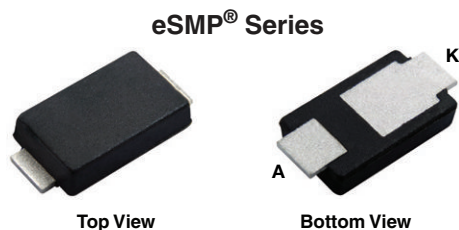


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



**SMPA (DO-221BC)**

Anode  Cathode

## 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: 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



3D Models

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	8.0 A
$V_{RRM}$	120 V
$I_{FSM}$	100 A
$V_F$ at $I_F = 8.0$ A ( $T_A = 125$ °C)	0.65 V
$T_J$ max.	175 °C
Package	SMPA (DO-221BC)
Circuit configuration	Single

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

**Case:** SMPA (DO-221BC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

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

**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	V8PAM12	UNIT
Device marking code		8M12	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	8.0	A
	$I_{F(AV)}^{(2)}$	2.7	
Peak forward surge current 8.3 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 +175	°C

## Notes

(1) Units mounted on 3 cm x 3 cm aluminum PCB

(2) Free air, mounted on recommended copper pad area

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 4.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.63	-	V
	I <sub>F</sub> = 8.0 A			0.8	0.88	
	I <sub>F</sub> = 4.0 A	T <sub>A</sub> = 125 °C		0.54	-	
	I <sub>F</sub> = 8.0 A			0.65	0.73	
Reverse current	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.01	-	mA
		T <sub>A</sub> = 125 °C		1.5	-	
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C		-	0.5	
		T <sub>A</sub> = 125 °C		3	10	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	730	-	pF

**Notes**

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

(2) Pulse test: Pulse width  $\leq 5\text{ ms}$ 

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V8PAM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	100	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	5	

**Notes**

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

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

(3) Units mounted on 3 cm x 3 cm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V8PAM12-M3/I	0.032	I	14 000	13" diameter plastic tape and reel
V8PAM12HM3/I <sup>(1)</sup>	0.032	I	14 000	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

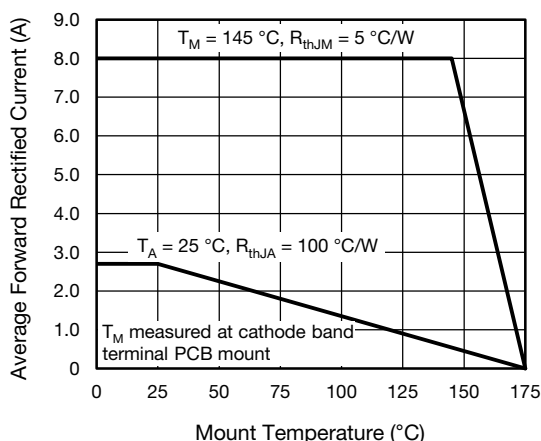
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

