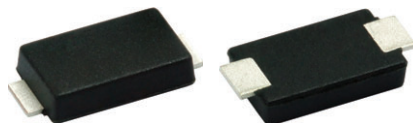


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

## eSMP® Series



Top View

Bottom View

### SlimSMA (DO-221AC)

Cathode  Anode

## 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	3.0 A
$V_{RRM}$	50 V
$I_{FSM}$	80 A
$V_F$ at $I_F = 3.0$ A	0.40 V
$T_J$ max.	150 °C
Package	SlimSMA (DO-221AC)
Circuit configuration	Single

## TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

## MECHANICAL DATA

**Case:** SlimSMA (DO-221AC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD22-B102

M3 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	VSSAF3N50	UNIT
Device marking code		3N5	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	V
Maximum DC forward current (fig. 1)	$I_F^{(1)}$	3.0	A
	$I_F^{(2)}$	2.7	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	80	A
Maximum DC reserve voltage	$V_{DC}$	35	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +150	°C

### Note

(1) Mounted on 5 mm x 5 mm copper pad areas, 2 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.40	-	V
	I <sub>F</sub> = 3.0 A			0.47	0.54	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.30	-	
	I <sub>F</sub> = 3.0 A			0.40	0.48	
Reverse current	V <sub>R</sub> = 35 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.01	-	mA
		T <sub>A</sub> = 125 °C		8	-	
	V <sub>R</sub> = 50 V	T <sub>A</sub> = 25 °C		-	1	
		T <sub>A</sub> = 125 °C		12.5	35	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	570	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 5\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	VSSAF3N50	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	115	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(1)}$	12	

**Note**(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**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
VSSAF3N50-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF3N50-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel

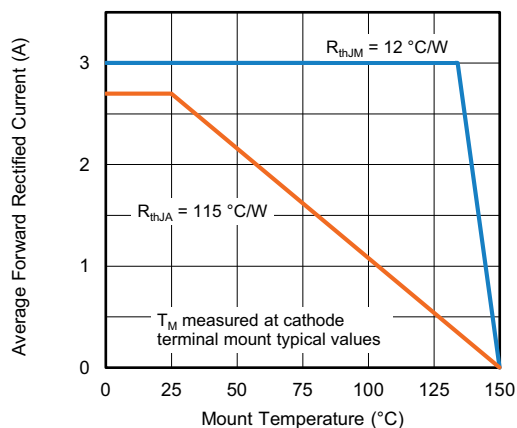
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

