

## Surface-Mount Schottky Barrier Rectifiers

### eSMP® Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode Anode

### FEATURES

- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified available  
- Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


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

### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

### PRIMARY CHARACTERISTICS

|  |                |
|--|----------------|
| $I_{F(AV)}$                              | 1.0 A          |
| $V_{RRM}$                                | 40 V           |
| $I_{FSM}$                                | 40 A           |
| $V_F$ at $I_F = 1.0$ A ( $T_A = 125$ °C) | 0.37 V         |
| $T_J$ max. (AC mode)                     | 150 °C         |
| $T_J$ max. (DC forward current)          | 175 °C         |
| Package                                  | SMF (DO-219AB) |
| Circuit configuration                    | Single         |

### 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

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

| PARAMETER   | SYMBOL                     | SS1F4       | UNIT |
|---|----------------------------|-------------|------|
| Device marking code   |                            | 14          |      |
| Maximum repetitive peak reverse voltage                                       | $V_{RRM}$                  | 40          | V    |
| Maximum average forward rectified current (fig.1)                             | $I_{F(AV)}$ <sup>(1)</sup> | 1.0         | A    |
| Peak forward surge current 8.3 ms single half sine-wave $T_{J(init)} = 25$ °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

<sup>(1)</sup> 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   | $I_F = 0.7\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.43 | -    | V             |
|   | $I_F = 1.0\text{ A}$ |                                   |             | 0.46 | 0.52 |               |
|   | $I_F = 0.7\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.33 | -    |               |
|   | $I_F = 1.0\text{ A}$ |                                   |             | 0.37 | 0.43 |               |
| Reverse current   | $V_R = 40\text{ V}$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 150  | $\mu\text{A}$ |
|   |                      | $T_A = 125\text{ }^\circ\text{C}$ |             | 7    | 25   | mA            |
| Typical junction capacitance  | 4.0 V, 1 MHz         |                                   | $C_J$       | 85   | -    | 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                      | SS1F4 | UNIT               |
| Typical thermal resistance   | $R_{\theta JA}^{(1)(2)(3)}$ | 125   | $^\circ\text{C/W}$ |
|  | $R_{\theta JM}^{(2)(3)}$    | 16.5  |                    |

**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                      |
| SS1F4-M3/H                     | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| SS1F4-M3/I                     | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |
| SS1F4HM3/H <sup>(1)</sup>      | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| SS1F4HM3/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)

