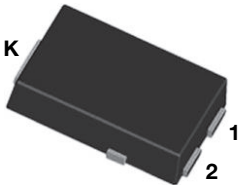
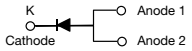
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.53 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
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

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}	120 V
I_{FSM}	160 A
V_F at I_F = 10 A	0.63 V
T_J max.	150 °C
Package	TO-277A (SMPC)
Diode variation	Single die

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 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	V10PM12	UNIT
Device marking code		10M12	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum DC forward current	I_F (1)	10	A
	I_F (2)	3.9	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	160	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 A	T_A = 25 °C	V_F (1)	0.60	-	V
	I_F = 10 A			0.75	0.83	
	I_F = 5 A	T_A = 125 °C		0.53	-	
	I_F = 10 A			0.63	0.71	
Reverse current	V_R = 90 V	T_A = 25 °C	I_R (2)	2.9	-	µA
		T_A = 125 °C		2.0	-	mA
	V_R = 120 V	T_A = 25 °C		-	400	µA
		T_A = 125 °C		4.8	28	mA

Notes

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V10PM12**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	62	°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**
V10PM12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10PM12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10PM12HM3/86A (1)	0.10	86A	1500	7" diameter plastic tape and reel
V10PM12HM3/87A (1)	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) Automotive grade

