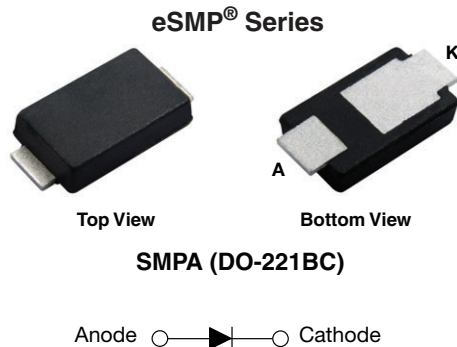


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



## 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
- 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



3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
$V_{RRM}$	50 V
$I_{FSM}$	80 A
$V_F$ at $I_F = 4.0$ A ( $T_A = 125$ °C)	0.46 V
$T_J$ max.	150 °C
Package	SMPA (DO-221BC)
Circuit configuration	Single

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD22-B102

M3 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	V4PAN50	UNIT
Device marking code		4N5	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	V
Maximum DC forward current	$I_F^{(1)}$	4.0	A
	$I_F^{(2)}$	3.0	
Maximum DC reverse voltage	$V_{DC}$	35	V
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

### Notes

(1) Units mounted on 15 mm x 15 mm pad areas, 2 oz. 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> = 2.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.43	-	V
	I <sub>F</sub> = 4.0 A			0.51	0.59	
	I <sub>F</sub> = 2.0 A	T <sub>A</sub> = 125 °C		0.34	-	
	I <sub>F</sub> = 4.0 A			0.46	0.54	
Reverse current	V <sub>R</sub> = 35 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	8	-	μA
		T <sub>A</sub> = 125 °C		8.8	-	mA
	V <sub>R</sub> = 50 V	T <sub>A</sub> = 25 °C		-	600	μA
		T <sub>A</sub> = 125 °C		12	35	mA
Typical junction capacitance	4.0 V, 1 MHz	C <sub>J</sub>	480	-	pF	

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)			
PARAMETER	SYMBOL	V4PAN50	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	100	°C/W
	R <sub>θJM</sub> <sup>(1)</sup>	9	

**Note**

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance R<sub>θJA</sub> - junction to ambient; R<sub>θJM</sub> - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V4PAN50-M3/I	0.032	I	14 000	13" diameter plastic tape and reel

