AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN

FREE



Vishay General Semiconductor

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

eSMP® Series



SMF (DO-219AB)

Bottom view

Cathode O Anode

LINKS TO ADDITIONAL RESOURCES

Top view



PRIMARY CHARACTERISTICS			
I _{F(AV)}	1.0 A		
V _{RRM}	200 V		
I _{FSM}	30 A		
V_F at $I_F = 1 \text{ A (T}_A = 125 ^{\circ}\text{C)}$	0.64 V		
T _J 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 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: 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

 $\ensuremath{\mathsf{J-STD}}\xspace$ -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 _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V1F22	UNIT	
Device marking code		V1D		
Maximum repetitive peak reverse voltage	V _{RRM}	200	V	
Maximum DC reverse voltage	V _{DC}	160	V	
Maximum average forward rectified current (fig.1)	I _{F(AV)} ⁽¹⁾	1.0	А	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	30	А	
Operating junction temperature range	T _J ⁽²⁾	-40 to +175	°C	
Storage temperature range	T _{STG}	-55 to +175		

Notes

- (1) Free air, mounted on recommended copper pad area
- $^{(2)}$ 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 _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 0.5 A	- T _A = 25 °C		0.73	-	V
	I _F = 1.0 A		V _F (1)	0.80	0.88	
	$I_F = 0.5 A$	T _A = 125 °C	V _F ('')	0.57	=	
	I _F = 1.0 A			0.64	0.72	
Reverse current	V _R = 160 V	T _A = 25 °C T _A = 125 °C		0.1	-	μΑ
	v _R = 100 v		I _R ⁽²⁾	100	=	
	V _R = 200 V	T _A = 25 °C	IR (=)	-	35	
	V _R = 200 V T _A = 125 °C		300	1500		
Typical junction capacitance	4.0 V, 1 MHz		CJ	75	-	pF

Notes

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

 $^{(2)}$ Pulse test: Pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS (T _A = 25 °c unless otherwise noted)				
PARAMETER SYMBOL V1F22				
Typical thermal resistance	R ₀ JA (1)(2)	125	°C/W	
	R _{0JM} (3)	30	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
V1F22-M3/H	0.015	Н	3000	7" diameter plastic tape and reel
V1F22-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
V1F22HM3/H (1)	0.015	Н	3000	7" diameter plastic tape and reel
V1F22HM3/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_A = 25 °C unless otherwise noted)

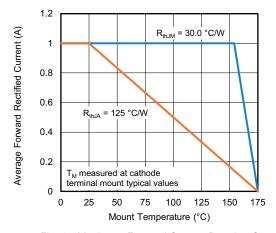


Fig. 1 - Maximum Forward Current Derating Curve

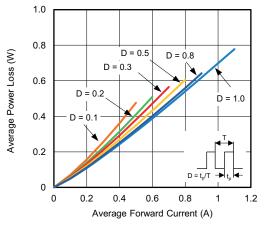


Fig. 2 - Average Power Loss Characteristics

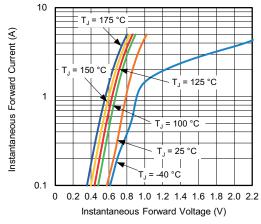


Fig. 3 - Typical Instantaneous Forward Characteristics

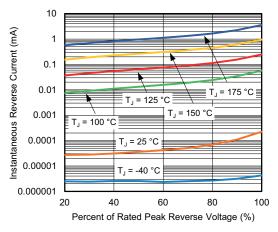


Fig. 4 - Typical Reverse Leakage Characteristics

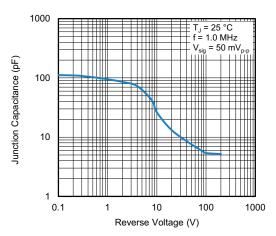


Fig. 5 - Typical Junction Capacitance

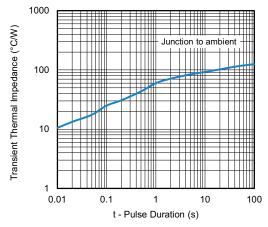
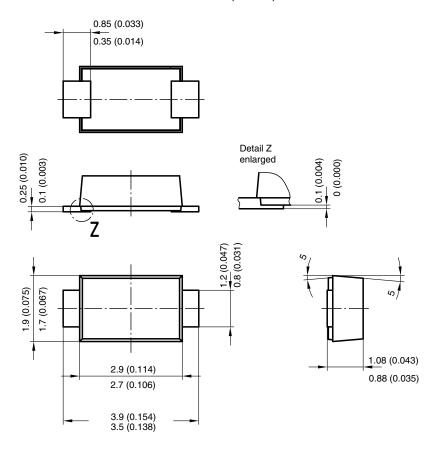


Fig. 6 - Typical Transient Thermal Impedance

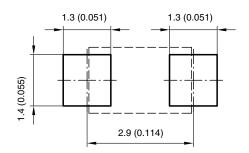


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PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



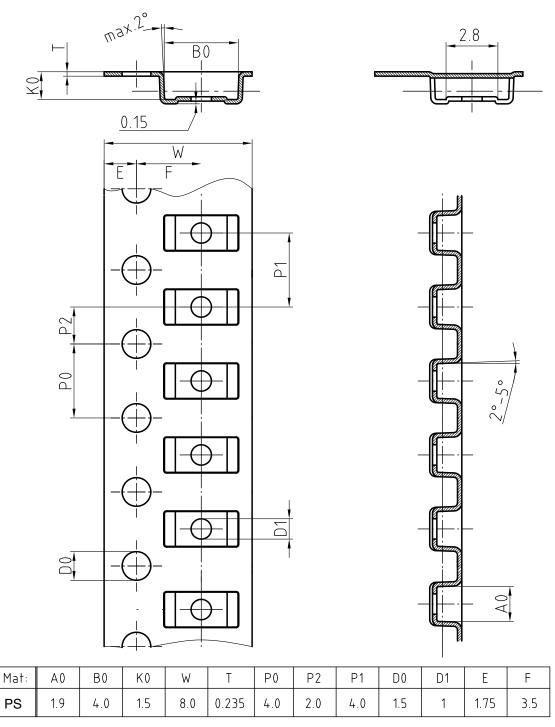
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BLISTERTAPE DIMENSIONS in millimeters: **SMF (DO-219AB)**



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