

## 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



### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	5.0 A
$V_{RRM}$	50 V
$I_{FSM}$	100 A
$V_F$ at $I_F = 5.0$ A	0.41 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	VSSAF5N50	UNIT
Device marking code		5N5	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	V
Maximum DC forward current (fig. 1)	$I_F$ (1)	5.0	A
	$I_F$ (2)	3.0	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	100	A
Maximum DC reverse voltage	$V_{DC}$	35	V
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +150	°C

#### Notes

(1) Mounted on 10 mm x 10 mm pad areas, 2 oz. FR4 PCB

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

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 2.5 \text{ A}$	$V_F$ (1)	0.41	-	V
	$I_F = 5.0 \text{ A}$		0.48	0.56	
	$I_F = 2.5 \text{ A}$		0.31	-	
	$I_F = 5.0 \text{ A}$		0.41	0.50	
Reverse current	$V_R = 35 \text{ V}$	$I_R$ (2)	0.02	-	mA
	$T_A = 25^\circ\text{C}$		12	-	
	$T_A = 125^\circ\text{C}$		-	1.4	
	$V_R = 50 \text{ V}$		19	50	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	850	-	pF

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40 \text{ ms}$

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

PARAMETER	SYMBOL	VSSAF5N50	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	115	°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

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
VSSAF5N50-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF5N50-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel

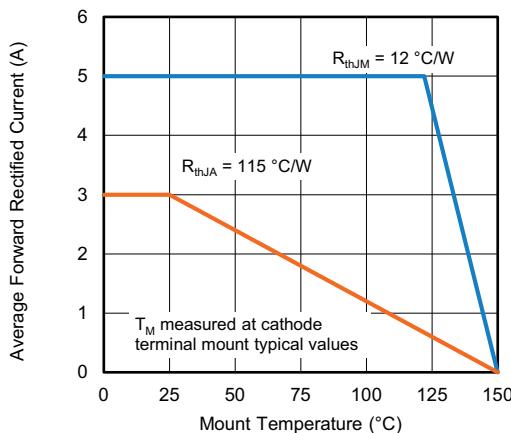
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