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise specified)**

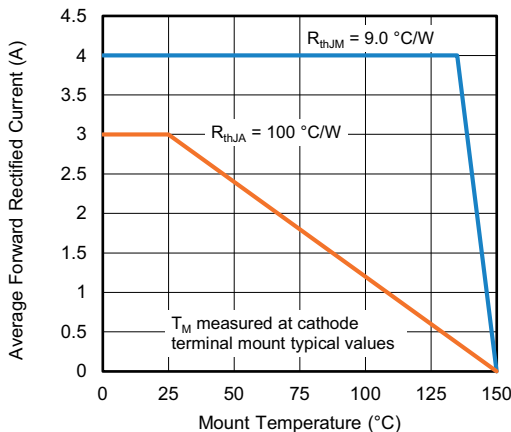


Fig. 1 - Maximum Forward Current Derating Curve

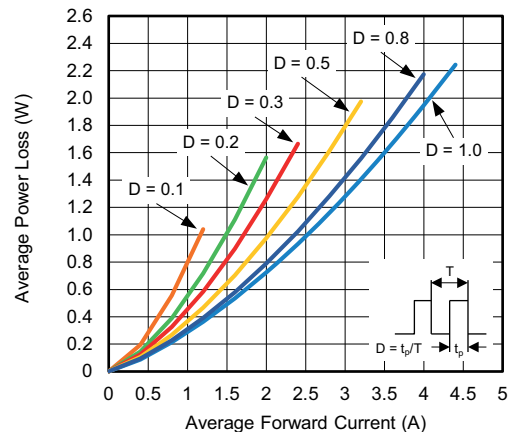


Fig. 2 - Forward Power Loss Characteristics

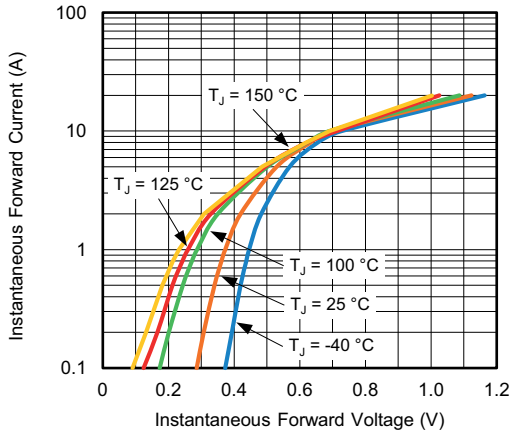


Fig. 3 - Typical Instantaneous Forward Characteristics

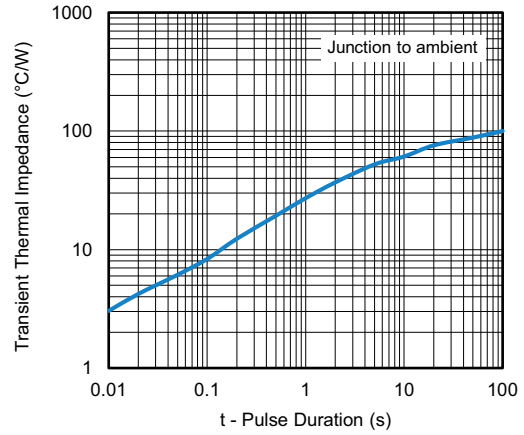


Fig. 6 - Typical Transient Thermal Impedance

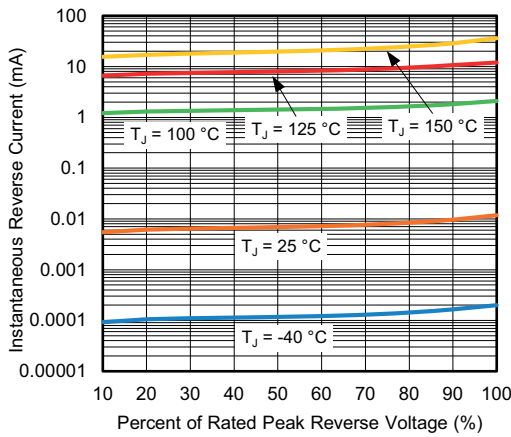


Fig. 4 - Typical Reverse Leakage Characteristics

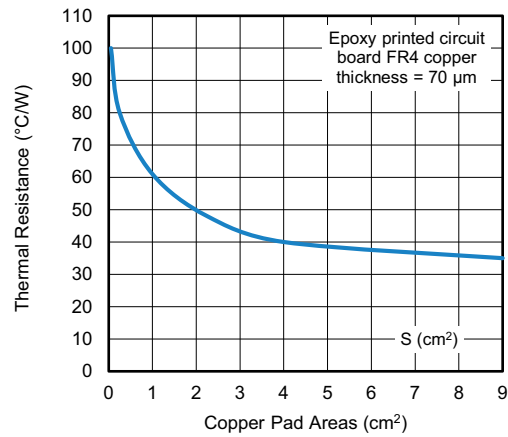


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

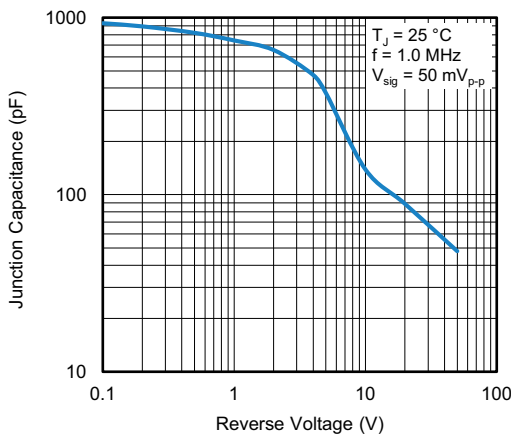
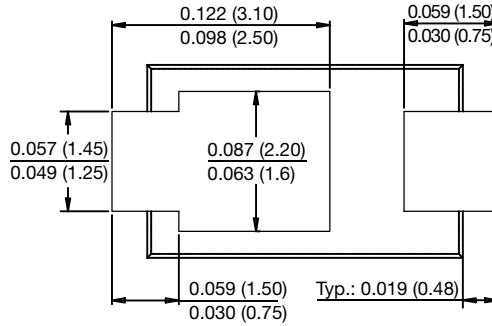
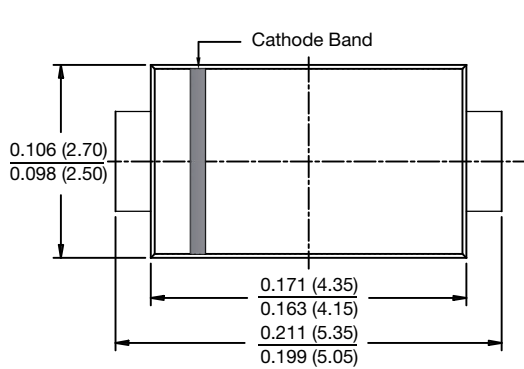


Fig. 5 - Typical Junction Capacitance

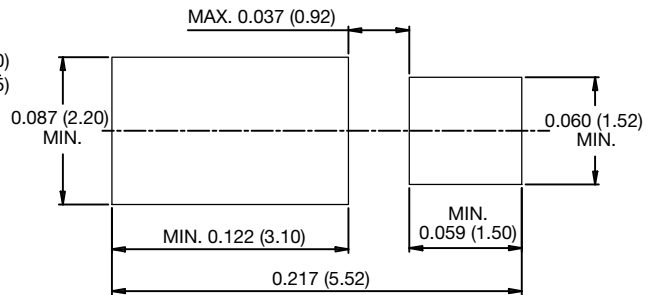
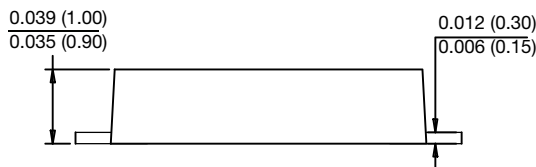


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMPS (DO-221BC)



### Mounting Pad Layout





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