

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

 eSMP<sup>®</sup> Series

**SMP (DO-220AA)**

Cathode Anode

## FEATURES

- Low profile package
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- 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)

 AUTOMOTIVE  
GRADE  
Available

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

## DESIGN SUPPORT TOOLS AVAILABLE



3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
$V_{RRM}$	45 V
$I_{FSM}$	80 A
$V_F$ at $I_F = 3.0$ A	0.37 V
$T_J$ max.	150 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

**Case:** SMP (DO-220AA)

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 AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, 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	V3PL45	UNIT
Device marking code		3LE	
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	V
Maximum DC forward current	$I_F$ <sup>(1)</sup>	3	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	80	A
Operating junction and storage temperature range	$T_J$ <sup>(2)</sup>	-40 to +150	°C
Operating junction and storage temperature range	$T_{STG}$	-55 to +150	°C

### Notes

(1) Free air, mounted on recommended copper pad area

(2) 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> = 1.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.41	-	V
	I <sub>F</sub> = 3 A			0.46	0.54	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.31	-	
	I <sub>F</sub> = 3 A			0.37	0.46	
Reverse current	V <sub>R</sub> = 45 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	0.45	mA
		T <sub>A</sub> = 125 °C		5.0	25.0	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	550	-	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 specified)			
PARAMETER	SYMBOL	V3PL45	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	125	°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	15	

Notes

- (3) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance R<sub>θJA</sub> - junction-to-ambient
- (4) Mounted on 10 mm x 10 mm copper pad area PCB; 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
V3PL45-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V3PL45-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V3PL45HM3/H <sup>(1)</sup>	0.024	H	3000	7" diameter plastic tape and reel
V3PL45HM3/I <sup>(1)</sup>	0.024	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)

