## Surface Mount Fast Switching Rectifier



DO-214AC (SMA)

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Fast switching for high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

### TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

### MECHANICAL DATA

**Case:** DO-214AC (SMA)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS-compliant, commercial grade
Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified
Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified
("_X" denotes revision code e.g. A, B, .....)

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 1.0 A |
| $V_{RRM}$ | 50 V to 800 V |
| $I_{FSM}$ | 30 A |
| $t_{rr}$ | 150 ns, 250 ns, 500 ns |
| $V_F$ | 1.3 V |
| $T_J$ max. | 150 °C |

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

| PARAMETER | SYMBOL | RS1A | RS1B | RS1D | RS1G | RS1J | RS1K | UNIT |
|---|---|---|---|---|---|---|---|---|
| Device marking code | | RA | RB | RD | RG | RJ | RK | |
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 50 | 100 | 200 | 400 | 600 | 800 | V |
| Maximum RMS voltage | $V_{RMS}$ | 35 | 70 | 140 | 280 | 420 | 500 | V |
| Maximum DC blocking voltage | $V_{DC}$ | 50 | 100 | 200 | 400 | 600 | 800 | V |
| Maximum average forward rectified current at $T_L$ = 90 °C | $I_{F(AV)}$ | 1.0 | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 30 | | | | | | A |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | - 55 to + 150 | | | | | | °C |



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| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | RS1A | RS1B | RS1D | RS1G | RS1J | RS1K | UNIT |
| Maximum instantaneous forward voltage | 1.0 A | | $V_F$ | 1.3 | | | | | | V |
| Maximum DC reverse current at rated DC blocking voltage | | $T_A$ = 25 °C | $I_R$ | 5.0 | | | | | | μA |
| | | $T_A$ = 125 °C | | 50 | | | | | | |
| Maximum reverse recovery time | $I_F$ = 0.5 A, $I_R$ = 1.0 A, $I_{rr}$ = 0.25 A | | $t_{rr}$ | 150 | | | | 250 | 500 | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 10 | | | | 7.0 | | pF |

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | RS1A | RS1B | RS1D | RS1G | RS1J | RS1K | UNIT |
| Typical thermal resistance | $R_{\theta JA}$ (1) | 105 | | | | | | °C/W |
| | $R_{\theta JL}$ (1) | 32 | | | | | | |

**Note**

(1) Thermal resistance from junction to ambient and from junction to lead mounted on PCB with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

| ORDERING INFORMATION (Example) | | | | |
|---|---|---|---|---|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| RS1J-E3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| RS1J-E3/5AT | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| RS1JHE3/61T (1) | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| RS1JHE3/5AT (1) | 0.064 | 5AT | 7500 | 13" diameter plastic tape and reel |
| RS1JHE3_A/H (1) | 0.064 | H | 1800 | 7" diameter plastic tape and reel |
| RS1JHE3_A/I (1) | 0.064 | I | 7500 | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

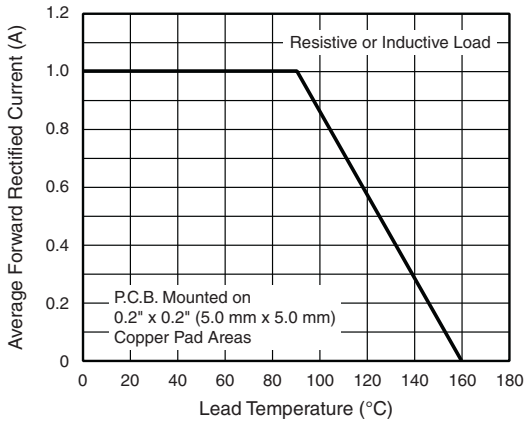



Fig. 1 - Forward Current Derating Curve

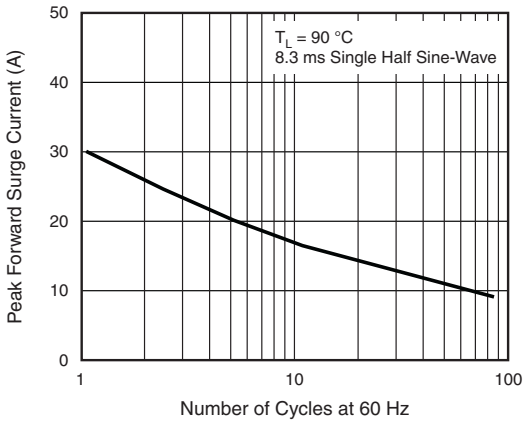



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current



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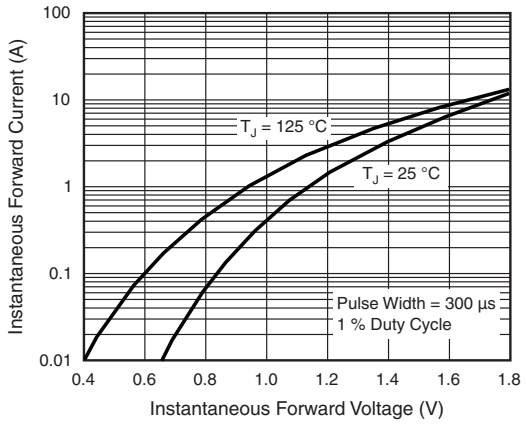



