RoHS

COMPLIANT

HALOGEN FREE

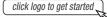


## Vishay General Semiconductor

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



### **DESIGN SUPPORT TOOLS**

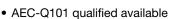




PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	2 A			
$V_{RRM}$	120 V			
I <sub>FSM</sub>	50 A			
$V_F$ at $I_F = 2 \text{ A } (T_A = 125 \text{ °C})$	0.59 V			
T <sub>J</sub> max.	175 °C			
Package	SlimSMAW (DO-221AD)			
Circuit configuration	Single			

#### **FEATURES**

- Low-profile package
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C



- Automotive ordering code: base P/NHM3

Compatible to SOD-128 package case outline

· Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

### TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial, industrial, and automotive applications.

#### **MECHANICAL DATA**

Case: SlimSMAW (DO-221AD)

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 cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSS8D2M12	UNIT	
Device marking code		2M12		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	120	V	
Maximum average forward rectified current (fig.1)	I <sub>F(AV)</sub> (1)	2	A	
	I <sub>F(AV)</sub> (2)	1.9		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	50	А	
Operating junction temperature range	T <sub>J</sub> <sup>(3)</sup>	-40 to +175		
Storage temperature range	T <sub>STG</sub>	-55 to +175	°C	

#### Notes

- (1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
- (2) Free air, mounted on recommended copper pad area
- (3) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$



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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 A	- T <sub>A</sub> = 25 °C	V <sub>E</sub> (1)	0.60	-	V	
	I <sub>F</sub> = 2 A			0.73	0.81		
	I <sub>F</sub> = 1 A	T <sub>A</sub> = 125 °C	T _ 105 °C	<b>V</b> F (1)	0.51	-	V
	I <sub>F</sub> = 2 A			0.59	0.67		
Reverse current	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C	I <sub>R</sub> <sup>(2)</sup>	0.01	-	mA	
	V <sub>R</sub> = 90 V	T <sub>A</sub> = 125 °C		0.5	-		
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C	I <sub>R</sub> <sup>(2)</sup>	-	0.25	mA	
		T <sub>A</sub> = 125 °C		1	3		
Typical junction capacitance	4.0 V, 1 MHz		CJ	220	-	pF	

#### Notes

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

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER SYMBOL TYP. MAX. U				UNIT
Typical thermal resistance	R <sub>0</sub> JA (1)(2)	120	150	°C/W
	R <sub>0JM</sub> (3)	12	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) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

(3) Thermal resistance junction-to-mount to follow JEDEC 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
VSS8D2M12-M3/H	0.033	Н	3500	7" diameter plastic tape and reel	
VSS8D2M12-M3/I	0.033	I	14 000	13" diameter plastic tape and reel	
VSS8D2M12HM3/H (1)	0.033	Н	3500	7" diameter plastic tape and reel	
VSS8D2M12HM3/I (1)	0.033	I	14 000	13" diameter plastic tape and reel	

### Note

(1) AEC-Q101 qualified



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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

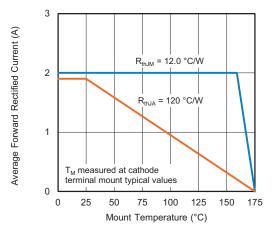


Fig. 1 - Maximum Forward Current Derating Curve

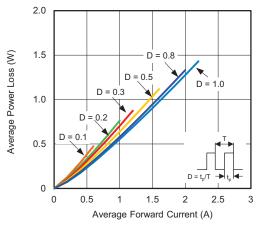


Fig. 2 - Forward Power Loss Characteristics

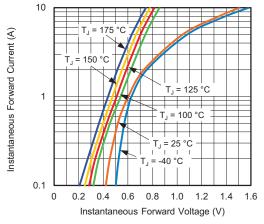


Fig. 3 - Typical Instantaneous Forward Characteristics

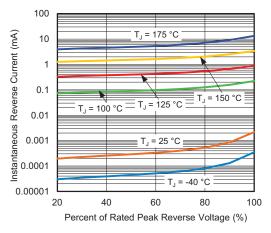


Fig. 4 - Typical Reverse Leakage Characteristics

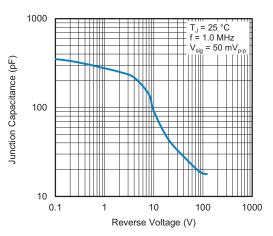


Fig. 5 - Typical Junction Capacitance

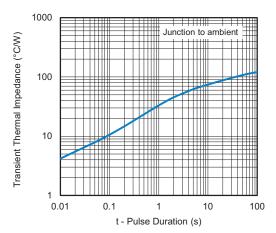


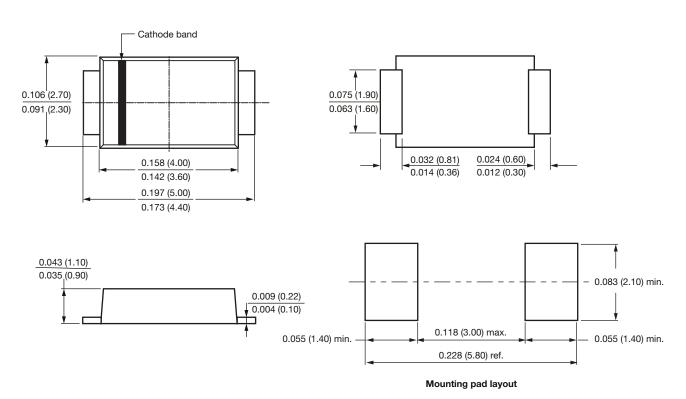
Fig. 6 - Typical Transient Thermal Impedance



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

## SlimSMAW (DO-221AD)





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