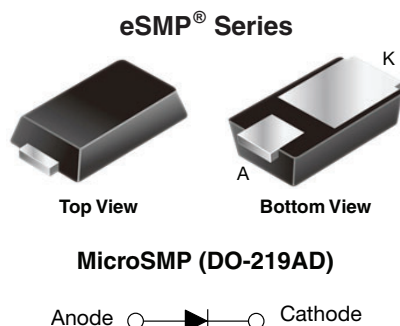


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



## FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop
- Low power loss, high efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available  
- 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)



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

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS         |                     |
|---------------------------------|---------------------|
| $I_{F(AV)}$                     | 1.0 A               |
| $V_{RRM}$                       | 120 V               |
| $I_{FSM}$                       | 25 A                |
| $V_F$ at $I_F = 1.0$ A (125 °C) | 0.61 V              |
| $T_J$ max.                      | 175 °C              |
| Package                         | MicroSMP (DO-219AD) |
| Circuit configuration           | Single              |

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications, in commercial, industrial, and automotive applications.

## MECHANICAL DATA

**Case:** MicroSMP (DO-219AD)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, and 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                           | V1PM12      | UNIT |
| Device marking code                                                               |                                  | 1MS         |      |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$                        | 120         | V    |
| Maximum DC forward current                                                        | $I_{F(AV)}$                      | 1.0         | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$                        | 25          | A    |
| Operating junction and storage temperature range                                  | $T_J$ <sup>(1)</sup> , $T_{STG}$ | -40 to +175 | °C   |

### Note

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

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |       |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|-------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP.  | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 0.5 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.62  | -    | V    |
|                                                                            | I <sub>F</sub> = 1.0 A |                         |                               | 0.79  | 0.87 |      |
|                                                                            | I <sub>F</sub> = 0.5 A | T <sub>A</sub> = 125 °C |                               | 0.52  | -    |      |
|                                                                            | I <sub>F</sub> = 1.0 A |                         |                               | 0.61  | 0.69 |      |
| Reverse current                                                            | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.001 | -    | mA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 0.15  | -    |      |
|                                                                            | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                               | -     | 0.05 |      |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 0.3   | 1.5  |      |
| Typical junction capacitance                                               | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 100   | -    | pF   |

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: pulse width  $\leq 5\text{ ms}$ 

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                          |        |                      |
|---------------------------------------------------------------------------------------------|--------------------------|--------|----------------------|
| PARAMETER                                                                                   | SYMBOL                   | V1PM12 | UNIT                 |
| Typical thermal resistance                                                                  | $R_{\theta JA}^{(1)(2)}$ | 130    | $^{\circ}\text{C/W}$ |
|                                                                                             | $R_{\theta JM}^{(3)}$    | 20     |                      |

**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) Free air, mounted on FR4 PCB, 2 oz. standard footprint,  $R_{\theta JA}$  - junction to ambient

(3) Mounted on FR4 PCB, 2 oz. standard footprint,  $R_{\theta JM}$  - junction to mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                   |
|---------------------------------------|-----------------|------------------------|---------------|-----------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                     |
| V1PM12-M3/H                           | 0.006           | H                      | 4500          | 7" diameter plastic tape and reel |
| V1PM12HM3/H <sup>(1)</sup>            | 0.006           | H                      | 4500          | 7" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

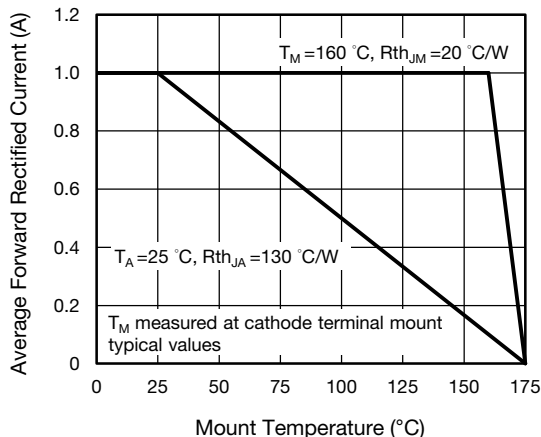
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

