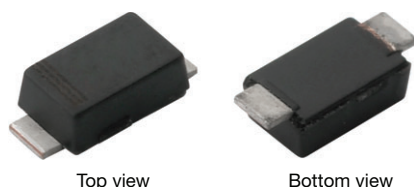


# Surface-Mount Schottky Barrier Rectifier

## eSMP® Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode  Anode

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

## FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified  
- Automotive ordering code: base 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 high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial, industrial, and automotive applications.

## MECHANICAL DATA

**Case:** SMF (DO-219AB)

Molding compound meets UL 94 V-0 flammability rating

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

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 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          |
| $V_{RRM}$                                | 60 V           |
| $I_{FSM}$                                | 40 A           |
| $V_F$ at $I_F = 1.0$ A ( $T_A = 125$ °C) | 0.38 V         |
| $T_J$ max. (AC mode)                     | 150 °C         |
| $T_J$ max. (DC forward current)          | 175 °C         |
| Package                                  | SMF (DO-219AB) |
| Circuit configuration                    | Single         |

## ADDITIONAL RESOURCES


[3D Models](#)

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

| PARAMETER                                                                                       | SYMBOL            | SS1FN6      | UNIT |
|-------------------------------------------------------------------------------------------------|-------------------|-------------|------|
| Device marking code                                                                             |                   | 1N6         |      |
| Maximum repetitive peak reverse voltage                                                         | $V_{RRM}$         | 60          | V    |
| Maximum average forward rectified current (fig. 1)                                              | $I_{F(AV)}^{(1)}$ | 1.0         | A    |
| Non-repetitive peak forward surge current 8.3 ms single half sine-wave at $T_{J(init)} = 25$ °C | $I_{FSM}$         | 40          | A    |
| Operating junction and storage temperature range                                                | $T_J, T_{STG}$    | -55 to +150 | °C   |
| Junction temperature in DC forward current without reverse bias                                 | $T_J$             | +175        | °C   |

### Note

(1) Free air, mounted on recommended copper pad area

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

| PARAMETER                     | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
|-------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| Instantaneous forward voltage | I <sub>F</sub> = 0.7 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.42 | -    | V    |
|                               | I <sub>F</sub> = 1.0 A |                         |                               | 0.45 | 0.53 |      |
|                               | I <sub>F</sub> = 0.7 A | T <sub>A</sub> = 125 °C |                               | 0.33 | -    |      |
|                               | I <sub>F</sub> = 1.0 A |                         |                               | 0.38 | 0.46 |      |
| Reverse current               | V <sub>R</sub> = 60 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 800  | μA   |
|                               |                        | T <sub>A</sub> = 125 °C |                               | 12   | 35   | mA   |
| Typical junction capacitance  | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 90   | -    | pF   |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 5\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL                      | SS1FN6 | UNIT                 |
|----------------------------|-----------------------------|--------|----------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)(3)}$ | 125    | $^{\circ}\text{C/W}$ |
|                            | $R_{\theta JM}^{(2)(3)}$    | 15     |                      |

**Notes**(1) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ 

(2) Device mounted on FR4 PCB, 2 oz. standard footprint

(3) Thermal resistance  $R_{\theta JA}$  - junction to ambient;  $R_{\theta JM}$  - junction to mount**ORDERING INFORMATION** (Example)

| PREFERRED P/N              | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|----------------------------|-----------------|------------------------|---------------|------------------------------------|
| SS1FN6-M3/H                | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| SS1FN6-M3/I                | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |
| SS1FN6HM3/H <sup>(1)</sup> | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| SS1FN6HM3/I <sup>(1)</sup> | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

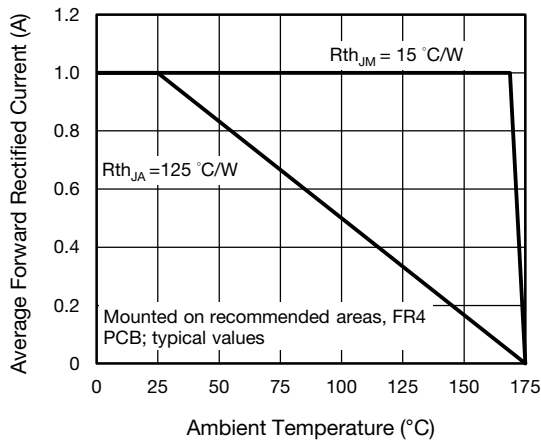
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Typical Forward Current Derating Curve

