

## Surface Mount Schottky Barrier Rectifier


**SMA (DO-214AC)**

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

**FEATURES**

- Low profile package
- Ideal for automated placement
- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- High 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 low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

**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 the cathode end

| PRIMARY CHARACTERISTICS |                              |
|-------------------------|------------------------------|
| $I_{F(AV)}$             | 1.0 A                        |
| $V_{RRM}$               | 20 V, 30 V, 40 V, 50 V, 60 V |
| $I_{FSM}$               | 40 A                         |
| $V_F$                   | 0.50 V, 0.75 V               |
| $T_J \text{ max.}$      | 150 °C                       |
| Package                 | SMA (DO-214AC)               |
| Circuit configuration   | Single                       |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |             |             |      |      |      |      |            |
|--|-------------|-------------|------|------|------|------|------------|
| PARAMETER  | SYMBOL      | SS12        | SS13 | SS14 | SS15 | SS16 | UNIT       |
| Device marking code  |             | S2          | S3   | S4   | S5   | S6   | V          |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$   | 20          | 30   | 40   | 50   | 60   | V          |
| Maximum RMS voltage  | $V_{RMS}$   | 14          | 21   | 28   | 35   | 42   | V          |
| Maximum DC blocking voltage  | $V_{DC}$    | 20          | 30   | 40   | 50   | 60   | V          |
| Maximum average forward rectified current at $T_L$ (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          |      |      |      |      | A          |
| Voltage rate of change (rated $V_R$ )  | $dV/dt$     | 10 000      |      |      |      |      | V/ $\mu$ s |
| Operating junction temperature range   | $T_J$       | -65 to +150 |      |      |      |      | °C         |
| Storage temperature range  | $T_{STG}$   | -65 to +150 |      |      |      |      | °C         |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                               |      |      |      |      |      |      |    |
|--|-------------------------|-------------------------------|------|------|------|------|------|------|----|
| PARAMETER  | TEST CONDITIONS         | SYMBOL                        | SS12 | SS13 | SS14 | SS15 | SS16 | UNIT |    |
| Maximum instantaneous forward voltage                                      | 1.0 A                   | V <sub>F</sub> <sup>(1)</sup> | 0.50 |      |      | 0.75 |      | V    |    |
| Maximum DC reverse current at rated DC blocking voltage                    | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.2  |      |      |      |      |      | mA |
|  | T <sub>A</sub> = 100 °C |                               | 6.0  |      |      | 5.0  |      |      |    |

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |      |      |      |      |      |      |  |
|---|------------------|------|------|------|------|------|------|--|
| PARAMETER   | SYMBOL           | SS12 | SS13 | SS14 | SS15 | SS16 | UNIT |  |
| Typical thermal resistance <sup>(1)</sup>                               | R <sub>θJA</sub> | 88   |      |      |      |      | °C/W |  |
|   | R <sub>θJL</sub> | 28   |      |      |      |      |      |  |

**Note**

- (1) PCB mounted 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                      |
| SS16-E3/61T                    | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |
| SS16-E3/5AT                    | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |
| SS16HE3_B/H <sup>(1)</sup>     | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| SS16HE3_B/I <sup>(1)</sup>     | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |
| SS16-M3/61T                    | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |
| SS16-M3/5AT                    | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |
| SS16HM3_B/H <sup>(1)</sup>     | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| SS16HM3_B/I <sup>(1)</sup>     | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

