

## 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](http://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
$I_{F(AV)}$	5.0 A
$V_{RRM}$	60 V
$I_{FSM}$	100 A
$V_F$ at $I_F = 5.0$ A	0.48 V
$T_J$ max.	150 °C
Diode variations	Single

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VSSAF56	UNIT
Device marking code		V56	
Maximum repetitive peak reverse voltage	$V_{RRM}$	60	V
Maximum DC forward current	$I_F$ <sup>(1)</sup>	5.0	A
	$I_F$ <sup>(2)</sup>	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 30 mm x 30 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	$I_F = 2.5 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F^{(1)}$	0.47	-	V
	$I_F = 5.0 \text{ A}$			0.54	0.62	
	$I_F = 2.5 \text{ A}$			0.38	-	
	$I_F = 5.0 \text{ A}$			0.48	0.56	
Reverse current	$V_R = 60 \text{ V}$	$T_A = 25^\circ\text{C}$	$I_R^{(2)}$	-	0.4	mA
		$T_A = 125^\circ\text{C}$		4.5	15	
Typical junction capacitance	$4.0 \text{ V}, 1 \text{ MHz}$		$C_J$	540	-	pF

**Notes**

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

(2) Pulse test: pulse width  $\leq 5 \text{ ms}$ 
**THERMAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	VSSAF56	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 30 mm x 30 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
VSSAF56-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF56-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel
VSSAF56HM3/6A (1)	0.032	6A	3500	7" diameter plastic tape and reel
VSSAF56HM3/6B (1)	0.032	6B	14 000	13" diameter plastic tape and reel
VSSAF56HM3_A/H (1)	0.032	H	3500	7" diameter plastic tape and reel
VSSAF56HM3_A/I (1)	0.032	I	14 000	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

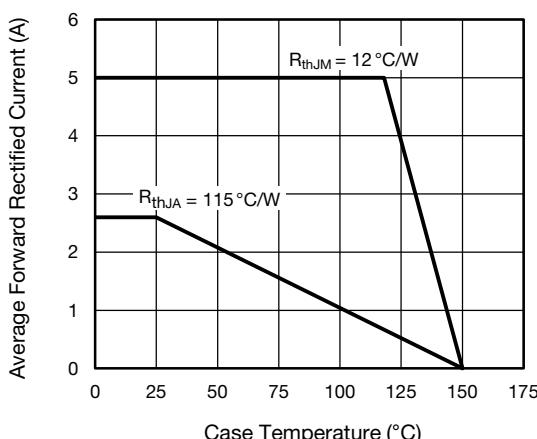
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

