{C}$                                         |          | -   | 100 | $\mu\text{A}$ |
| Junction capacitance                                   | 1 MHz, $V_R = 4.0\text{V}$                                        | $C_J$    | 10  | -   | pF            |
| Reverse recovery time                                  | $I_F = 0.5\text{A}, I_R = 1.0\text{A}$<br>$I_{RR} = 0.25\text{A}$ | $t_{rr}$ | -   | 150 | ns            |
|                                                        |                                                                   |          | -   |     | ns            |
|                                                        |                                                                   |          | -   |     | ns            |
|                                                        |                                                                   |          | -   |     | ns            |
|                                                        |                                                                   |          | -   | 250 | ns            |
|                                                        |                                                                   |          | -   |     | ns            |
|                                                        |                                                                   |          | -   |     | ns            |

**Notes:**

1. Pulse test with  $PW = 0.3\text{ ms}$
2. Pulse test with  $PW = 30\text{ ms}$

**ORDERING INFORMATION**

| PART NO.                | PACKING CODE | PACKING CODE SUFFIX | PACKAGE | PACKING                             |
|-------------------------|--------------|---------------------|---------|-------------------------------------|
| FR10xG-K<br>(Note 1, 2) | A0           | G                   | DO-41   | 3,000 / Ammo box<br>(52mm taping)   |
|                         | R0           |                     | DO-41   | 5,000 / 13" Paper reel              |
|                         | R1           |                     | DO-41   | 5,000 / 13" Paper reel<br>(Reverse) |
|                         | B0           |                     | DO-41   | 1,000 / Bulk packing                |

**Notes:**

1. "x" defines voltage from 50V (FR101G-K) to 1000V (FR107G-K)
2. Whole series with green compound (halogen-free)

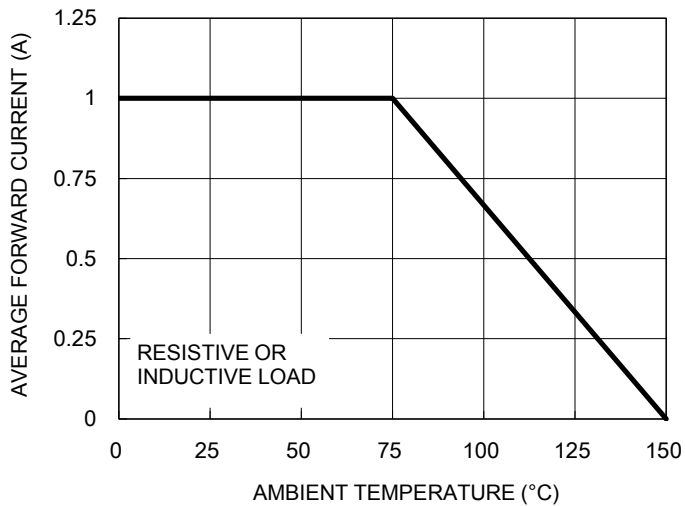
**EXAMPLE P/N**

| EXAMPLE P/N  | PART NO. | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION    |
|--------------|----------|--------------|---------------------|----------------|
| FR107G-K A0G | FR107G-K | A0           | G                   | Green compound |

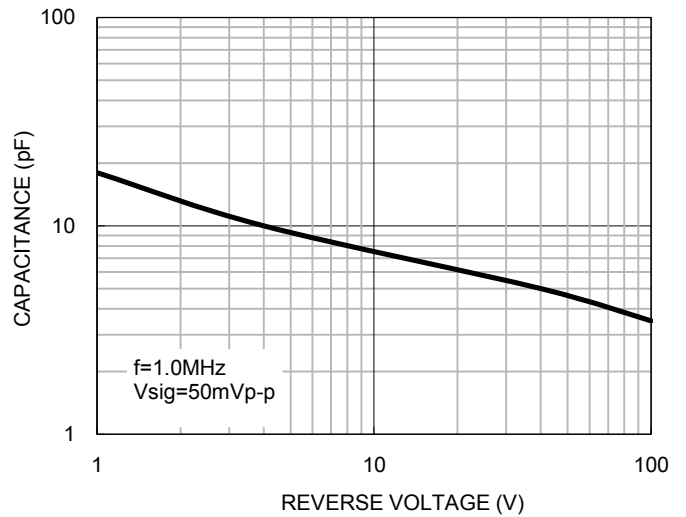
## CHARACTERISTICS CURVES

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

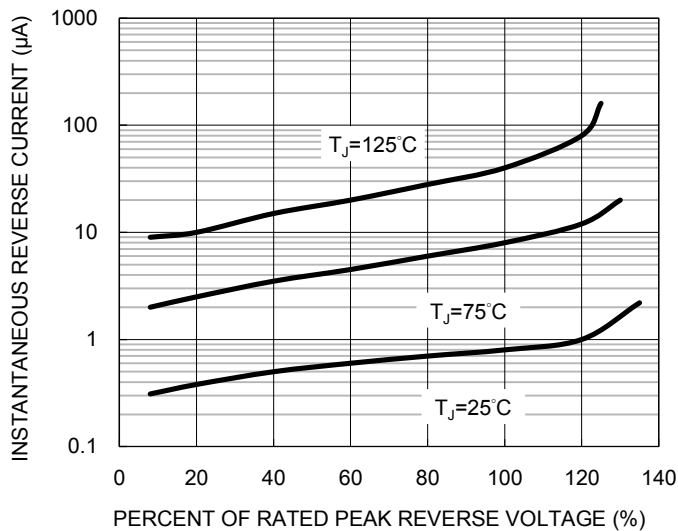
**Fig1. Forward Current Derating Curve**