Fig. 3 - Typical Instantaneous Forward Characteristics

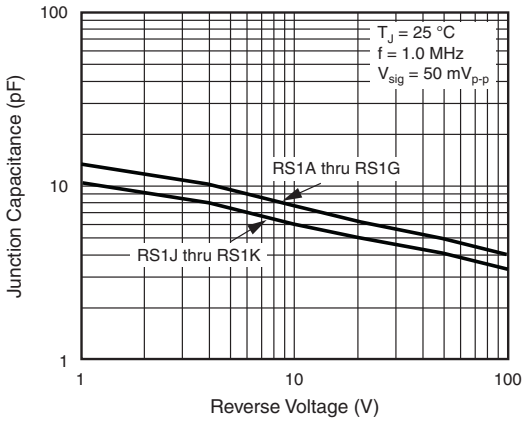



Fig. 5 - Typical Junction Capacitance

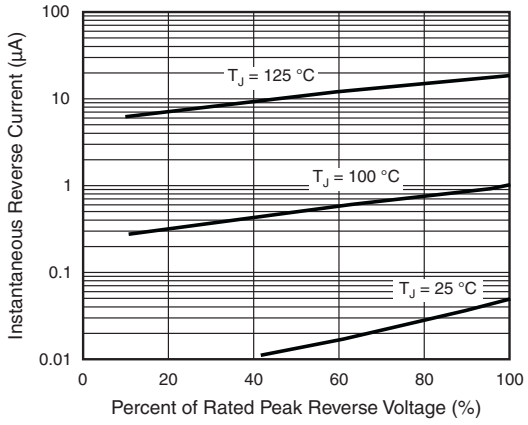



Fig. 4 - Typical Reverse Characteristics

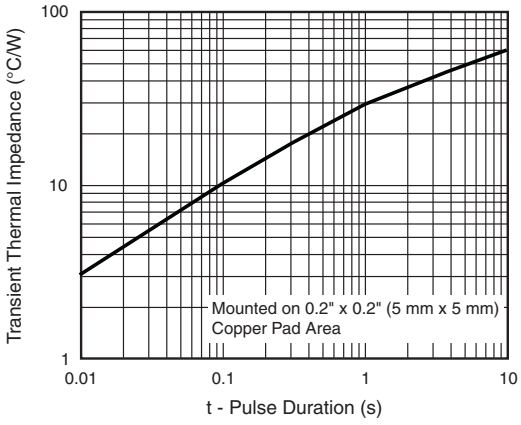
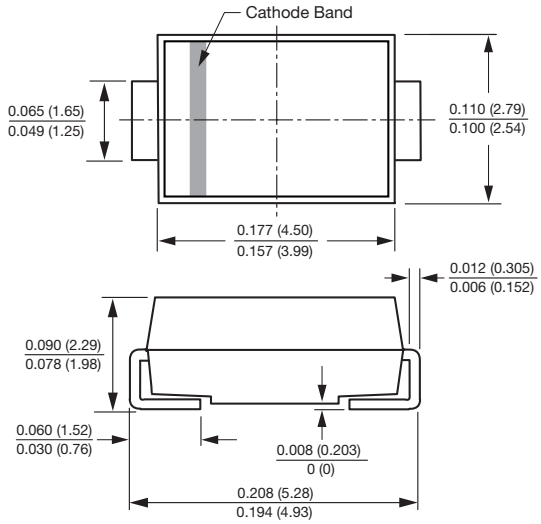


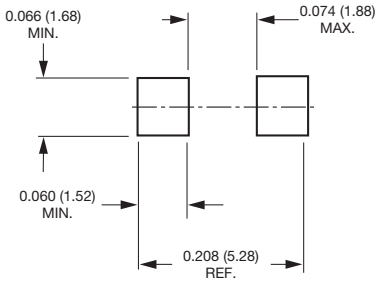

Fig. 6 - Typical Transient Thermal Impedance

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

**DO-214AC (SMA)**




**Mounting Pad Layout**






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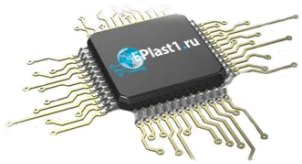
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