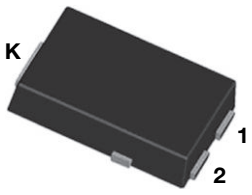
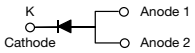
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.43 V at I_F = 5 A

TMBS® eSMP® Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automatic 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	30 A
V_{RRM}	100 V
I_{FSM}	200 A
E_{AS}	100 mJ
V_F at I_F = 12 A	0.58 V
T_J max.	150 °C

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 - halogen-free, RoHS compliant, and automotive grade

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 °C unless otherwise noted)

PARAMETER	SYMBOL	V12P10	UNIT
Device marking code		V1210	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	12	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Non-repetitive avalanche energy at I_{AS} = 2.0 A, T_J = 25 °C	E_{AS}	100	mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz, T_J = 38 °C ± 2 °C	I_{RRM}	1.0	A
Operating junction and storage temperature range	T_J, T_{STG}	- 40 to + 150	°C

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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}	100 (minimum)	-	V
Instantaneous forward voltage	I_F = 5 A	T_A = 25 °C	V_F (1)	0.50	-	
	I_F = 12 A			0.65	0.70	
	I_F = 5 A	T_A = 125 °C		0.43	-	
	I_F = 12 A			0.58	0.64	
Reverse current	V_R = 70 V	T_A = 25 °C	I_R (2)	7.0	-	µA
		T_A = 125 °C		4.4	-	mA
	V_R = 100 V	T_A = 25 °C		21.3	250	µA
		T_A = 125 °C		11.8	20	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 specified)			
PARAMETER	**SYMBOL**	**V12P10**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	60	°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**
V12P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V12P10HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V12P10HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) Automotive grade

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RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

