

# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifiers

## eSMP<sup>®</sup> Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode Anode

## 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
- 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)

 AUTOMOTIVE  
GRADE  
Available

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

## LINKS TO ADDITIONAL RESOURCES



3D Models

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.0 A
$V_{RRM}$	60 V
$I_{FSM}$	30 A
$V_F$ at $I_F = 1$ A ( $T_A = 125$ °C)	0.45 V
$T_J$ max.	150 °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 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	V1F6	UNIT
Device marking code		V16	
Maximum repetitive peak reverse voltage	$V_{RRM}$	60	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 superimposed on rated load	$I_{FSM}$	30	A
Operating junction temperature range	$T_J$ <sup>(2)</sup>	-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> = 0.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.45	-	V
	I <sub>F</sub> = 1.0 A			0.52	0.60	
	I <sub>F</sub> = 0.5 A	T <sub>A</sub> = 125 °C		0.36	-	
	I <sub>F</sub> = 1.0 A			0.45	0.53	
Reverse current	V <sub>R</sub> = 60 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	0.27	mA
		T <sub>A</sub> = 125 °C		1.0	5	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	135	-	pF

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V1F6	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)(2)</sup>	125	°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	27	

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP<sub>D</sub>/dT<sub>J</sub> < 1/R<sub>θJA</sub>
- (2) Device mounted on FR4 PCB, 2 oz. standard footprint, thermal resistance R<sub>θJA</sub> – junction-to-ambient; thermal resistance R<sub>θJM</sub> – junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V1F6-M3/H	0.015	H	3000	7" diameter plastic tape and reel
V1F6-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
V1F6HM3/H <sup>(1)</sup>	0.015	H	3000	7" diameter plastic tape and reel
V1F6HM3/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)