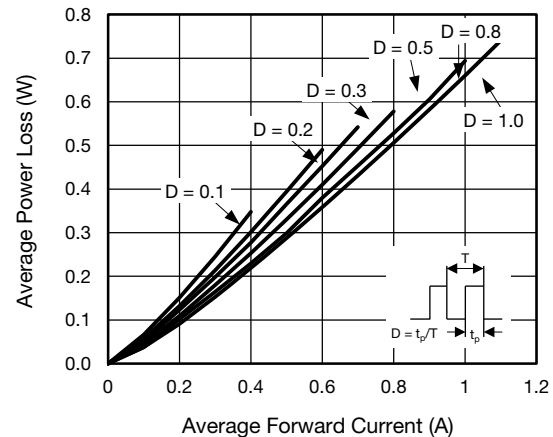


Fig. 2 - Average Power Loss Characteristics

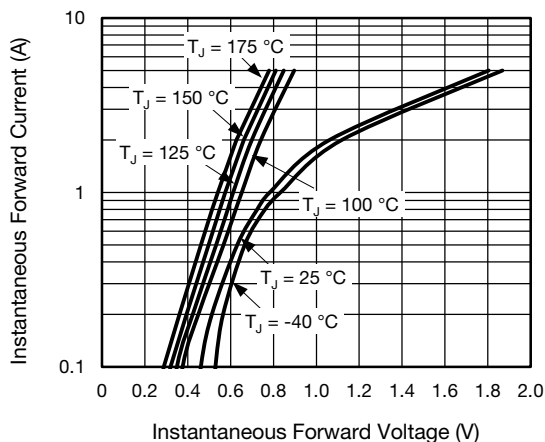


Fig. 3 - Typical Instantaneous Forward Characteristics

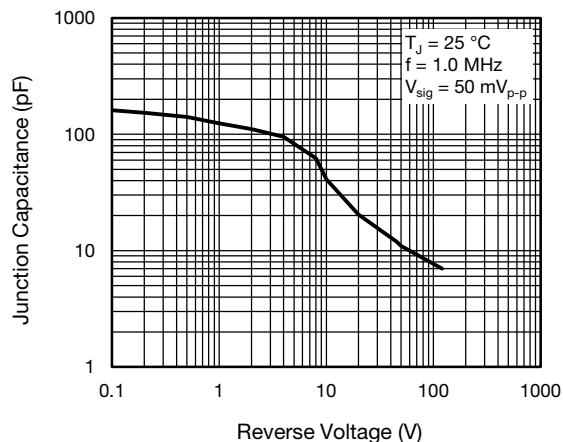


Fig. 5 - Typical Junction Capacitance

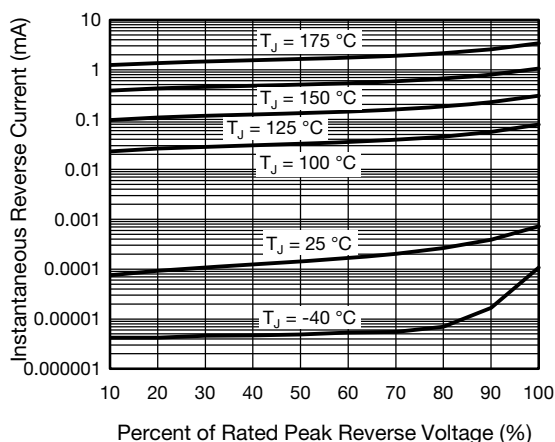


Fig. 4 - Typical Reverse Leakage Characteristics

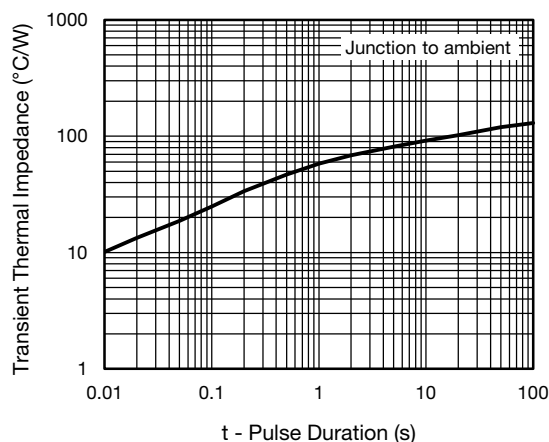
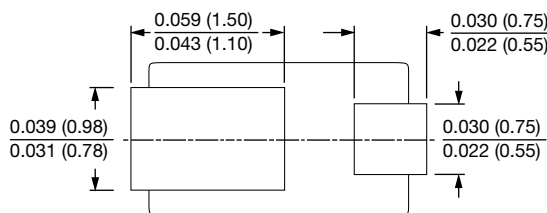
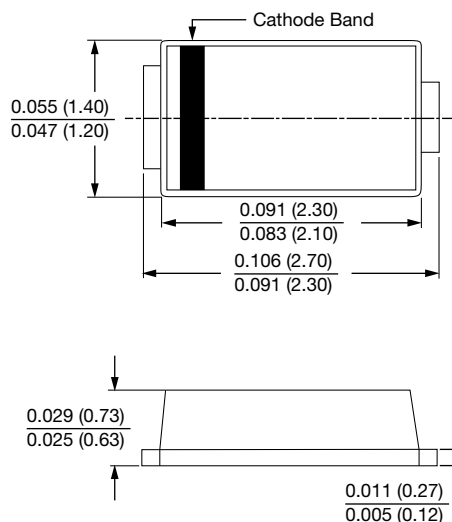


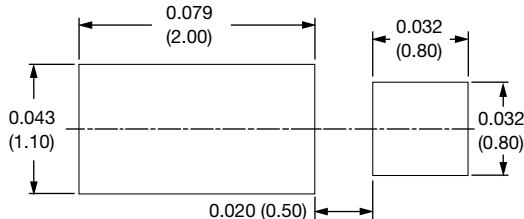
Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### MicroSMP (DO-219AD)



### Mounting Pad Layout





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