

# 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
$V_{RRM}$	120 V
$I_{FSM}$	80 A
$V_F$ at $I_F = 3.0$ A	0.61 V
$T_J$ max.	175 °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	V3PM12	UNIT
Device marking code		3MS	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward current	$I_{F(AV)}$ <sup>(1)</sup>	3	A
	$I_{F(AV)}$ <sup>(2)</sup>	1.9	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>(3)</sup>	-40 to +175	°C
Operating junction and storage temperature range	$T_{STG}$	-55 to +175	°C

### Notes

<sup>(1)</sup> Mounted on 10 mm x 10 mm copper pad area PCB

<sup>(2)</sup> Free air, mounted on recommended copper pad area

<sup>(3)</sup> The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 1.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.62	-	V
	$I_F = 3.0\text{ A}$			0.75	0.83	
	$I_F = 1.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.52	-	
	$I_F = 3.0\text{ A}$			0.61	0.69	
Reverse current	$V_R = 90\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	0.001	-	mA
		$T_A = 125\text{ }^\circ\text{C}$		0.6	-	
	$V_R = 120\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	0.3	mA
		$T_A = 125\text{ }^\circ\text{C}$		1.0	3.0	
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	290	-	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 specified)			
PARAMETER	SYMBOL	V3PM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	125	$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	15	

**Notes**

- (1) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction-to-ambient  
(2) Units mounted on PCB with specific copper pad areas;  $R_{\theta JM}$  - junction-to-mount

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V3PM12-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V3PM12-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V3PM12HM3/H <sup>(1)</sup>	0.024	H	3000	7" diameter plastic tape and reel
V3PM12HM3/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)

