

# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

**eSMP<sup>®</sup> 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](#)
**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

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

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	$I_F = 1.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.40	-	V
	$I_F = 3.0\text{ A}$			0.47	0.54	
	$I_F = 1.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.30	-	
	$I_F = 3.0\text{ A}$			0.40	0.48	
Reverse current	$V_R = 35\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	0.01	-	mA
		$T_A = 125\text{ }^\circ\text{C}$		8	-	
	$V_R = 50\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	1	
		$T_A = 125\text{ }^\circ\text{C}$		12.5	35	
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	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)

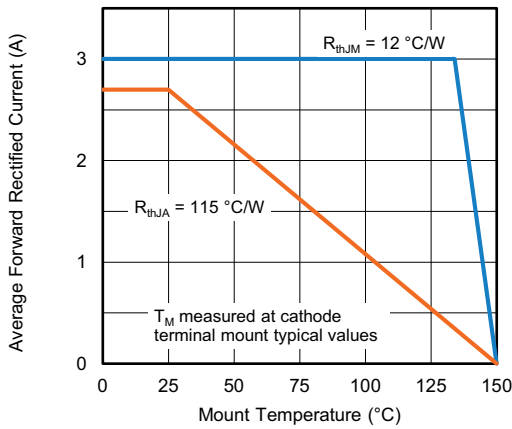


Fig. 1 - Maximum Forward Current Derating Curve

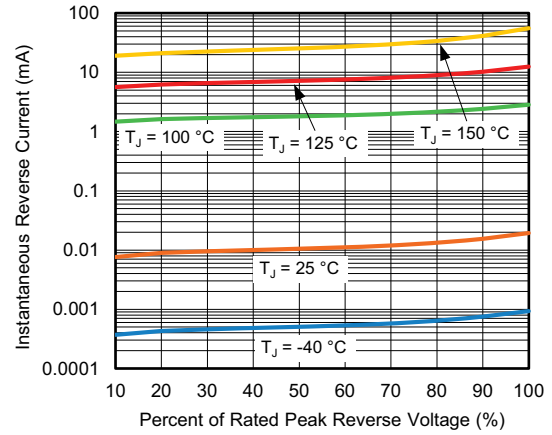


Fig. 4 - Typical Reverse Leakage Characteristics

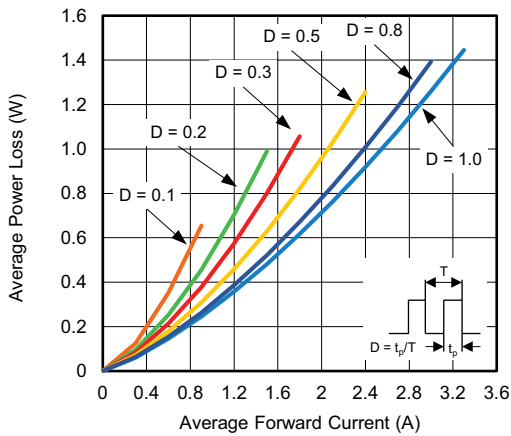


Fig. 2 - Forward Power Loss Characteristics

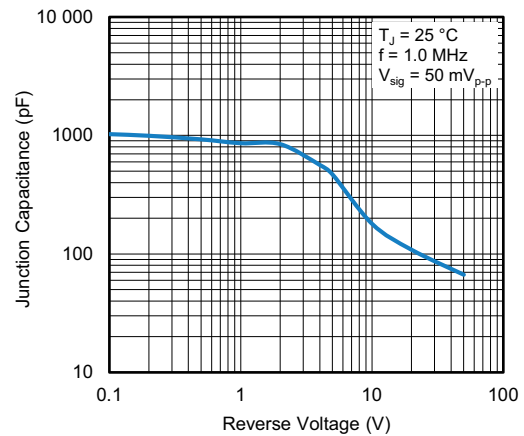


Fig. 5 - Typical Junction Capacitance

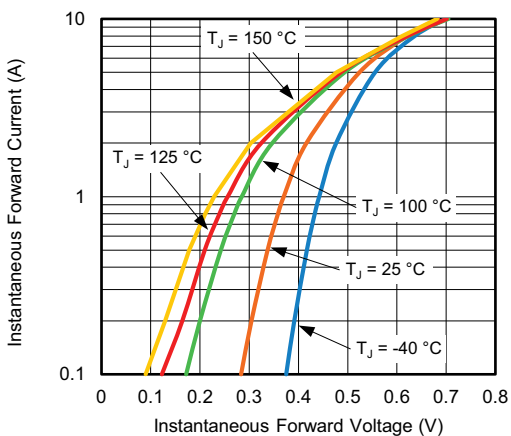


Fig. 3 - Typical Instantaneous Forward Characteristics

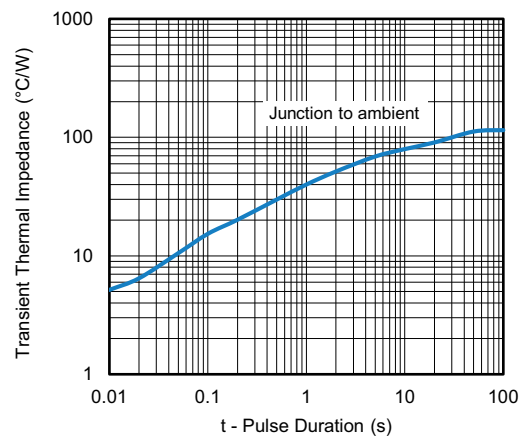


Fig. 6 - Typical Transient Thermal Impedance

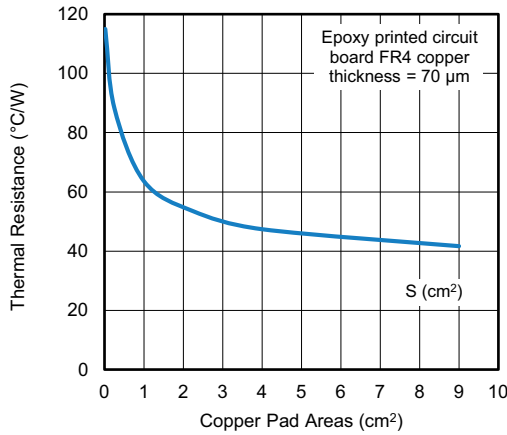
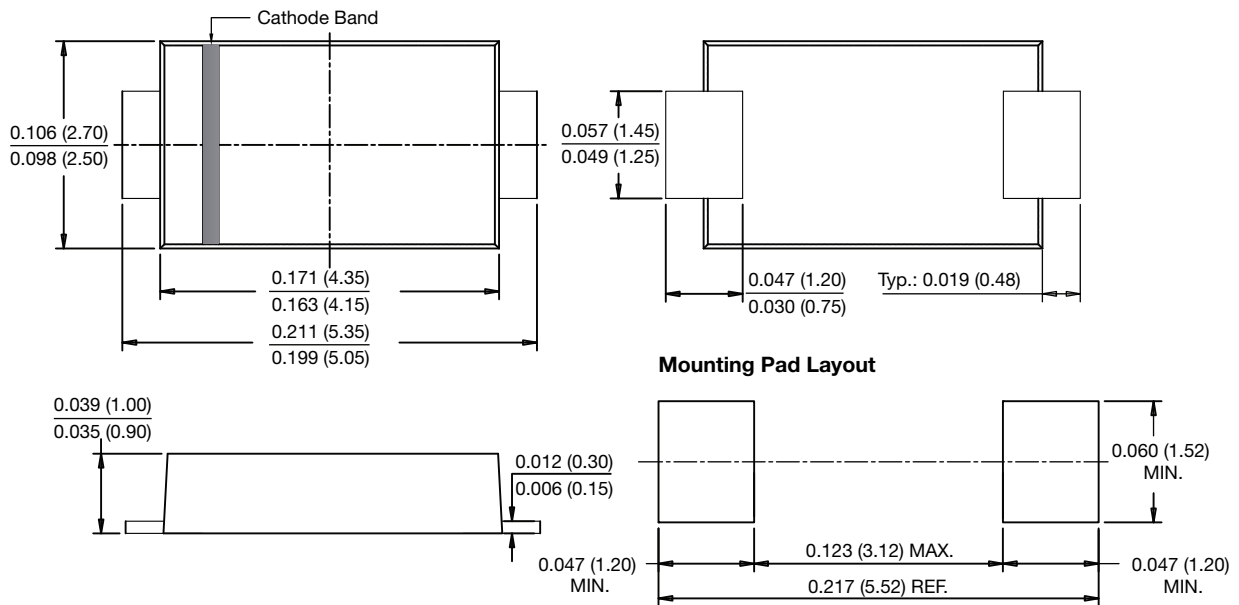


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

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

**SlimSMA (DO-221AC)**





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