

Surface Mount Trench MOS Barrier Schottky Rectifier



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



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

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	DO-221AC (SlimSMA)
Diode variations	Single die

MECHANICAL DATA

Case: DO-221AC (SlimSMA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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, T_{STG}	-40 to +150	°C

Note

(1) 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	$I_F = 1.5\text{ A}$	V_F ⁽¹⁾	0.41	-	V
	$I_F = 3.0\text{ A}$		0.46	0.54	
	$I_F = 1.5\text{ A}$		0.31	-	
	$I_F = 3.0\text{ A}$		0.37	0.46	
Reverse current	$V_R = 45\text{ V}$	I_R ⁽²⁾	-	450	μA
			5	25	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⁾	115	$^{\circ}\text{C/W}$
	$R_{\theta JM}$ ⁽²⁾	12	

Notes

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

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
VSSAF3L45HM3/6A ⁽¹⁾	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF3L45HM3/6B ⁽¹⁾	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

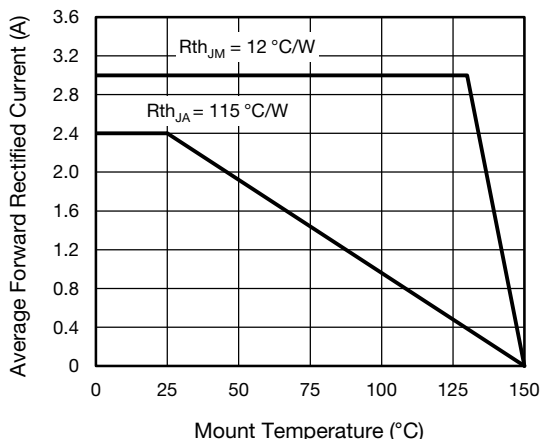
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

