

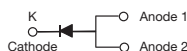
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.28\text{ V}$ 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
- Compliant to RoHS Directive 2011/65/EU
- **Halogen-free according to IEC 61249-2-21 definition**



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	10 A
V_{RRM}	45 V
I_{FSM}	200 A
V_F at $I_F = 10\text{ A}$	0.35 V
T_J max.	150 °C

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	V10PL45	UNIT
Device marking code		V10L45	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum DC forward current	$I_F^{(1)}$	10	A
	$I_F^{(2)}$	6.0	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200	
Operating junction and storage temperature range (AC mode)	T_J, T_{STG}	- 40 to + 150	°C

Notes

- (1) Mounted on 30 mm x 30 mm pad areas aluminum 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 = 5.0 A	T _A = 25 °C	V _F ⁽¹⁾	0.39	-	V
	I _F = 10 A			0.44	0.52	
	I _F = 5.0 A	T _A = 125 °C		0.28	-	
	I _F = 10 A			0.35	0.43	
Reverse current	V _R = 45 V	T _A = 25 °C	I _R ⁽²⁾	-	5.0	mA
		T _A = 125 °C		30	75	

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	V10PL45	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	68	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	4	

Notes

- (1) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
(2) Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10PL45-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10PL45-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

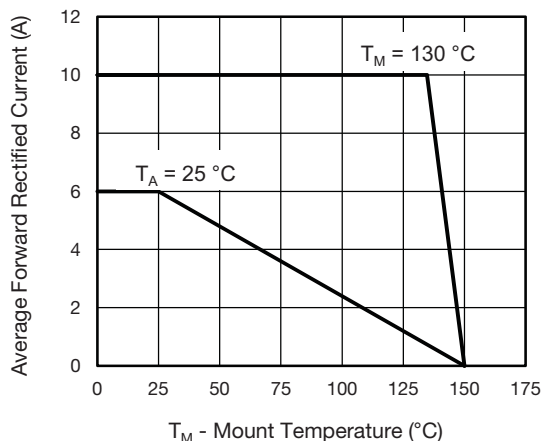
($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

Notes

- (1) Mounted on 30 mm x 30 mm aluminum PCB; T_M measured at the terminal of cathode band ($R_{\theta JM} = 4\text{ }^{\circ}\text{C/W}$)
(2) Free air, mounted on recommended copper pad area ($R_{\theta JA} = 68\text{ }^{\circ}\text{C/W}$)

