

Surface Mount Trench MOS Barrier Schottky Rectifier

TMBS® SlimSMA


Top View

Bottom View

DO-221AC

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 applications.

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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

PRIMARY CHARACTERISTICS	
Package	DO-221AC (SlimSMA)
$I_{F(AV)}$	5.0 A
V_{RRM}	45 V
I_{FSM}	100 A
V_F at $I_F = 5.0$ A	0.39 V
T_J max.	150 °C
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VSSAF5L45	UNIT
Device marking code		5L45	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum DC forward current	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
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	$I_F = 2.5 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F^{(1)}$	0.42	-	V
	$I_F = 5.0 \text{ A}$			0.47	0.56	
	$I_F = 2.5 \text{ A}$			0.31	-	
	$I_F = 5.0 \text{ A}$			0.39	0.47	
Reverse current	$V_R = 45 \text{ V}$	$T_A = 25^\circ\text{C}$	$I_R^{(2)}$	-	650	μA
		$T_A = 125^\circ\text{C}$		8	45	mA
Typical junction capacitance	$4.0 \text{ V}, 1 \text{ MHz}$		C_J	740	-	pF

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

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

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

PARAMETER	SYMBOL	VSSAF5L45	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

(2) 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
VSSAF5L45-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF5L45-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel
VSSAF5L45HM3/6A ⁽¹⁾	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF5L45HM3/6B ⁽¹⁾	0.032	6B	14 000	13" diameter plastic tape and reel
VSSAF5L45HM3_A/H ⁽¹⁾	0.032	H	3500	7" diameter plastic tape and reel
VSSAF5L45HM3_A/I ⁽¹⁾	0.032	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

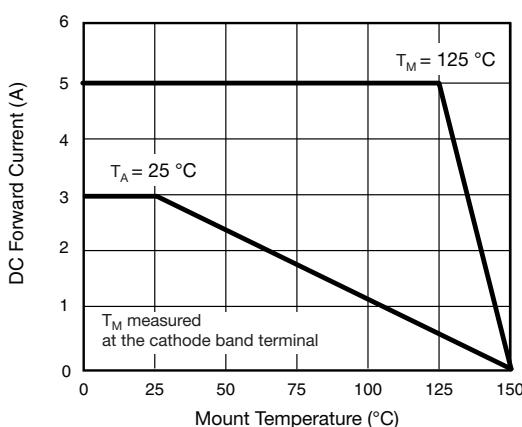
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

