

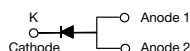
High Current Density Surface Mount MOS Barrier Schottky Rectifier Ultra Low

$$V_F = 0.453 \text{ V at } I_F = 5 \text{ A}$$

TMBS® eSMP® Series



SMPC (TO-277A)



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.

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_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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	100 V
I_{FSM}	180 A
E_{AS}	100 mJ
V_F at $I_F = 10 \text{ A}$	0.574 V
$T_J \text{ max.}$	150 °C
Package	TO-277A (SMPC)
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V10P10	UNIT
Device marking code		V1010	
Maximum repetitive peak reverse voltage	V_{RRM}	100	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}	180	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}	1.0	A
Operating junction temperature range	T_J ⁽¹⁾	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Note

⁽¹⁾ The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I _R = 1 mA	T _A = 25 °C	V _{BR}	100 (minimum)	-	V
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.512	-	V
	I _F = 10 A			0.625	0.68	
	I _F = 5 A	T _A = 125 °C		0.453	-	
	I _F = 10 A			0.574	0.62	
Reverse current	V _R = 70 V	T _A = 25 °C	I _R ⁽²⁾	7.1	-	μA
		T _A = 125 °C		4.5	-	mA
	V _R = 100 V	T _A = 25 °C		30.4	150	μA
		T _A = 125 °C		10.4	20	mA

Notes(2) Pulse test: 300 μs pulse width, 1 % duty cycle(3) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V10P10	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	60	$^{\circ}\text{C/W}$
	$R_{\theta JL}$	3	

Note

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

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P10HM3_A/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V10P10HM3_A/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

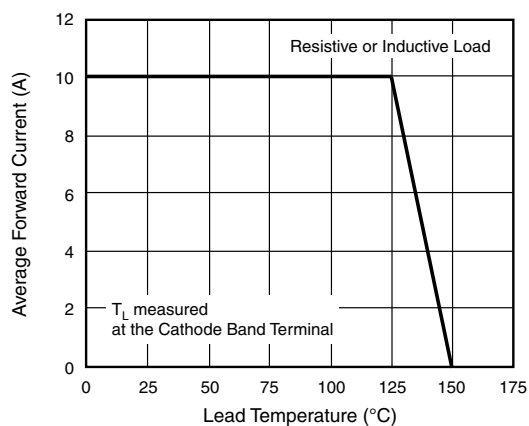
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