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

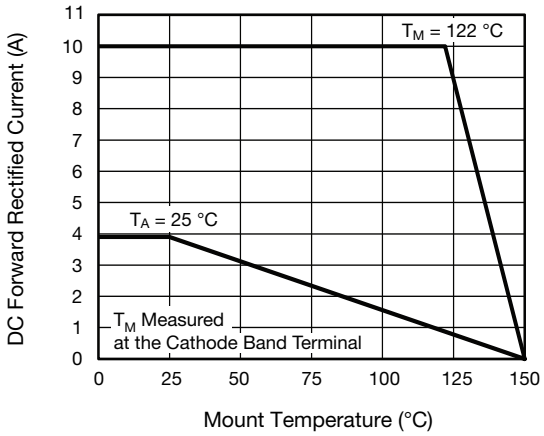


Fig. 1 - Forward Current Derating Curve

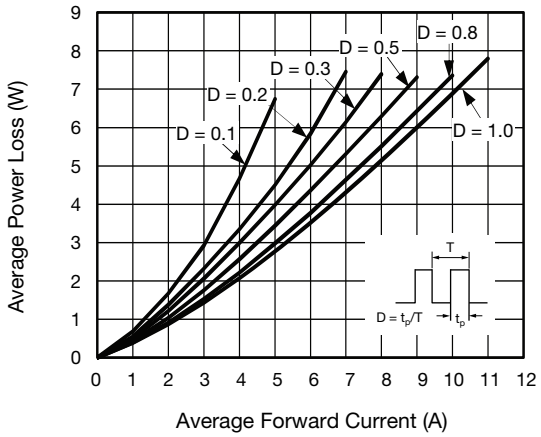


Fig. 2 - Forward Power Loss Characteristics

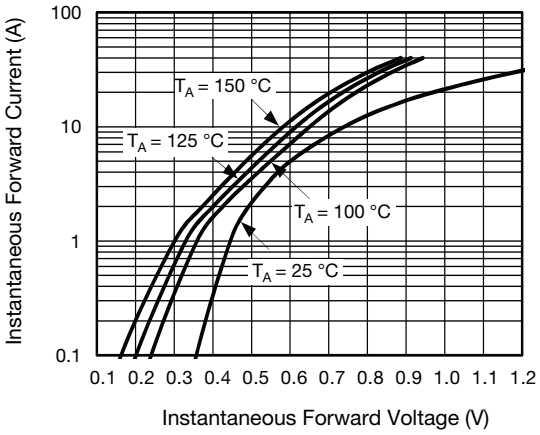


Fig. 3 - Typical Instantaneous Forward Characteristics

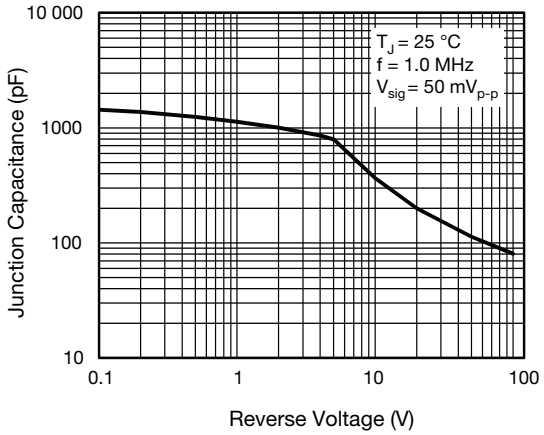


Fig. 5 - Typical Junction Capacitance

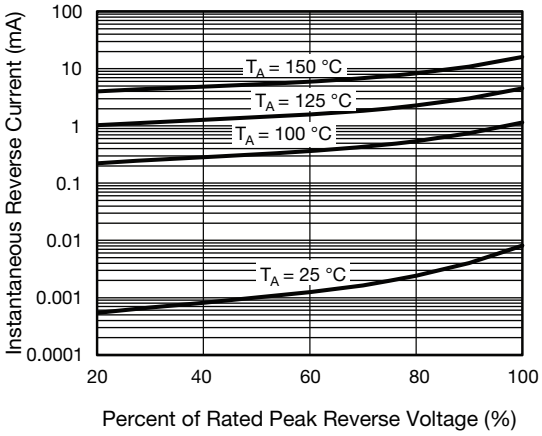


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

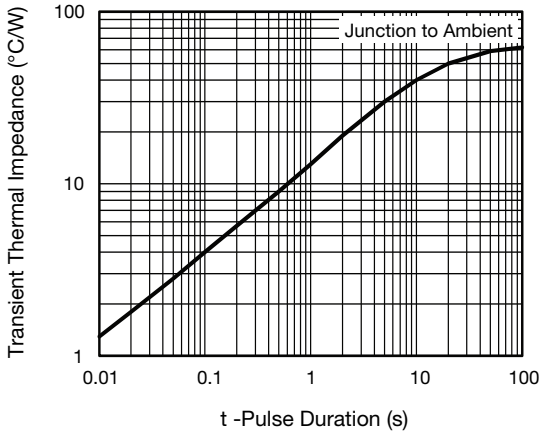
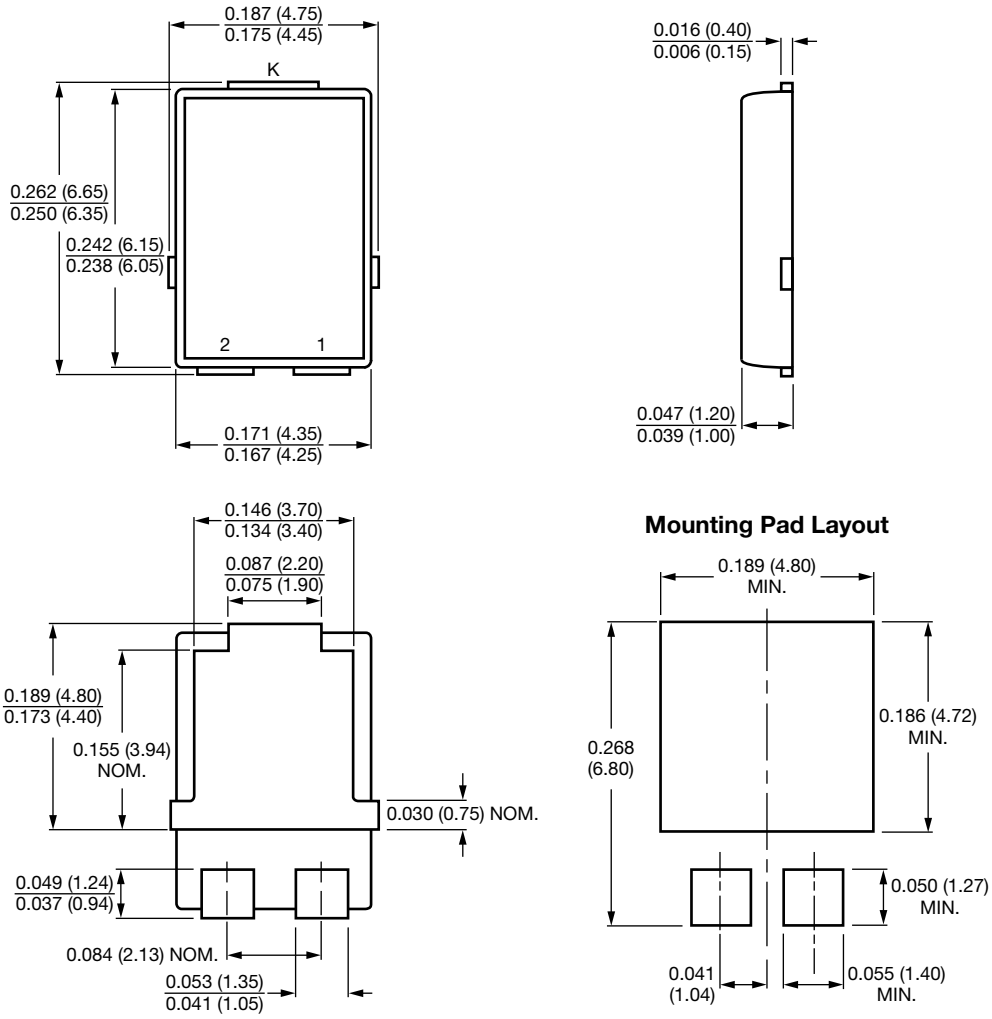


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Mounting Pad Layout

Conform to JEDEC TO-277A

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V10PM12-M3/87A