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

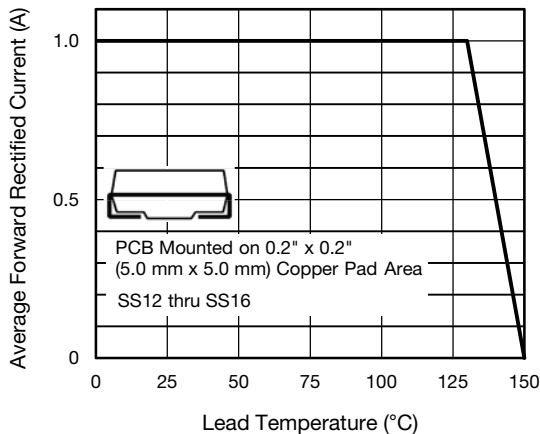


Fig. 1 - Forward Current Derating Curve

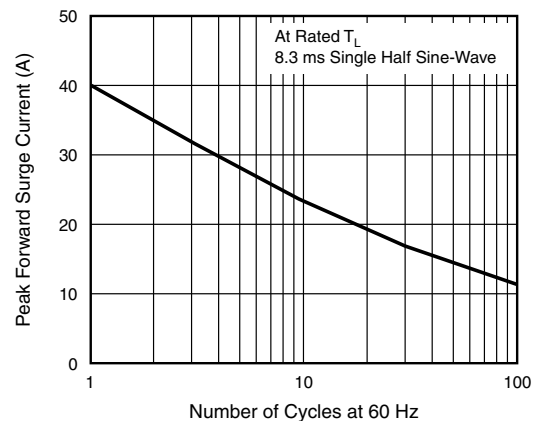


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

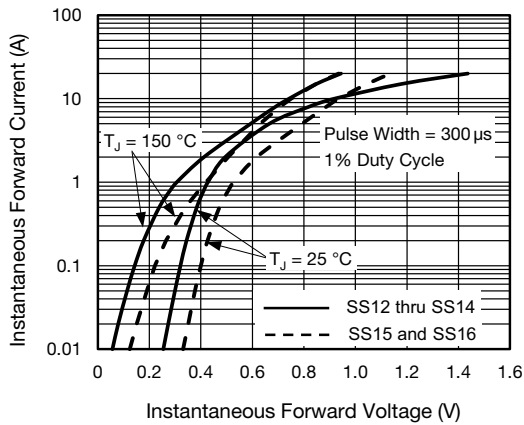


Fig. 3 - Typical Instantaneous Forward Characteristics

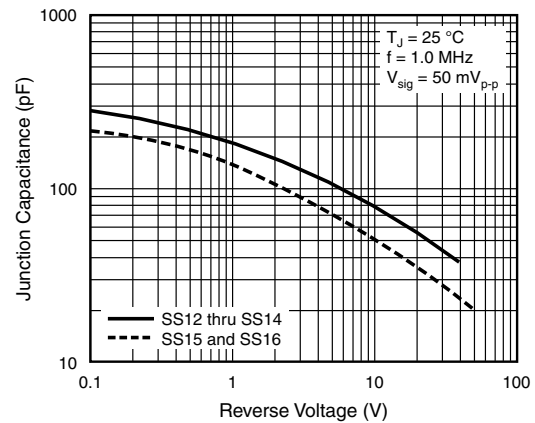


Fig. 5 - Typical Junction Capacitance

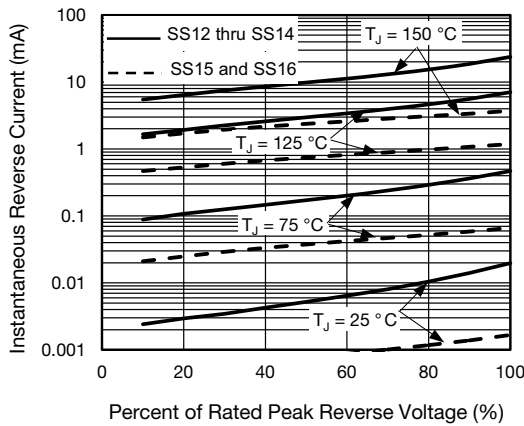
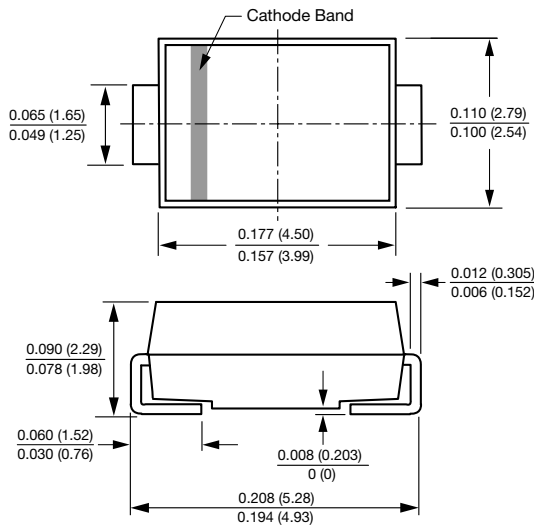


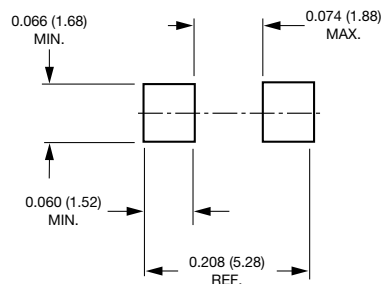
Fig. 4 - Typical Reverse Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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