

# 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
- AEC-Q101 qualified available  
- Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
Available

RoHS  
COMPLIANT  
HALOGEN  
FREE

## LINKS TO ADDITIONAL RESOURCES



## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	3.0 A
$V_{RRM}$	45 V
$I_{FSM}$	80 A
$I_R$ at $V_R = 45$ V (125 °C)	5 mA
$V_F$ at $I_F = 3.0$ A (125 °C)	0.37 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 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, and commercial grade

Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified  
("X" denotes revision code e.g. A, B,.....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD22-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	VSSAF3L45	UNIT
Device marking code		3L45	
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	V
Maximum DC forward rectified current	$I_{F(AV)}^{(1)}$	3.0	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	80	A
Operating junction and storage temperature range	$T_J^{(2)}, T_{STG}$	-40 to +150	°C

### Note

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

(2) The heat generated must be less than thermal conductivity from junction to ambient:  $dP_D/DT_J < 1/R_{\theta JA}$

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 1.5\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	0.41	-	V
	$I_F = 3.0\text{ A}$		0.46	0.54	
	$I_F = 1.5\text{ A}$	$T_A = 125\text{ }^{\circ}\text{C}$	0.31	-	
	$I_F = 3.0\text{ A}$		0.37	0.46	
Reverse current	$V_R = 45\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	-	450	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$	5	25	mA
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	425	-	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** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	VSSAF3L45	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	115	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)(3)}$	12	

**Notes**

(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

(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 10 mm x 10 mm pad areas, 2 oz. FR4 PCB,  $R_{\theta JM}$  - junction to mount

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
VSSAF3L45-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF3L45-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel
VSSAF3L45HM3_A/H <sup>(1)</sup>	0.032	H	3500	7" diameter plastic tape and reel
VSSAF3L45HM3_A/I <sup>(1)</sup>	0.032	I	14 000	13" diameter plastic tape and reel

**Note**
<sup>(1)</sup> AEC-Q101 qualified

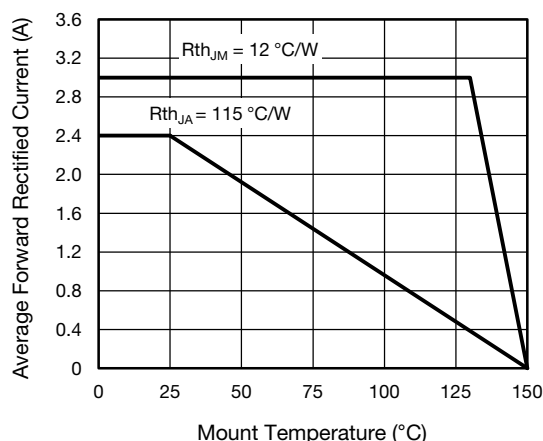
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

