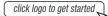


## Vishay General Semiconductor

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

# eSMP® Series **Top View Bottom View** SlimSMAW (DO-221AD) Cathode O —○ Anode

**DESIGN SUPPORT TOOLS** 





PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	3 A		
V <sub>RRM</sub>	60 V		
I <sub>FSM</sub>	60 A		
V <sub>F</sub> at I <sub>F</sub> = 3 A (125 °C)	0.47 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

RoHS

COMPLIANT

• AEC-Q101 qualified available

- Automotive ordering code: base P/NHM3

HALOGEN FREE 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	VSS8D3M6	UNIT		
Device marking code		V3M6			
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	60	V		
Maximum average forward rectified current (fig.1)	I <sub>F(AV)</sub> (1)	3	Α		
	I <sub>F(AV)</sub> (2)	2.5			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	60	А		
Operating junction temperature range	T <sub>J</sub> <sup>(3)</sup> -40 to +175		°C		
Storage temperature range	T <sub>STG</sub>	-55 to +175			

#### Notes

- (1) Mounted on 30 mm x 30 mm AL 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:  $dP_D/dT_J < 1/R_{\theta JA}$



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 1.5 A	$I_F = 1.5 \text{ A}$ $I_F = 3 \text{ A}$ $T_A = 25 \text{ °C}$	V <sub>F</sub> <sup>(1)</sup>	0.49	-	V
	I <sub>F</sub> = 3 A			0.54	0.62	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.39	-	
	I <sub>F</sub> = 3 A			0.47	0.54	
Reverse current	V <sub>R</sub> = 60 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	0.3	- mA
	v <sub>R</sub> = 60 v	T <sub>A</sub> = 125 °C		2	6	
Typical junction capacitance	4.0 V, 1 MF	4.0 V, 1 MHz		500	-	pF

#### Notes

 $^{(1)}\,$  Pulse test: 300  $\mu s$  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.	UNIT	
Typical thermal resistance	R <sub>0</sub> JA (1)(2)	120	150	°C/W	
Typical thermal resistance	R <sub>0JM</sub> (3)	12	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) 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		
VSS8D3M6-M3/H	0.033	Н	3500	7" diameter plastic tape and reel		
VSS8D3M6-M3/I	0.033	I	14 000	13" diameter plastic tape and reel		
VSS8D3M6HM3/H (1)	0.033	Н	3500	7" diameter plastic tape and reel		
VSS8D3M6HM3/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)

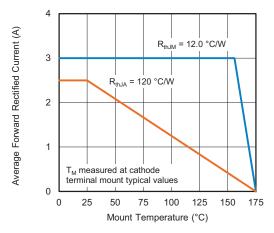


Fig. 1 - Maximum Forward Current Derating Curve

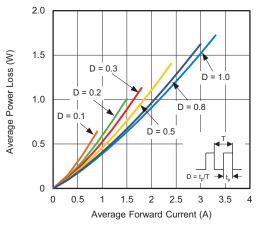


Fig. 2 - Forward Power Loss Characteristics

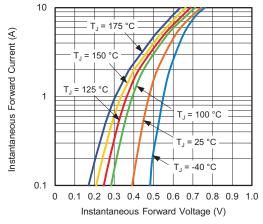


Fig. 3 - Typical Instantaneous Forward Characteristics

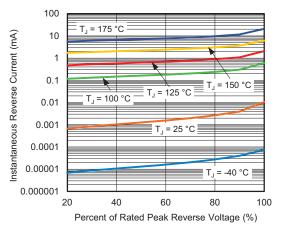


Fig. 4 - Typical Reverse Leakage Characteristics

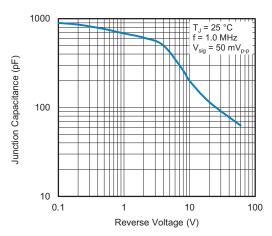


Fig. 5 - Typical Junction Capacitance

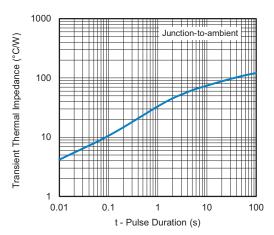
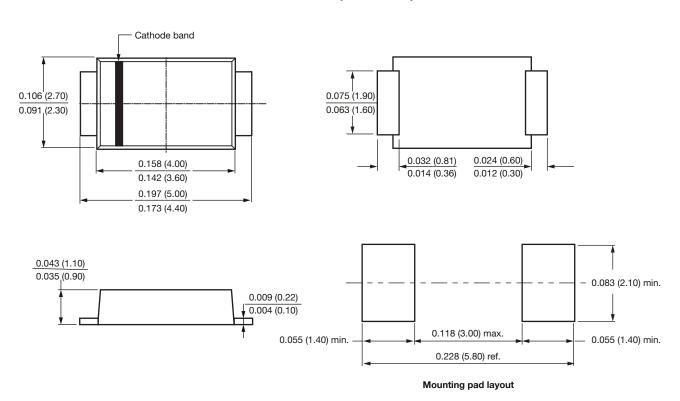


Fig. 6 - Typical Transient Thermal Impedance

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

### SlimSMAW (DO-221AD)





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