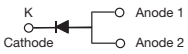
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.34 V at I_F = 5 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 2002/95/EC and in accordance to WEEE 2002/96/EC
- **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}	180 A
V_F at I_F = 10 A	0.41 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 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V10P45**	**UNIT**
Device marking code		V1045	
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum DC forward current	I_F (1)	10	A
	I_F (2)	4.4	
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 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)	0.42	-	V
	I_F = 10 A			0.48	0.57	
	I_F = 5.0 A	T_A = 125 °C		0.34	-	
	I_F = 10 A			0.41	0.50	
Reverse current	V_R = 45 V	T_A = 25 °C	I_R (2)	21	800	µA
		T_A = 125 °C		9	35	mA

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V10P45**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	75	°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**
V10P45-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P45-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

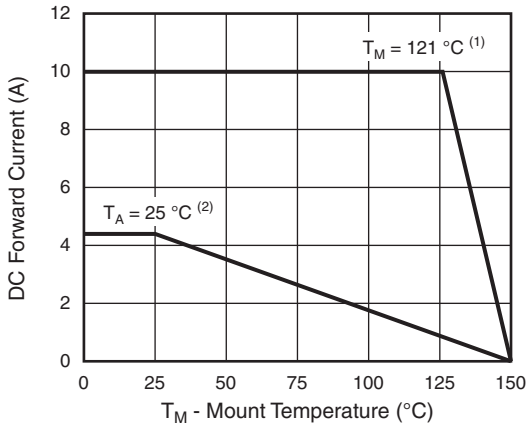


Fig. 1 - Maximum Forward Current Derating Curve

Notes

(1) Mounted on 30 mm x 30 mm aluminum PCB; T_M measured at the terminal of cathode band ($R_{\theta JM}$ = 4 °C/W)

(2) Free air, mounted on recommended copper pad area ($R_{\theta JA}$ = 75 °C/W)

