

# Surface Mount Trench MOS Barrier Schottky Rectifiers

## TMBS® eSMP® Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode  Anode

## DESIGN SUPPORT TOOLS

[click logo to get started](#)
**3D**  
Models  
Available

## PRIMARY CHARACTERISTICS

|                                        |                |
|----------------------------------------|----------------|
| $I_{F(AV)}$                            | 2.0 A          |
| $V_{RRM}$                              | 45 V           |
| $I_{FSM}$                              | 40 A           |
| $V_F$ at $I_F = 2$ A ( $T_A = 125$ °C) | 0.40 V         |
| $T_J$ max.                             | 150 °C         |
| Package                                | SMF (DO-219AB) |
| Circuit configuration                  | Single         |

## FEATURES

- Trench MOS Schottky technology
- 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
Available

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

## 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 meet JESD 201 class 2 whisker test

**Polarity:** color band denotes the cathode end

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

| PARAMETER                                                                          | SYMBOL            | V2FL45      | UNIT |
|------------------------------------------------------------------------------------|-------------------|-------------|------|
| Device marking code                                                                |                   | 2LE         |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 45          | V    |
| Maximum average forward rectified current (fig.1)                                  | $I_{F(AV)}^{(1)}$ | 2.0         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 40          | A    |
| Operating junction temperature range                                               | $T_J^{(2)}$       | -40 to +150 | °C   |
| Storage temperature range                                                          | $T_{STG}$         | -55 to +150 |      |

## Notes

<sup>(1)</sup> Free air, mounted on FR4 PCB, 2 oz. standard footprint

<sup>(2)</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> = 1.0 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.43 | -    | V    |
|                                                                            | I <sub>F</sub> = 2.0 A |                         |                               | 0.48 | 0.56 |      |
|                                                                            | I <sub>F</sub> = 1.0 A | T <sub>A</sub> = 125 °C |                               | 0.32 | -    |      |
|                                                                            | I <sub>F</sub> = 2.0 A |                         |                               | 0.40 | 0.48 |      |
| Reverse current                                                            | V <sub>R</sub> = 45 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 0.57 | mA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 3    | 10   |      |
| Typical junction capacitance                                               | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 270  | -    | 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                   | V2FL45 | UNIT                 |
| Typical thermal resistance                                                           | $R_{\theta JA}^{(1)(2)}$ | 125    | $^{\circ}\text{C/W}$ |
|                                                                                      | $R_{\theta JM}^{(2)}$    | 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) Device mounted on FR4 PCB, 2 oz. standard footprint, thermal resistance  $R_{\theta JA}$  – junction-to-ambient; thermal resistance  $R_{\theta JM}$  – junction-to-mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V2FL45-M3/H                    | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| V2FL45-M3/I                    | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |
| V2FL45HM3/H <sup>(1)</sup>     | 0.015           | H                      | 3000          | 7" diameter plastic tape and reel  |
| V2FL45HM3/I <sup>(1)</sup>     | 0.015           | I                      | 10 000        | 13" diameter plastic tape and reel |

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

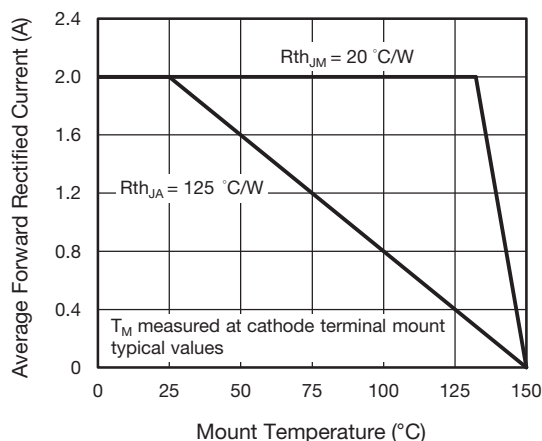
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