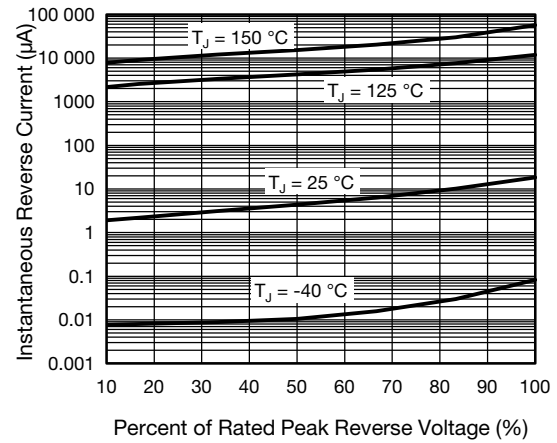


Fig. 4 - Typical Reverse Leakage Characteristics

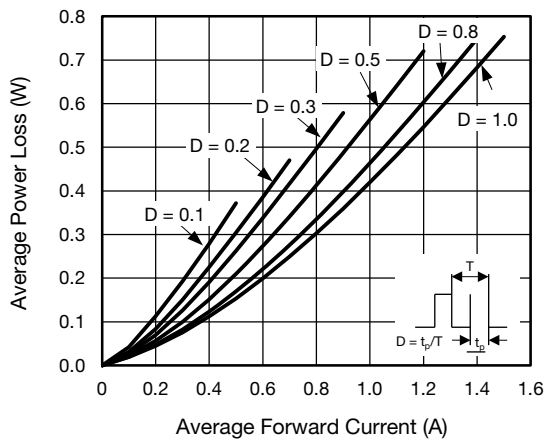


Fig. 2 - Forward Power Loss Characteristics

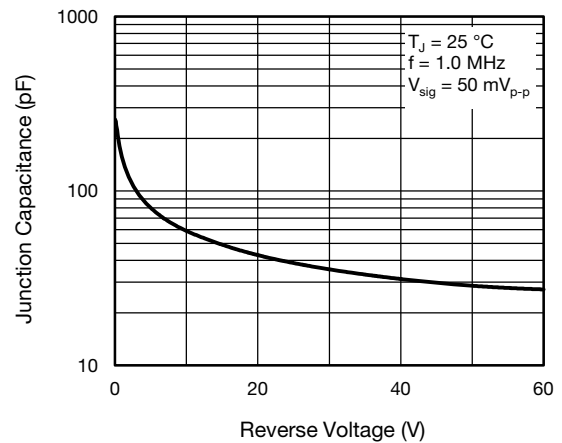


Fig. 5 - Typical Junction Capacitance

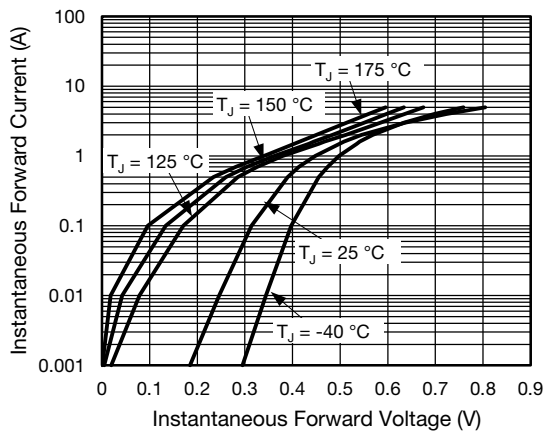


Fig. 3 - Typical Instantaneous Forward Characteristics

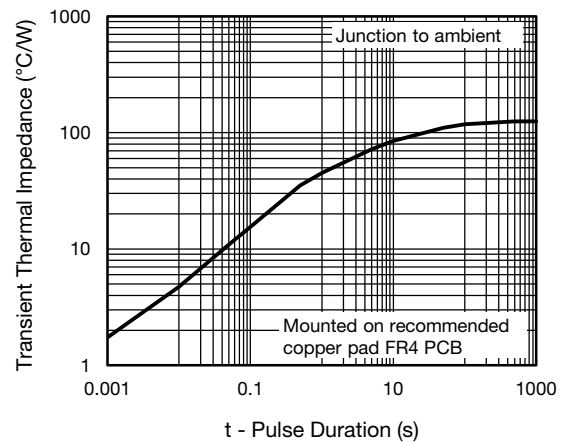
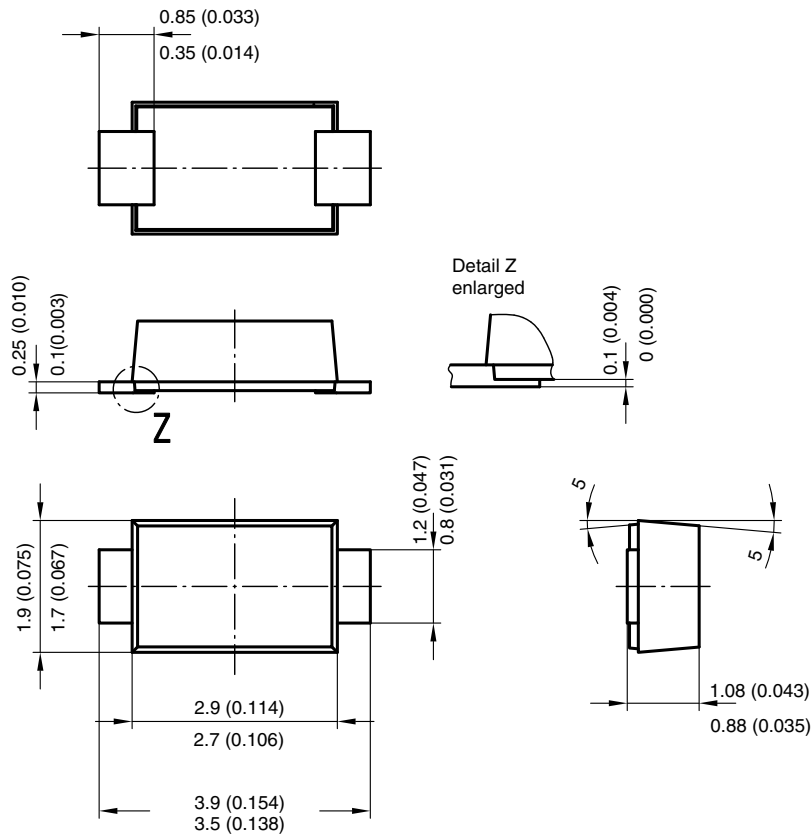


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in millimeters (inches): **SMF (DO-219AB)**


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