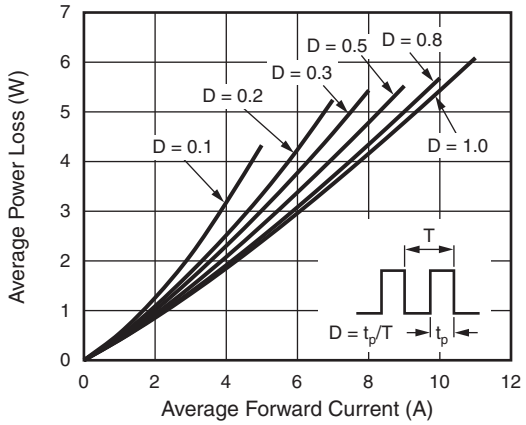


Fig. 2 - Forward Power Loss Characteristics

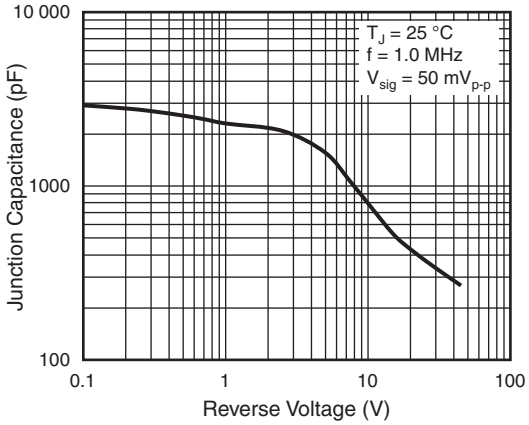


Fig. 5 - Typical Junction Capacitance

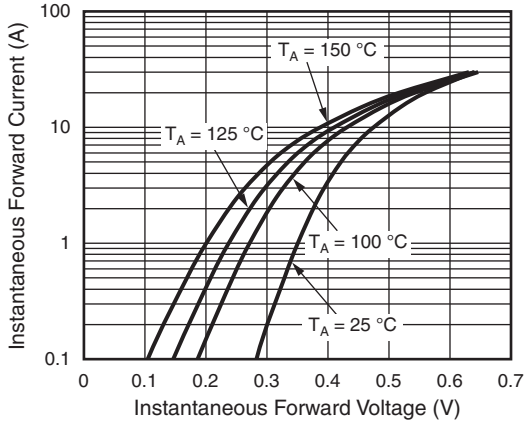


Fig. 3 - Typical Instantaneous Forward Characteristics

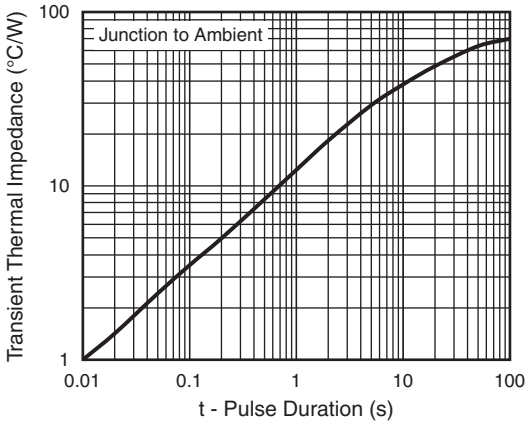


Fig. 6 - Typical Transient Thermal Impedance

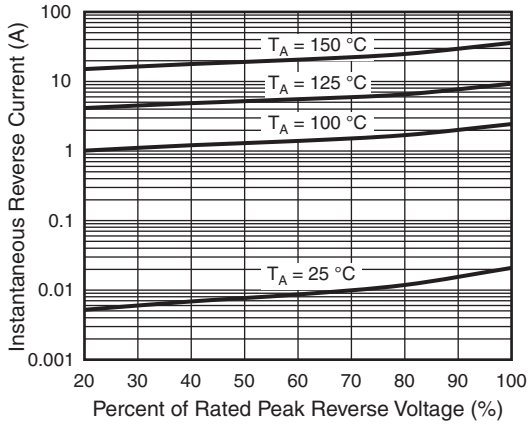
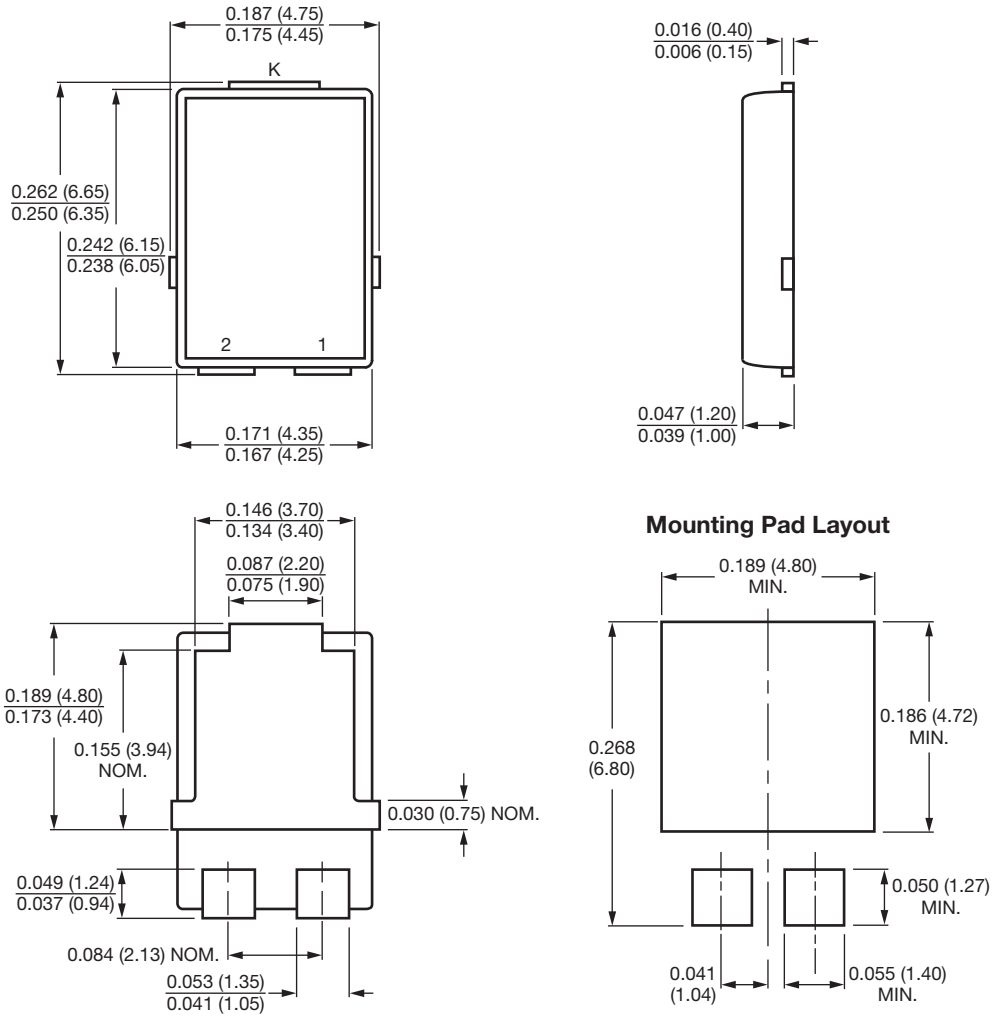


Fig. 4 - Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Mounting Pad Layout

Conform to JEDEC TO-277A

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