AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN

FREE



## Vishay General Semiconductor

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

### eSMP® Series



Bottom view

SMF (DO-219AB)

Cathode O Anode

#### LINKS TO ADDITIONAL RESOURCES

Top view



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	2.0 A		
V <sub>RRM</sub>	150 V		
I <sub>FSM</sub>	40 A		
$V_F$ at $I_F = 2 A (T_A = 125 °C)$	0.69 V		
T <sub>J</sub> max.	175 °C		
Package	SMF (DO-219AB)		
Circuit configuration	Single		

#### **FEATURES**

- Trench MOS Schottky technology
- · Low profile package
- · Ideal for automated placement
- · Low forward voltage drop, low power losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### TYPICAL APPLICATIONS

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

#### **MECHANICAL DATA**

Case: SMF (DO-219AB)

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 the cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V2FM15	UNIT	
Device marking code		2MC		
Maximum repetitive peak reverse voltage	$V_{RRM}$	150	V	
Maximum average forward rectified current (fig.1)	I <sub>F(AV)</sub> (1)	2.0	Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	40	А	
Operating junction temperature range	T <sub>J</sub> <sup>(2)</sup>	-40 to +175	°C	
Storage temperature range	T <sub>STG</sub>	-55 to +175	$\neg$	

#### Notes

(1) Free air, mounted on FR4 PCB, 2 oz. standard footprint

(2) 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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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		0.87	-	V
	I <sub>F</sub> = 2.0 A		V <sub>E</sub> (1)	1.28	1.46	
	I <sub>F</sub> = 1.0 A	T <sub>A</sub> = 125 °C	V <sub>F</sub> (')	0.60	-	
	I <sub>F</sub> = 2.0 A			0.69	0.77	
Reverse current	V <sub>R</sub> = 100 V	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C		0.3	-	μΑ
	v <sub>R</sub> = 100 v		I <sub>R</sub> <sup>(2)</sup>	300	-	
	V 150 V	T <sub>A</sub> = 25 °C	IR (=)	-	50	
	V <sub>R</sub> = 150 V T <sub>A</sub> = 125 °C		550	2000		
Typical junction capacitance	4.0 V, 1 MHz		CJ	90	-	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 noted)				
PARAMETER	SYMBOL	V2FM15	UNIT	
Typical thormal registeres	R <sub>0</sub> JA (1)(2)	125	°C/W	
Typical thermal resistance	R <sub>0JM</sub> (2)	26	C/VV	

#### **Notes**

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

<sup>(4)</sup> Device mounted on FR4 PCB, 2 oz. standard footprint, thermal resistance  $R_{\theta JA}$  – junction-to-ambient; thermal resistance  $R_{\theta JM}$  – junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V2FM15-M3/H	0.015	Н	3000	7" diameter plastic tape and reel
V2FM15-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
V2FM15HM3/H (1)	0.015	Н	3000	7" diameter plastic tape and reel
V2FM15HM3/I (1)	0.015	I	10 000	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)

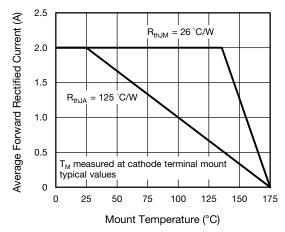


Fig. 1 - Maximum Forward Current Derating Curve

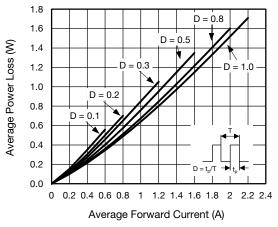


Fig. 2 - Average Power Loss Characteristics

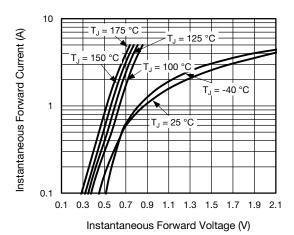


Fig. 3 - Typical Instantaneous Forward Characteristics

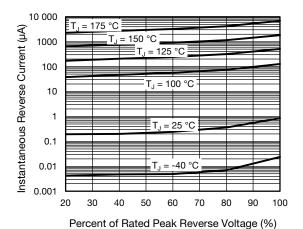


Fig. 4 - Typical Reverse Leakage Characteristics

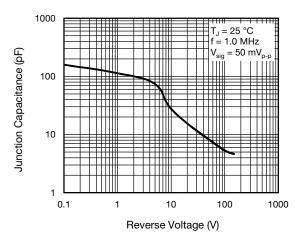


Fig. 5 - Typical Junction Capacitance

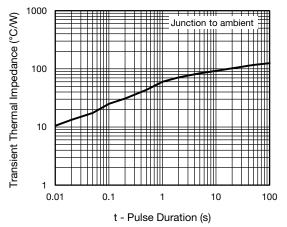
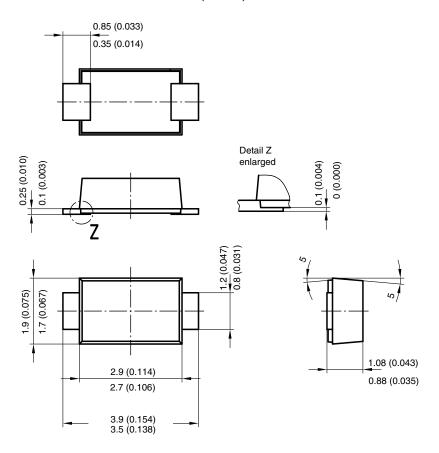


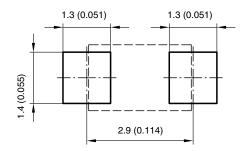
Fig. 6 - Typical Transient Thermal Impedance

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



#### Foot print recommendation:



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