RoHS

HALOGEN FREE



## Vishay General Semiconductor

# **Surface Mount Trench MOS Barrier Schottky Rectifier**





SlimSMA (DO-221AC)

**Bottom View** 

Cathode O Anode

### **DESIGN SUPPORT TOOLS**

**Top View** 

click logo to get started



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	5.0 A		
V <sub>RRM</sub>	150 V		
I <sub>FSM</sub>	100 A		
V <sub>F</sub> at I <sub>F</sub> = 5.0 A (125 °C)	0.66 V		
T <sub>J</sub> 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 <a href="https://www.vishav.com/doc?99912"><u>www.vishav.com/doc?99912</u></a>

### **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 <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	VSSAF515	UNIT		
Device marking code		V515			
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	150	V		
I <sub>F(AV)</sub> <sup>(1)</sup>		1.8			
Maximum average forward rectified current	I <sub>F(AV)</sub> (2)	5.0	A		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	100	А		
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-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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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 2.5 A$	T <sub>A</sub> = 25 °C	V <sub>E</sub> <sup>(1)</sup>	0.77	-	V	
	$I_F = 5.0 A$			1.02	1.10		
	$I_F = 2.5 A$	- T <sub>A</sub> = 125 °C		vF (·)	0.58	-	]
	$I_F = 5.0 A$			0.66	0.75		
Reverse current	V 100 V	$V_R = 100 \text{ V}$ $T_A = 25 \text{ °C}$ $T_A = 125 \text{ °C}$	I <sub>R</sub> <sup>(2)</sup>	0.01	-	mA	
	v <sub>R</sub> = 100 v	T <sub>A</sub> = 125 °C		0.6	-		
	V <sub>R</sub> = 150 V	$T_A = 25  ^{\circ}\text{C}$ $T_A = 125  ^{\circ}\text{C}$		-	0.2		
	VH = 130 V	T <sub>A</sub> = 125 °C		2	5		
Typical junction capacitance	4.0 V, 1 MHz		CJ	280	-	pF	

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER SYMBOL VSSAF515			UNIT	
Typical thormal registance	R <sub>θJA</sub> (1)(2)	115	°C/W	
Typical thermal resistance	R <sub>0JM</sub> (3)	12	G/ <b>VV</b>	

#### 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	
VSSAF515-M3/H	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF515-M3/I	0.032	I	14 000	13" diameter plastic tape and reel	
VSSAF515HM3/H (1)	0.032	Н	3500	7" diameter plastic tape and reel	
VSSAF515HM3/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<sub>A</sub> = 25 °C unless otherwise noted)

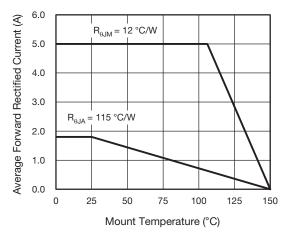


Fig. 1 - Maximum Forward Current Derating Curve

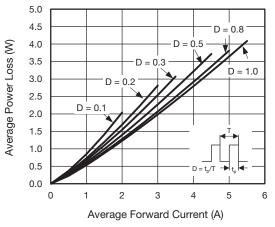


Fig. 2 - Forward Power Loss Characteristics

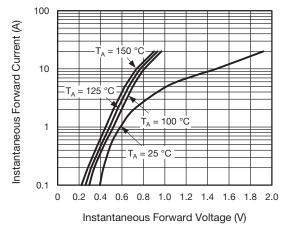


Fig. 3 - Typical Instantaneous Forward Characteristics

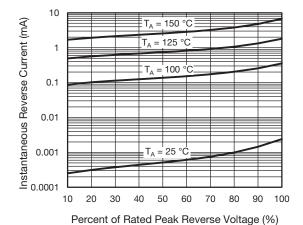


Fig. 4 - Typical Reverse Leakage Characteristics

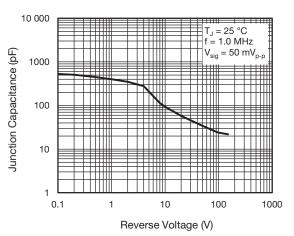


Fig. 5 - Typical Junction Capacitance

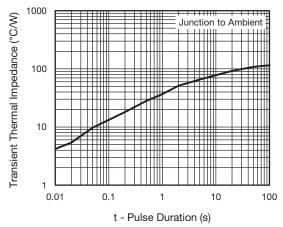


Fig. 6 - Typical Transient Thermal Impedance



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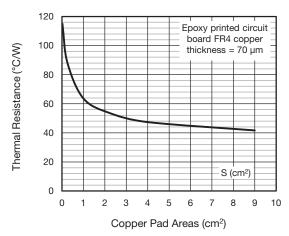
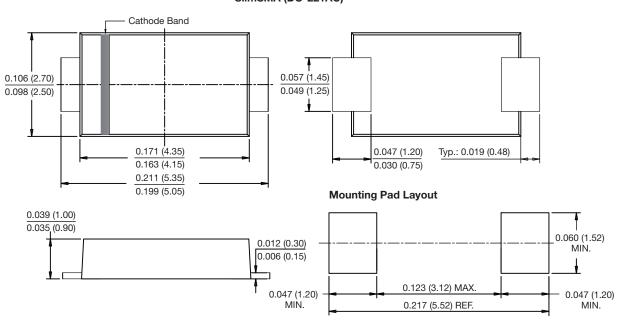


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

### SlimSMA (DO-221AC)





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