AUTOMOTIVE

RoHS

COMPLIANT HALOGEN

FREE



Vishay General Semiconductor

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



SlimSMA (DO-221AC)



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	5.0 A			
V_{RRM}	100 V			
I _{FSM}	100 A			
V _F at I _F = 5.0 A (125 °C)	0.59 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	VSSAF510	UNIT
Device marking code		V510	
Maximum repetitive peak reverse voltage	V _{RRM}	100	V
Maximum average forward rectified current	I _{F(AV)} (1)	2.2	Δ.
	I _{F(AV)} (2)	5.0	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	100	А
Operating junction and storage temperature range	T _J , T _{STG}	-40 to +150	°C

Notes

- (1) Free air, mounted on recommended copper pad area
- (2) Mounted on 30 mm x 30 mm pad area



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 2.5 A	- T _A = 25 °C	V _F ⁽¹⁾	0.54	-	V
	$I_F = 5.0 A$			0.66	0.75	
	$I_F = 2.5 A$	T _A = 125 °C		0.48	-	
	$I_F = 5.0 A$			0.59	0.68	
Reverse current	V _R = 70 V	T _A = 25 °C	25 °C 125 °C 25 °C 125 °C	0.01	-	mA.
	v _R = 70 v	T _A = 125 °C		2	-	
	V _R = 100 V	T _A = 25 °C		-	0.5	mA
	v _R = 100 v	T _A = 125 °C		5	20]
Typical junction capacitance	4.0 V, 1 MF	4.0 V, 1 MHz		440	-	pF

Notes

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

(2) Pulse test: Pulse width \leq 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise specified)				
PARAMETER SYMBOL VSSAF510 UNIT				
Typical thermal resistance	R ₀ JA (1)(2)	115	°C/W	
Typical thermal resistance	R _{θJM} ⁽³⁾	12]	

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ junction to ambient, $R_{\theta JM}$ junction to mount
- $^{(2)}$ 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

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
VSSAF510-M3/H	0.032	Н	3500	7" diameter plastic tape and reel		
VSSAF510-M3/I	0.032	I	14 000	13" diameter plastic tape and reel		
VSSAF510HM3/H (1)	0.032	Н	3500	7" diameter plastic tape and reel		
VSSAF510HM3/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)

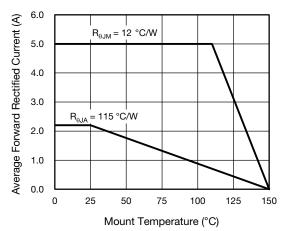


Fig. 1 - Maximum Forward Current Derating Curve

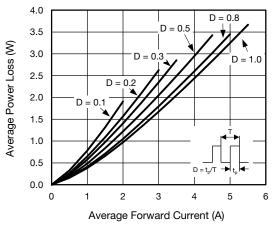


Fig. 2 - Forward Power Loss Characteristics

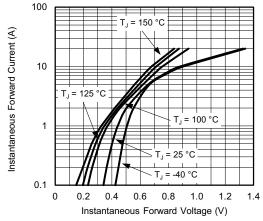


Fig. 3 - Typical Instantaneous Forward Characteristics

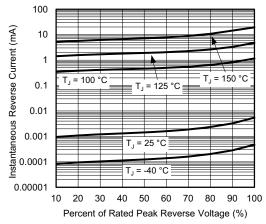


Fig. 4 - Typical Reverse Leakage Characteristics

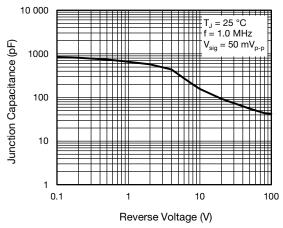


Fig. 5 - Typical Junction Capacitance

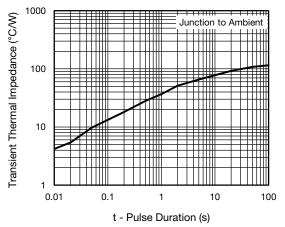


Fig. 6 - Typical Transient Thermal Impedance



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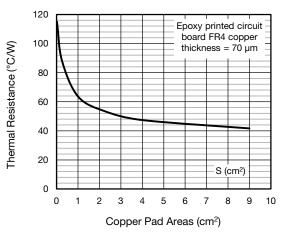
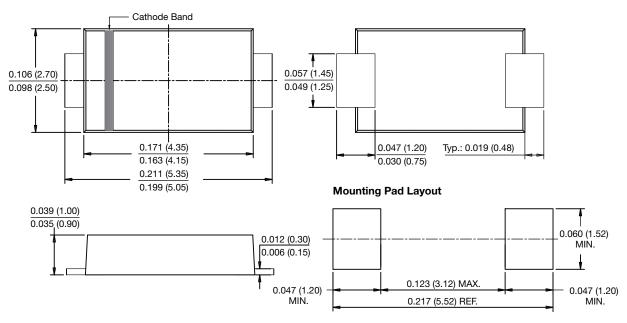


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)







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