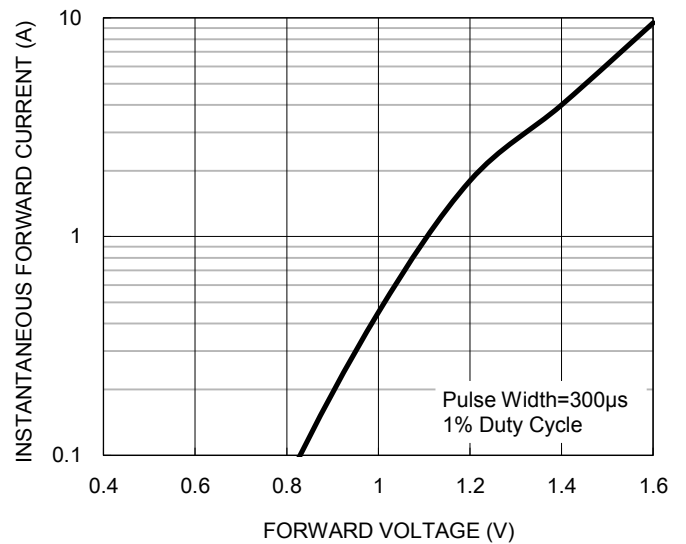
**Fig2. Typical Junction Capacitance**



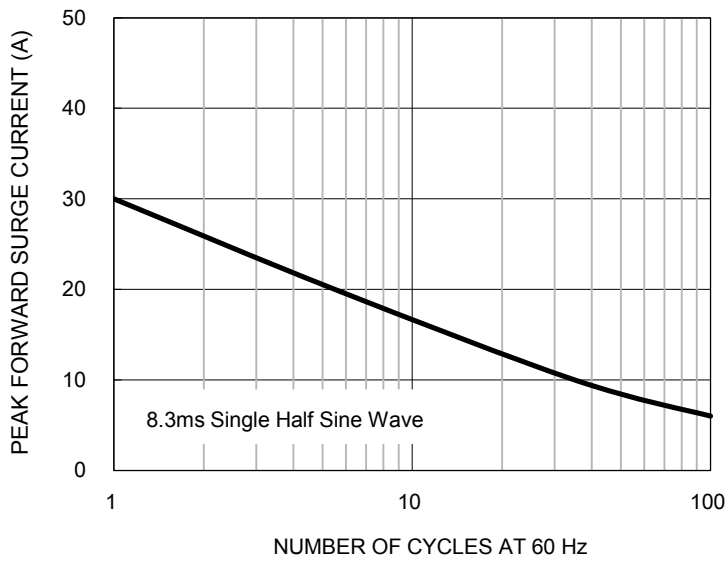
**Fig3. Typical Reverse Characteristics**



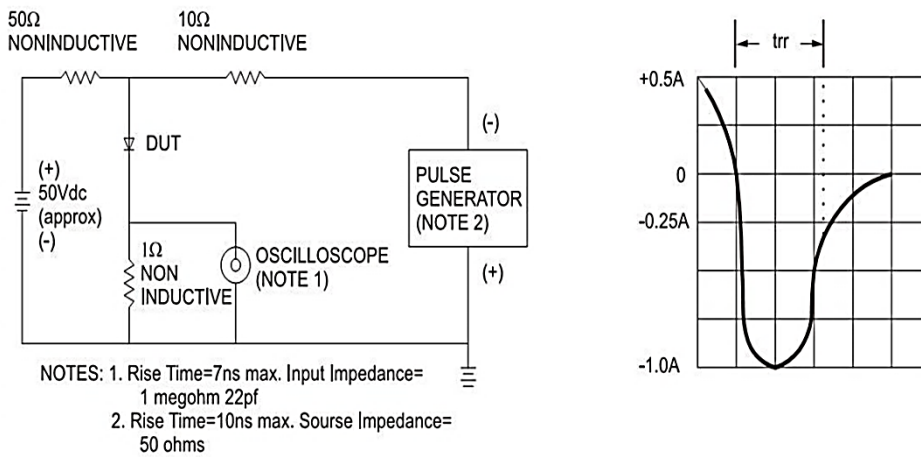
**Fig4. Typical Forward Characteristics**



**Fig5. Maximum Non-repetitive Forward Surge Current**

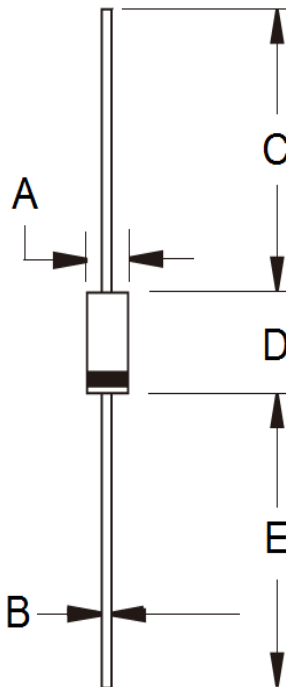


**Fig6. Reverse Recovery Time Characteristic And Test Circuit Diagram**



## PACKAGE OUTLINE DIMENSIONS

DO-204AL (DO-41)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 2.00      | 2.70 | 0.079       | 0.106 |
| B    | 0.71      | 0.86 | 0.028       | 0.034 |
| C    | 25.40     | -    | 1.000       | -     |
| D    | 4.20      | 5.20 | 0.165       | 0.205 |
| E    | 25.40     | -    | 1.000       | -     |

## MARKING DIAGRAM



P/N = Marking Code  
 G = Green Compound  
 YWW = Date Code  
 F = Factory Code

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