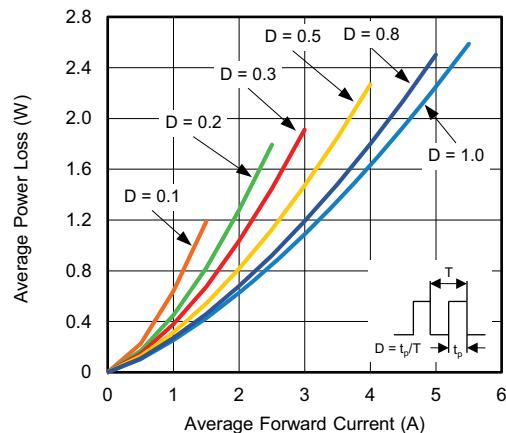


Fig. 2 - Average Power Loss Characteristics

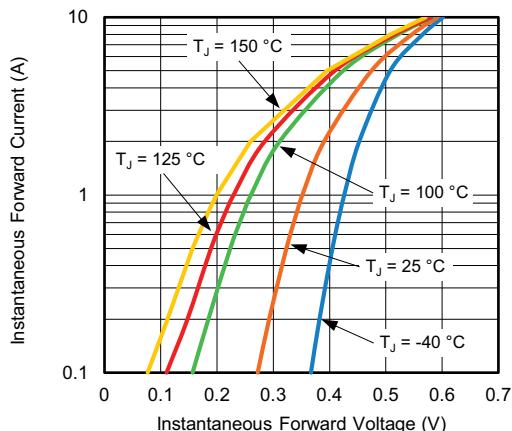


Fig. 3 - Typical Instantaneous Forward Characteristics

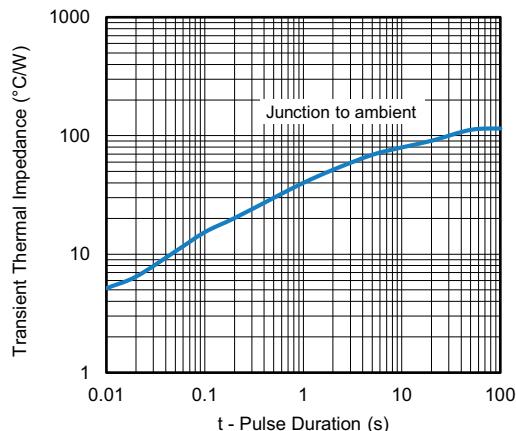


Fig. 6 - Typical Transient Thermal Impedance

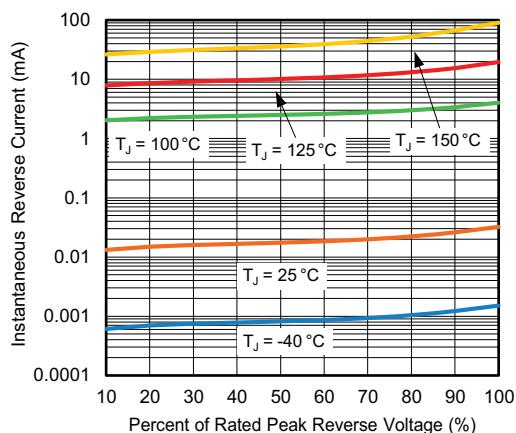


Fig. 4 - Typical Reverse Leakage Characteristics

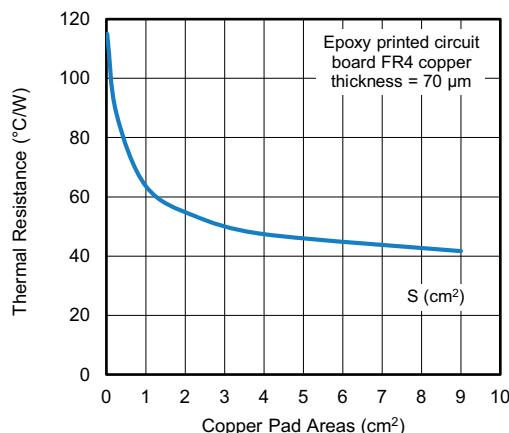


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

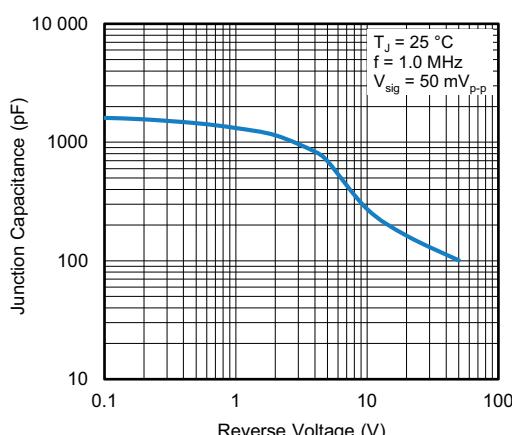
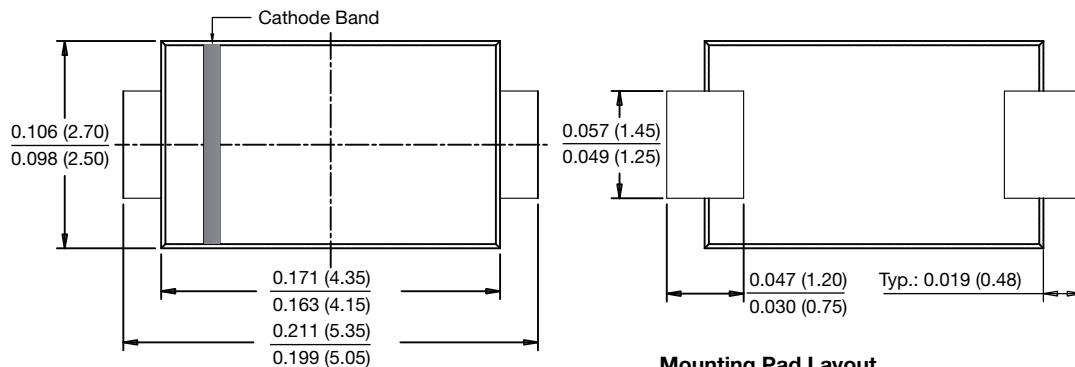
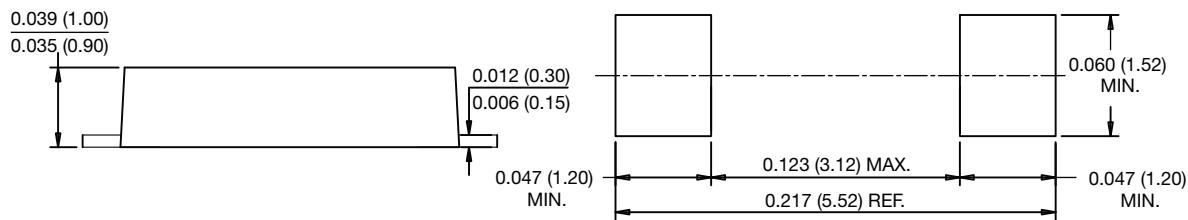


Fig. 5 - Typical Junction Capacitance

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

**SlimSMA (DO-221AC)**

**Mounting Pad Layout**


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