

## Surface-Mount Glass Passivated Rectifier


**SMA (DO-214AC)**

Cathode  Anode

### ADDITIONAL RESOURCES



### 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)


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

### 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)                                  |
| Circuit configuration   | Single                                          |

| MAXIMUM RATINGS (T <sub>A</sub> = 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 <sub>RRM</sub>                  | 50          | 100 | 200 | 400 | 600 | 800 | 1000 | V    |
| Maximum RMS voltage                                                                     | V <sub>RMS</sub>                  | 35          | 70  | 140 | 280 | 420 | 560 | 700  | V    |
| Maximum DC blocking voltage                                                             | V <sub>DC</sub>                   | 50          | 100 | 200 | 400 | 600 | 800 | 1000 | V    |
| Maximum average forward rectified current (fig. 1)                                      | I <sub>F(AV)</sub>                | 1.0         |     |     |     |     |     |      | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load      | I <sub>FSM</sub>                  | 40          |     |     |     |     | 30  |      | A    |
| Non-repetitive peak reverse avalanche energy at 25 °C, I <sub>AS</sub> = 1 A, L = 10 mH | E <sub>AS</sub>                   | 5           |     |     |     |     |     |      | mJ   |
| Operating junction and storage temperature range                                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 |     |     |     |     |     |      | °C   |

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  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** ( $T_A = 25\text{ }^{\circ}\text{C}$  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

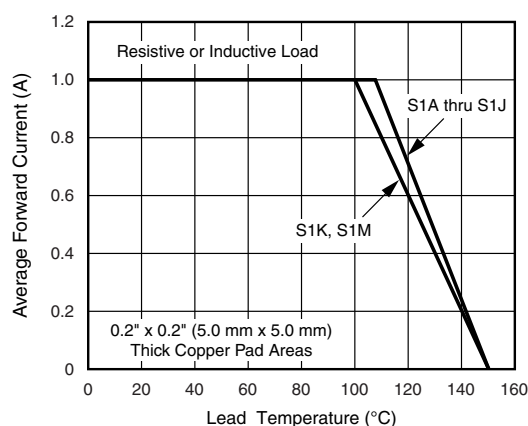
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

