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V10PN50-M3

Vishay General Semiconductor

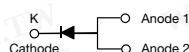
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.30\text{ V}$ at $I_F = 5\text{ A}$

TMBS® eSMP® Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS

$I_{F(AV)}$	10 A
V_{RRM}	50 V
I_{FSM}	180 A
V_F at $I_F = 10\text{ A}$	0.40 V
T_J max.	150 °C
Package	TO-277A (SMPC)
Diode variation	Single die

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- 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 DC/DC converters, freewheeling, and polarity protection applications.

MECHANICAL DATA

Case: TO-277A (SMPC)

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 JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V10PN50	UNIT
Device marking code		10N5	
Maximum repetitive peak reverse voltage	V_{RRM}	50	V
Maximum average forward rectified current (fig. 1)	$I_F^{(1)}$	10	A
	$I_F^{(2)}$	5.3	
Maximum DC reverse voltage	V_{DC}	35	V
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	180	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C

Notes

(1) Mounted on 30 mm x 30 mm 2 oz. pad PCB

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

ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.40	-	V
	I _F = 10 A			0.47	0.55	
	I _F = 5 A	T _A = 125 °C		0.30	-	
	I _F = 10 A			0.40	0.49	
Reverse current	V _R = 50 V	T _A = 25 °C	I _R ⁽²⁾	50	1500	μA
		T _A = 125 °C		32	85	mA

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 noted)			
PARAMETER	SYMBOL	V10PN50	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	70	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	4	

Notes

- (1) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP/dT_J < 1/R_{\theta JA}$
(3) Mounted on 30 mm x 30 mm 2 oz. pad PCB; thermal resistance $R_{\theta JM}$ - junction-to-mount measured at cathode side

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10PN50-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10PN50-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

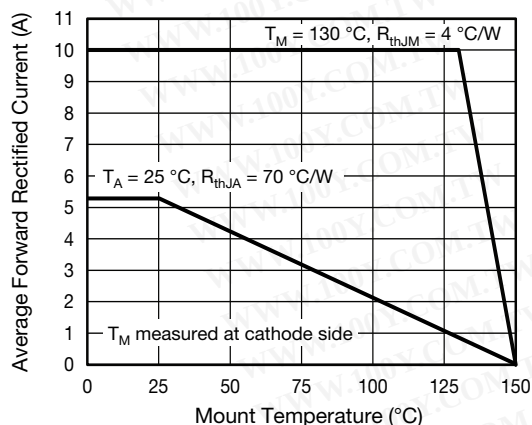
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve
(D = Duty Cycle = 0.5)

