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 <sub>RRM</sub>	200 V		
I <sub>FSM</sub>	25 A		
V <sub>F</sub> at I <sub>F</sub> = 1.0 A (125 °C)	0.65 V		
T <sub>J</sub> max.	175 °C		
Package	MicroSMP (DO-219AD)		
Circuit configuration	Single		

### **FEATURES**

Very low profile - typical height of 0.65 mm



· 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\_X - halogen-free, RoHS-compliant, and

AEC-Q101 qualified

("\_X" denotes revision code e.g. A, B,....)

Terminals: matte tin plated leads, solderable per

 $\ensuremath{\mathsf{J-STD}}\xspace-002$  and  $\ensuremath{\mathsf{JESD}}\xspace 22\xspace-B102$ 

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V1P22	UNIT	
Device marking code		V1D		
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V	
Maximum DC reverse voltage	V <sub>DC</sub>	160	V	
Maximum average forward rectified current	I <sub>F(AV)</sub> (1)	1.0	Α	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	25	Α	
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	°C	

## Notes

(1) Free air mounted on recommended copper pad area

 $<sup>^{(2)}</sup>$  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	$I_F = 0.5 A$	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.74	1	V
	$I_F = 1.0 A$			0.80	0.88	
	$I_F = 0.5 A$	T <sub>A</sub> = 125 °C		0.58	1	
	$I_F = 1.0 A$			0.65	0.73	
	V <sub>R</sub> = 160 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.001	-	- mA
Reverse current		T <sub>A</sub> = 125 °C		0.1	1	
	V <sub>R</sub> = 200 V	T <sub>A</sub> = 25 °C		-	0.015	
		T <sub>A</sub> = 125 °C		0.2	1.0	
Typical junction capacitance	4.0 V, 1 MHz		CJ	50.0	-	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 noted)			
PARAMETER	SYMBOL V1P22		UNIT
Typical thermal resistance	R <sub>0</sub> JA (1)(2)	130	°C/W
Typical inermal resistance	R <sub>0JM</sub> (3)	20	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 recommended copper pad area; thermal resistance,  $R_{\theta JM}$  junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V1P22-M3/H	0.006	Н	4500	7" diameter plastic tape and reel
V1P22HM3_A/H (1)	0.006	Н	4500	7" 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)

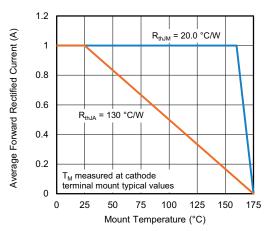


Fig. 1 - Maximum Forward Current Derating Curve

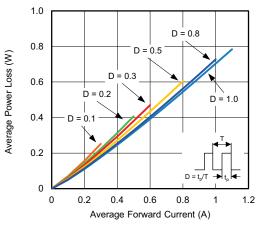


Fig. 2 - Average Power Loss Characteristics

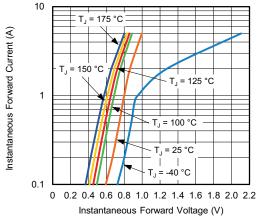


Fig. 3 - Typical Instantaneous Forward Characteristics

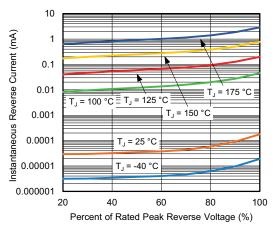


Fig. 4 - Typical Reverse Leakage Characteristics

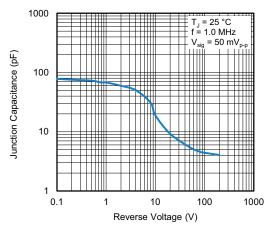


Fig. 5 - Typical Junction Capacitance

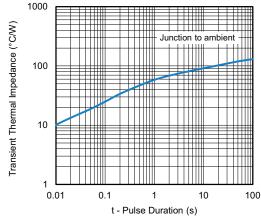
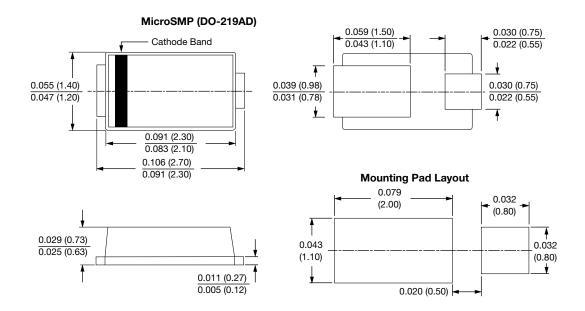


Fig. 6 - Typical Transient Thermal Impedance



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





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