

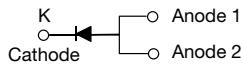
High Current Density Surface Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.30 V at I_F = 5 A

eSMP® Series



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES



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



TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMPC (TO-277A)

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 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	50 V
I_{FSM}	180 A
V_F at I_F = 10 A	0.40 V
T_J max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

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

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5 \text{ A}$	$T_A = 25^\circ\text{C}$	V_F ⁽¹⁾	0.40	-	V
	$I_F = 10 \text{ A}$			0.47	0.55	
	$I_F = 5 \text{ A}$			0.30	-	
	$I_F = 10 \text{ A}$			0.40	0.49	
Reverse current	$V_R = 50 \text{ V}$	$T_A = 25^\circ\text{C}$	I_R ⁽²⁾	50	1500	μA
		$T_A = 125^\circ\text{C}$		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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	V10PN50	UNIT
Typical thermal resistance	$R_{\theta JA}$ ^{(1) (2)}	70	$^\circ\text{C}/\text{W}$
	$R_{\theta JM}$ ⁽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: $dP_D/dT_J < 1/R_{\theta JA}$

(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

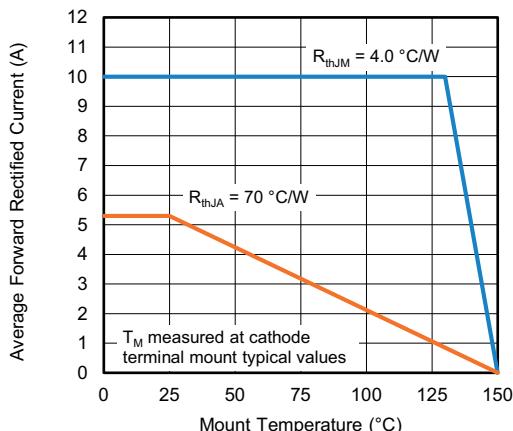
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