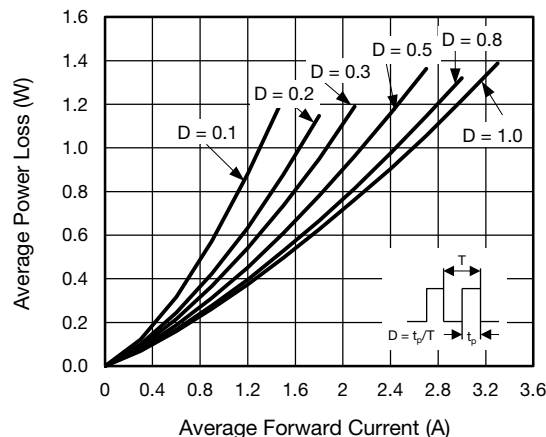


Fig. 2 - Average Power Loss Characteristics

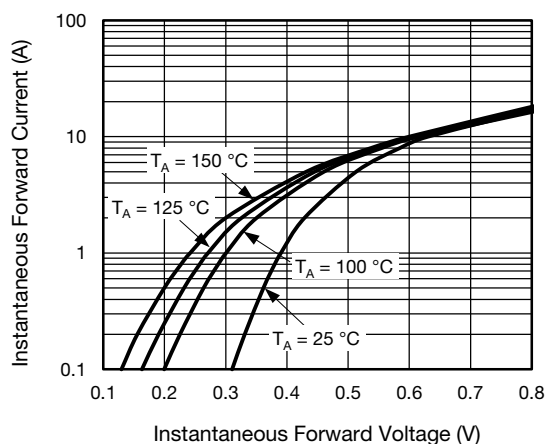


Fig. 3 - Typical Instantaneous Forward Characteristics

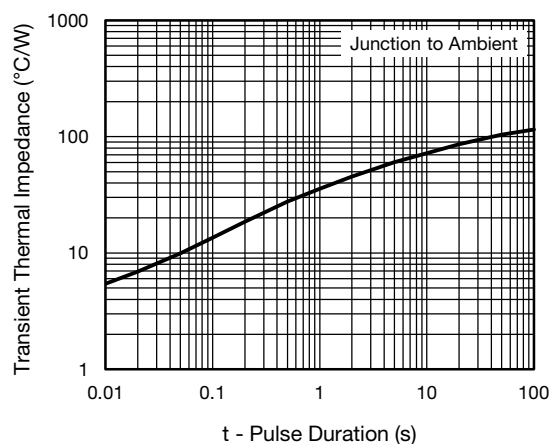


Fig. 6 - Typical Transient Thermal Impedance

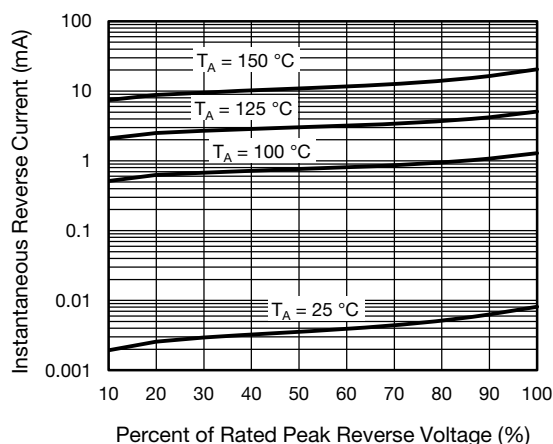


Fig. 4 - Typical Reverse Leakage Characteristics

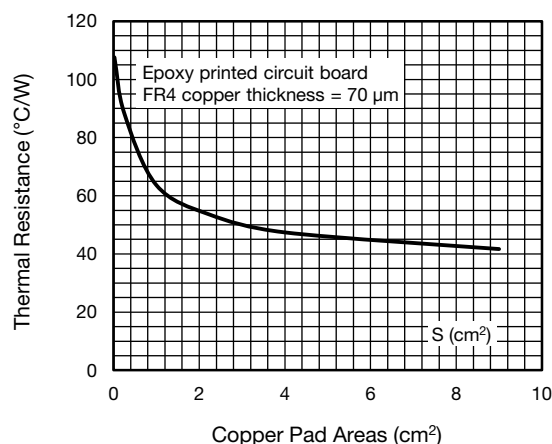


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

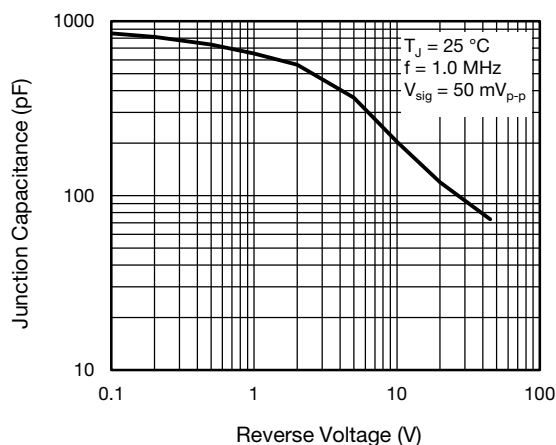
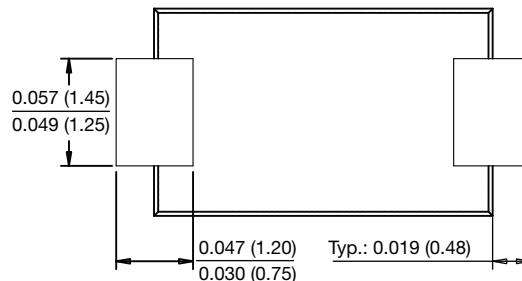
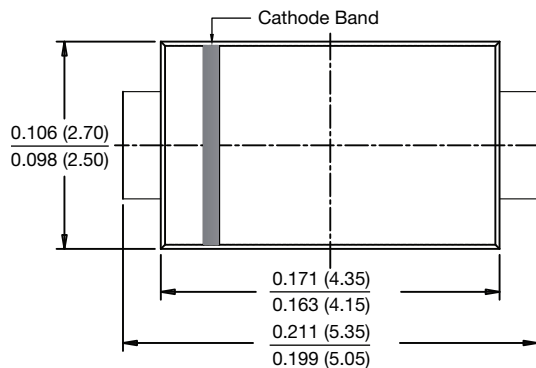


Fig. 5 - Typical Junction Capacitance

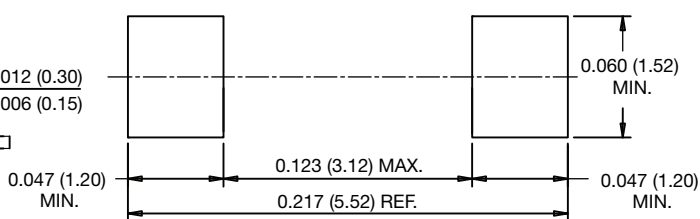
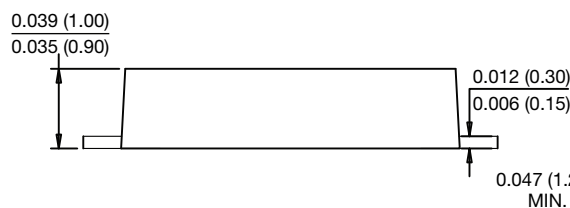


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-221AC (SlimSMA)



Mounting Pad Layout





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