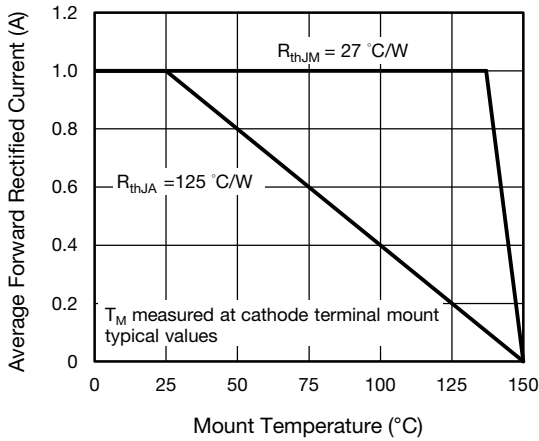


Fig. 1 - Maximum Forward Current Derating Curve

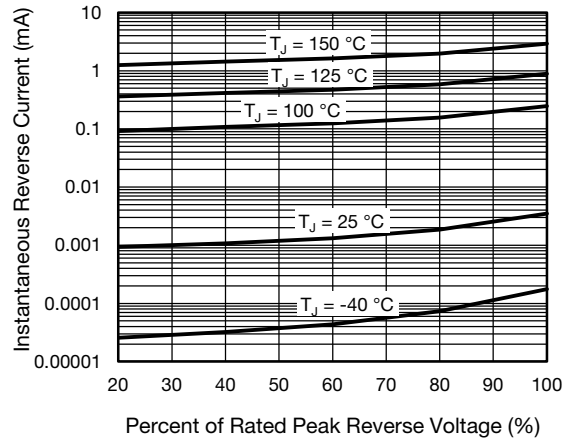


Fig. 4 - Typical Reverse Leakage Characteristics

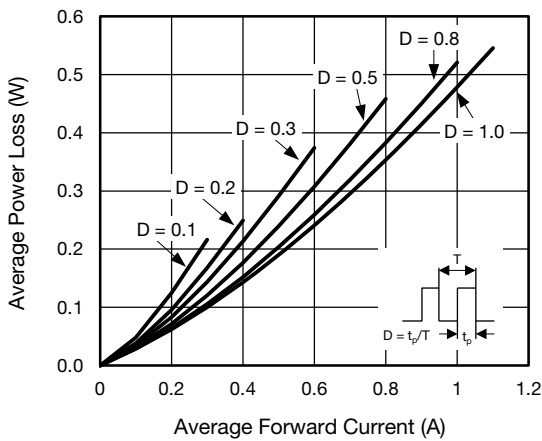


Fig. 2 - Average Power Loss Characteristics

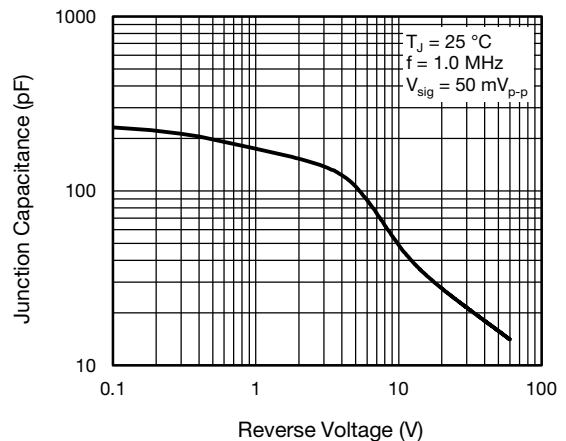


Fig. 5 - Typical Junction Capacitance

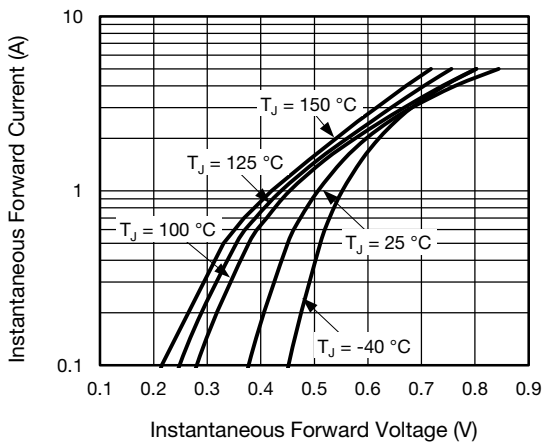


Fig. 3 - Typical Instantaneous Forward Characteristics

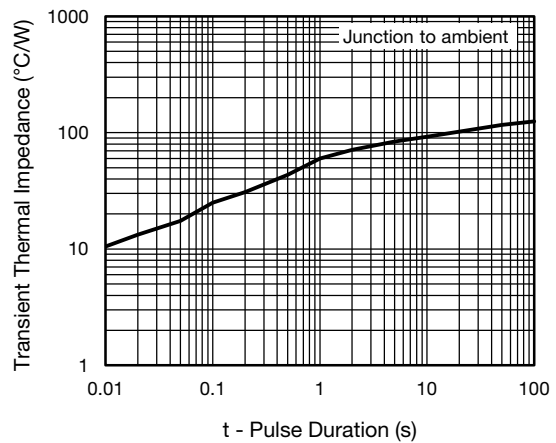
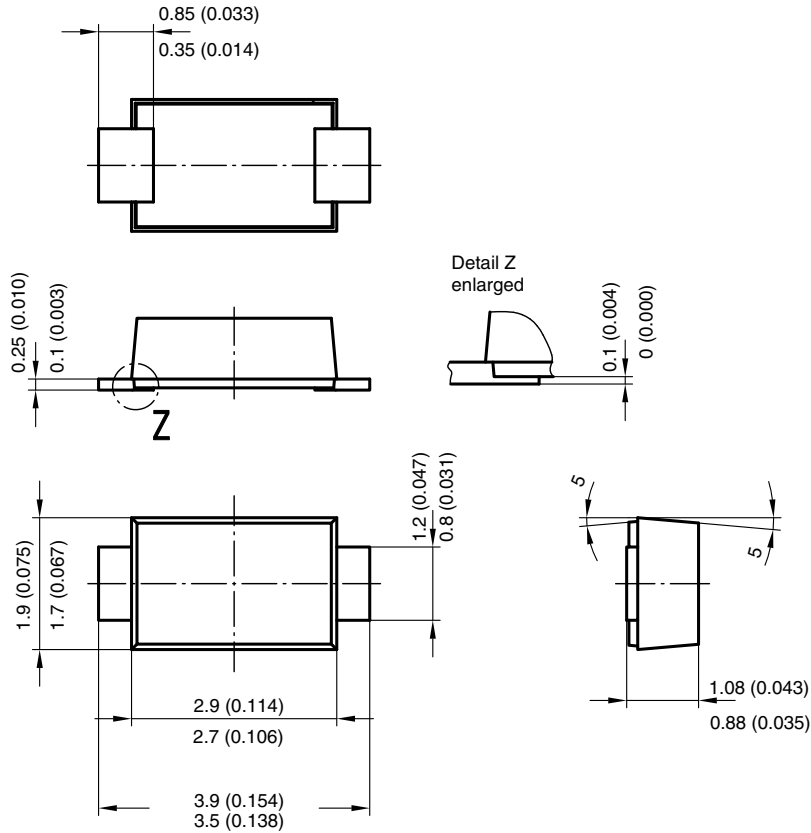
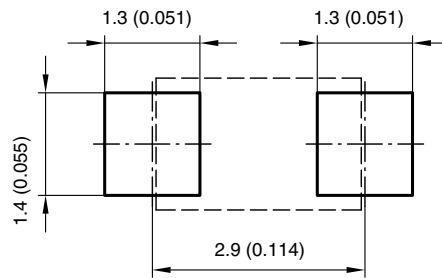


Fig. 6 - Typical Transient Thermal Impedance

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



Foot print recommendation:



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 17247



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