

## 1A, 200V - 1000V Surface Mount Fast Recovery Rectifier

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low forward voltage drop
- Fast switching for 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
- Lighting application
- Converter

### MECHANICAL DATA

- Case: DO-214AC (SMA)
- Molding compound meets UL 94V-0 flammability rating
- Moisture sensitivity level: level 1, per J-STD-020
- Packing code with suffix "G" means green compound (halogen-free)
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: As marked
- Weight: 0.06 g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_{F(AV)}$    | 1              | A    |
| $V_{RRM}$      | 200 - 1000     | V    |
| $I_{FSM}$      | 30             | A    |
| $T_{J\ MAX}$   | 150            | °C   |
| Package        | DO-214AC (SMA) |      |
| Configuration  | Single Die     |      |



**DO-214AC (SMA)**

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                    |              |              |        |        |        |        |      |
|------------------------------------------------------------------------------------------------|--------------|--------------|--------|--------|--------|--------|------|
| PARAMETER                                                                                      | SYMBOL       | RS1D-T       | RS1G-T | RS1J-T | RS1K-T | RS1M-T | UNIT |
| Marking code on the device                                                                     |              | RS1D         | RS1G   | RS1J   | RS1K   | RS1M   |      |
| Repetitive peak reverse voltage                                                                | $V_{RRM}$    | 200          | 400    | 600    | 800    | 1000   | V    |
| Reverse voltage, total rms value                                                               | $V_{R(RMS)}$ | 140          | 280    | 420    | 560    | 700    | V    |
| Maximum DC blocking voltage                                                                    | $V_{DC}$     | 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   |

| <b>THERMAL PERFORMANCE</b>             |                 |            |             |
|----------------------------------------|-----------------|------------|-------------|
| <b>PARAMETER</b>                       | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b> |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 105        | °C/W        |
| Junction-to-case thermal resistance    | $R_{\theta JC}$ | 32         | °C/W        |

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                                                                   |               |            |            |               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------|------------|------------|---------------|
| <b>PARAMETER</b>                                                                    | <b>CONDITIONS</b>                                                 | <b>SYMBOL</b> | <b>TYP</b> | <b>MAX</b> | <b>UNIT</b>   |
| 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          | $\mu\text{A}$ |
|                                                                                     | $T_J = 125^\circ\text{C}$                                         |               | -          | 50         | $\mu\text{A}$ |
| 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            |
|                                                                                     |                                                                   |               | -          | 250        | ns            |
|                                                                                     |                                                                   |               | -          | 500        | ns            |
|                                                                                     |                                                                   |               | -          |            |               |
|                                                                                     |                                                                   |               | -          |            |               |

**Notes:**

- Pulse test with  $PW = 0.3\text{ ms}$
- Pulse test with  $PW = 30\text{ ms}$

| <b>ORDERING INFORMATION</b> |                     |                            |                |                          |
|-----------------------------|---------------------|----------------------------|----------------|--------------------------|
| <b>PART NO.</b>             | <b>PACKING CODE</b> | <b>PACKING CODE SUFFIX</b> | <b>PACKAGE</b> | <b>PACKING</b>           |
| RS1x-T<br>(Note 1, 2)       | R3                  | G                          | SMA            | 1,800 / 7" Plastic reel  |
|                             | R2                  |                            | SMA            | 7,500 / 13" Paper reel   |
|                             | M2                  |                            | SMA            | 7,500 / 13" Plastic reel |

**Notes:**

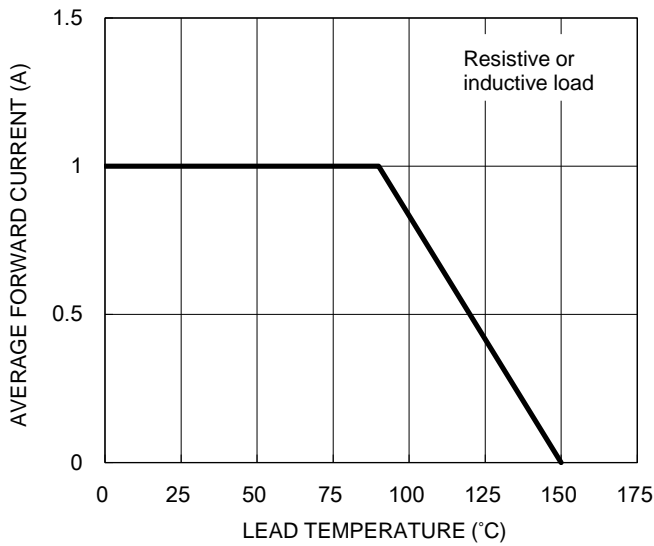
- "x" defines voltage from 200V (RS1D-T) to 1000V (RS1M-T)
- Whole series with green compound (halogen-free)

| <b>EXAMPLE P/N</b> |                 |                     |                            |                    |
|--------------------|-----------------|---------------------|----------------------------|--------------------|
| <b>EXAMPLE P/N</b> | <b>PART NO.</b> | <b>PACKING CODE</b> | <b>PACKING CODE SUFFIX</b> | <b>DESCRIPTION</b> |
| RS1M-T R3G         | RS1M-T          | R3                  | G                          | Green compound     |

