

Surface Mount 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
- AEC-Q101 qualified
- 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: DO-221BC (SMPA)

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

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 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

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	DO-221BC (SMPA)
Diode variation	Single die

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 current	$I_F^{(1)}$	4.0	A
	$I_F^{(2)}$	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

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 2.0\text{ A}$	$V_F^{(1)}$	0.43	-	V
	$I_F = 4.0\text{ A}$		0.49	0.57	
	$I_F = 2.0\text{ A}$		0.33	-	
	$I_F = 4.0\text{ A}$		0.41	0.50	
Reverse current	$V_R = 45\text{ V}$	$I_R^{(2)}$	-	450	μA
			5	15	mA
Typical junction capacitance	4.0 V, 1 MHz	C_J	450	-	pF

Notes

- (1) Pulse test: 300 μs 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	V4PAL45	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	100	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(1)}$	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
V4PAL45-M3/I	0.032	I	14 000	13" diameter plastic tape and reel
V4PAL45HM3/I (1)	0.032	I	14 000	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

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

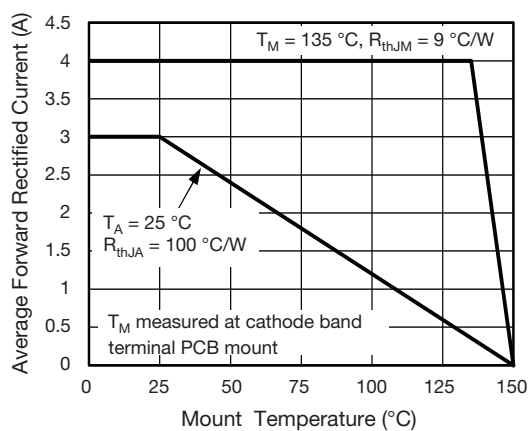


Fig. 1 - Maximum Forward Current Derating Curve

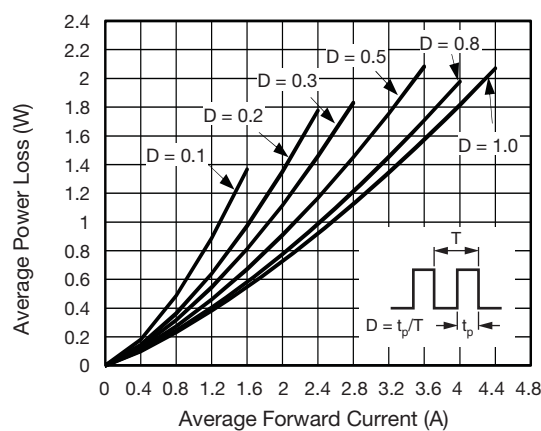


Fig. 2 - Forward Power Loss Characteristics

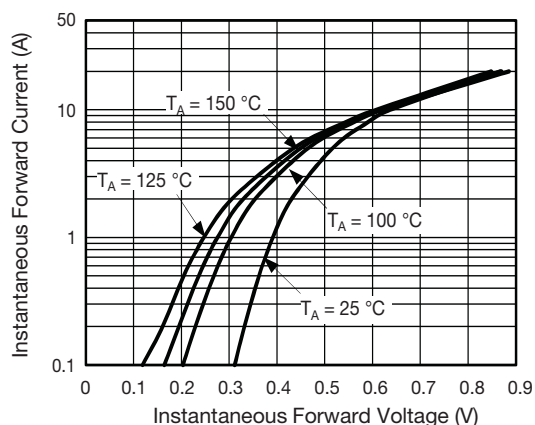


Fig. 3 - Typical Instantaneous Forward Characteristics

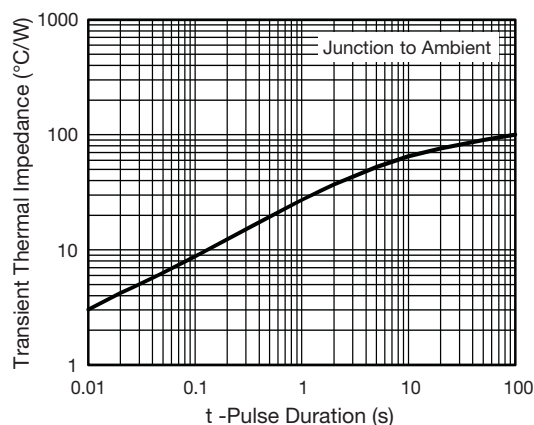


Fig. 6 - Typical Transient Thermal Impedance

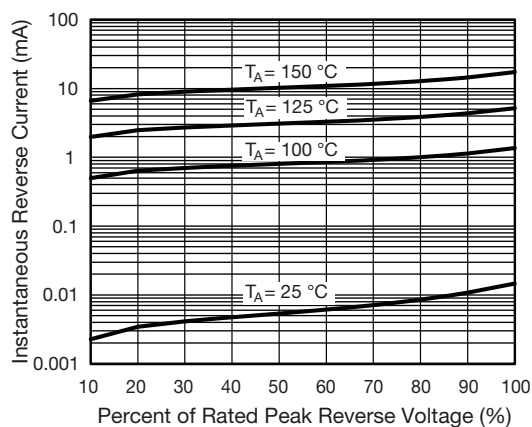


Fig. 4 - Typical Reverse Leakage Characteristics

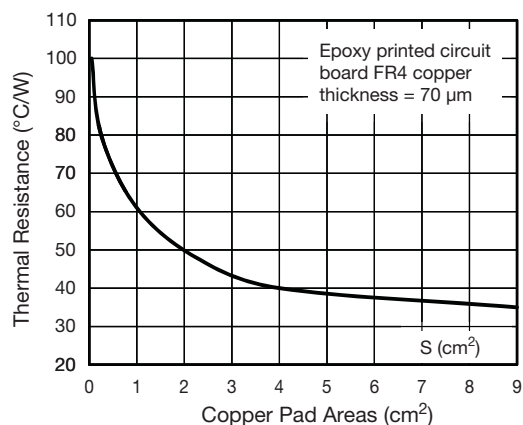


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

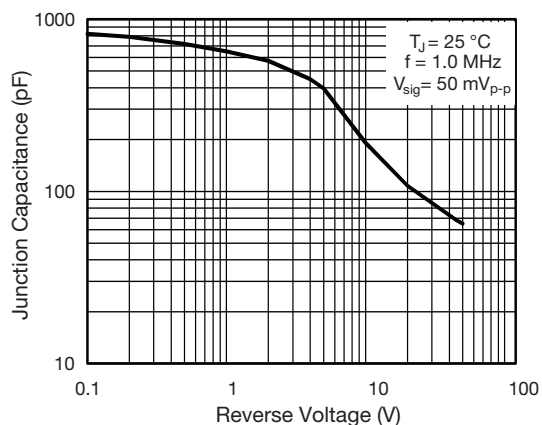
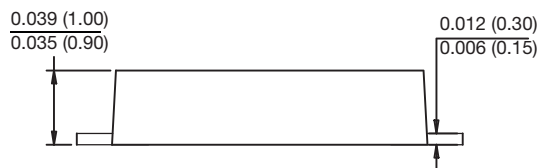
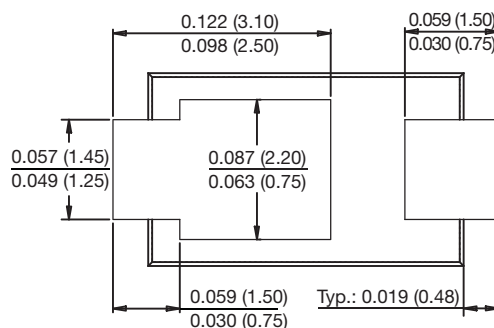
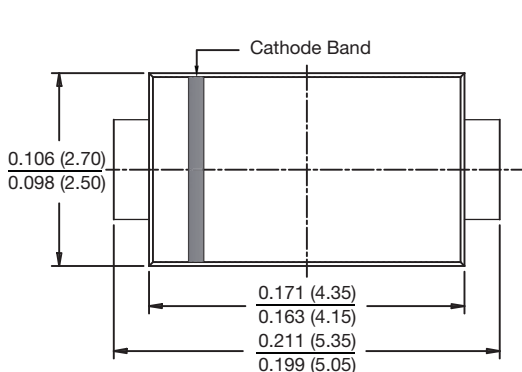


Fig. 5 - Typical Junction Capacitance

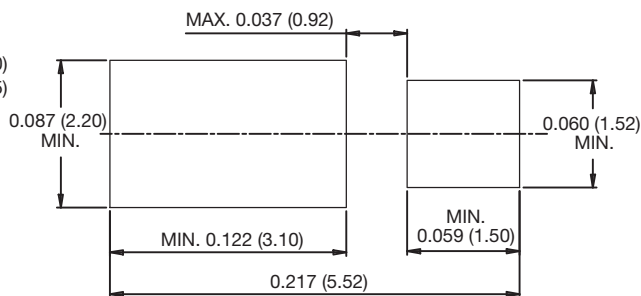


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-221BC (SMPA)



Mounting Pad Layout





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