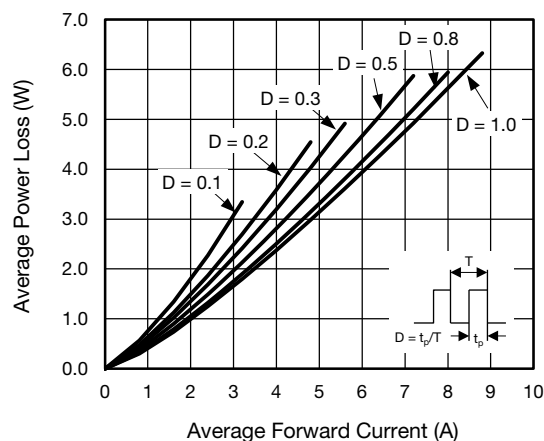


Fig. 2 - Forward Power Loss Characteristics

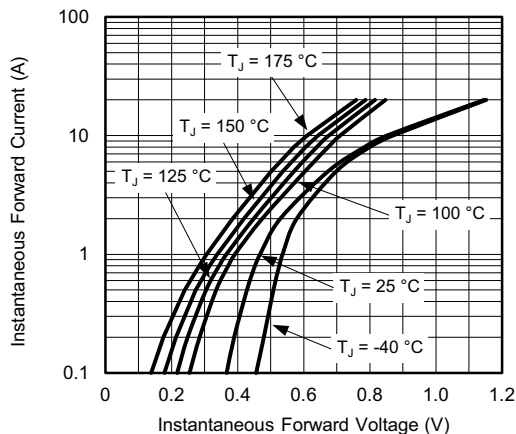


Fig. 3 - Typical Instantaneous Forward Characteristics

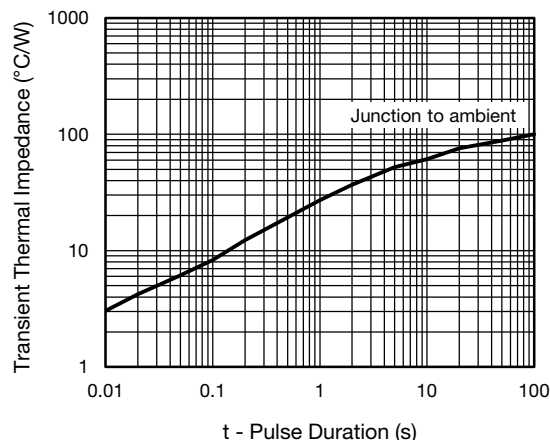


Fig. 6 - Typical Transient Thermal Impedance

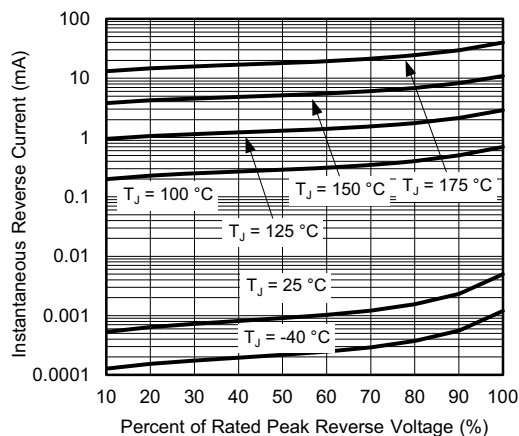


Fig. 4 - Typical Reverse Leakage Characteristics

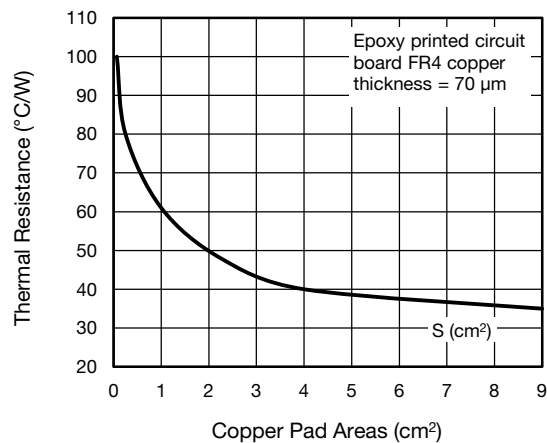


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

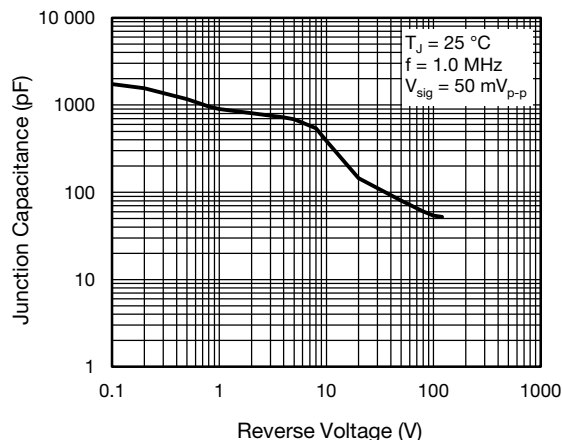
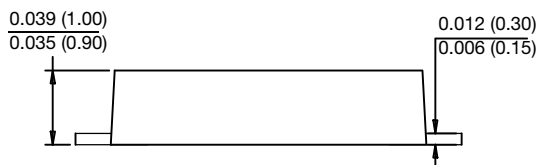
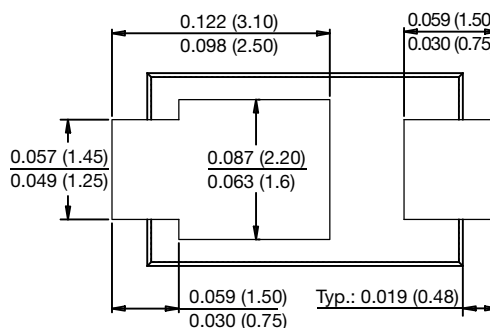
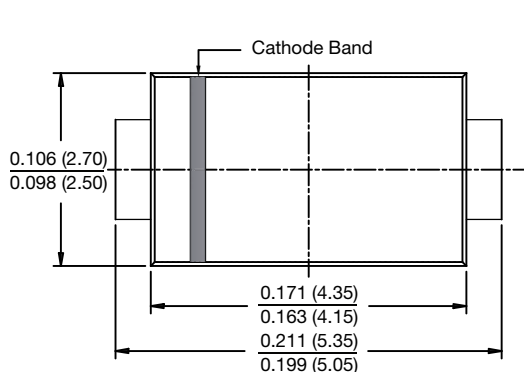


Fig. 5 - Typical Junction Capacitance

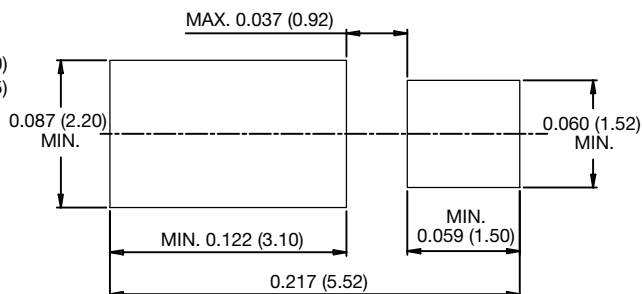


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMPA (DO-221BC)**



**Mounting Pad Layout**





## Disclaimer

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