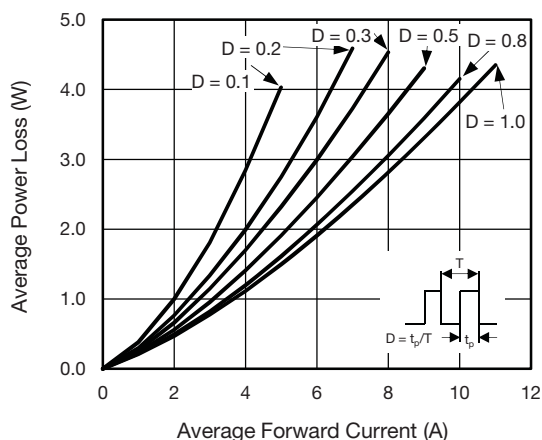


Fig. 2 - Forward Power Loss Characteristics

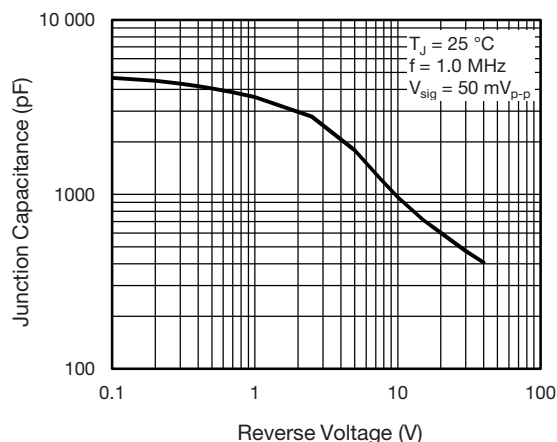


Fig. 5 - Typical Junction Capacitance

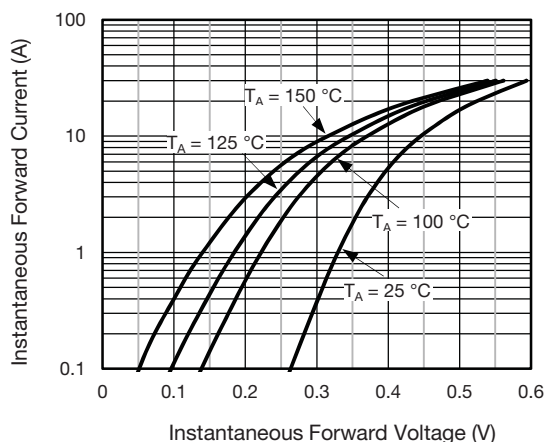


Fig. 3 - Typical Instantaneous Forward Characteristics

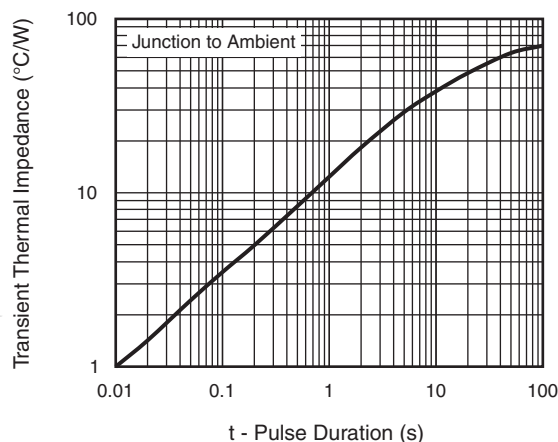


Fig. 6 - Typical Transient Thermal Impedance

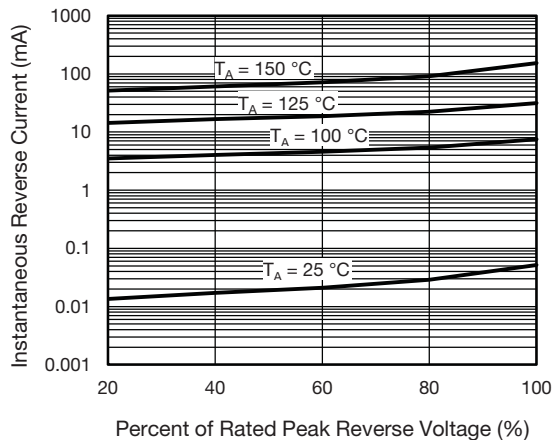
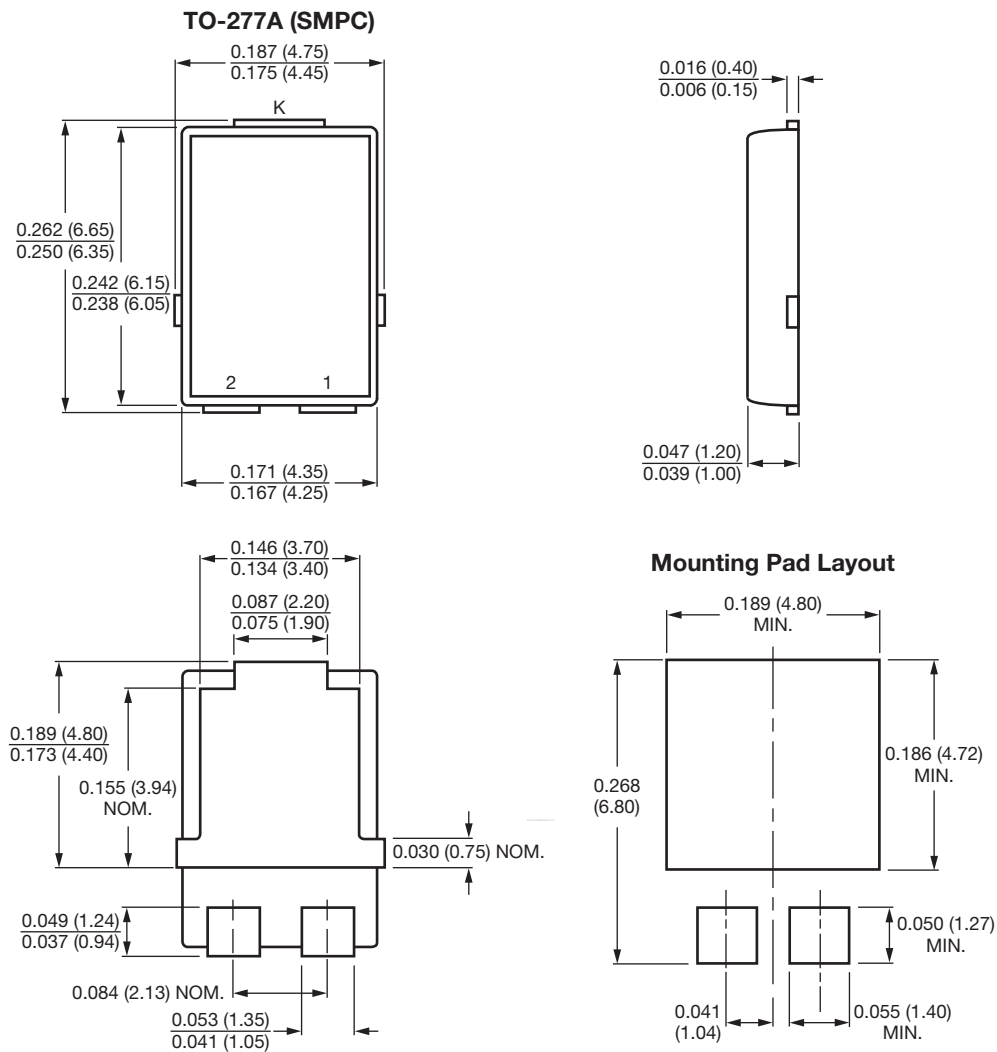


Fig. 4 - Typical Reverse Leakage Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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