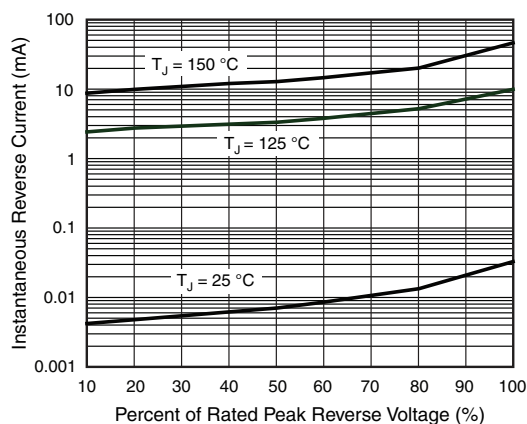


Fig. 4 - Typical Reverse Characteristics

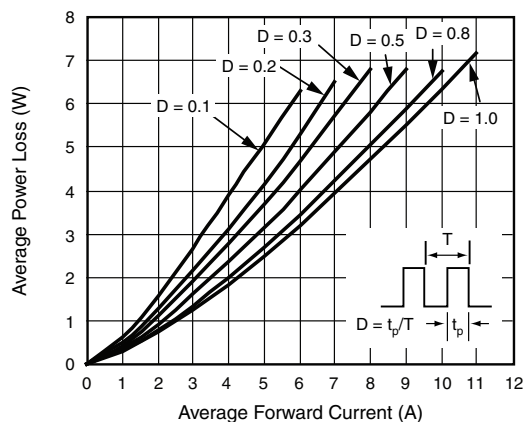


Fig. 2 - Forward Power Loss Characteristics

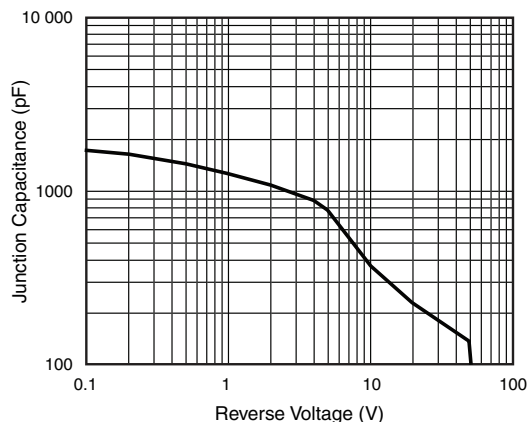


Fig. 5 - Typical Junction Capacitance

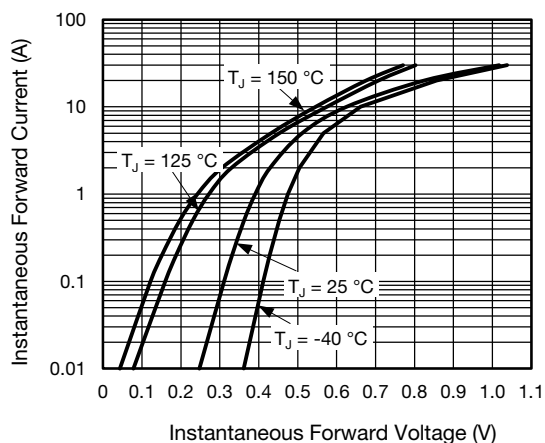


Fig. 3 - Typical Instantaneous Forward Characteristics

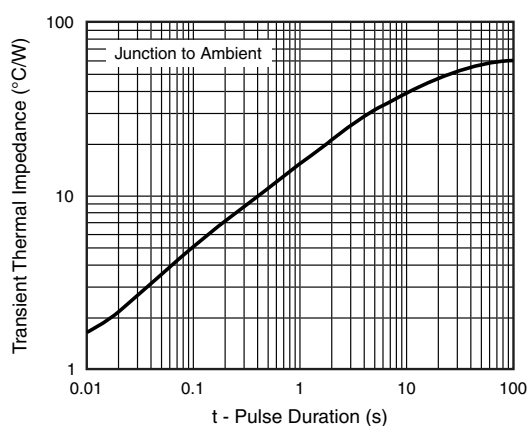
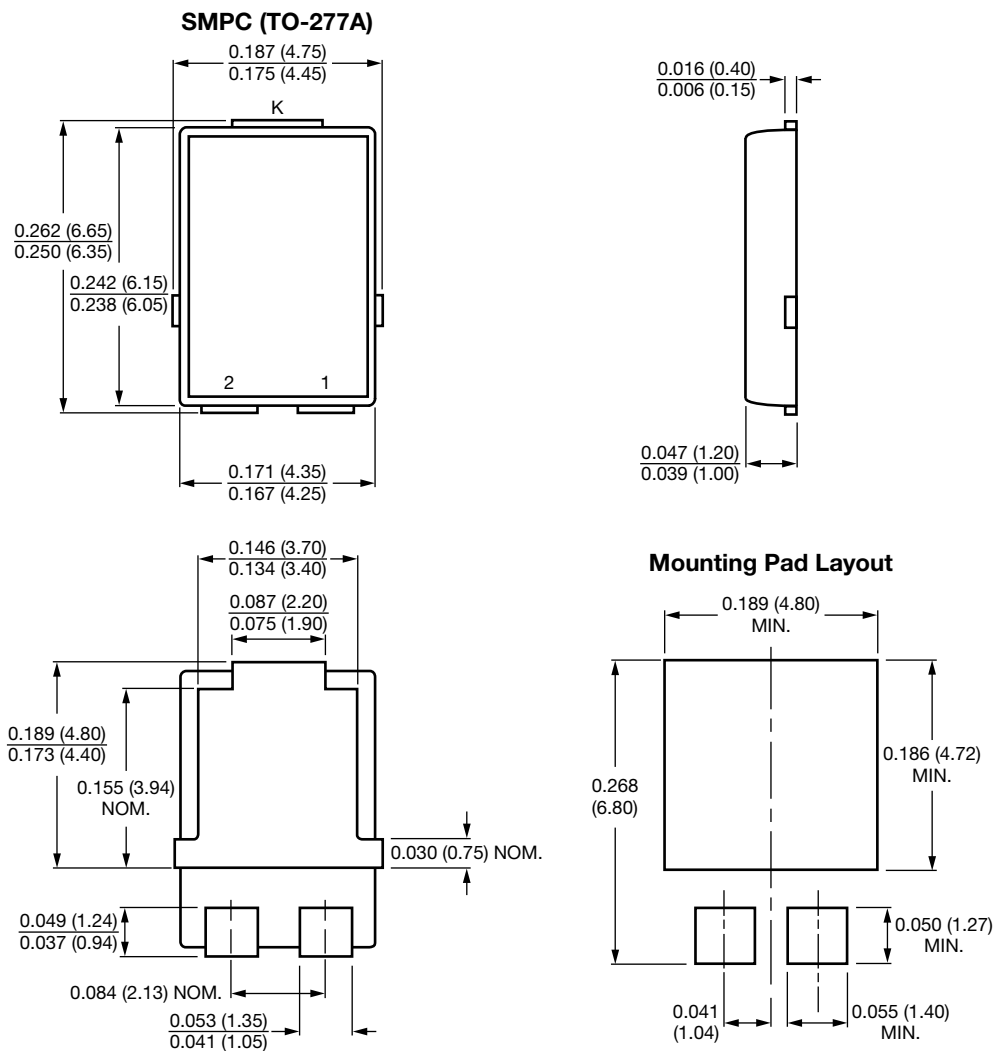


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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