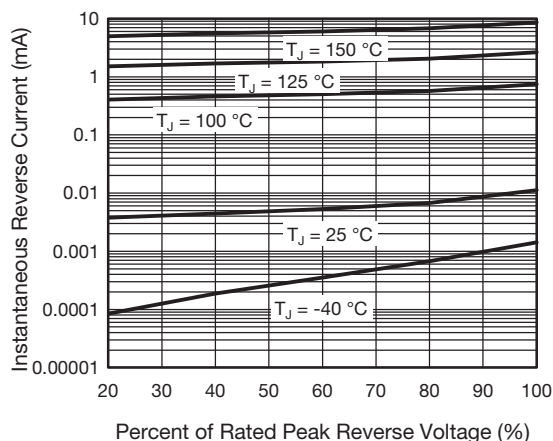


Fig. 4 - Typical Reverse Leakage Characteristics

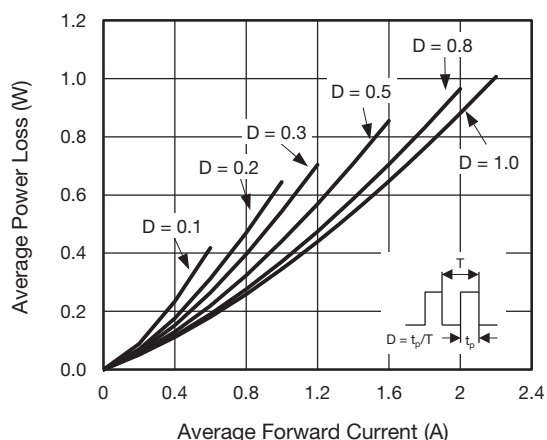


Fig. 2 - Average Power Loss Characteristics

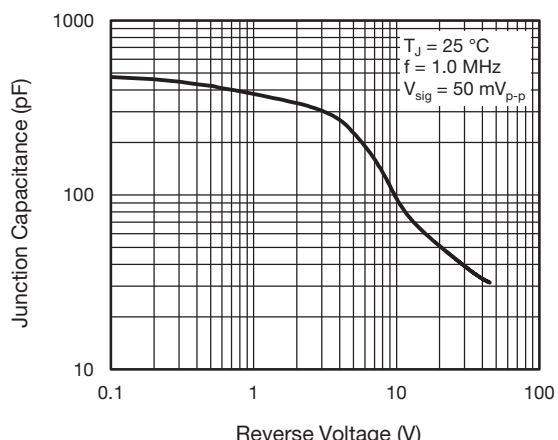


Fig. 5 - Typical Junction Capacitance

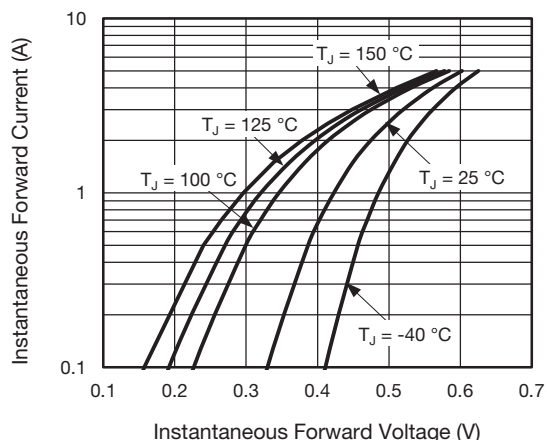


Fig. 3 - Typical Instantaneous Forward Characteristics

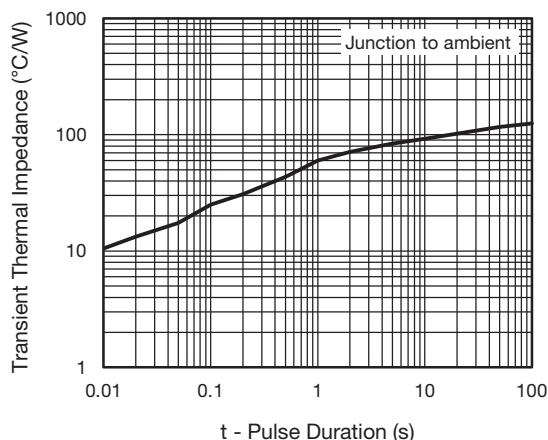
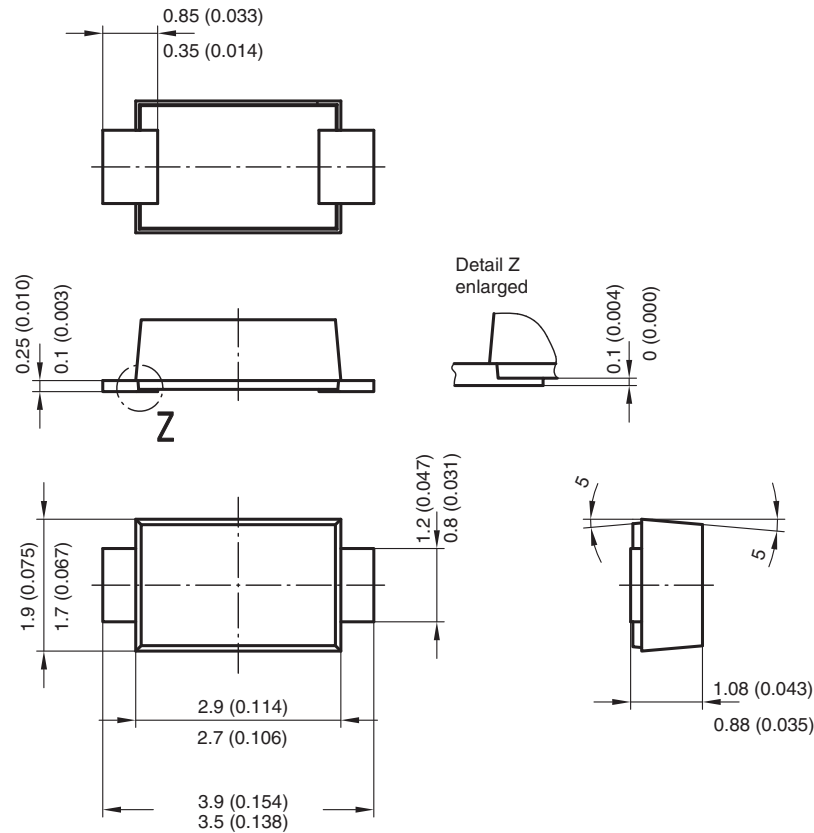
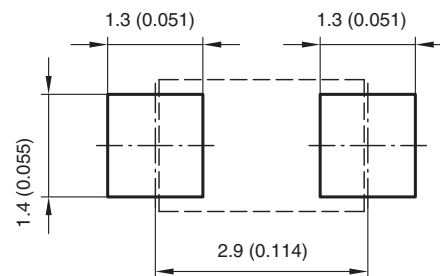