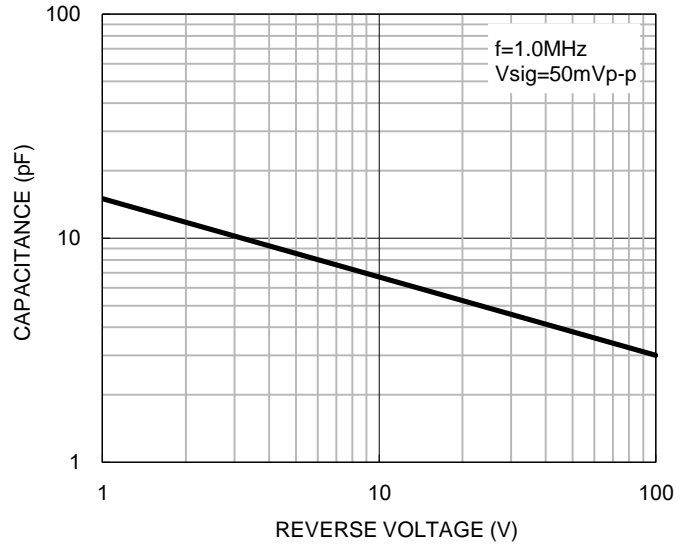
**CHARACTERISTICS CURVES**

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

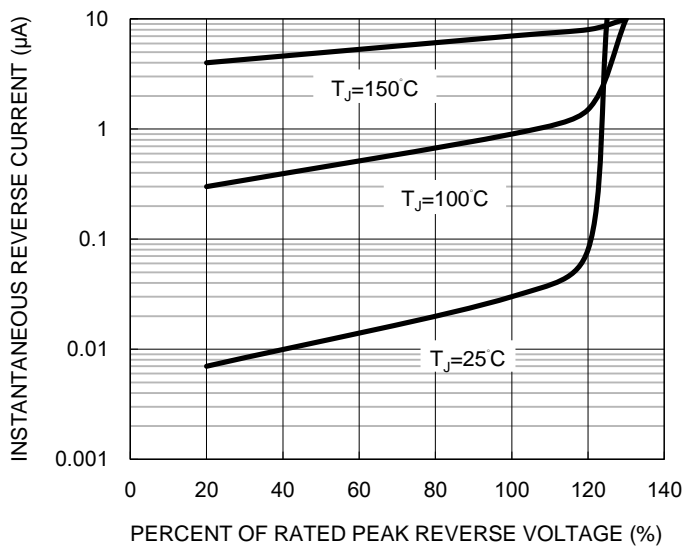
**Fig1. Forward Current Derating Curve**



