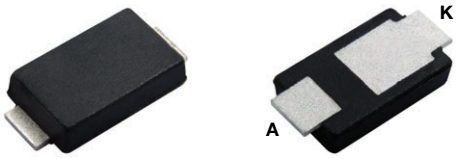
Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

eSMP® Series



Top View Bottom View

SMPA (DO-221BC)



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

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: 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

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

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

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 2.0 A	T_A = 25 °C	V_F (1)	0.43	-	V
	I_F = 4.0 A			0.51	0.59	
	I_F = 2.0 A	T_A = 125 °C		0.34	-	
	I_F = 4.0 A			0.46	0.54	
Reverse current	V_R = 35 V	T_A = 25 °C	I_R (2)	8	-	µA
		T_A = 125 °C		8.8	-	mA
	V_R = 50 V	T_A = 25 °C		-	600	µA
		T_A = 125 °C		12	35	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	480	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)			
PARAMETER	**SYMBOL**	**V4PAN50**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	100	°C/W
	$R_{\theta JM}$ (1)	9	

Note

(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient; $R_{\theta JM}$ - 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_A = 25 °C unless otherwise specified)

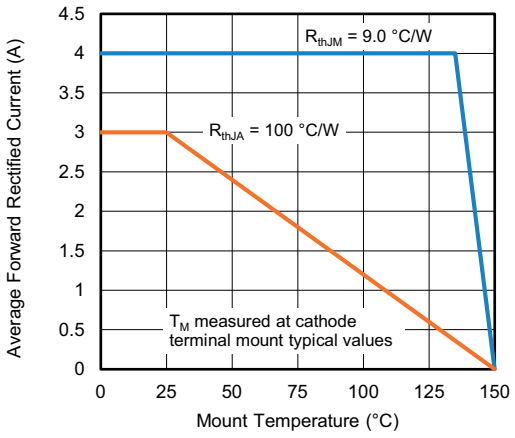


Fig. 1 - Maximum Forward Current Derating Curve

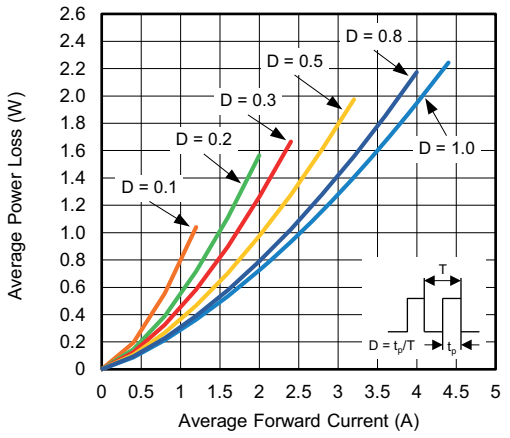


Fig. 2 - Forward Power Loss Characteristics

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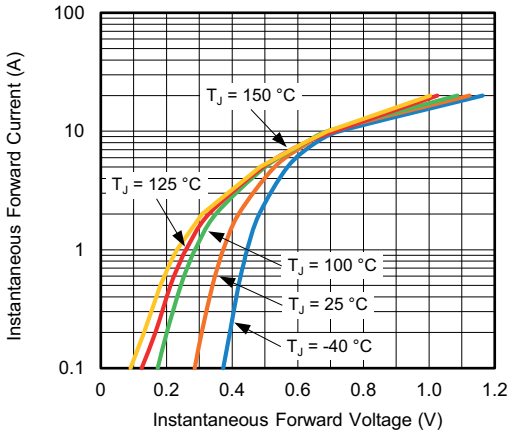