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

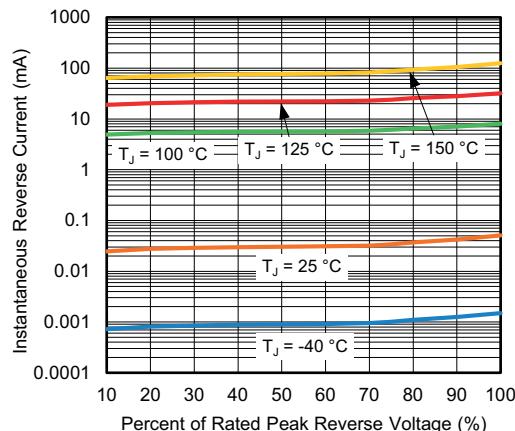


Fig. 4 - Typical Reverse Leakage Characteristics

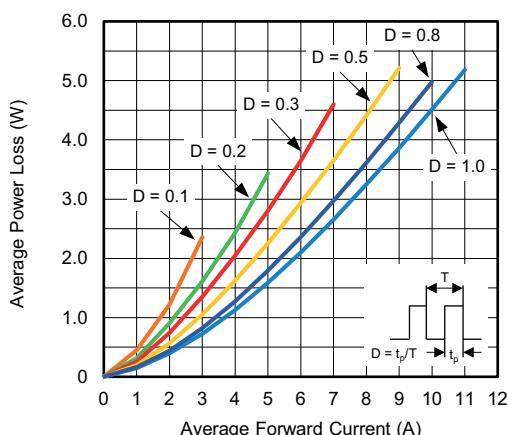


Fig. 2 - Forward Power Loss Characteristics

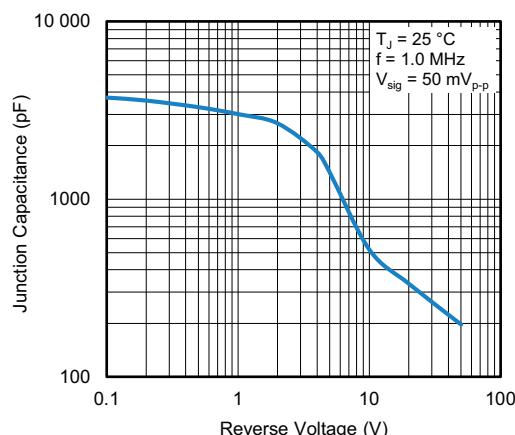


Fig. 5 - Typical Junction Capacitance

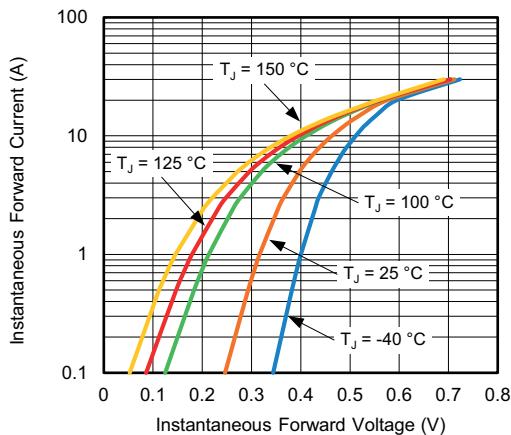


Fig. 3 - Typical Instantaneous Forward Characteristics

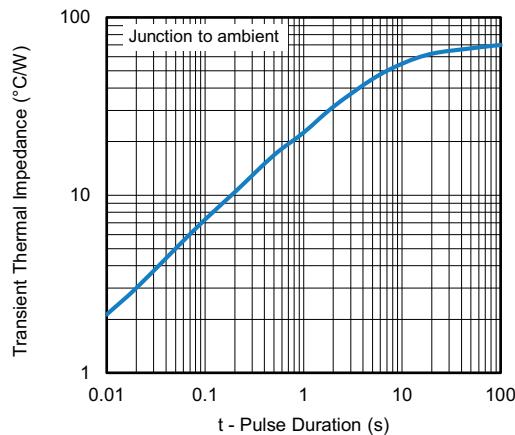
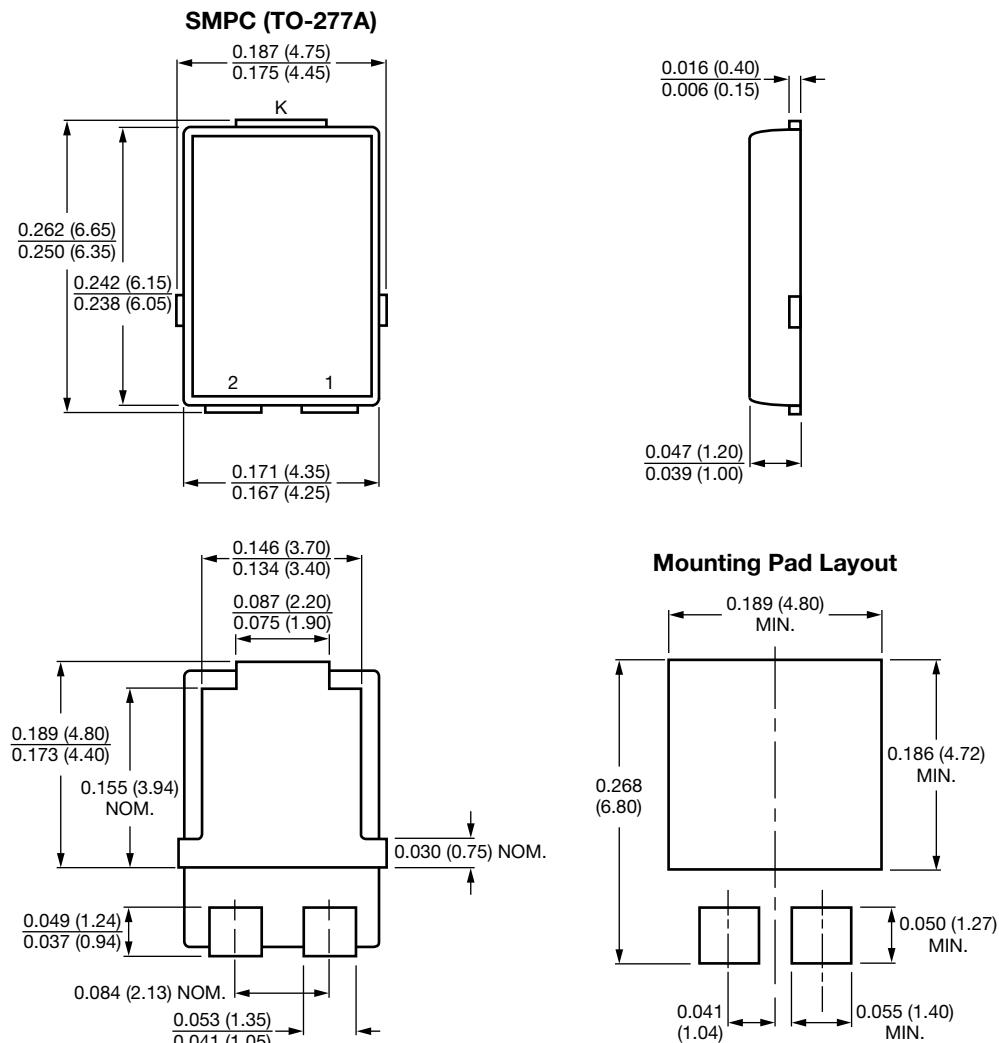


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)


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