

## Surface Mount Glass Passivated Rectifier


**SMA (DO-214AC)**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**  
 Available

**FEATURES**

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**TYPICAL APPLICATIONS**

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive, and telecommunication.

**MECHANICAL DATA**

**Case:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHM3\_X - halogen-free, 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, M3, HE3, and HM3 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, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V |
| $I_{FSM}$               | 40 A, 30 A                                      |
| $E_{AS}$                | 5 mJ  |
| $I_R$                   | 1.0 $\mu$ A, 5.0 $\mu$ A                        |
| $V_F$                   | 1.1 V   |
| $T_J$ max.              | 150 °C  |
| Package                 | SMA (DO-214AC)                                  |
| Diode variations        | Single  |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                |             |     |     |     |     |     |      |      |
|--|----------------|-------------|-----|-----|-----|-----|-----|------|------|
| PARAMETER  | SYMBOL         | S1A         | S1B | S1D | S1G | S1J | S1K | S1M  | UNIT |
| Device marking code  |                | SA          | SB  | SD  | SG  | SJ  | SK  | SM   |      |
| Maximum recurrent peak reverse voltage   | $V_{RRM}$      | 50          | 100 | 200 | 400 | 600 | 800 | 1000 | V    |
| Maximum RMS voltage  | $V_{RMS}$      | 35          | 70  | 140 | 280 | 420 | 560 | 700  | V    |
| Maximum DC blocking voltage  | $V_{DC}$       | 50          | 100 | 200 | 400 | 600 | 800 | 1000 | 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          |     |     |     |     | 30  |      | A    |
| Non-repetitive peak reverse avalanche energy at 25 °C, $I_{AS} = 1$ A, $L = 10$ mH | $E_{AS}$       | 5           |     |     |     |     |     |      | mJ   |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +150 |     |     |     |     |     |      | °C   |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |  |                 |     |     |     |     |     |     |     |      |
|--|--|-----------------|-----|-----|-----|-----|-----|-----|-----|------|
| PARAMETER  | TEST CONDITIONS  | SYMBOL          | S1A | S1B | S1D | S1G | S1J | S1K | S1M | UNIT |
| Maximum instantaneous forward voltage                                      | 1.0 A  | V <sub>F</sub>  | 1.1 |     |     |     |     |     |     | V    |
| Maximum DC reverse current at rated DC blocking voltage                    | T <sub>A</sub> = 25 °C   | I <sub>R</sub>  | 1.0 |     |     |     |     | 5.0 |     | μA   |
|  | T <sub>A</sub> = 125 °C  |                 | 50  |     |     |     |     |     |     |      |
| Typical 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> | 1.8 |     |     |     |     |     |     | μs   |
| Typical junction capacitance   | 4.0 V, 1 MHz   | C <sub>J</sub>  | 12  |     |     |     |     |     |     | pF   |

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |     |     |     |     |     |     |     |      |  |
|---|------------------|-----|-----|-----|-----|-----|-----|-----|------|--|
| PARAMETER   | SYMBOL           | S1A | S1B | S1D | S1G | S1J | S1K | S1M | UNIT |  |
| Typical thermal resistance <sup>(1)</sup>                               | R <sub>θJA</sub> | 75  |     |     |     |     | 85  |     | °C/W |  |
|   | R <sub>θJL</sub> | 27  |     |     |     |     | 30  |     |      |  |

**Note**

<sup>(1)</sup> 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                      |  |
| S1J-E3/61T                     | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |  |
| S1J-E3/5AT                     | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |  |
| S1JHE3_A/H <sup>(1)</sup>      | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |  |
| S1JHE3_A/I <sup>(1)</sup>      | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |  |
| S1J-M3/61T                     | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |  |
| S1J-M3/5AT                     | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |  |
| S1JHM3_A/H <sup>(1)</sup>      | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |  |
| S1JHM3_A/I <sup>(1)</sup>      | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |  |

