

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

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	$I_F = 1.5\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	0.41	V
	$I_F = 3.0\text{ A}$			0.46	
	$I_F = 1.5\text{ A}$	$T_A = 125\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	0.31	
	$I_F = 3.0\text{ A}$			0.37	
Reverse current	$V_R = 45\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	-	μA
		$T_A = 125\text{ }^{\circ}\text{C}$		5	mA
Typical junction capacitance	4.0 V, 1 MHz	C_J	425	-	pF

Notes

(1) Pulse test: 300 μs 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 ⁽¹⁾	0.032	H	3500	7" diameter plastic tape and reel
VSSAF3L45HM3_A/I ⁽¹⁾	0.032	I	14 000	13" diameter plastic tape and reel

Note
⁽¹⁾ AEC-Q101 qualified

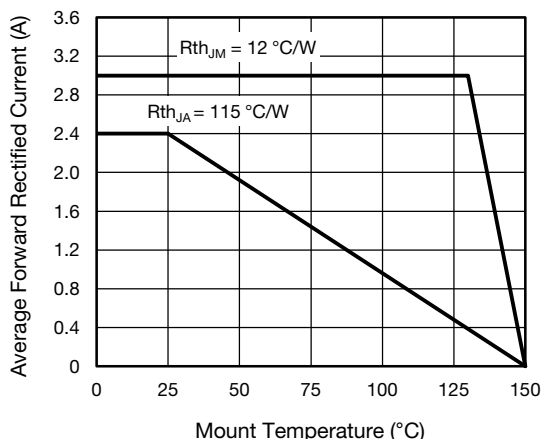
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

