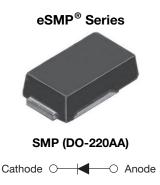
HALOGEN

FREE



## Vishay General Semiconductor

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



#### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	3.0 A		
V <sub>RRM</sub>	200 V		
I <sub>FSM</sub>	60 A		
$V_F$ at $I_F = 3.0$ A	0.70 V		
T <sub>J</sub> max.	175 °C		
Package	SMP (DO-220AA)		
Circuit configuration	Single		

#### **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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### 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, Hivis suiffx

Polarity: color band denotes the cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V3P22	UNIT
Device marking code		V3D	
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	200	V
Maximum DC forward current	I <sub>F(AV)</sub> (1)	3	A
Maximum DC forward current	I <sub>F(AV)</sub> (2)	1.7	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	60	А
Operating junction and storage temperature range	T <sub>J</sub> <sup>(3)</sup>	-40 to +175	°C
Operating junction and storage temperature range	T <sub>STG</sub>	-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:  $dP_D/dT_J < 1/R_{hJA}$



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<b>ELECTRICAL CHARACTERISTICS</b> (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>	0.78	-	V
	I <sub>F</sub> = 3 A			0.85	0.94	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.62	-	
	I <sub>F</sub> = 3 A			0.70	0.78	
Reverse current	V 160 V	$V_R = 160 \text{ V}$ $T_A = 25 \text{ °C}$ $T_A = 125 \text{ °C}$	I <sub>R</sub> <sup>(2)</sup>	0.001	ı	- mA - mA
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 125 °C		0.3	-	
	V <sub>R</sub> = 200 V	T <sub>A</sub> = 25 °C		-	0.05	
		T <sub>A</sub> = 125 °C		0.7	3.0	
Typical junction capacitance	4.0 V, 1 MHz		CJ	120	-	pF

#### Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width  $\leq 5 \text{ ms}$ 

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER SYMBOL V3P22 UN				
Typical thermal resistance	R <sub>θJA</sub> (1)(2)	125	°C/W	
	R <sub>0JM</sub> (3)	15	C/VV	

#### 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	
V3P22-M3/H	0.024	Н	3000	7" diameter plastic tape and reel	
V3P22-M3/I	0.024	I	10 000	13" diameter plastic tape and reel	
V3P22HM3_A/H (1)	0.024	Н	3000	7" diameter plastic tape and reel	
V3P22HM3_A/I (1)	0.024	I	10 000	13" diameter plastic tape and reel	

#### Note

(1) AEC-Q101 qualified



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### **RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25$ °C unless otherwise noted)

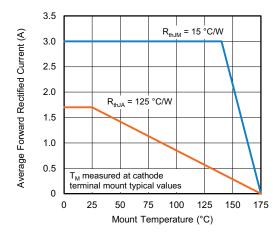


Fig. 1 - Maximum Forward Current Derating Curve

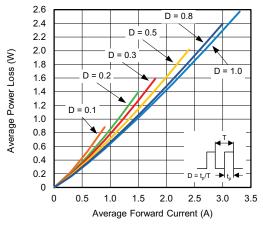


Fig. 2 - Forward Power Loss Characteristics

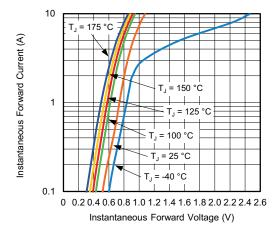


Fig. 3 - Typical Instantaneous Forward Characteristics

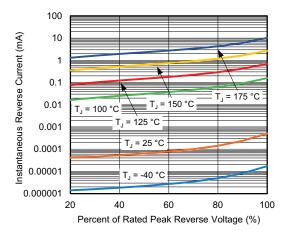


Fig. 4 - Typical Reverse Characteristics

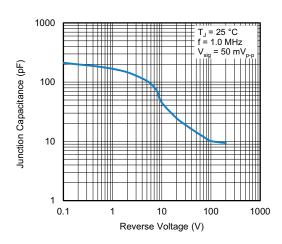


Fig. 5 - Typical Junction Capacitance

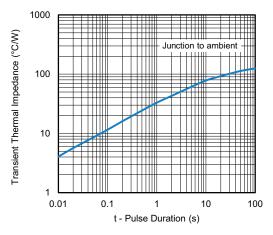


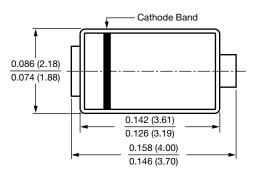
Fig. 6 - Typical Transient Thermal Impedance

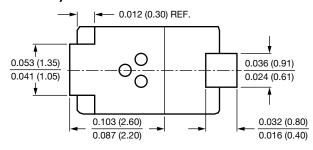


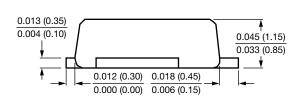
# Vishay General Semiconductor

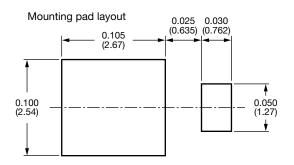
### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

### **SMP (DO-220AA)**











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