**Note**

<sup>(1)</sup> AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

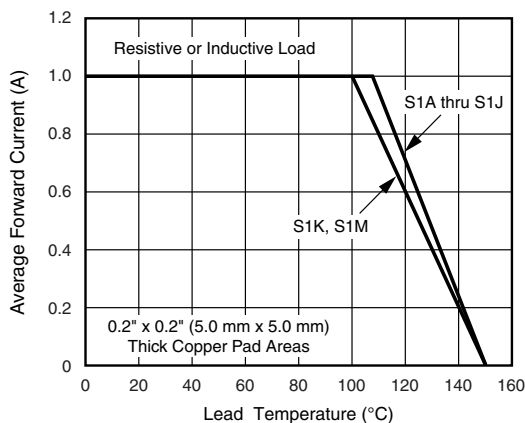


Fig. 1 - Forward Current Derating Curve

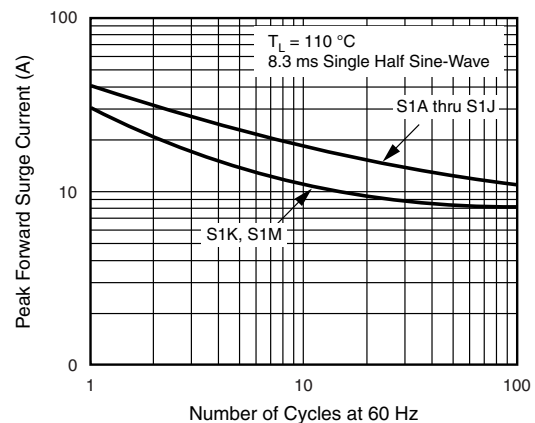


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

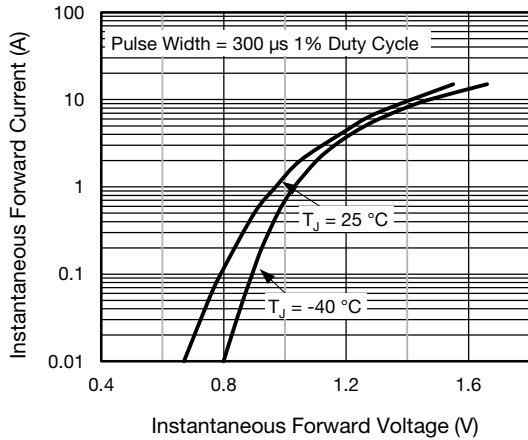


Fig. 3 - Typical Instantaneous Forward Characteristics

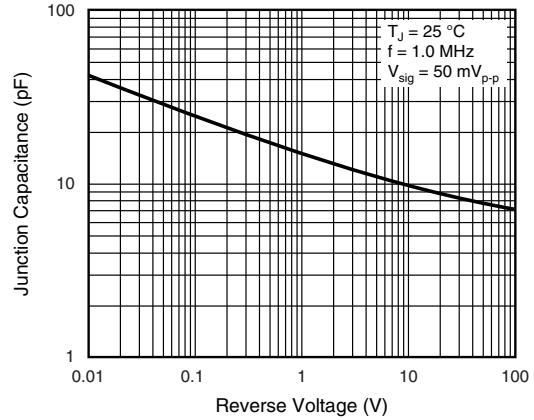


Fig. 5 - Typical Junction Capacitance

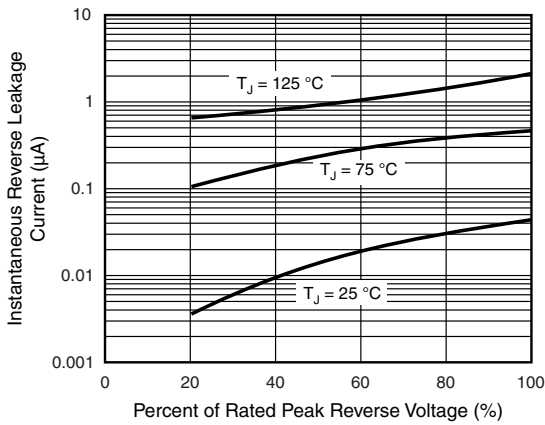


Fig. 4 - Typical Reverse Leakage Characteristics

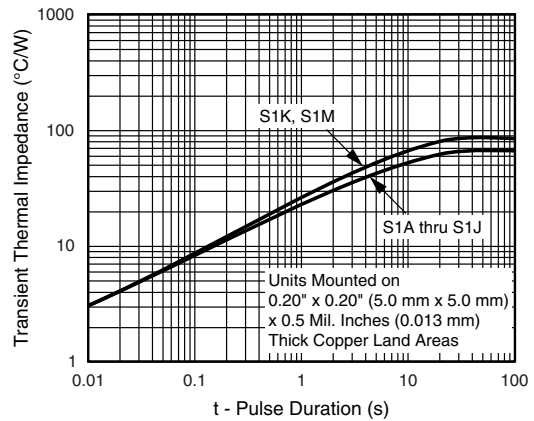
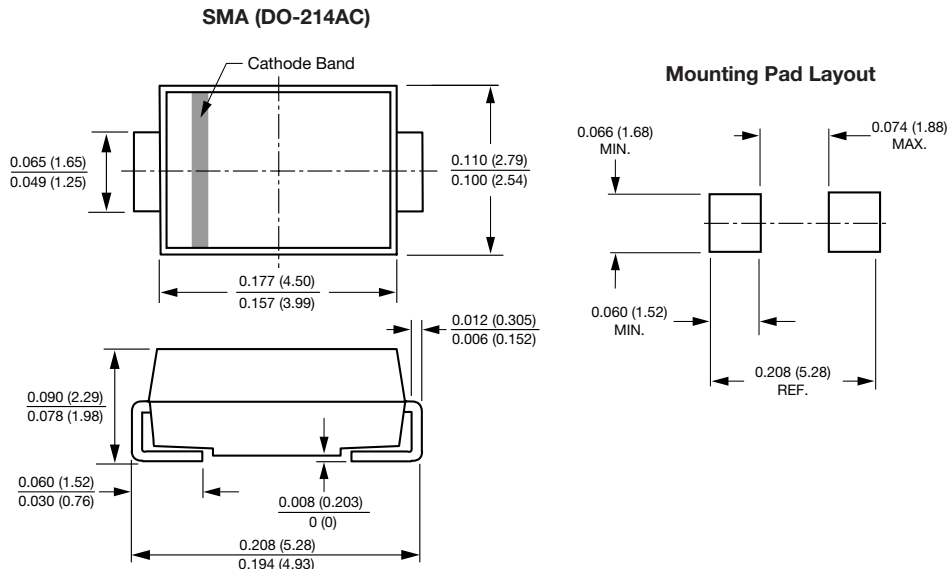


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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