AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN FREE



## Vishay General Semiconductor

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



#### MicroSMP (DO-219AD)



### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	1.0 A		
$V_{RRM}$	45 V		
I <sub>FSM</sub>	25 A		
$V_F$ at $I_F = 1.0$ A (125 °C)	0.36 V		
T <sub>J</sub> max.	150 °C		
Package	MicroSMP (DO-219AD)		
Circuit configuration	Single		

#### **FEATURES**

- Very low profile typical height of 0.65 mm
- · Ideal for automated placement
- Trench MOS Schottky technology
- · Low forward voltage drop
- Low power loss, high efficiency
- 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">www.vishay.com/doc?99912</a>

### **TYPICAL APPLICATIONS**

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

### **MECHANICAL DATA**

Case: MicroSMP (DO-219AD)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, and RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

TEO GTOT qualifica

Terminals: Matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets 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	V1PL45	UNIT	
Device marking code		1LE		
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	V	
Maximum DC forward current	I <sub>F(AV)</sub>	1.0		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	25	A	
Operating junction and storage temperature range	T <sub>J</sub> <sup>(1)</sup> , T <sub>STG</sub>	-40 to +150	°C	

#### Note

 $^{(1)}$  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 C	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 0.5 A	T <sub>A</sub> = 25 °C T <sub>A</sub> = 125 °C	V <sub>F</sub> <sup>(1)</sup>	0.41	-	V
	I <sub>F</sub> = 1.0 A			0.45	0.53	
	I <sub>F</sub> = 0.5 A			0.30	-	
	I <sub>F</sub> = 1.0 A			0.36	0.44	
Reverse current per diode	V <sub>R</sub> = 45 V	T <sub>A</sub> = 25 °C	1 (2)	-	0.25	- mA
	V <sub>R</sub> = 45 V	T <sub>A</sub> = 125 °C	I <sub>R</sub> <sup>(2)</sup>	2	10	
Typical junction capacitance	4.0 V, 1 MHz	4.0 V, 1 MHz		200	-	pF

#### **Notes**

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

(2) Pulse test: pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	RAMETER SYMBOL V1PL45		UNIT	
Typical thermal resistance	R <sub>0JA</sub> (1)(2)	130	°C/W	
	R <sub>0JM</sub> (3)	20		

#### 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 FR4 PCB, 2 oz. standard footprint,  $R_{\theta JA}$  junction to ambient
- $^{(3)}$  Mounted on FR4 PCB, 2 oz. standard footprint,  $R_{\theta JM}$  junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V1PL45M3/H	0.006	Н	4500	7" diameter plastic tape and reel
V1PL45HM3/H (1)	0.006	Н	4500	7" diameter plastic tape and reel

#### Note

(1) AEC-Q101 qualified

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

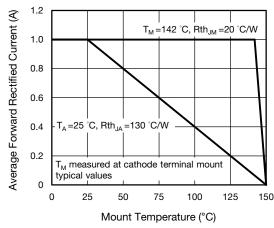


Fig. 1 - Maximum Forward Current Derating Curve

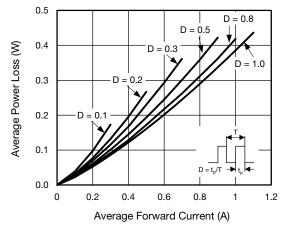


Fig. 2 - Average Power Loss Characteristics



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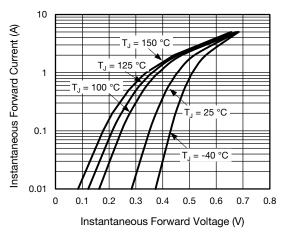


Fig. 3 - Typical Instantaneous Forward Characteristics

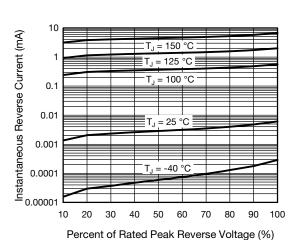


Fig. 4 - Typical Reverse Leakage Characteristics

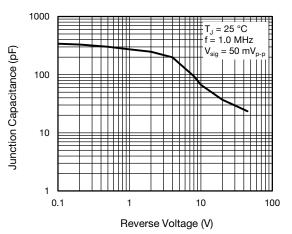


Fig. 5 - Typical Junction Capacitance

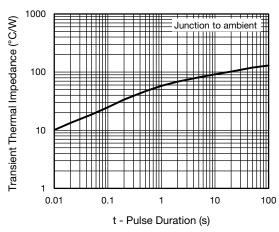
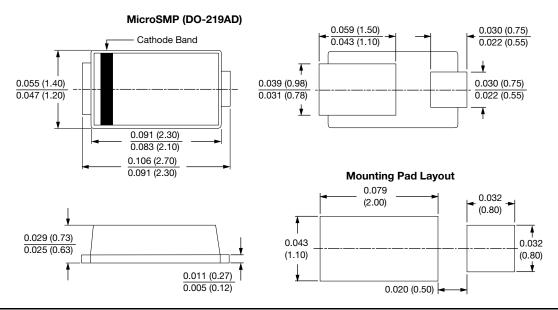


Fig. 6 - Typical Transient Thermal Impedance

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





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