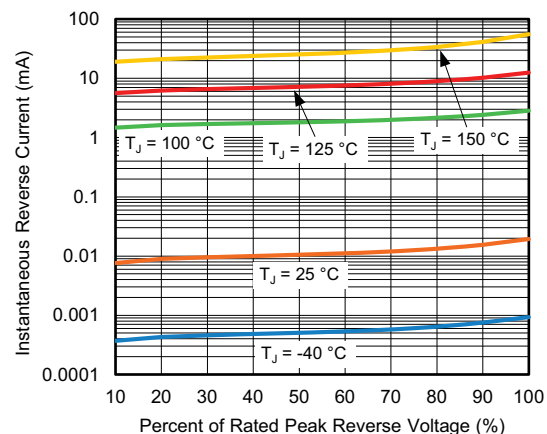


Fig. 4 - Typical Reverse Leakage Characteristics

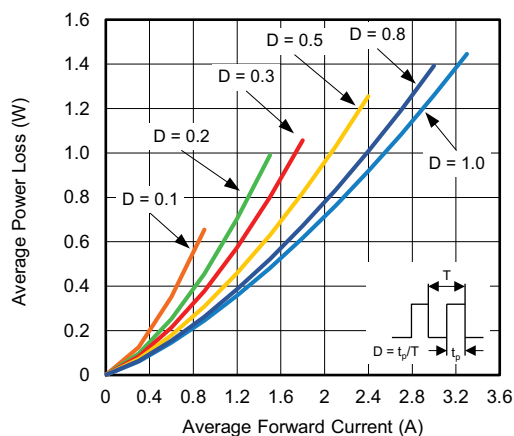


Fig. 2 - Forward Power Loss Characteristics

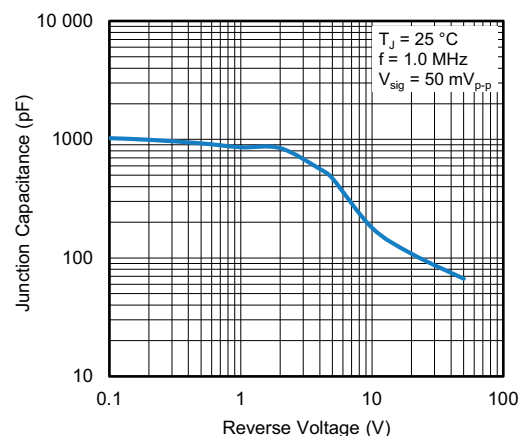


Fig. 5 - Typical Junction Capacitance

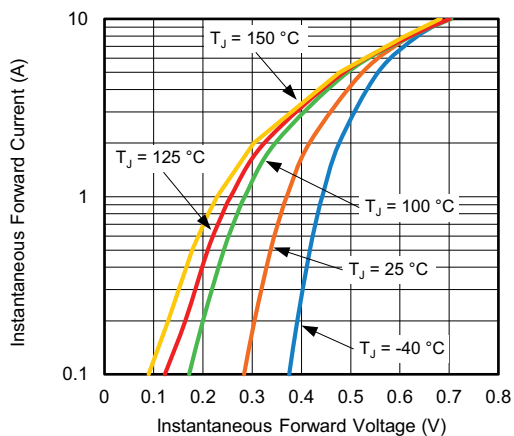


Fig. 3 - Typical Instantaneous Forward Characteristics

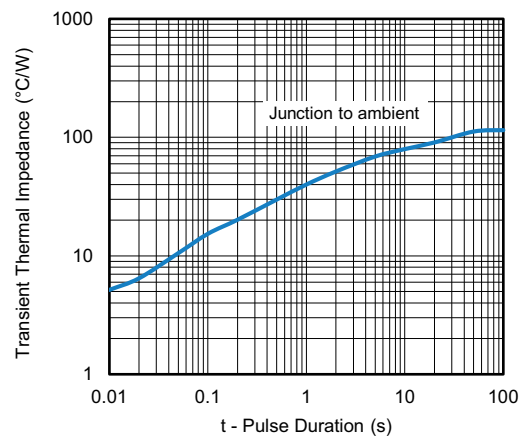


Fig. 6 - Typical Transient Thermal Impedance

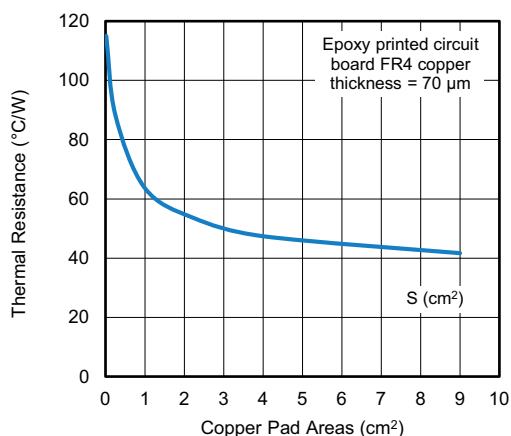
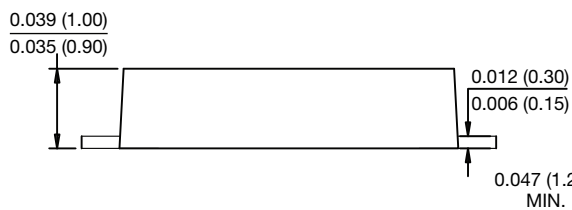
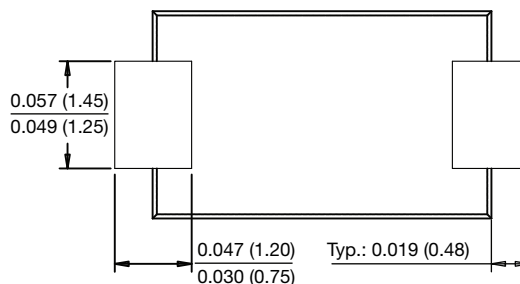
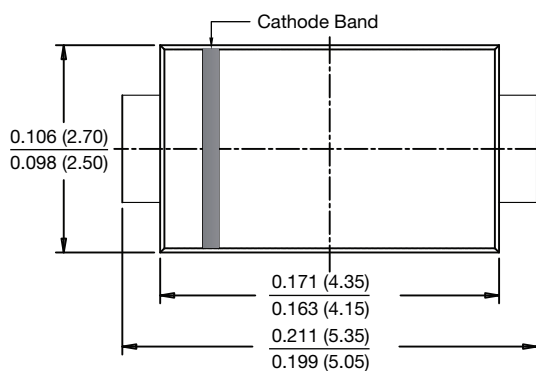


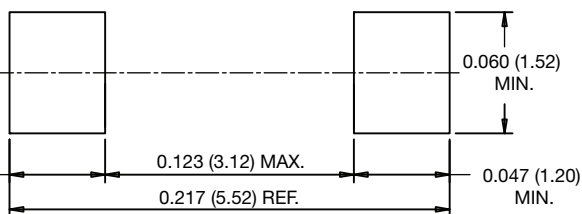
Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SlimSMA (DO-221AC)



### Mounting Pad Layout





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