

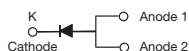
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.51\text{ V}$ at $I_F = 5\text{ A}$

TMBS® eSMP® Series



TO-277A (SMPC)



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
- AEC-Q101 qualified available
- Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc299912

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	10 A
V_{RRM}	120 V
I_{FSM}	160 A
E_{AS}	100 mJ
V_F at $I_F = 10\text{ A}$	0.62 V
T_J max.	150 °C
Package	TO-277A (SMPC)
Diode variations	Single

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

Base P/NHM3 - halogen-free, RoHS-compliant and AEC-Q101 qualified

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 JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

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

PARAMETER	SYMBOL	V10P12	UNIT
Device marking code		V1012	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	160	A
Non-repetitive avalanche energy at $I_{AS} = 2.0\text{ A}$, $T_J = 25\text{ °C}$	E_{AS}	100	mJ
Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$, 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$	I_{RRM}	0.5	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I _R = 1.0 mA	T _A = 25 °C	V _{BR}	120 (minimum)	-	V
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.57	-	V
	I _F = 10 A			0.74	0.82	
	I _F = 5 A	T _A = 125 °C		0.51	-	
	I _F = 10 A			0.62	0.70	
Reverse current	V _R = 90 V	T _A = 25 °C	I _R ⁽²⁾	6	-	μA
		T _A = 125 °C		4.5	-	mA
	V _R = 120 V	T _A = 25 °C		16	400	μA
		T _A = 125 °C		8.5	30	mA

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V10P12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	60	$^{\circ}\text{C/W}$
	$R_{\theta JL}$	4	

Note

(1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10P12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P12HM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
V10P12HM3/87A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel
V10P12HM3_A/H ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
V10P12HM3_A/I ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

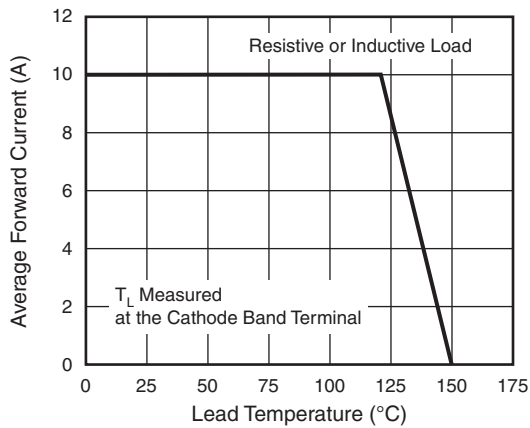
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

