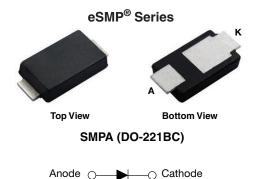
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Vishay General Semiconductor

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



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	4.0 A			
V _{RRM}	45 V			
I _{FSM}	80 A			
V_F at I_F = 4.0 A (T_A = 125 °C)	0.41 V			
T _J max.	150 °C			
Package	SMPA (DO-221BC)			
Circuit configuration	Single			

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 <u>www.vishay.com/doc?99912</u>

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

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 2 whisker test, 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	V4PAL45	UNIT	
Device marking code		4L45		
Maximum repetitive peak reverse voltage	V _{RRM}	45	V	
Maximum DC forward aureant	I _F ⁽¹⁾	4.0	— A	
Maximum DC forward current	I _F ⁽²⁾	3.0		
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





V4PAL45



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ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 2.0 A	T 25 °C	V _F ⁽¹⁾	0.43	-	V
	I _F = 4.0 A			0.49	0.57	
	I _F = 2.0 A	– T _A = 125 °C		0.33	-	
	I _F = 4.0 A			0.41	0.50	
Reverse current	V _R = 45 V	T _A = 25 °C	25 °C I _R ⁽²⁾	-	450	μA
	v _R = 45 v	T _A = 25 °C T _A = 125 °C		5	15	mA
Typical junction capacitance	4.0 V, 1 MH	4.0 V, 1 MHz		450	-	pF

Notes

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

 $^{(2)}$ Pulse test: pulse width $\leq 5\mbox{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise specified)				
PARAMETER	SYMBOL	V4PAL45	UNIT	
Typical thermal resistance	R _{0JA} ⁽¹⁾	100	°C/W	
	R _{0JM} ⁽¹⁾	9	0/10	

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		
V4PAL45-M3/I	0.032	I	14 000	13" diameter plastic tape and reel		
V4PAL45HM3_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 °C unless otherwise specified)

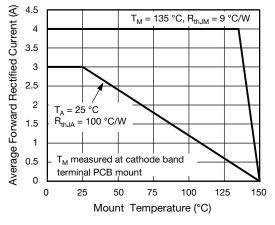
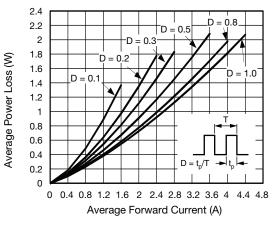
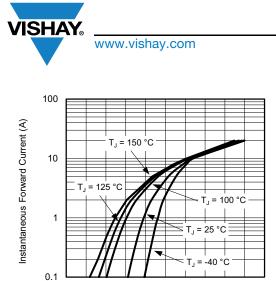


Fig. 1 - Maximum Forward Current Derating Curve



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0

0.2

Instantaneous Forward Voltage (V) Fig. 3 - Typical Instantaneous Forward Characteristics

0.6

0.8

1.0

0.4

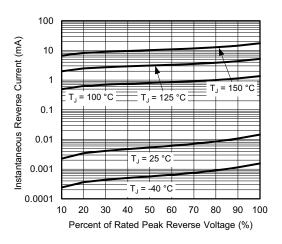


Fig. 4 - Typical Reverse Leakage Characteristics

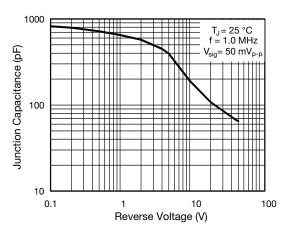


Fig. 5 - Typical Junction Capacitance

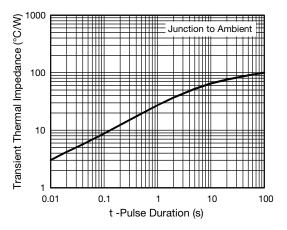


Fig. 6 - Typical Transient Thermal Impedance

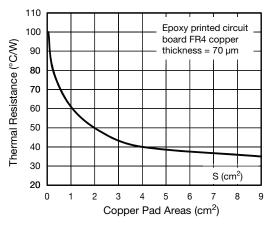


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

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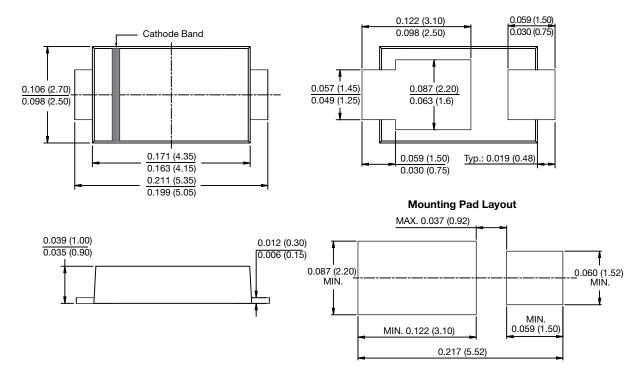
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)





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