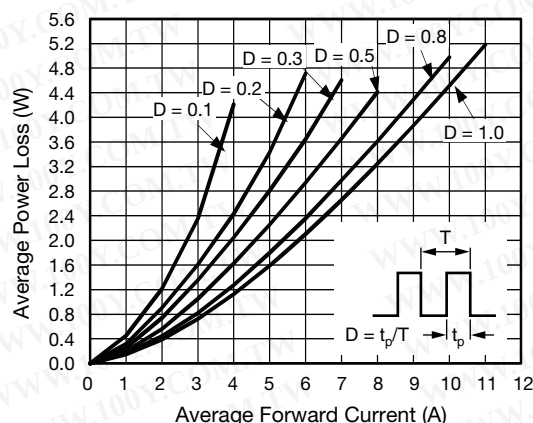


Fig. 2 - Forward Power Loss Characteristics

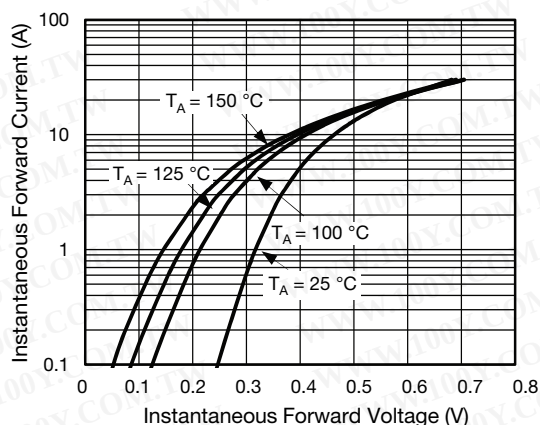


Fig. 3 - Typical Instantaneous Forward Characteristics

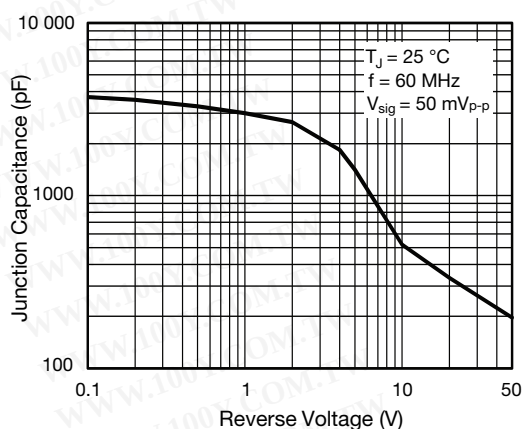


Fig. 5 - Typical Junction Capacitance

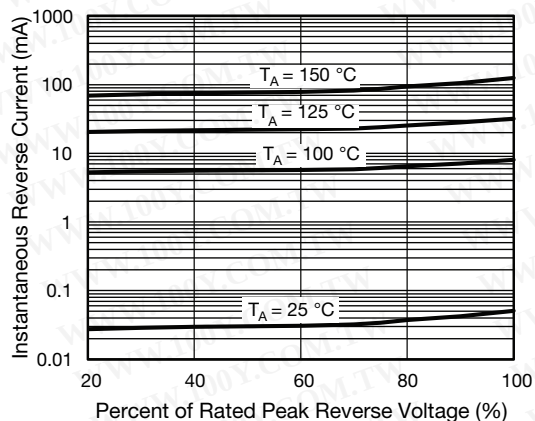


Fig. 4 - Typical Reverse Leakage Characteristics

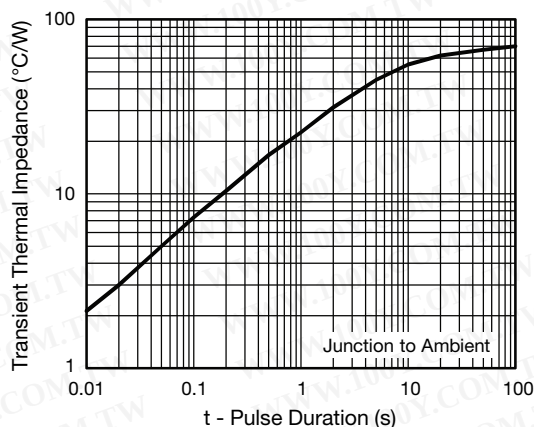
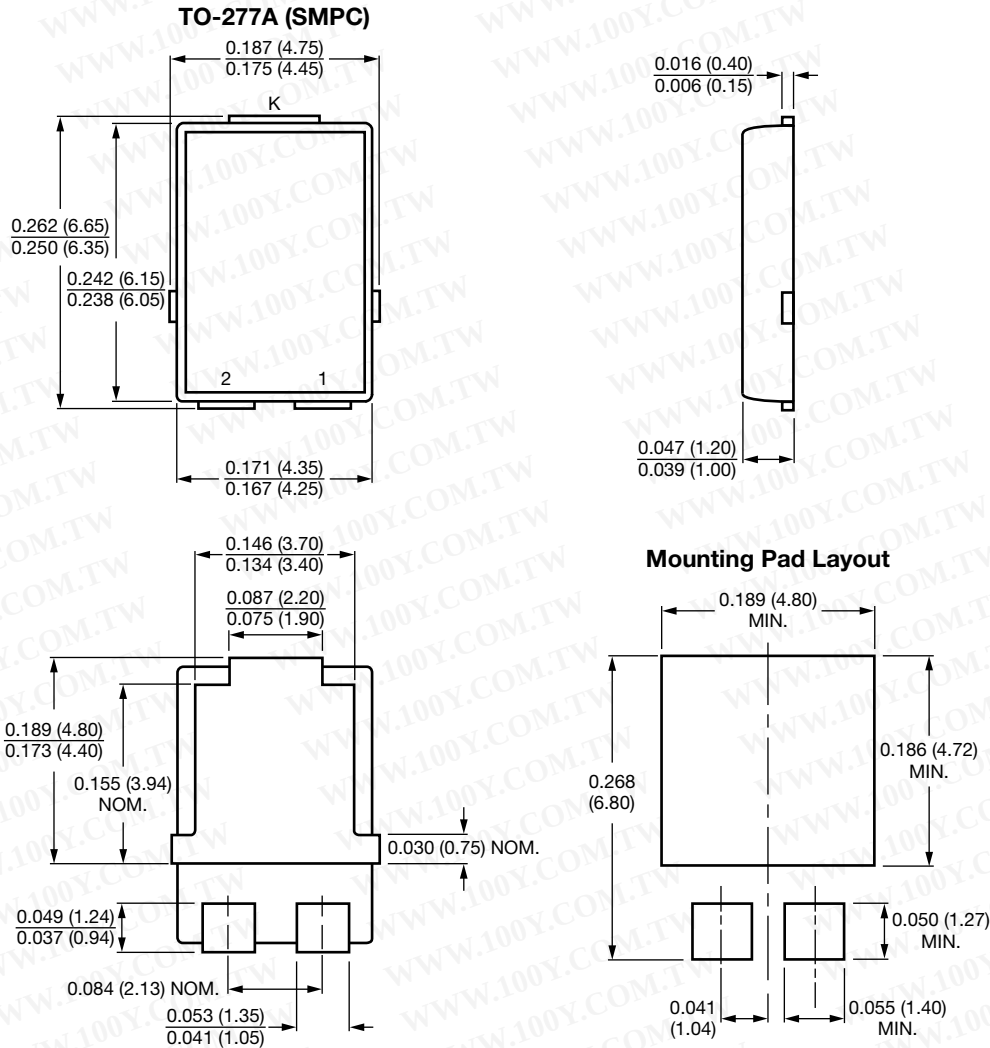


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A