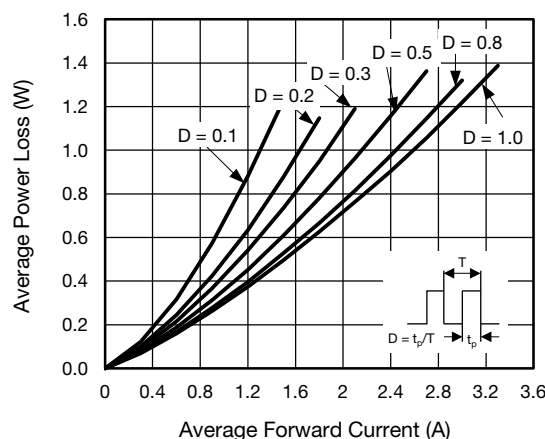


Fig. 2 - Average Power Loss Characteristics

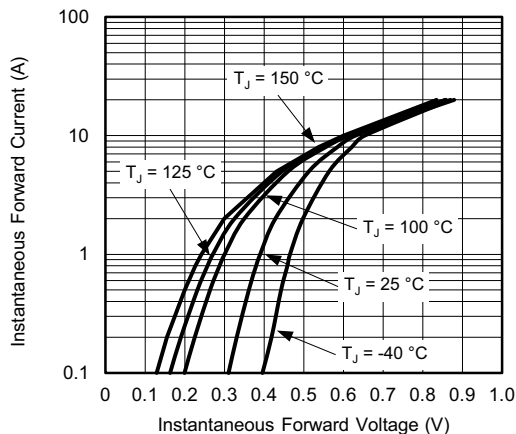


Fig. 3 - Typical Instantaneous Forward Characteristics

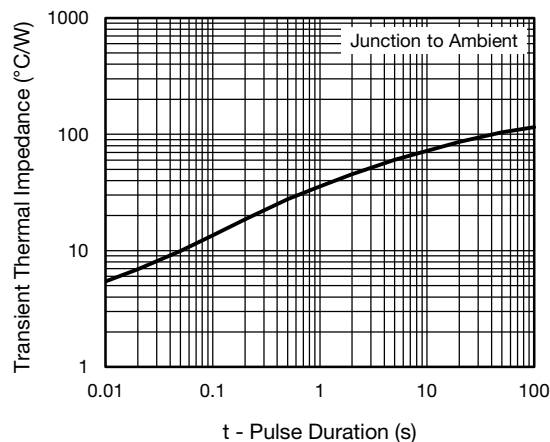


Fig. 6 - Typical Transient Thermal Impedance

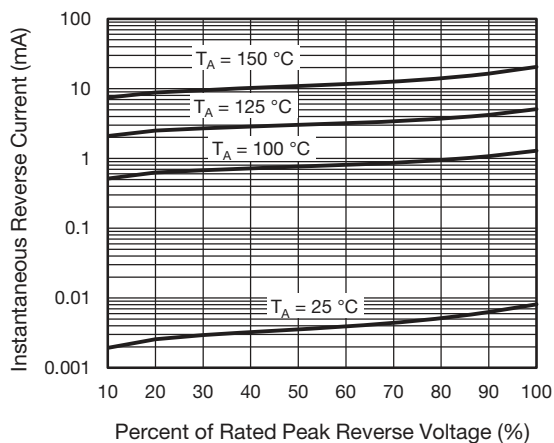


Fig. 4 - Typical Reverse Leakage Characteristics

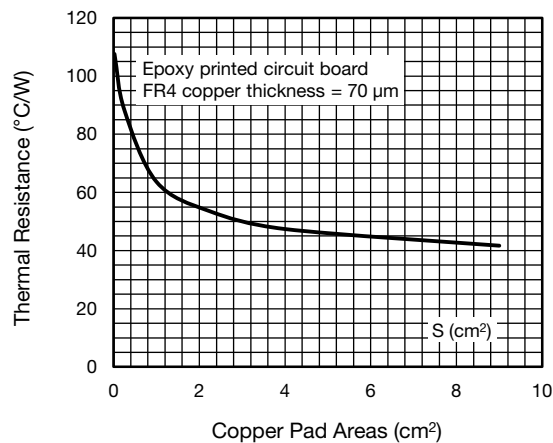


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

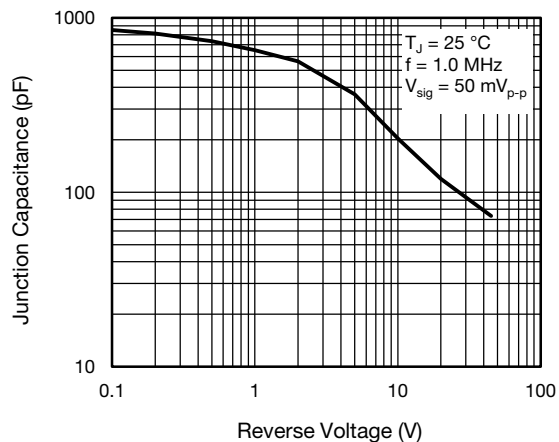
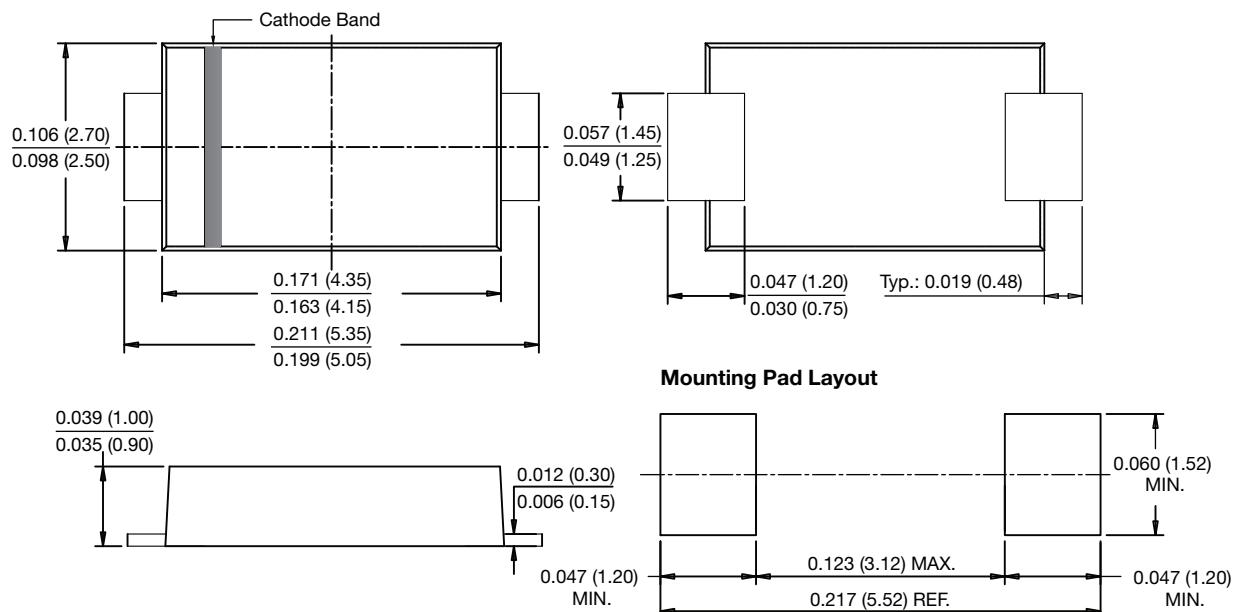


Fig. 5 - Typical Junction Capacitance



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

**SlimSMA (DO-221AC)**





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