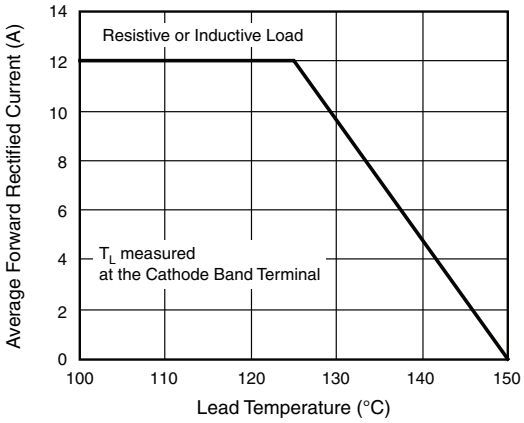


Fig. 1 - Maximum Forward Current Derating Curve

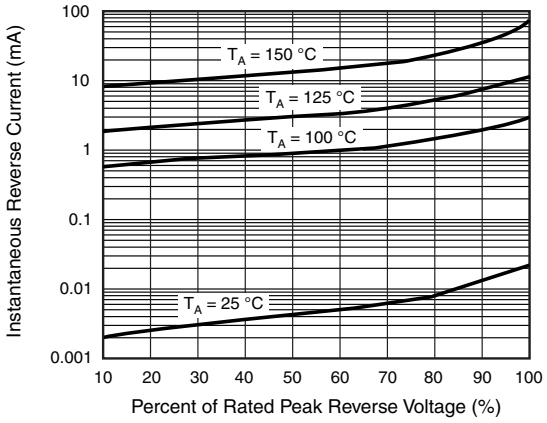


Fig. 4 - Typical Reverse Leakage Characteristics

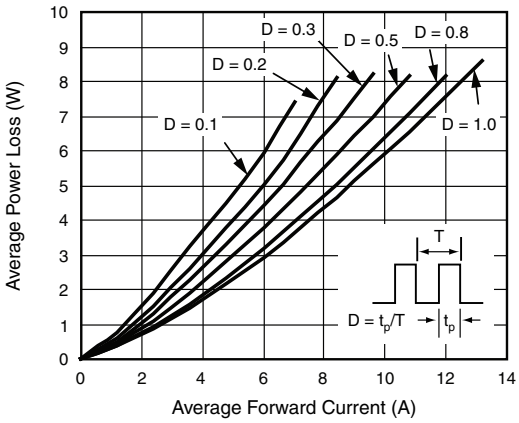


Fig. 2 - Forward Power Loss Characteristics

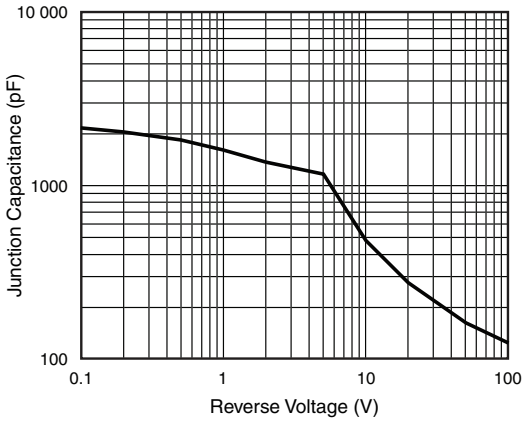


Fig. 5 - Typical Junction Capacitance

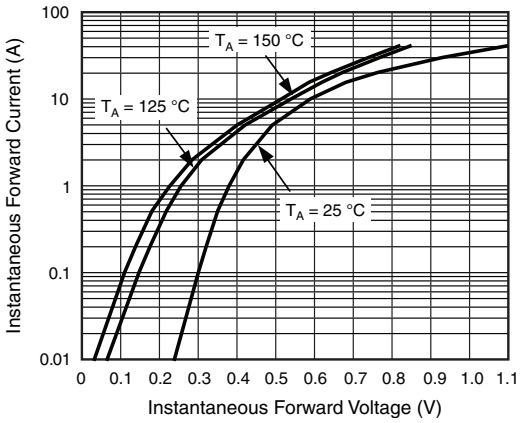


Fig. 3 - Typical Instantaneous Forward Characteristics

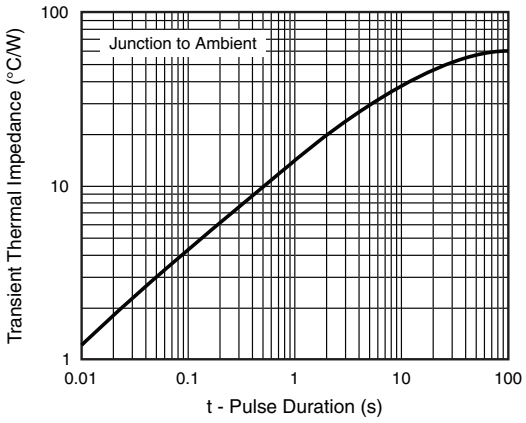
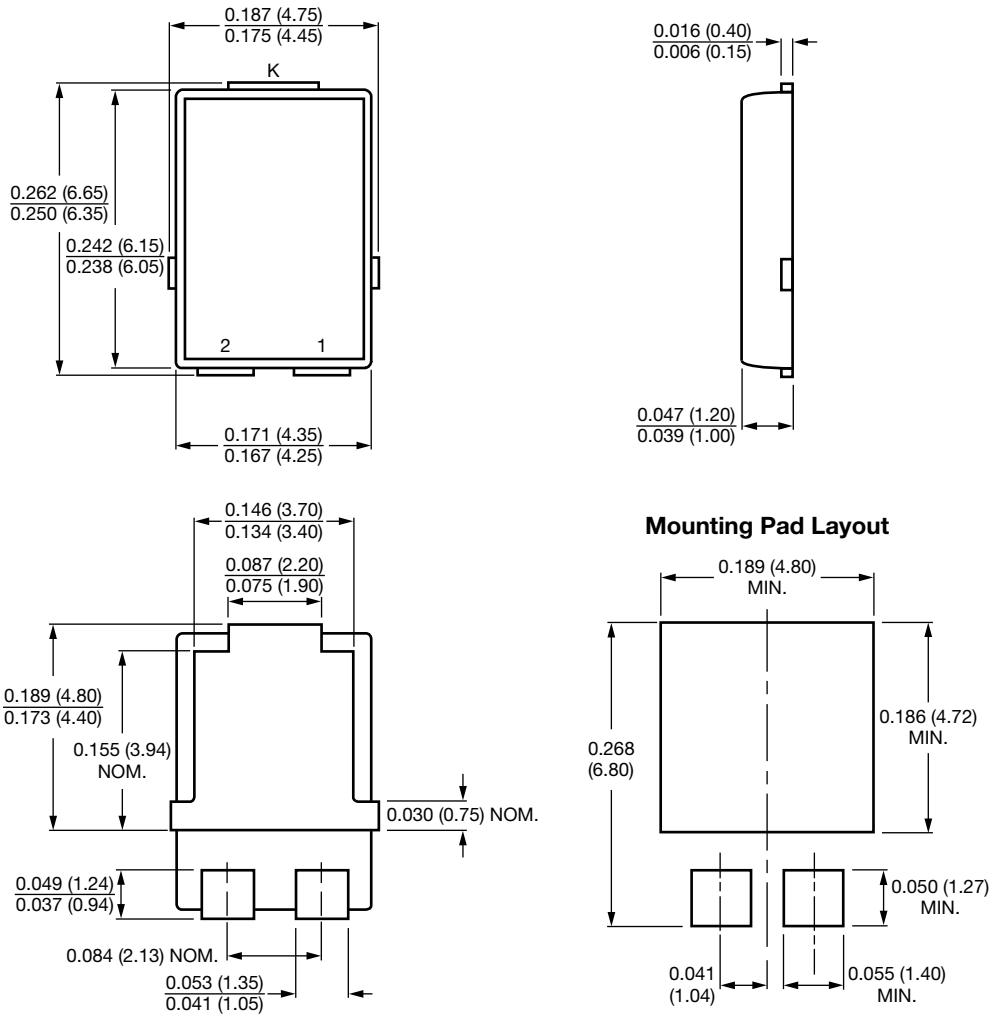


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Mounting Pad Layout

Conform to JEDEC TO-277A

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