

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

## eSMP® 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**

## LINKS TO ADDITIONAL RESOURCES



3D Models

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2.0 A
$V_{RRM}$	200 V
$I_{FSM}$	50 A
$V_F$ at $I_F = 2.0$ A	0.68 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\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("\_X" denotes revision code e.g. A, B,.....)

**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	V2P22L	UNIT
Device marking code		V2D	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	2	A
	$I_{F(AV)}^{(2)}$	1.6	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50	A
Operating junction and storage temperature range	$T_J^{(3)}$	-40 to +175	°C
Operating junction and storage temperature range	$T_{STG}$	-55 to +175	°C

## Notes

(1) Mounted on 10 mm x 10 mm PCB pad area

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

(3) 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>	0.76	-	V
	I <sub>F</sub> = 2.0 A			0.83	0.91	
	I <sub>F</sub> = 1.0 A	T <sub>A</sub> = 125 °C		0.60	-	
	I <sub>F</sub> = 2.0 A			0.68	0.76	
Reverse current	V <sub>R</sub> = 160 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.001	-	mA
		T <sub>A</sub> = 125 °C		0.2	-	
	V <sub>R</sub> = 200 V	T <sub>A</sub> = 25 °C		-	0.04	mA
		T <sub>A</sub> = 125 °C		0.4	2.0	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	90.0	-	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 specified)			
PARAMETER	SYMBOL	V2P22L	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	125	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	15	

**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 recommended copper pad area; thermal resistance  $R_{\theta JA}$  - junction-to-ambient  
 (3) Mounted on 10 mm x 10 mm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V2P22L-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V2P22L-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V2P22LHM3_A/H <sup>(1)</sup>	0.024	H	3000	7" diameter plastic tape and reel
V2P22LHM3_A/I <sup>(1)</sup>	0.024	I	10 000	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

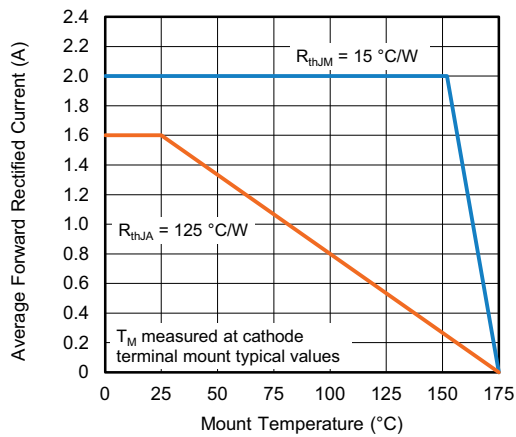
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

