

## Standard Avalanche Surface-Mount Rectifiers

### eSMP® Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode  Anode

### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                                    |
|-------------------------|------------------------------------|
| $I_{F(AV)}$             | 1.5 A                              |
| $V_{RRM}$               | 200 V, 400 V, 600 V, 800 V, 1000 V |
| $I_{FSM}$               | 30 A                               |
| $I_R$                   | 0.2 $\mu$ A                        |
| $V_F$ at $I_F = 1$ A    | 0.84 V                             |
| $E_{AS}$                | 20 mJ                              |
| $T_J$ max.              | 175 °C                             |
| Package                 | SMF (DO-219AB)                     |
| Circuit configuration   | Single                             |

### FEATURES

- Low profile package
- Glass passivated pellet chip junction
- Ideal for automated placement
- Low forward voltage drop, low reverse 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
- 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**

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and automotive grade

**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 cathode end

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

| PARAMETER                                                                         | SYMBOL         | AS1FD       | AS1FG | AS1FJ | AS1FK | AS1FM | UNIT |
|-----------------------------------------------------------------------------------|----------------|-------------|-------|-------|-------|-------|------|
| Device marking code                                                               |                | ASD         | ASG   | ASJ   | ASK   | ASM   |      |
| Max. repetitive peak reverse voltage                                              | $V_{RRM}$      | 200         | 400   | 600   | 800   | 1000  | V    |
| Max. DC forward current (see fig. 1)                                              | $I_F^{(1)}$    | 1.5         |       |       |       |       | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 30          |       |       |       |       | A    |
| Non-repetitive avalanche energy at $I_{AS} = 1.0$ A, $T_A = 25$ °C                | $E_{AS}$       | 20          |       |       |       |       | mJ   |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -55 to +175 |       |       |       |       | °C   |

#### Note

<sup>(1)</sup> Free air, mounted on recommended PCB, 2 oz. pad area

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

| PARAMETER                     | TEST CONDITIONS                                                          |                         | SYMBOL                        | TYP. | MAX. | UNIT |
|-------------------------------|--------------------------------------------------------------------------|-------------------------|-------------------------------|------|------|------|
| Instantaneous forward voltage | I <sub>F</sub> = 1.0 A                                                   | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.95 | -    | V    |
|                               |                                                                          | T <sub>J</sub> = 125 °C |                               | 0.84 | -    |      |
|                               | I <sub>F</sub> = 1.5 A                                                   | T <sub>J</sub> = 25 °C  |                               | 0.99 | 1.15 |      |
|                               |                                                                          | T <sub>J</sub> = 125 °C |                               | 0.89 | 1.0  |      |
| Reverse current               | Rated V <sub>R</sub>                                                     | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.14 | 5    | μA   |
|                               |                                                                          | T <sub>J</sub> = 125 °C |                               | 25   | 100  |      |
| 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>               | 1.3  | -    | μs   |
| Typical junction capacitance  | 4.0 V, 1 MHz                                                             |                         | C <sub>J</sub>                | 8.8  | -    | pF   |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL                   | AS1FD | AS1FG | AS1FJ | AS1FK | AS1FM | UNIT |
|----------------------------|--------------------------|-------|-------|-------|-------|-------|------|
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 130   |       |       |       |       | °C/W |
|                            | $R_{\theta JM}^{(1)}$    | 20    |       |       |       |       |      |

**Notes**(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient;  $R_{\theta JM}$  - junction to mount(2) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ **ORDERING INFORMATION** (Example)

| PREFERRED P/N             | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|---------------------------|-----------------|------------------------|---------------|------------------------------------|
| AS1FM-M3/H                | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| AS1FM-M3/I                | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |
| AS1FMHM3/H <sup>(1)</sup> | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| AS1FMHM3/I <sup>(1)</sup> | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |