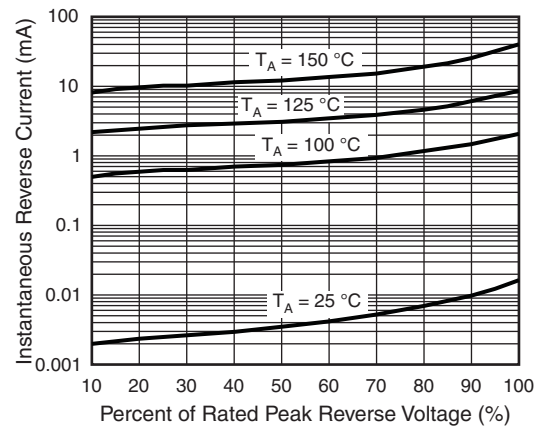


Fig. 4 - Typical Reverse Characteristics

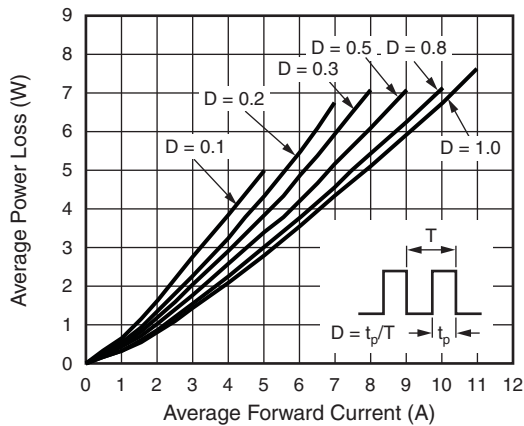


Fig. 2 - Forward Power Loss Characteristics

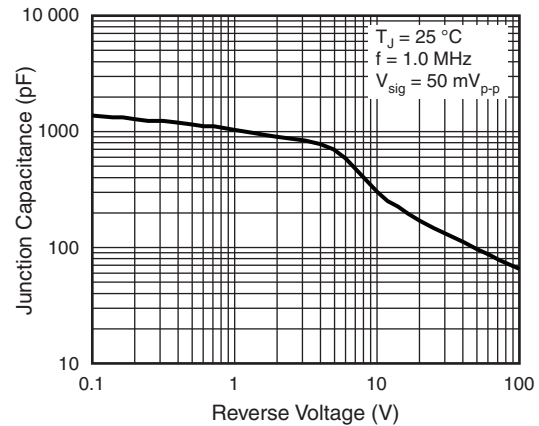


Fig. 5 - Typical Junction Capacitance

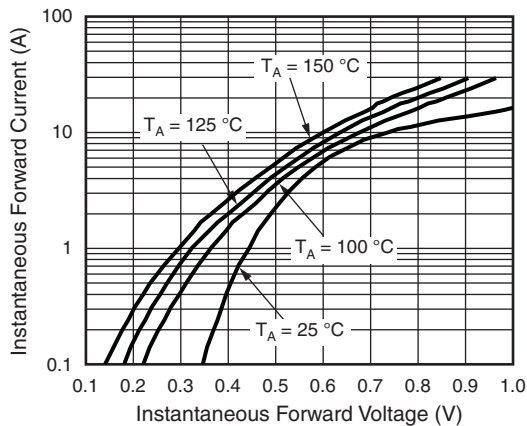


Fig. 3 - Typical Instantaneous Forward Characteristics

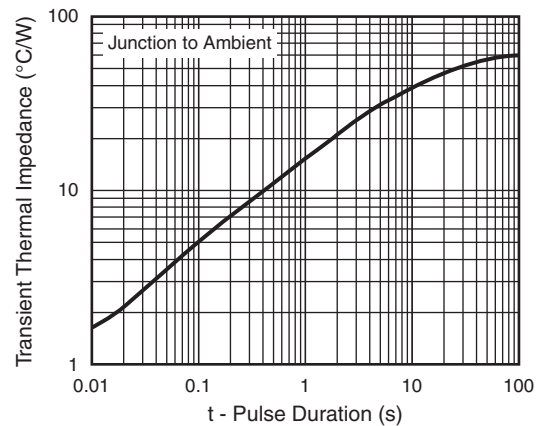
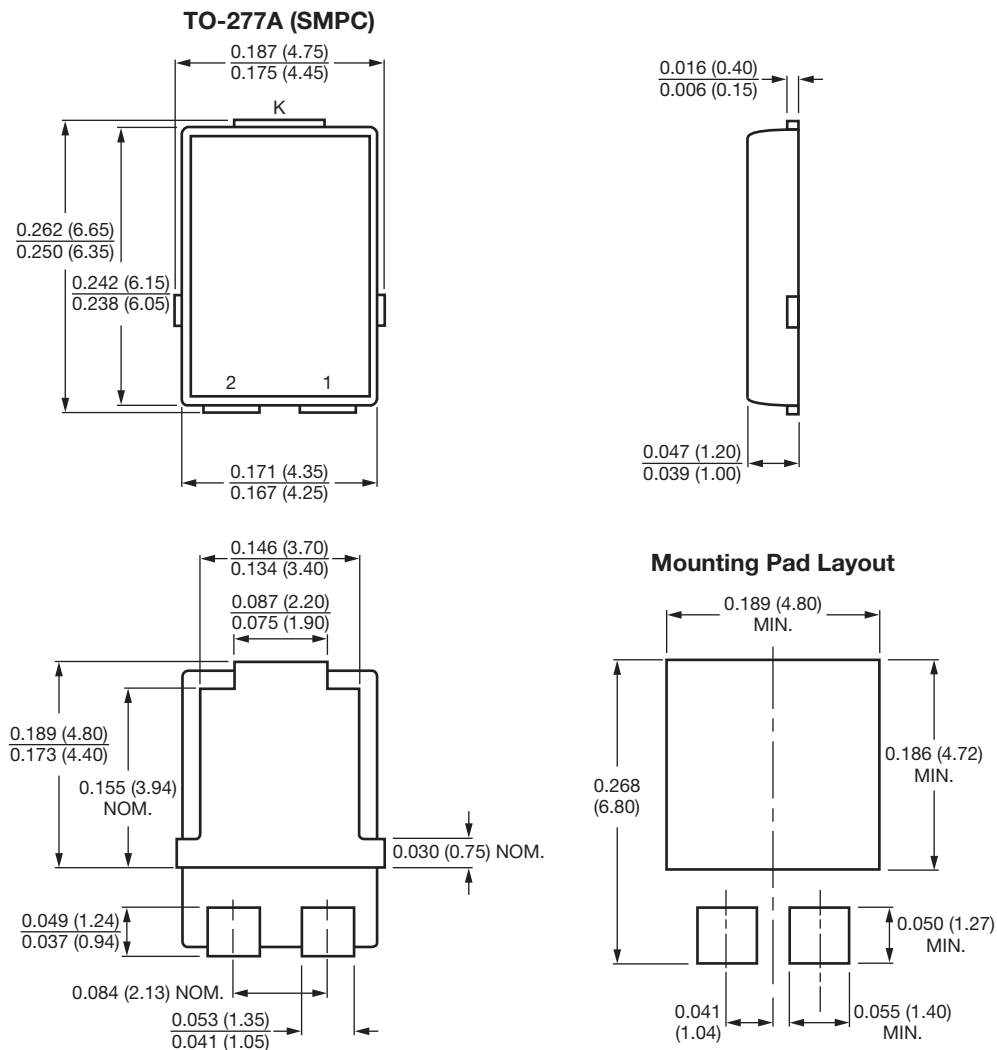


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)




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