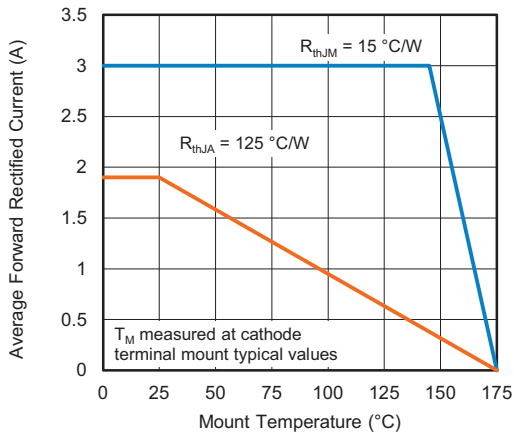


Fig. 1 - Maximum Forward Current Derating Curve

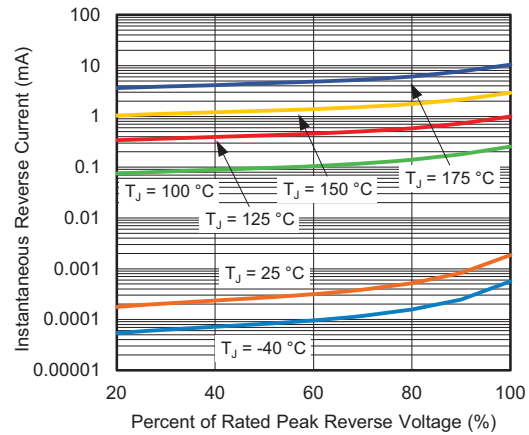


Fig. 4 - Typical Reverse Characteristics

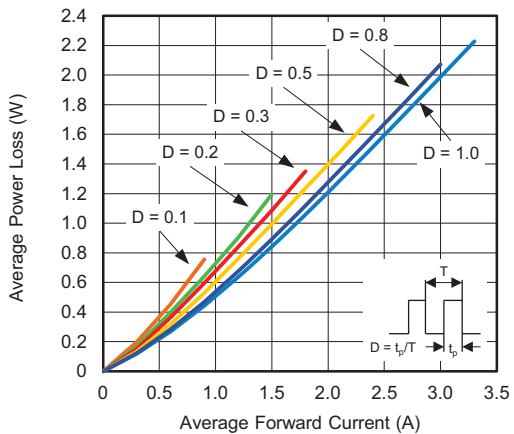


Fig. 2 - Forward Power Loss Characteristics

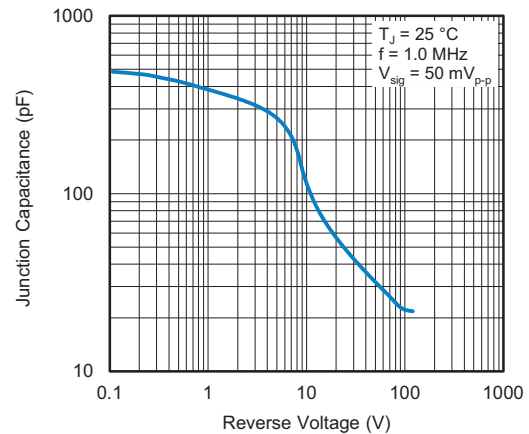


Fig. 5 - Typical Junction Capacitance

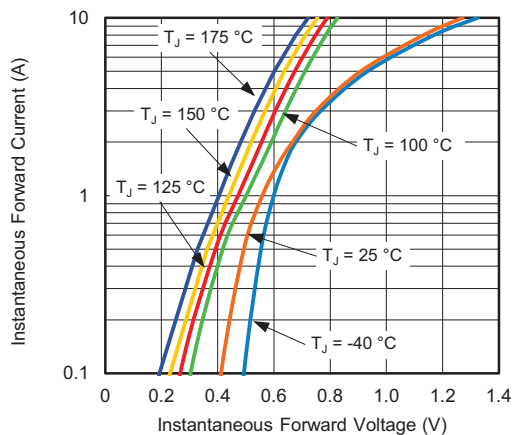


Fig. 3 - Typical Instantaneous Forward Characteristics

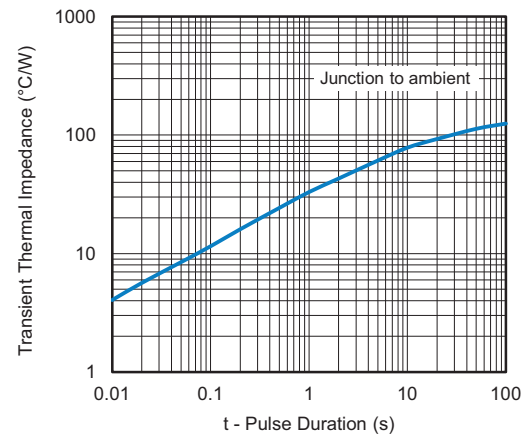
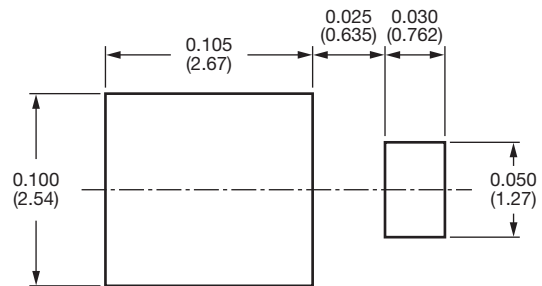
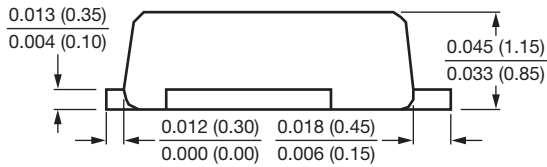
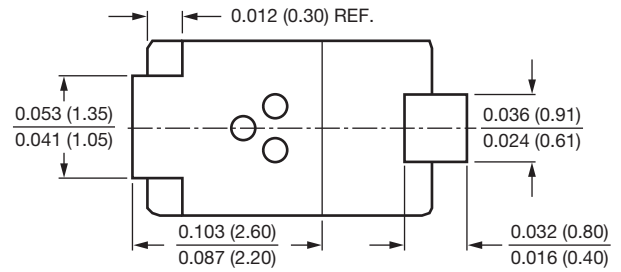
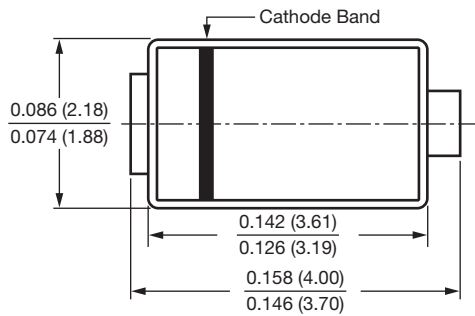


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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