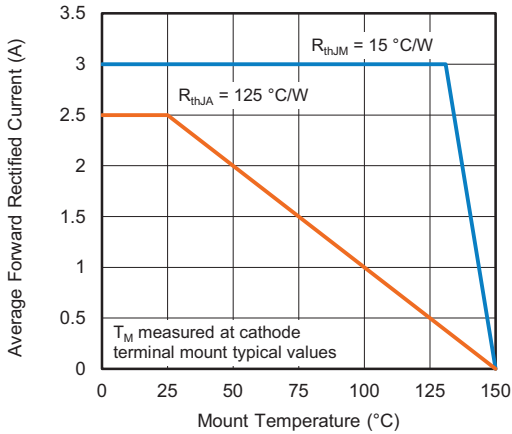


Fig. 1 - Maximum Forward Current Derating Curve

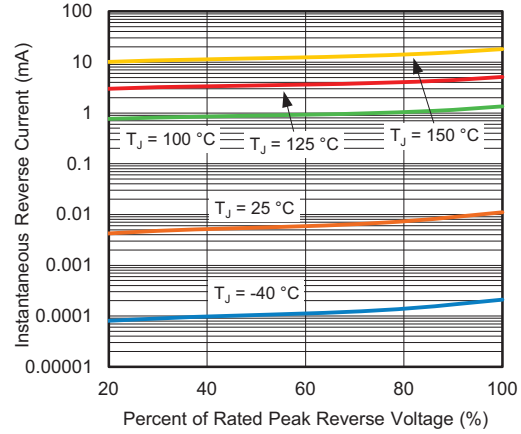


Fig. 4 - Typical Reverse Characteristics

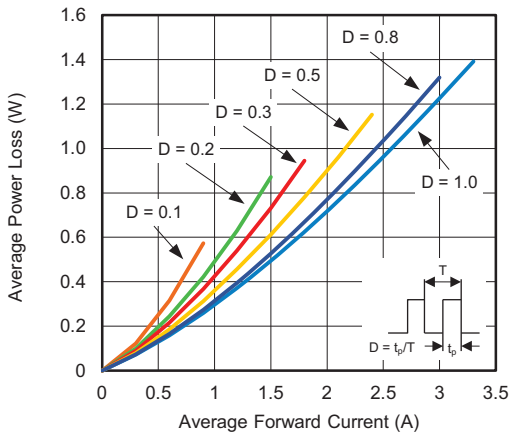


Fig. 2 - Forward Power Loss Characteristics

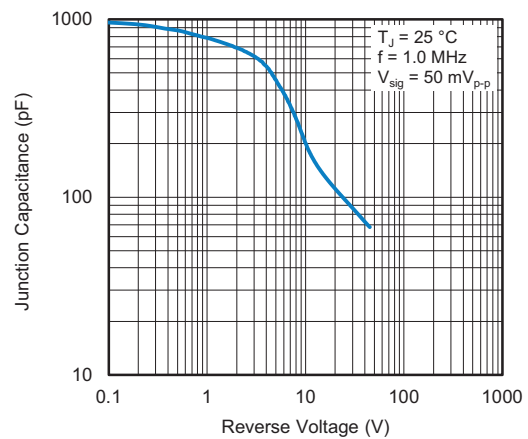


Fig. 5 - Typical Junction Capacitance

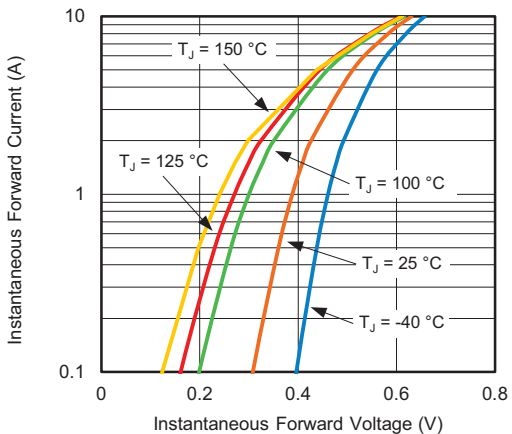


Fig. 3 - Typical Instantaneous Forward Characteristics

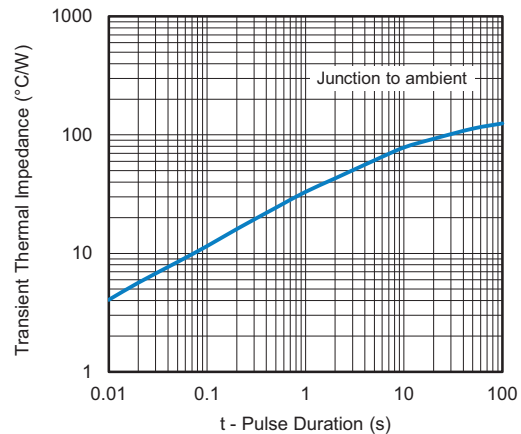
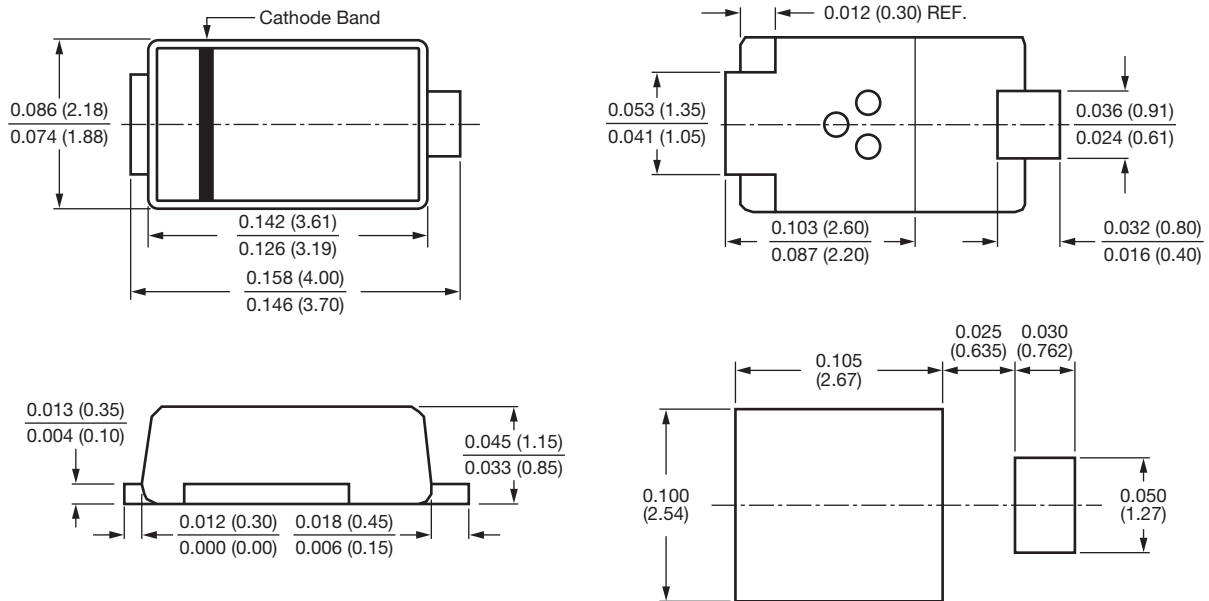


Fig. 6 - Typical Transient Thermal Impedance

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

**SMP (DO-220AA)**




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