AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN

FREE



Vishay General Semiconductor

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



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	3 A		
V_{RRM}	100 V		
I _{FSM}	80 A		
V_F at $I_F = 3$ A, $T_J = 125$ °C	0.52 V		
T _J max.	150 °C		
Package	SlimSMA (DO-221AC)		
Circuit configuration	Single		

FEATURES

- Very low profile typical height of 0.95 mm
- · Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- 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 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: SlimSMA (DO-221AC)

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 meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSAF3103	UNIT	
Device marking code		V313		
Maximum repetitive peak reverse voltage	V _{RRM}	100	V	
Maximum DC forward current	I _{F(AV)} (1)	2.1	^	
	I _{F(AV)} (2)	3	Α Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	80	А	
Operating junction temperature range	T _J (3)	-40 to +150	°C	
Storage temperature range	T _{STG}	-55 to +150	°C	

Notes

- (1) Free air, mounted on recommended copper pad area
- (2) Mounted on 30 mm x 30 mm 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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ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per	I _F = 1.5 A	T _J = 25 °C	V _F ⁽¹⁾	0.49	-	V
	I _F = 3 A			0.57	0.65	
	I _F = 1.5 A	T _J = 125 °C		0.42	-	
	I _F = 3 A			0.52	0.59	
Reverse current	$V_R = 70 \text{ V}$ $T_J = 25 \text{ °C}$ $T_J = 125 \text{ °C}$	I _R (2)	0.003	-	mA	
		T _J = 125 °C	IR (=)	2	-	IIIA
	V _R = 100 V	T _J = 25 °C	I _R	-	0.17	- mA
		T _J = 125 °C		4.5	12	
Typical junction capacitance	4.0 V, 1 MHz		CJ	450	-	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 specified)				
PARAMETER SYMBOL VSSAF3103 U				
Typical thermal resistance	R ₀ JA (1)(2)	115	°C/W	
	R _{0JM} (3)	12		

Notes

- $^{(1)}$ Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ junction to ambient
- The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/DT_J < 1/R_{\theta JA}$
- $^{(3)}$ Mounted on 30 mm x 30 mm pad area, $R_{\theta JM}$ junction to mount

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
VSSAF3103-M3/H	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF3103-M3/I	0.032	I	14 000	13" diameter plastic tape and reel	
VSSAF3103HM3/H (1)	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF3103HM3/I (1)	0.032	I	14 000	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)

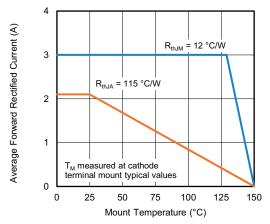


Fig. 1 - Maximum Forward Current Derating Curve

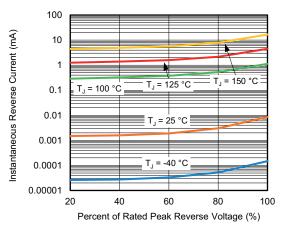


Fig. 4 - Typical Reverse Leakage Characteristics

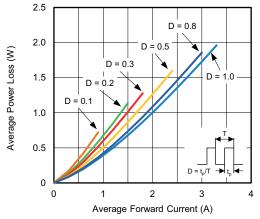


Fig. 2 - Forward Power Loss Characteristics

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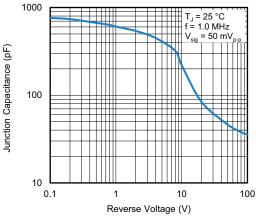


Fig. 5 - Typical Junction Capacitance

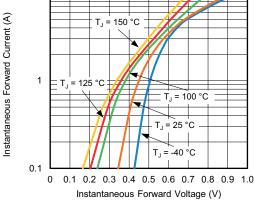


Fig. 3 - Typical Instantaneous Forward Characteristics

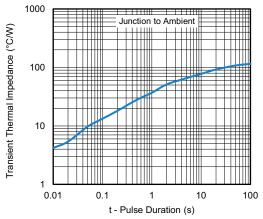


Fig. 6 - Typical Transient Thermal Impedance



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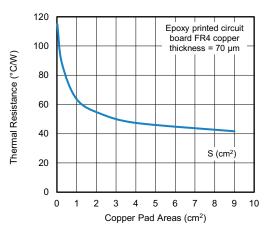
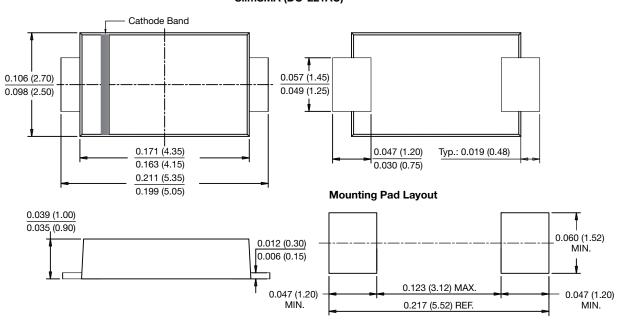


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)





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