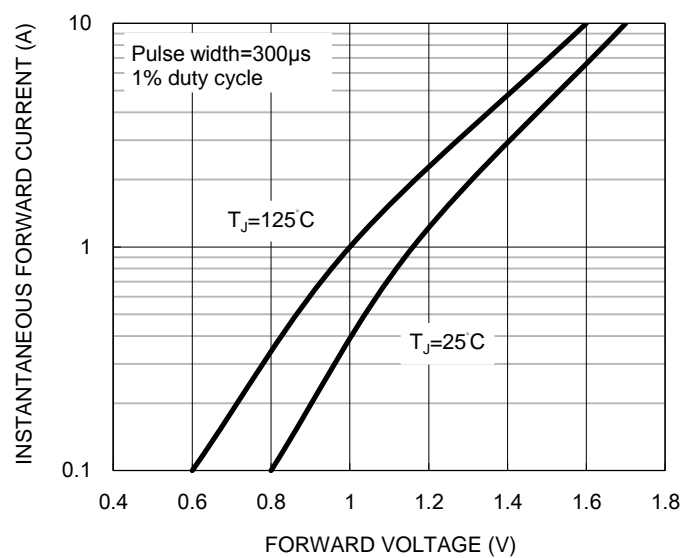
**Fig2. Typical Junction Capacitance**



**Fig3. Typical Reverse Characteristics**



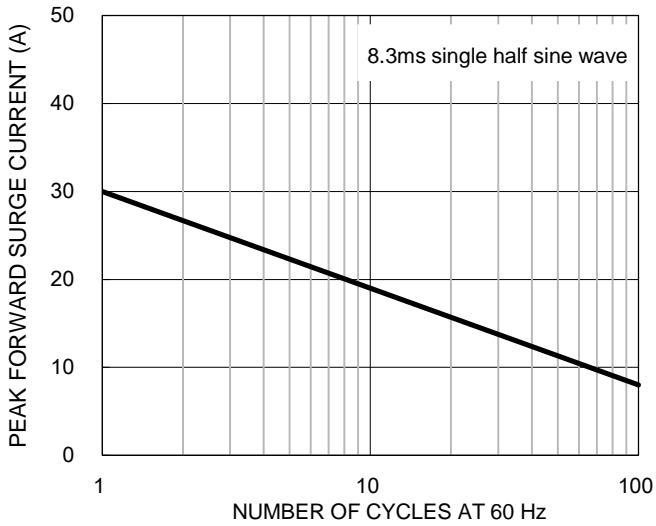
**Fig4. Typical Forward Characteristics**



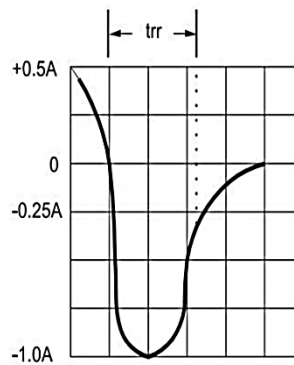
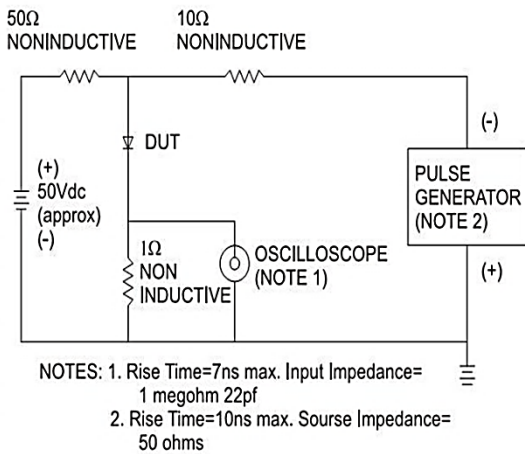
**CHARACTERISTICS CURVES**

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

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

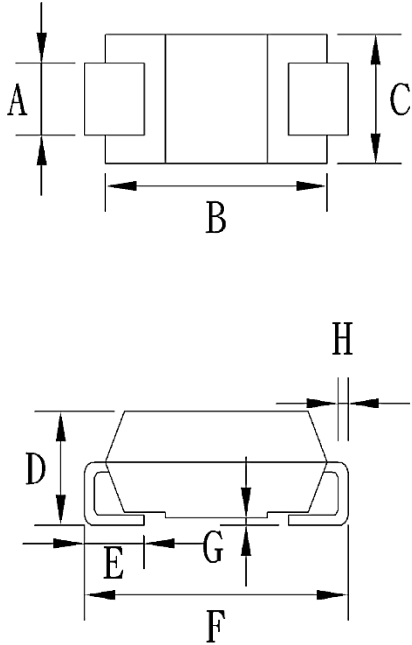


**Fig6. Reverse Recovery Time Characteristic And Test Circuit Diagram**



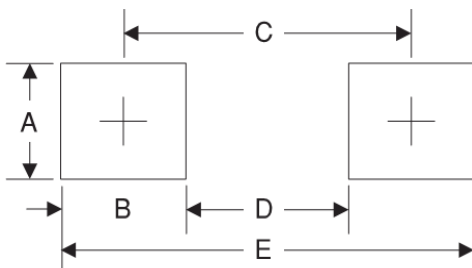
**PACKAGE OUTLINE DIMENSIONS**

DO-214AC (SMA)



| DIM | Unit (mm) |      | Unit (inch) |       |
|-----|-----------|------|-------------|-------|
|     | Min       | Max  | Min         | Max   |
| A   | 1.27      | 1.58 | 0.050       | 0.062 |
| B   | 4.06      | 4.60 | 0.160       | 0.181 |
| C   | 2.29      | 2.83 | 0.090       | 0.111 |
| D   | 1.99      | 2.50 | 0.078       | 0.098 |
| E   | 0.90      | 1.41 | 0.035       | 0.056 |
| F   | 4.95      | 5.33 | 0.195       | 0.210 |
| G   | 0.10      | 0.20 | 0.004       | 0.008 |
| H   | 0.15      | 0.31 | 0.006       | 0.012 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.68      | 0.066       |
| B      | 1.52      | 0.060       |
| C      | 3.93      | 0.155       |
| D      | 2.41      | 0.095       |
| E      | 5.45      | 0.215       |

**MARKING DIAGRAM**



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

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