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)	0.62 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	VSSAF5M10	UNIT		
Device marking code		5M10			
Maximum repetitive peak reverse voltage	V _{RRM}	100	V		
Marriago um DC formulard or umant	I _{F(AV)} (1)	2.6			
Maximum DC forward current	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 +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⁾	0.59	-	V
	$I_F = 5.0 A$			0.71	0.79	
	I _F = 2.5 A	T _A = 125 °C		0.51	-	
	I _F = 5.0 A			0.62	0.7	
Reverse current	V _R = 70 V	= 70 V $T_A = 25 ^{\circ}\text{C}$ $T_A = 125 ^{\circ}\text{C}$	I _R ⁽²⁾	0.01	-	- mA
	v _R = 70 v	T _A = 125 °C		0.8	-	
	V _R = 100 V	T _A = 25 °C T _A = 125 °C	I _R ⁽²⁾	-	0.4	- mA
	V _R = 100 V	T _A = 125 °C		1.5	4	
Typical junction capacitance	4.0 V, 1 MF	4.0 V, 1 MHz		470	-	pF

Notes

 $^{(1)}$ Pulse test: 300 μ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise specified)				
PARAMETER SYMBOL VSSAF5M10		VSSAF5M10	UNIT	
Typical thormal registance	R _{θJA} (1)(2)	115	°C/W	
Typical thermal resistance	R _{0JM} (3)	12	C/W	

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
- 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		
VSSAF5M10-M3/H	0.032	Н	3500	7" diameter plastic tape and reel		
VSSAF5M10-M3/I	0.032	I	14 000	13" diameter plastic tape and reel		
VSSAF5M10HM3/H (1)	0.032	Н	3500	7" diameter plastic tape and reel		
VSSAF5M10HM3/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)

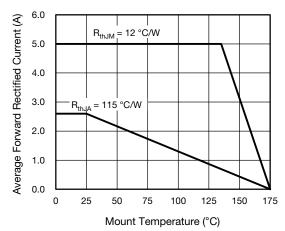


Fig. 1 - Maximum Forward Current Derating Curve

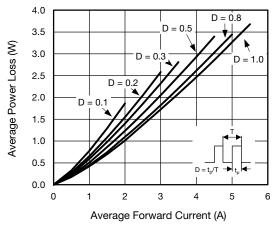


Fig. 2 - Forward Power Loss Characteristics

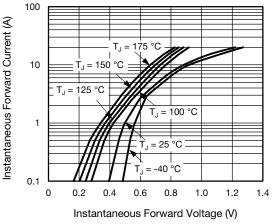


Fig. 3 - Typical Instantaneous Forward Characteristics

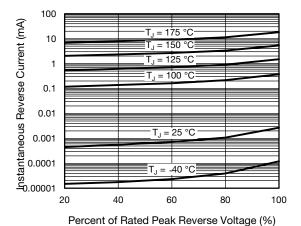


Fig. 4 - Typical Reverse Leakage Characteristics

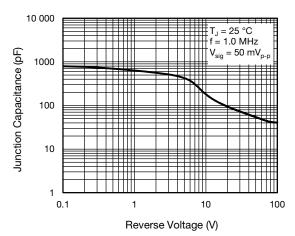


Fig. 5 - Typical Junction Capacitance

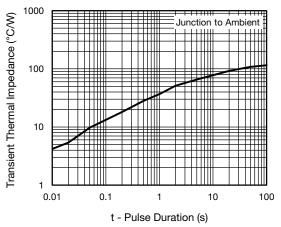


Fig. 6 - Typical Transient Thermal Impedance

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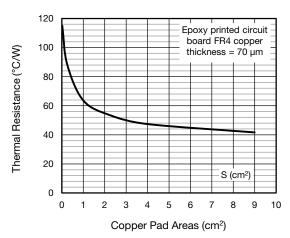


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC) Cathode Band 0.057 (1.45) 0.106 (2.70) 0.049 (1.25) 0.098 (2.50) 0.171 (4.35) 0.047 (1.20) Typ.: 0.019 (0.48) 0.163 (4.15) 0.030 (0.75) 0.211 (5.35) 0.199 (5.05) **Mounting Pad Layout** 0.039 (1.00) 0.035 (0.90) 0.060 (1.52) 0.012 (0.30) MIN. 0.006 (0.15) 0.123 (3.12) MAX 0.047 (1.20) 0.047 (1.20) MIN. 0.217 (5.52) REF. MIN.



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