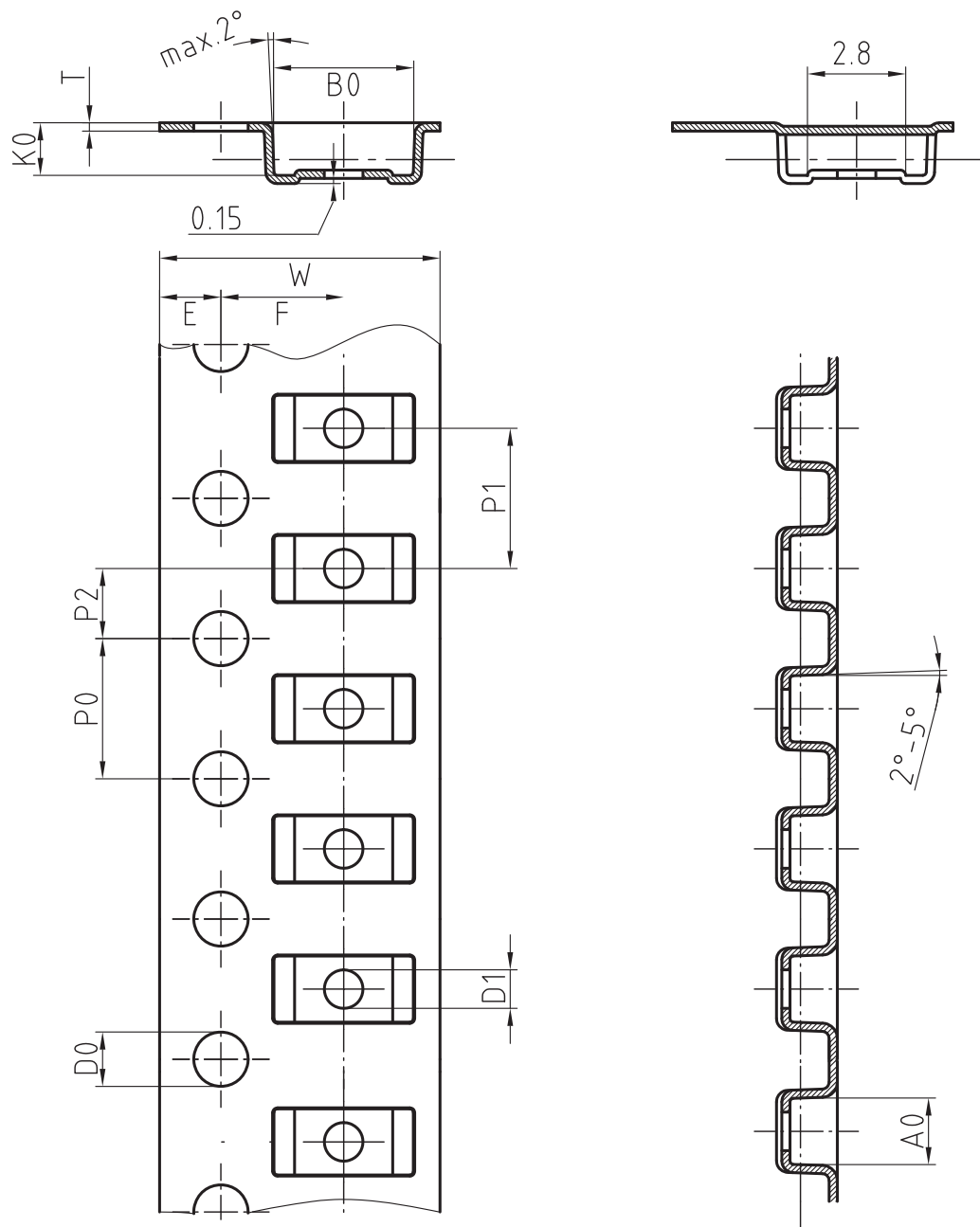
Fig. 6 - Typical Transient Thermal Impedance

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


Foot print recommendation:



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17247

**BLISTERTAPE DIMENSIONS** in millimeters: **SMF (DO-219AB)**


| Mat: | A0  | B0  | K0  | W   | T     | P0  | P2  | P1  | D0  | D1 | E    | F   |
|------|-----|-----|-----|-----|-------|-----|-----|-----|-----|----|------|-----|
| PS   | 1.9 | 4.0 | 1.5 | 8.0 | 0.235 | 4.0 | 2.0 | 4.0 | 1.5 | 1  | 1.75 | 3.5 |

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