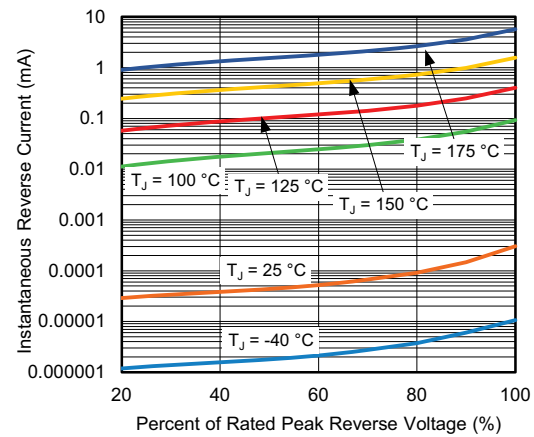


Fig. 4 - Typical Reverse Characteristics

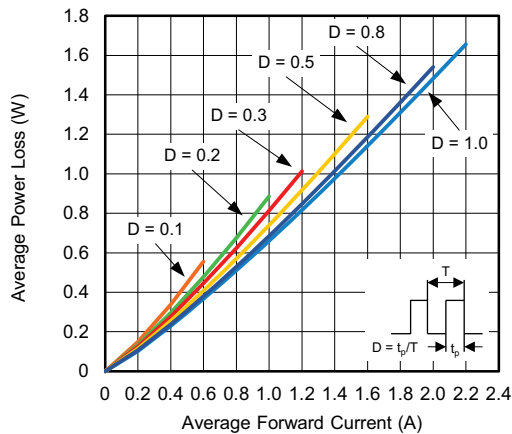


Fig. 2 - Forward Power Loss Characteristics

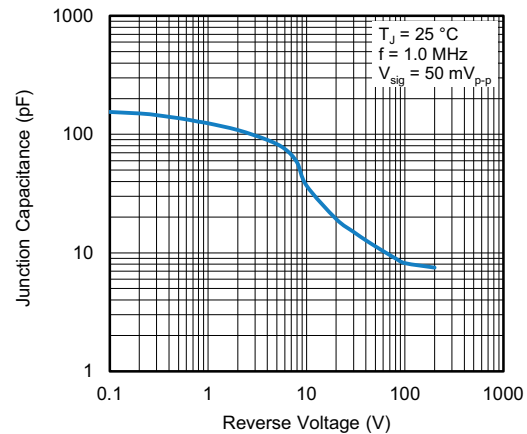


Fig. 5 - Typical Junction Capacitance

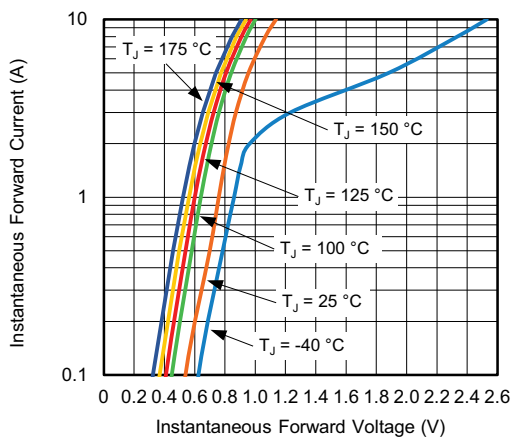


Fig. 3 - Typical Instantaneous Forward Characteristics

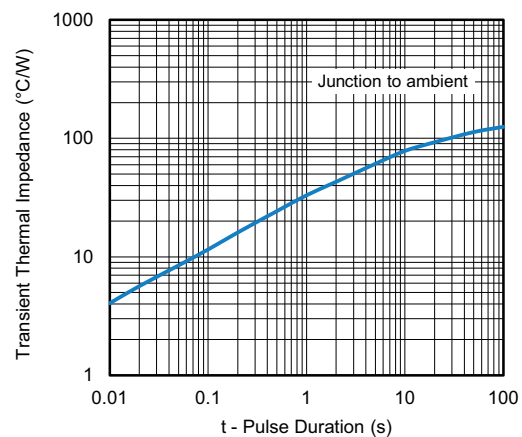
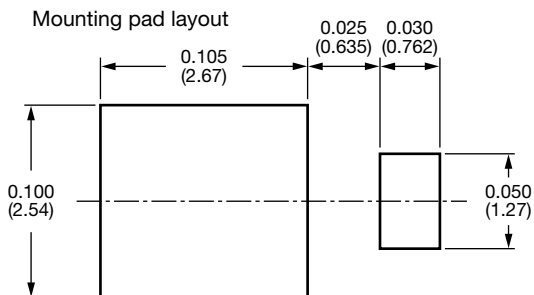
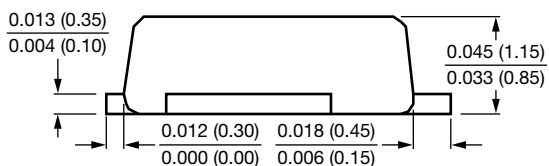
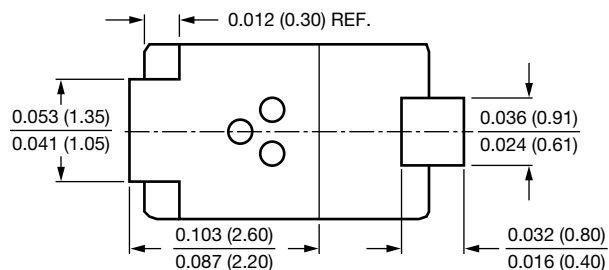
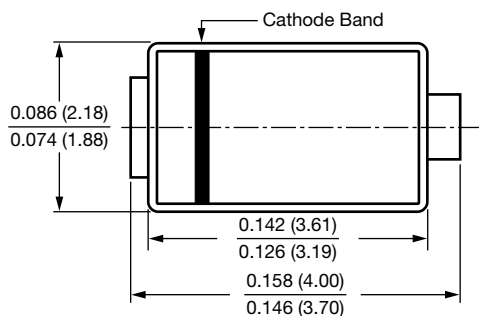


Fig. 6 - Typical Transient Thermal Impedance

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

**SMP (DO-220AA)**




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