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}	120 V			
I _{FSM}	100 A			
V _F at I _F = 5.0 A (125 °C)	0.64 V			
T _J max.	175 °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	VSSAF5M12	UNIT	
Device marking code		5M12		
Maximum repetitive peak reverse voltage	V_{RRM}	120	V	
Maximum DC forward current	I _{F(AV)} (1)	2.4	^	
Maximum DC forward current	I _{F(AV)} (2)	5.0	Α Α	
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 +175	°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⁾	0.64	-	V
	$I_F = 5.0 A$			0.81	0.89	
	$I_F = 2.5 A$	T _A = 125 °C		0.55	-	
	I _F = 5.0 A			0.64	0.74	
Reverse current	V _R = 90 V	$V_R = 90 \text{ V}$ $T_A = 25 \text{ °C}$ $T_A = 125 \text{ °C}$	I _R ⁽²⁾	0.01	-	mA
	V _R = 90 V	T _A = 125 °C		0.8	-	
	V _R = 120 V	T _A = 25 °C T _A = 125 °C	I _R ⁽²⁾	-	0.35	- mA
	v _R = 120 v	T _A = 125 °C		1.6	6	
Typical junction capacitance	4.0 V, 1 MF	4.0 V, 1 MHz		420	-	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 VSSAF5M12 UNIT				
Typical thermal resistance	R ₀ JA (1)(2)	115	°C/W	
Typical trieffial 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	
VSSAF5M12-M3/H	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF5M12-M3/I	0.032	I	14 000	13" diameter plastic tape and reel	
VSSAF5M12HM3/H (1)	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF5M12HM3/I (1)	0.032	L	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)

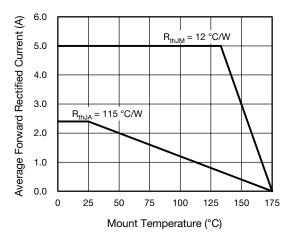


Fig. 1 - Maximum Forward Current Derating Curve

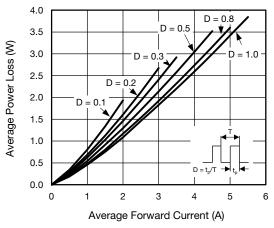


Fig. 2 - Forward Power Loss Characteristics

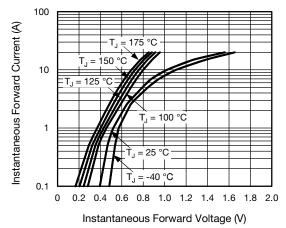


Fig. 3 - Typical Instantaneous Forward Characteristics

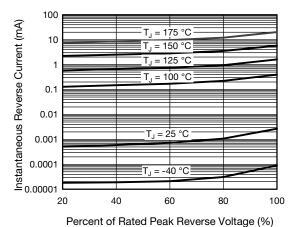


Fig. 4 - Typical Reverse Leakage Characteristics

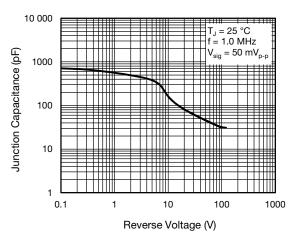


Fig. 5 - Typical Junction Capacitance

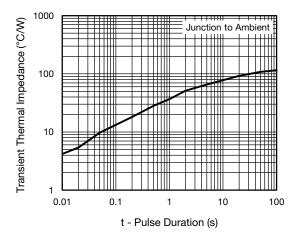


Fig. 6 - Typical Transient Thermal Impedance



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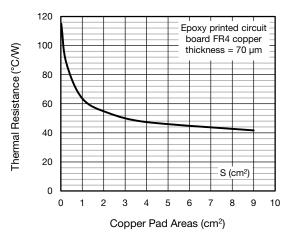
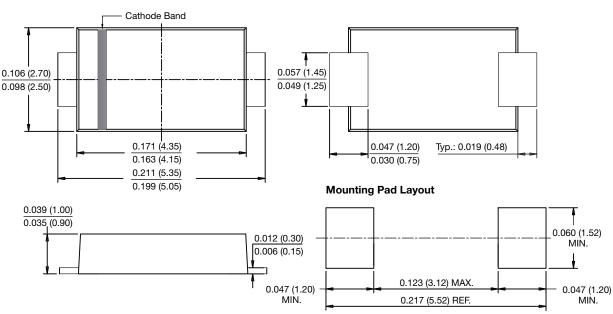


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-221AC (SlimSMA)





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