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



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

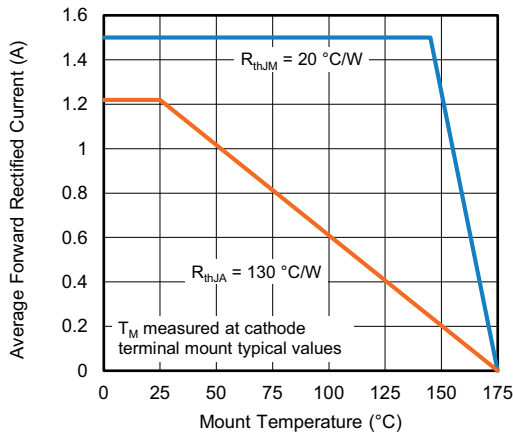


Fig. 1 - Max. Forward Current Derating Curve

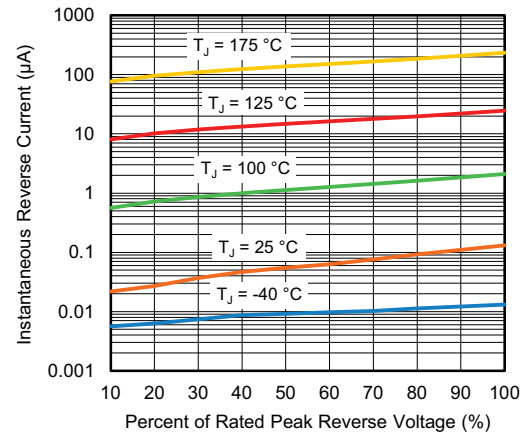


Fig. 4 - Typical Reverse Characteristics

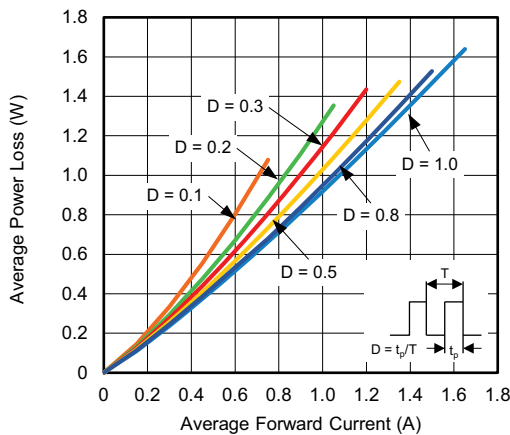


Fig. 2 - Forward Power Loss Characteristics

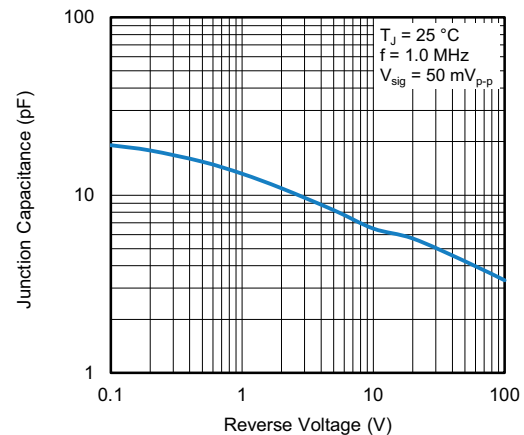


Fig. 5 - Typical Junction Capacitance

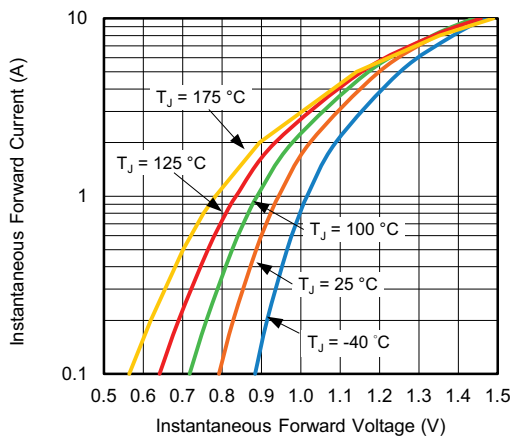


Fig. 3 - Typical Instantaneous Forward Characteristics

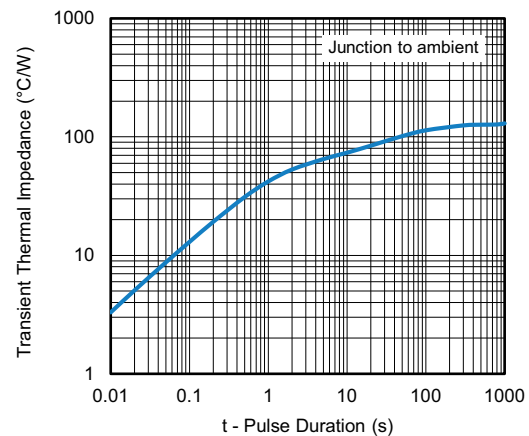
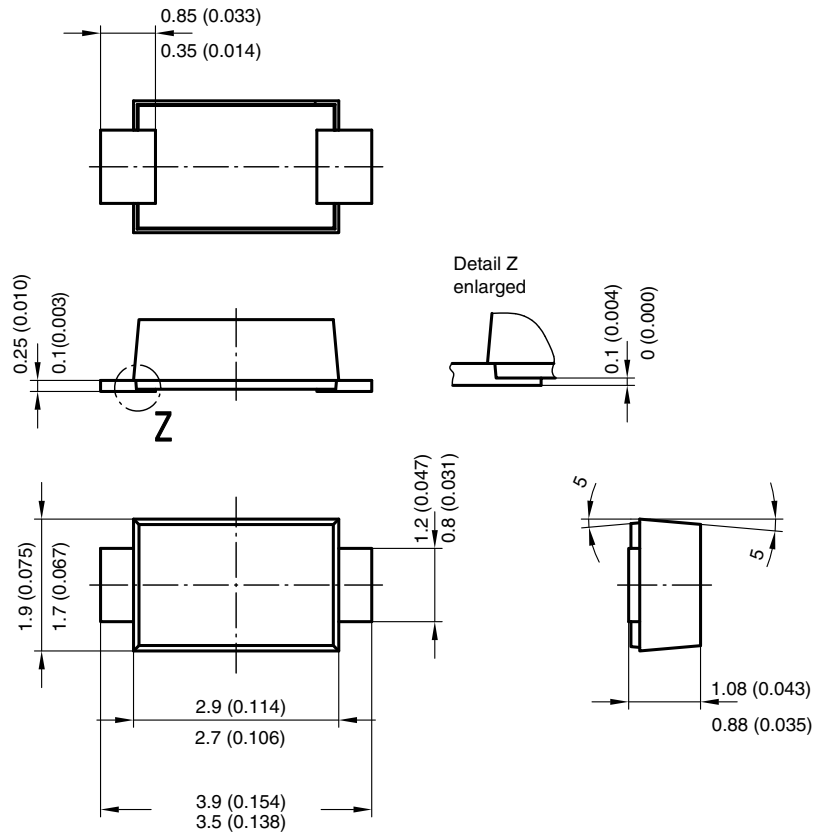


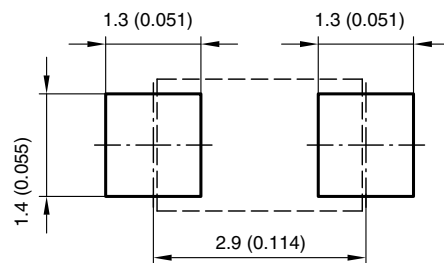
Fig. 6 - Typical Transient Thermal Impedance



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



Foot print recommendation:



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17247



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