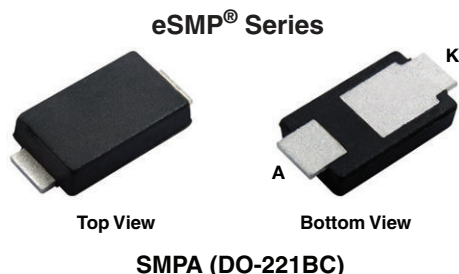


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



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)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## LINKS TO ADDITIONAL RESOURCES



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)	0.64 V
$T_J$ max.	150 °C
Package	SMPS (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:** SMPS (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	V8PA12	UNIT
Device marking code		V812	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	8.0	A
	$I_{F(AV)}^{(2)}$	2.5	
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 +150	°C

### Notes

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

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

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 4.0\text{ A}$	$V_F^{(1)}$	0.60	-	V
	$I_F = 8.0\text{ A}$		0.79	0.87	
	$I_F = 4.0\text{ A}$		0.53	-	
	$I_F = 8.0\text{ A}$		0.64	0.72	
Reverse current	$V_R = 90\text{ V}$	$I_R^{(2)}$	0.01	-	mA
	$T_A = 25\text{ }^{\circ}\text{C}$		5	-	
	$T_A = 125\text{ }^{\circ}\text{C}$		-	0.6	
	$V_R = 120\text{ V}$		10	20	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	700	-	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** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

PARAMETER	SYMBOL	V8PA12	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

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V8PA12-M3/I	0.032	I	14 000	13" diameter plastic tape and reel
V8PA12HM3/I <sup>(1)</sup>	0.032	I	14 000	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

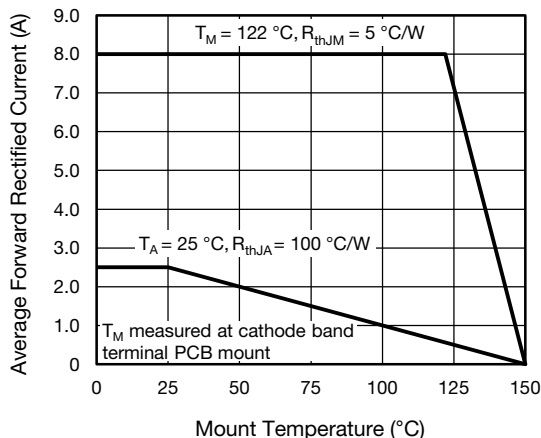
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