Fig. 3 - Typical Instantaneous Forward Characteristics

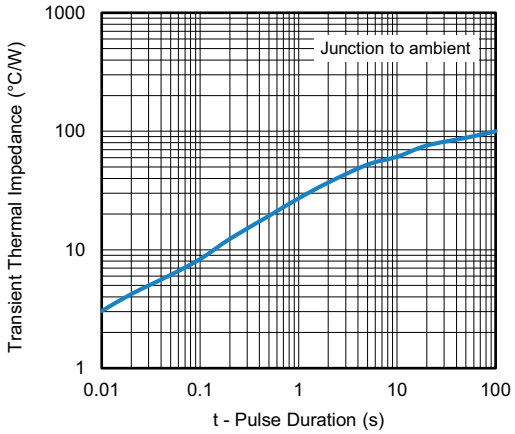


Fig. 6 - Typical Transient Thermal Impedance

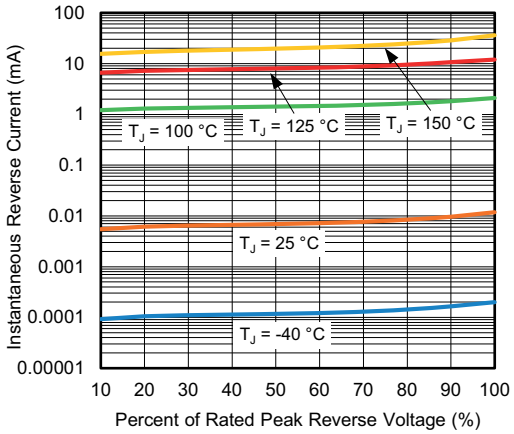


Fig. 4 - Typical Reverse Leakage Characteristics

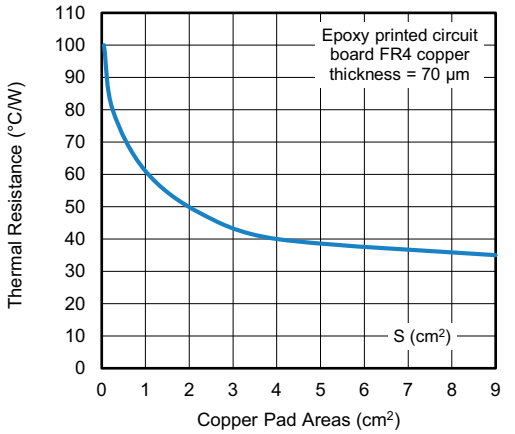


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

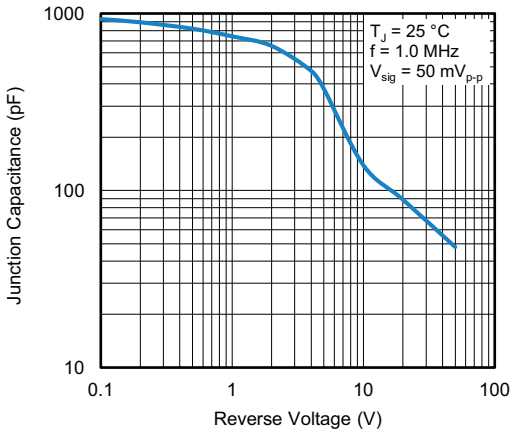
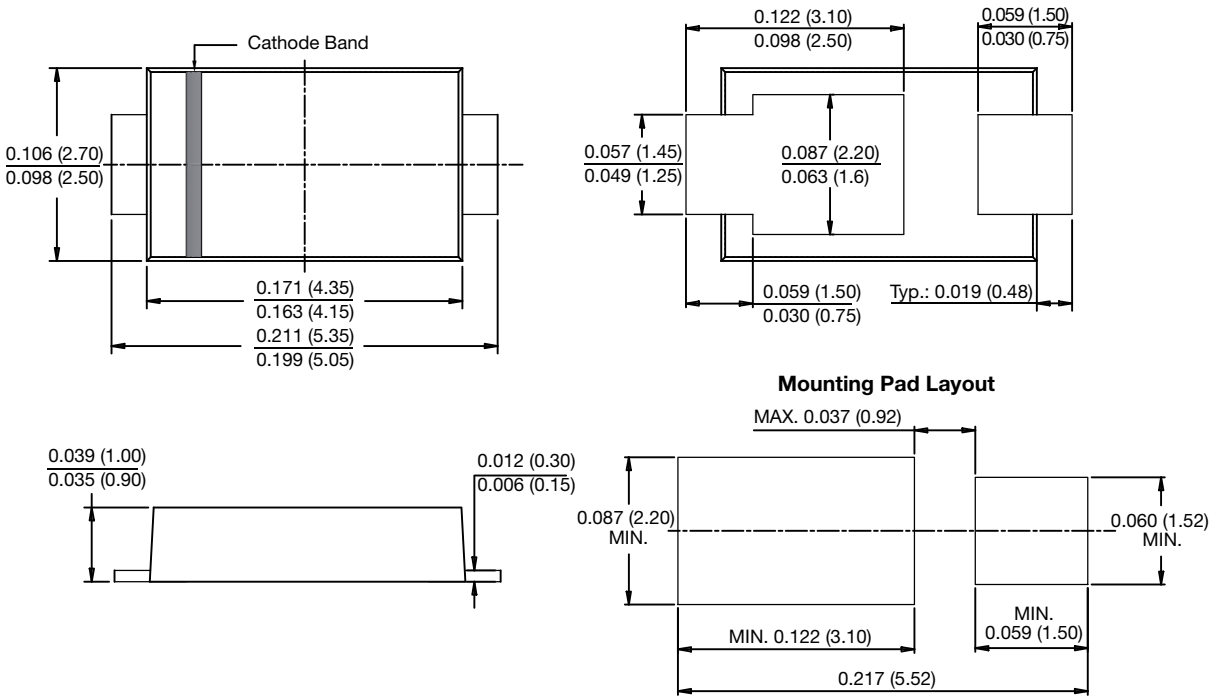


Fig. 5 - Typical Junction Capacitance

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)



Mounting Pad Layout

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