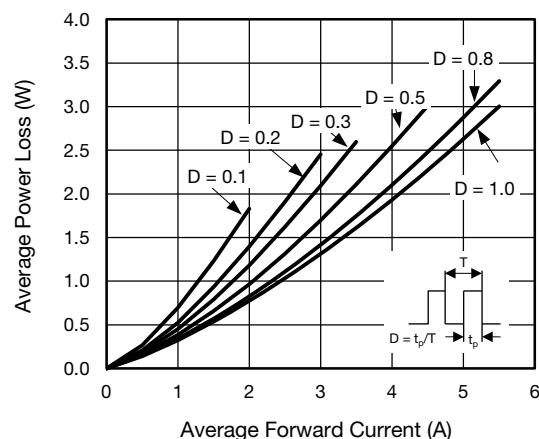


Fig. 2 - Average Power Loss Characteristics

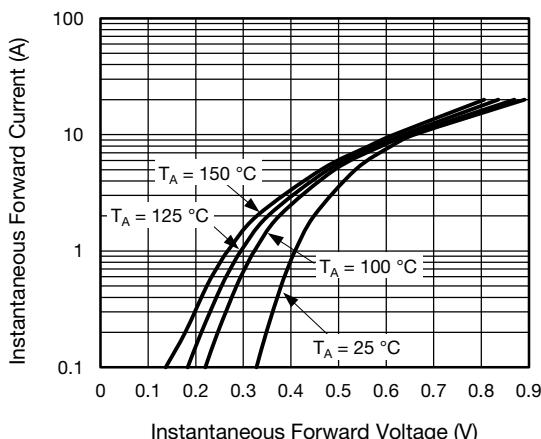


Fig. 3 - Typical Instantaneous Forward Characteristics

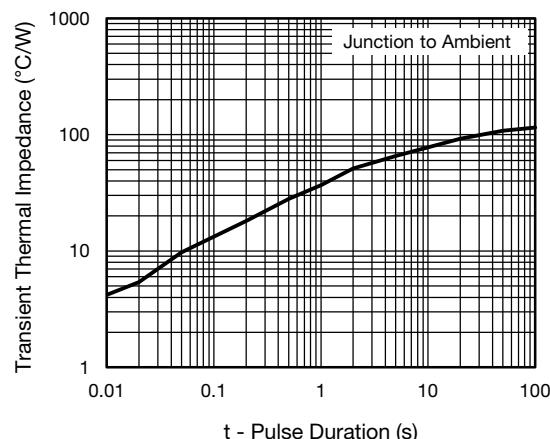


Fig. 6 - Typical Transient Thermal Impedance

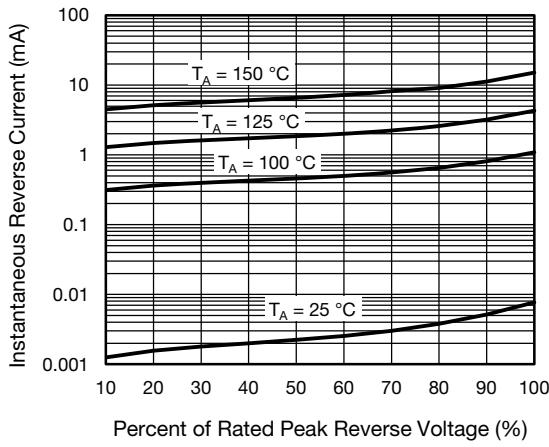


Fig. 4 - Typical Reverse Leakage Characteristics

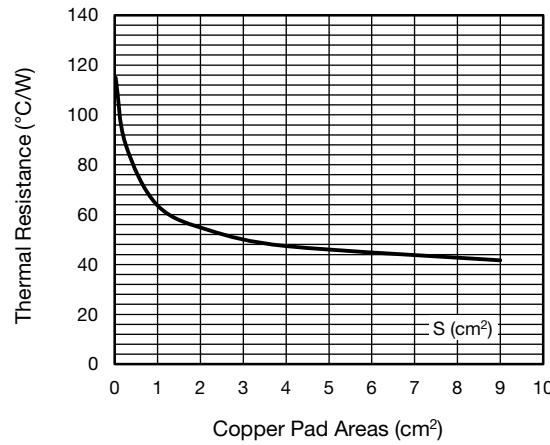


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

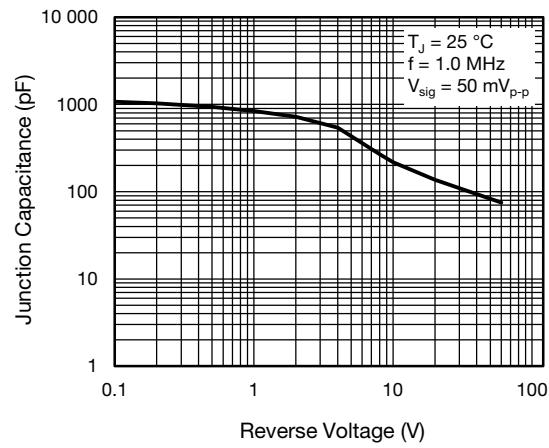
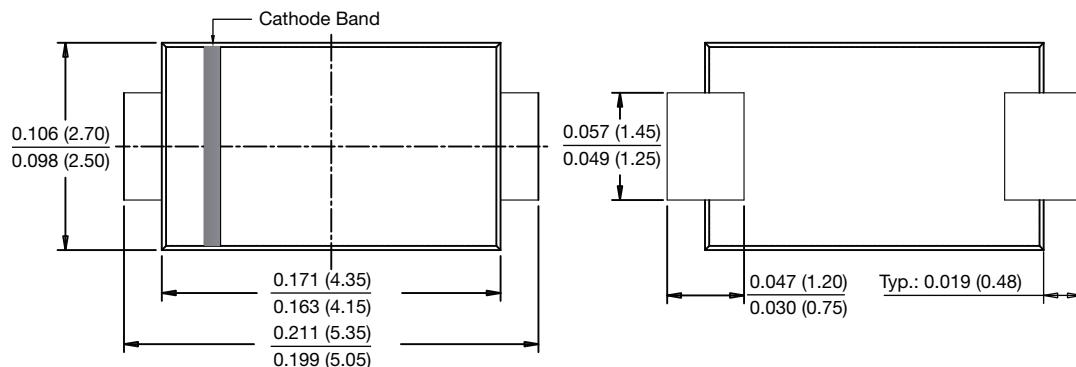
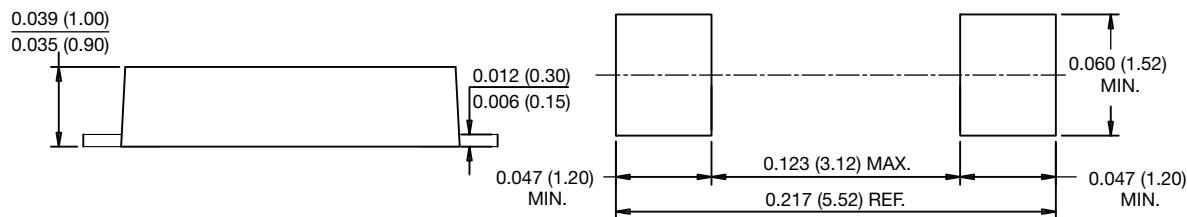


Fig. 5 - Typical Junction Capacitance

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

**DO-221AC (SlimSMA)**

**Mounting Pad Layout**


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