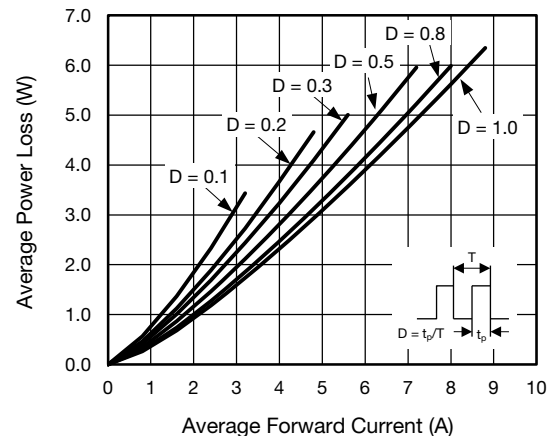


Fig. 2 - Forward Power Loss Characteristics

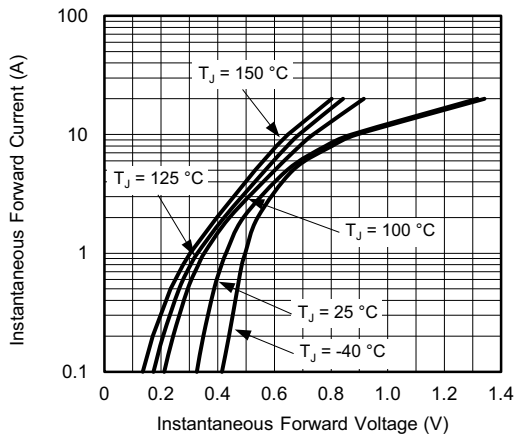


Fig. 3 - Typical Instantaneous Forward Characteristics

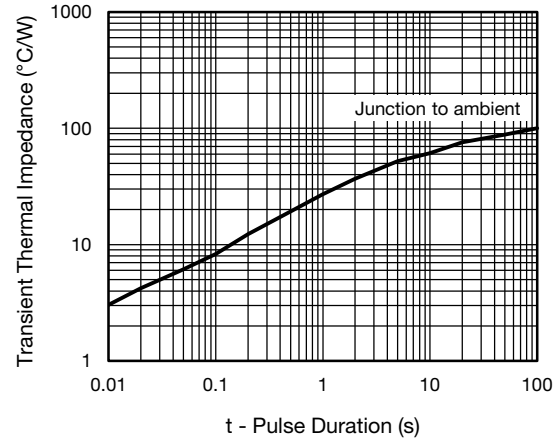


Fig. 6 - Typical Transient Thermal Impedance

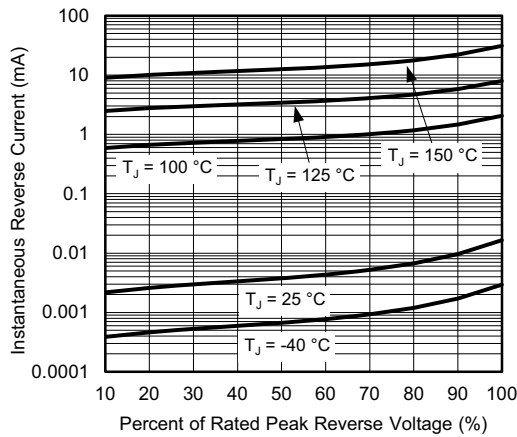


Fig. 4 - Typical Reverse Leakage Characteristics

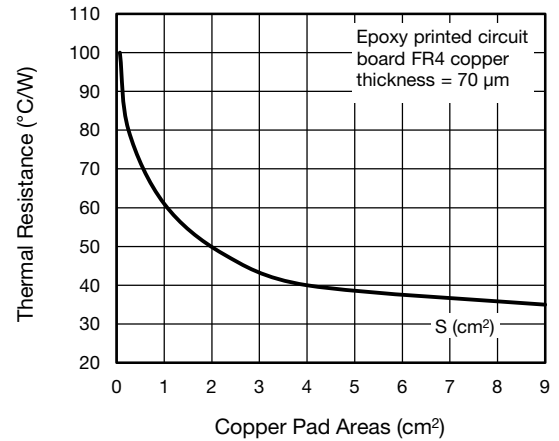


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

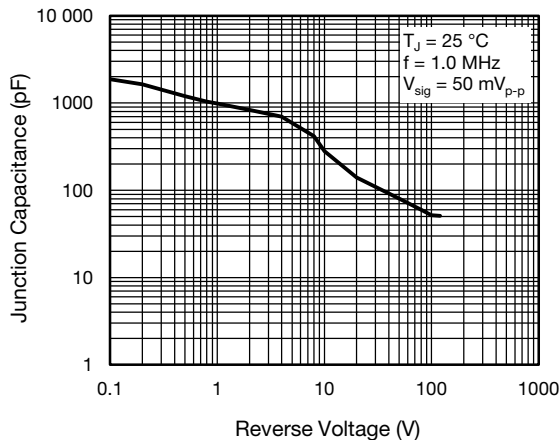
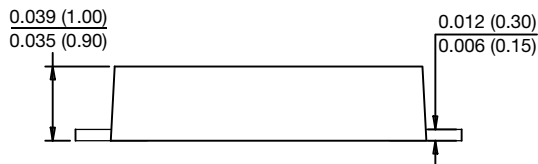
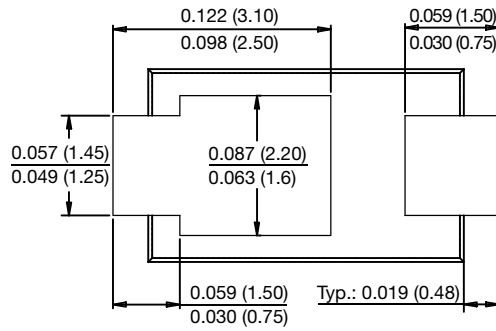
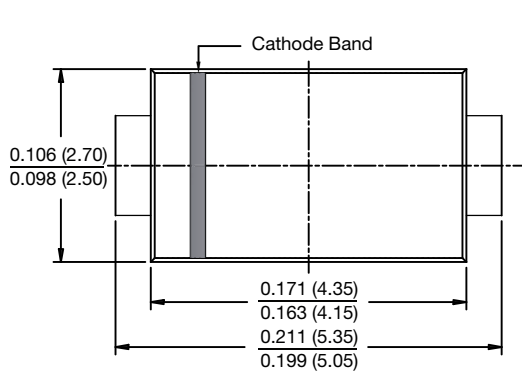


Fig. 5 - Typical Junction Capacitance

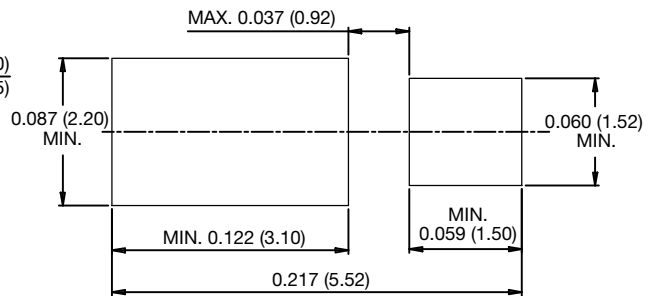


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMPA (DO-221BC)**



**Mounting Pad Layout**





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