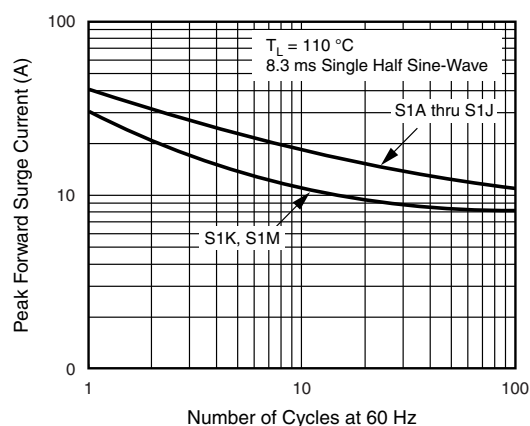


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

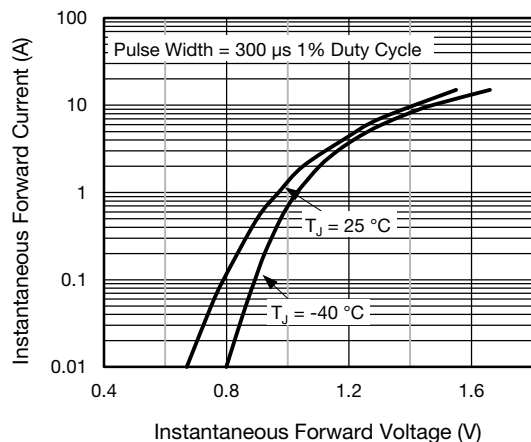


Fig. 3 - Typical Instantaneous Forward Characteristics

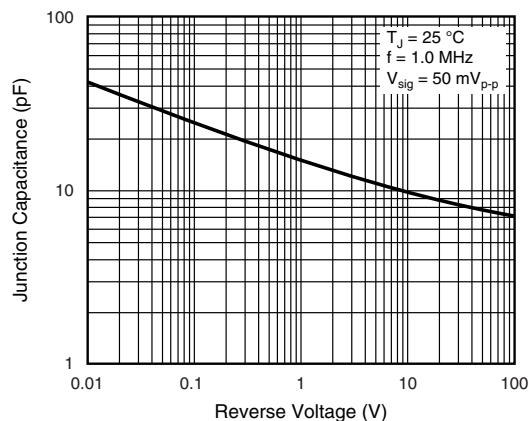


Fig. 5 - Typical Junction Capacitance

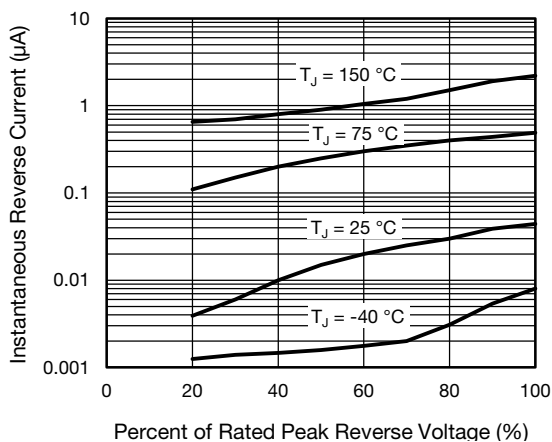


Fig. 4 - Typical Reverse Leakage Characteristics

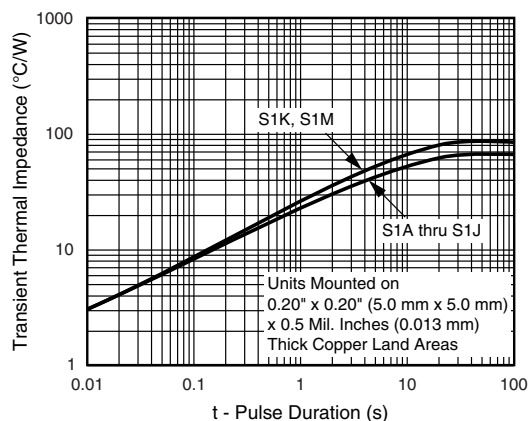
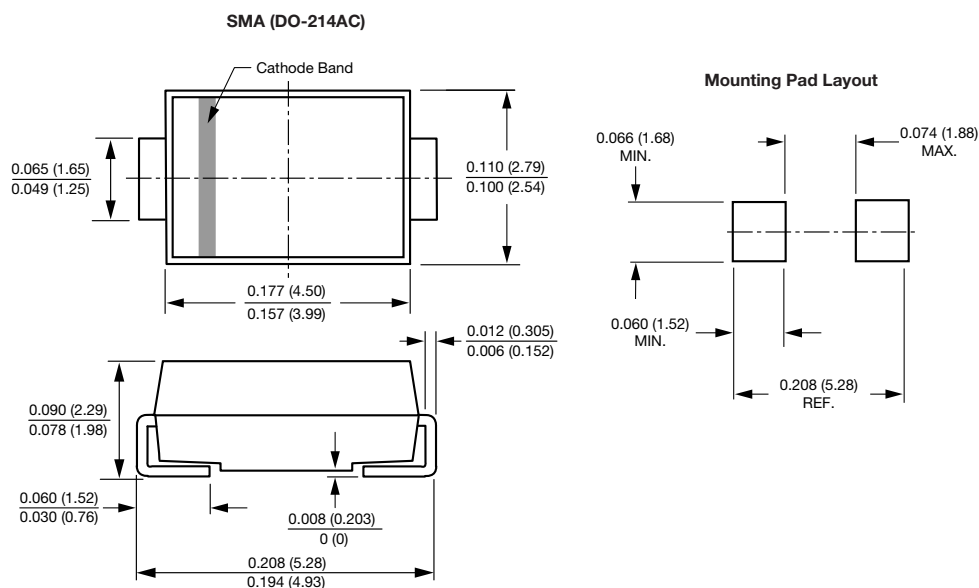


Fig. 6 - Typical Transient Thermal Impedance

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




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