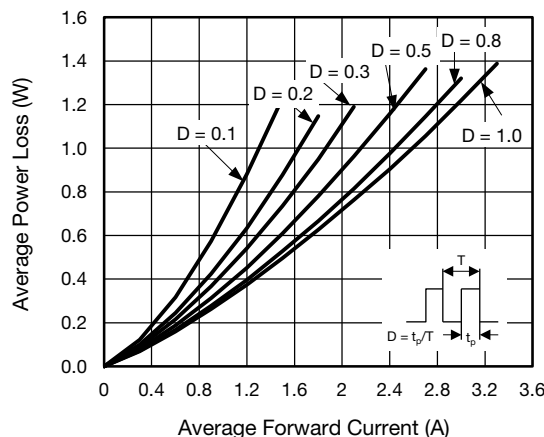


Fig. 2 - Average Power Loss Characteristics

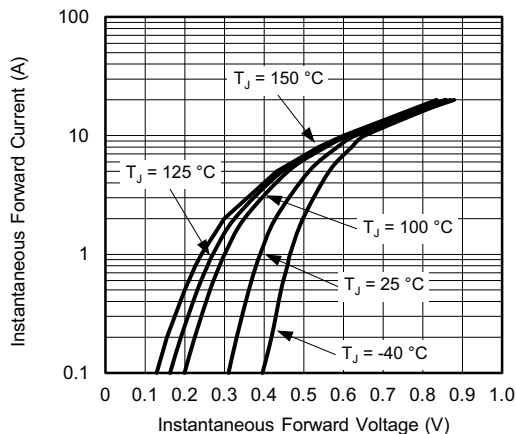


Fig. 3 - Typical Instantaneous Forward Characteristics

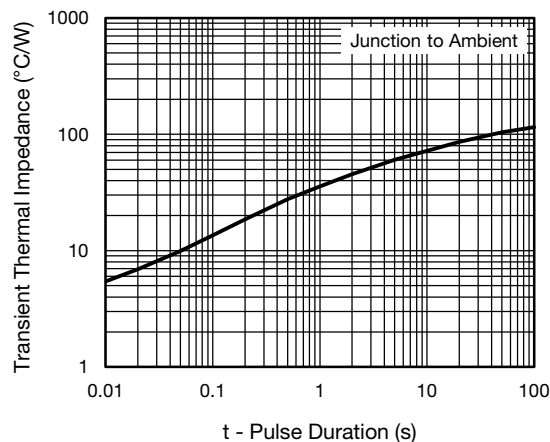


Fig. 6 - Typical Transient Thermal Impedance

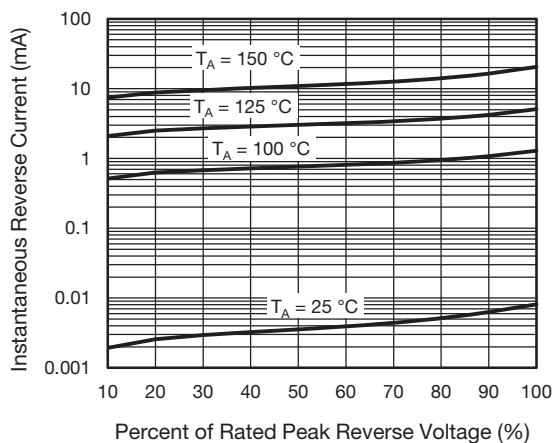


Fig. 4 - Typical Reverse Leakage Characteristics

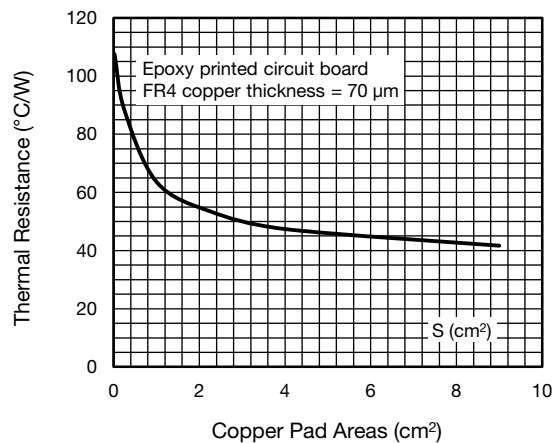


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

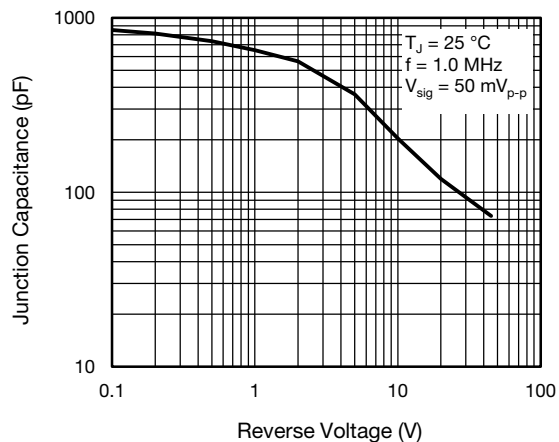
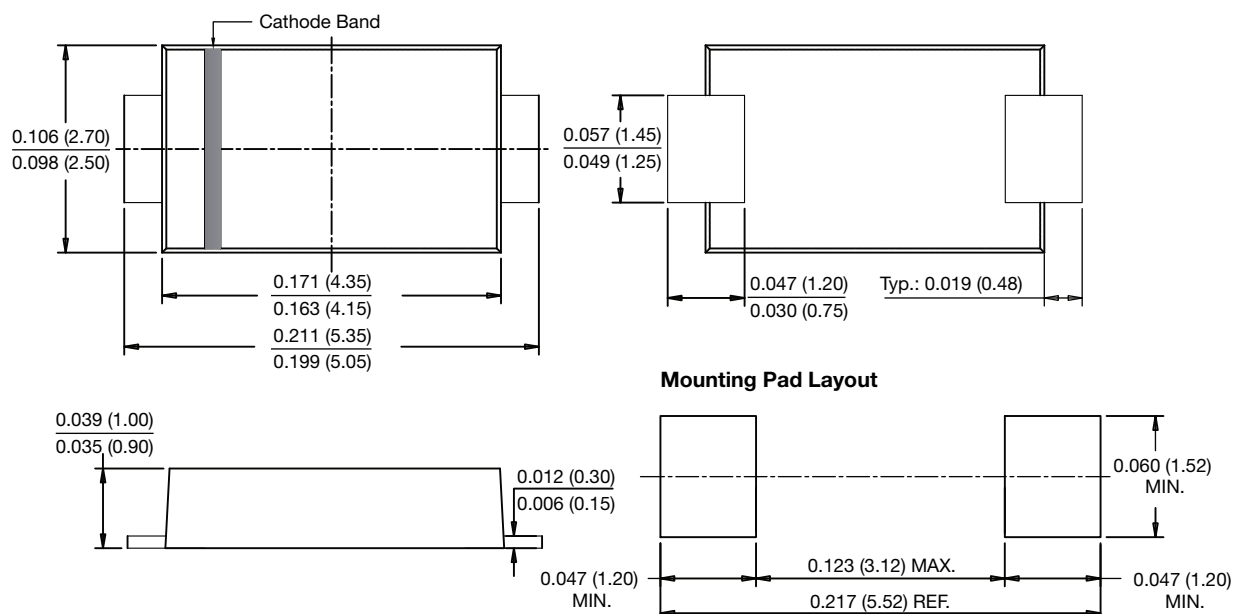


Fig. 5 - Typical Junction Capacitance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)





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