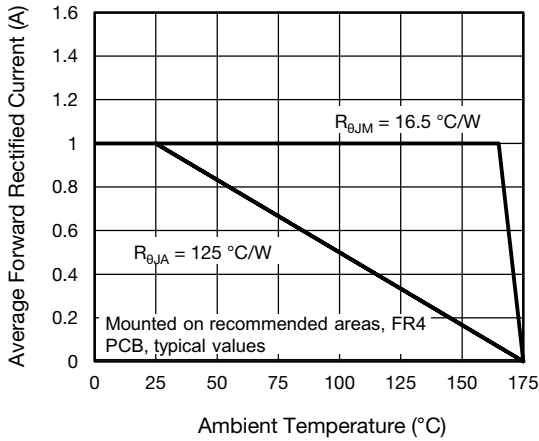


Fig. 1 - Maximum Forward Current Derating Curve

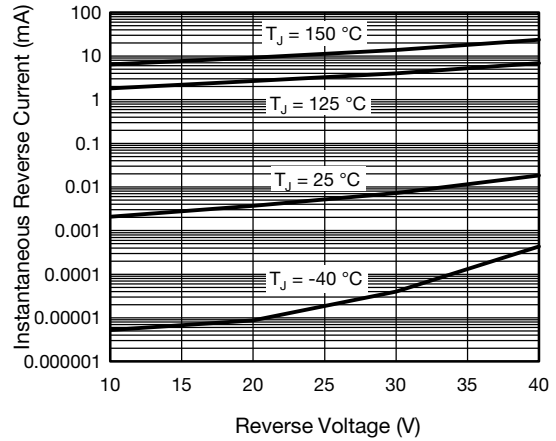


Fig. 4 - Typical Reverse Leakage Characteristics

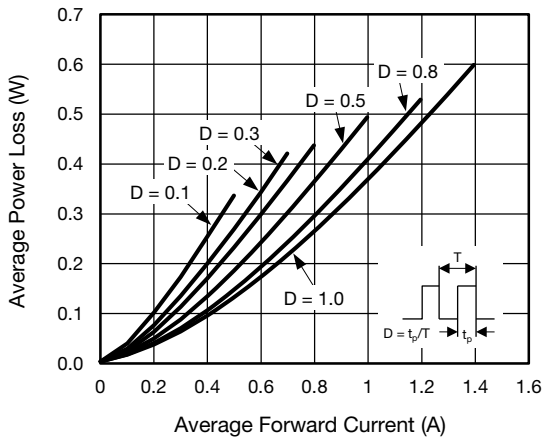


Fig. 2 - Average Power Loss Characteristics

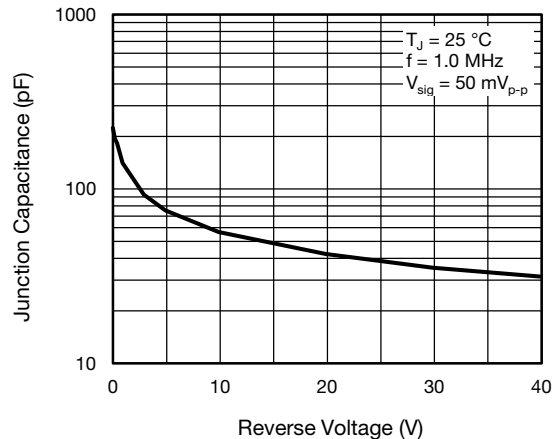


Fig. 5 - Typical Junction Capacitance

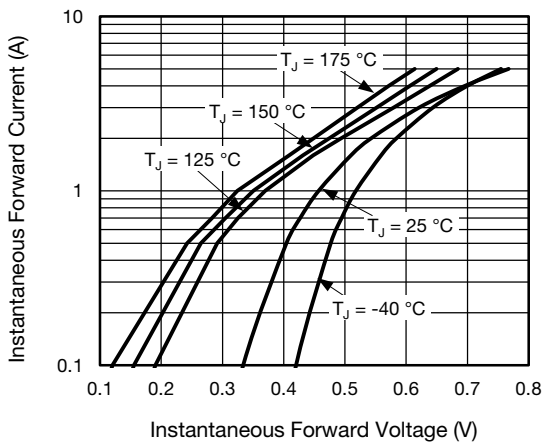


Fig. 3 - Typical Instantaneous Forward Characteristics

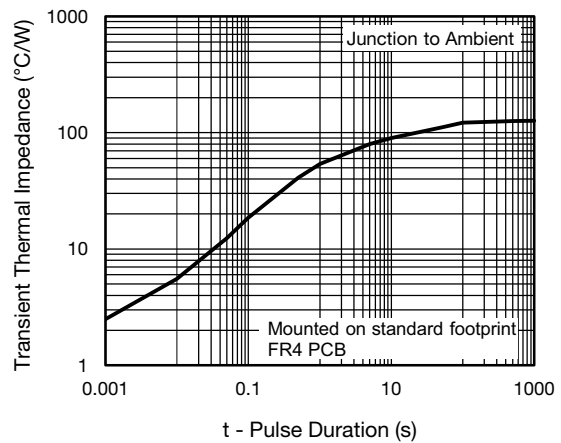
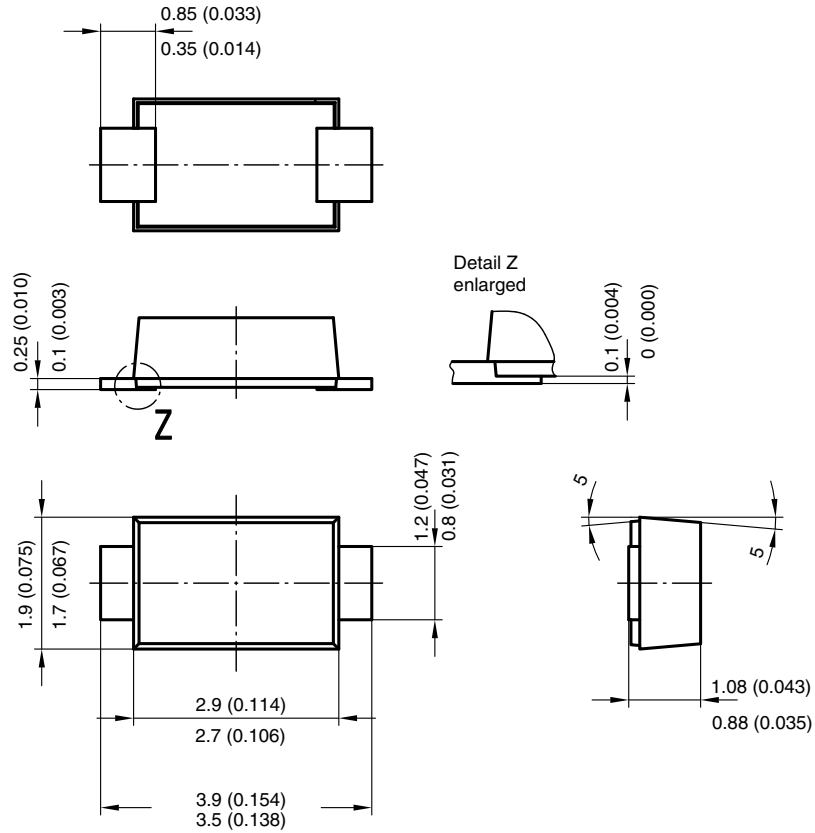


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



Created - Date: 15. February 2005  
 Rev. 3 - Date: 13. March 2007  
 Document no.: S8-V-3915.01-001 (4)  
 17247



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