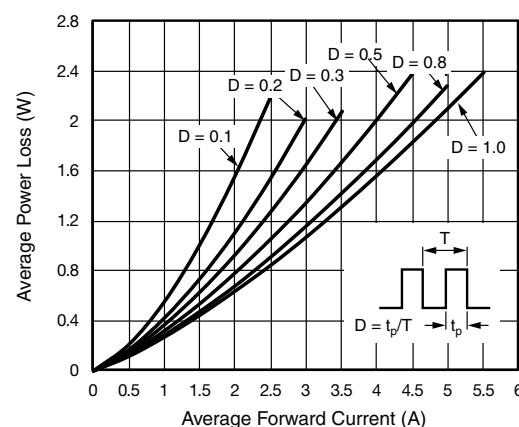


Fig. 2 - Average Power Loss Characteristics

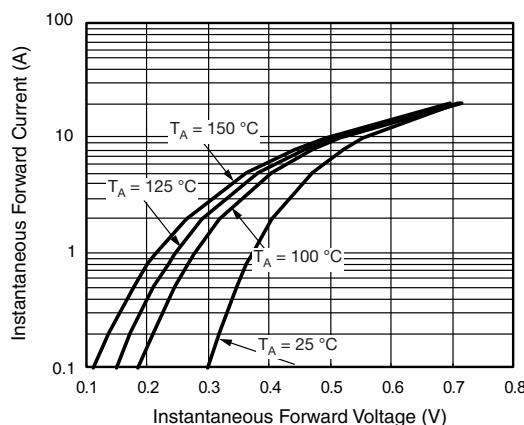


Fig. 3 - Typical Instantaneous Forward Characteristics

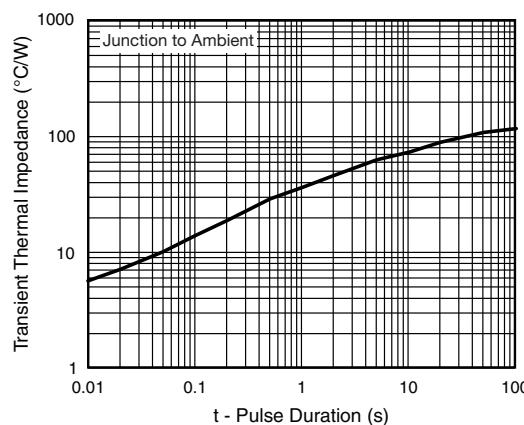


Fig. 6 - Typical Transient Thermal Impedance

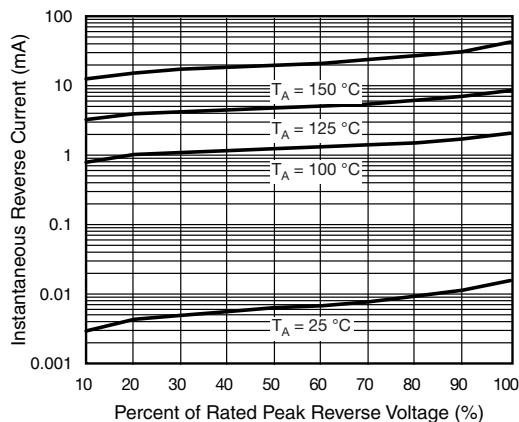


Fig. 4 - Typical Reverse Leakage Characteristics

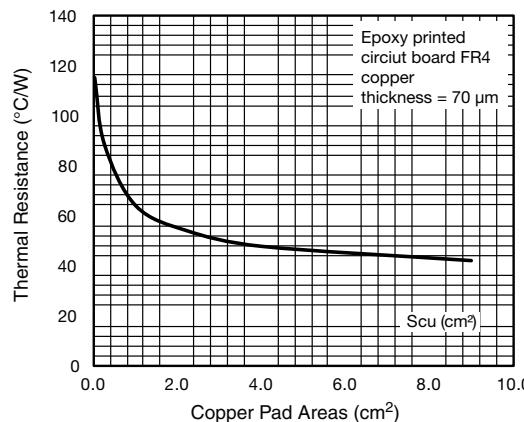


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

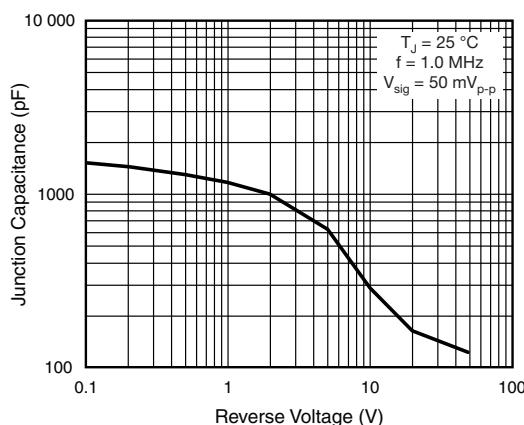
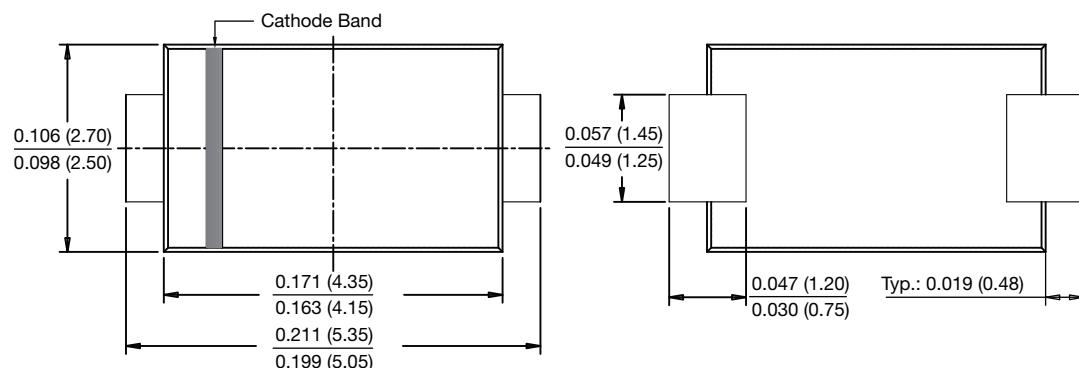
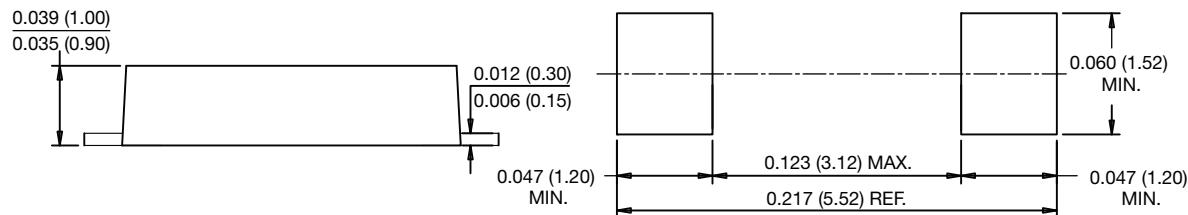


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-221AC (SlimSMA)

Mounting Pad Layout


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