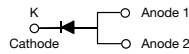


# High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.53$  V at  $I_F = 6$  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](http://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.

## 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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
$V_{RRM}$	120 V
$I_{FSM}$	160 A
$V_F$ at $I_F = 12$ A	0.63 V
$T_J$ max.	150 °C
Package	TO-277A (SMPC)
Diode variation	Single die

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V12PM12	UNIT
Device marking code		12M12	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward current	$I_F^{(1)}$	12	A
	$I_F^{(2)}$	4.1	
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 ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.60	-	V
	$I_F = 12\text{ A}$			0.75	0.83	
	$I_F = 6\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.53	-	
	$I_F = 12\text{ A}$			0.63	0.71	
Reverse current	$V_R = 90\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	3	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		2	-	mA
	$V_R = 120\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	500	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		5	35	mA

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width  $\leq 5\text{ ms}$

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V12PM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	62	$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	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
V12PM12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V12PM12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V12PM12HM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
V12PM12HM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel

**Note**

- (1) Automotive grade

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

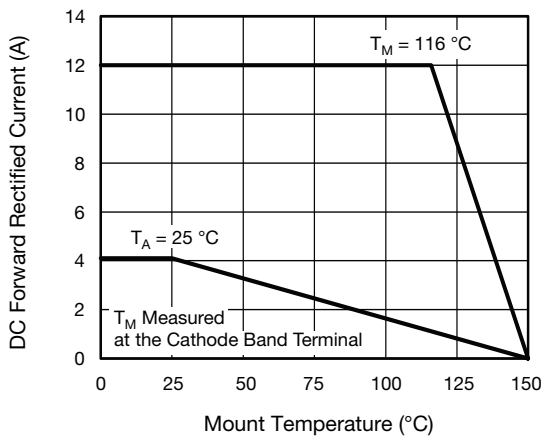


Fig. 1 - Forward Current Derating Curve

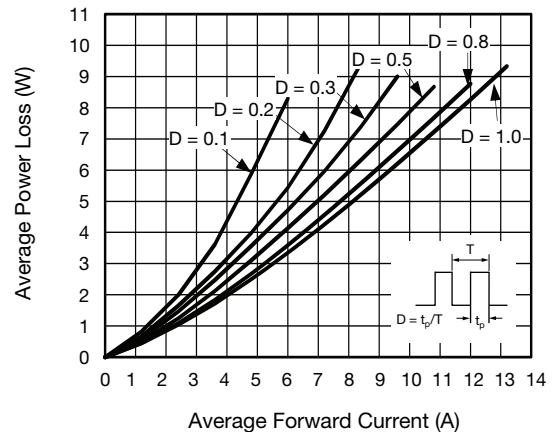


Fig. 2 - Forward Power Loss Characteristics

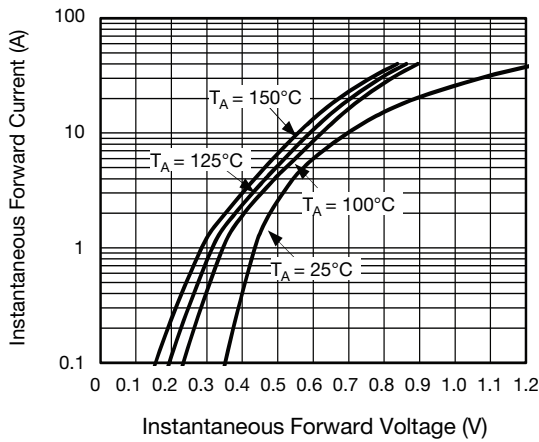


Fig. 3 - Typical Instantaneous Forward Characteristics

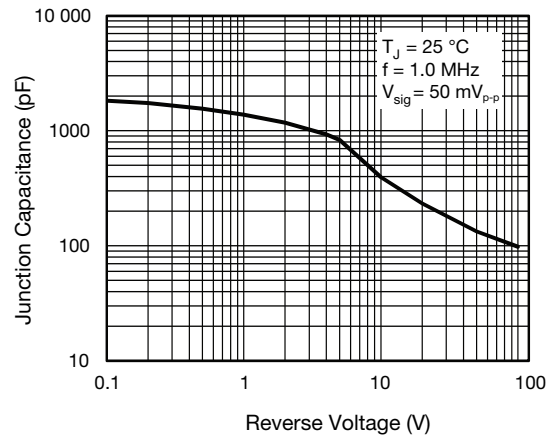


Fig. 5 - Typical Junction Capacitance

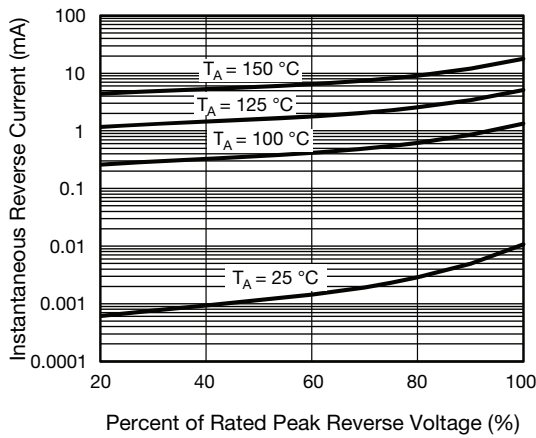


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

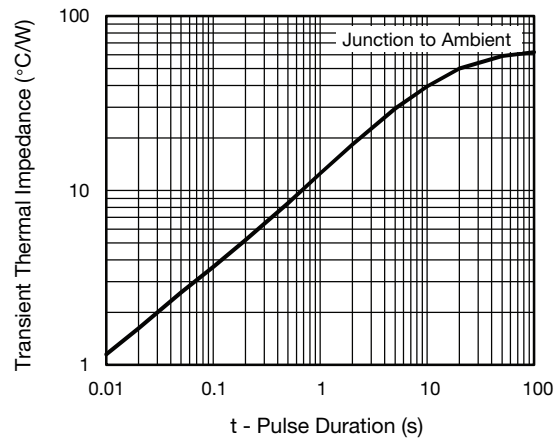
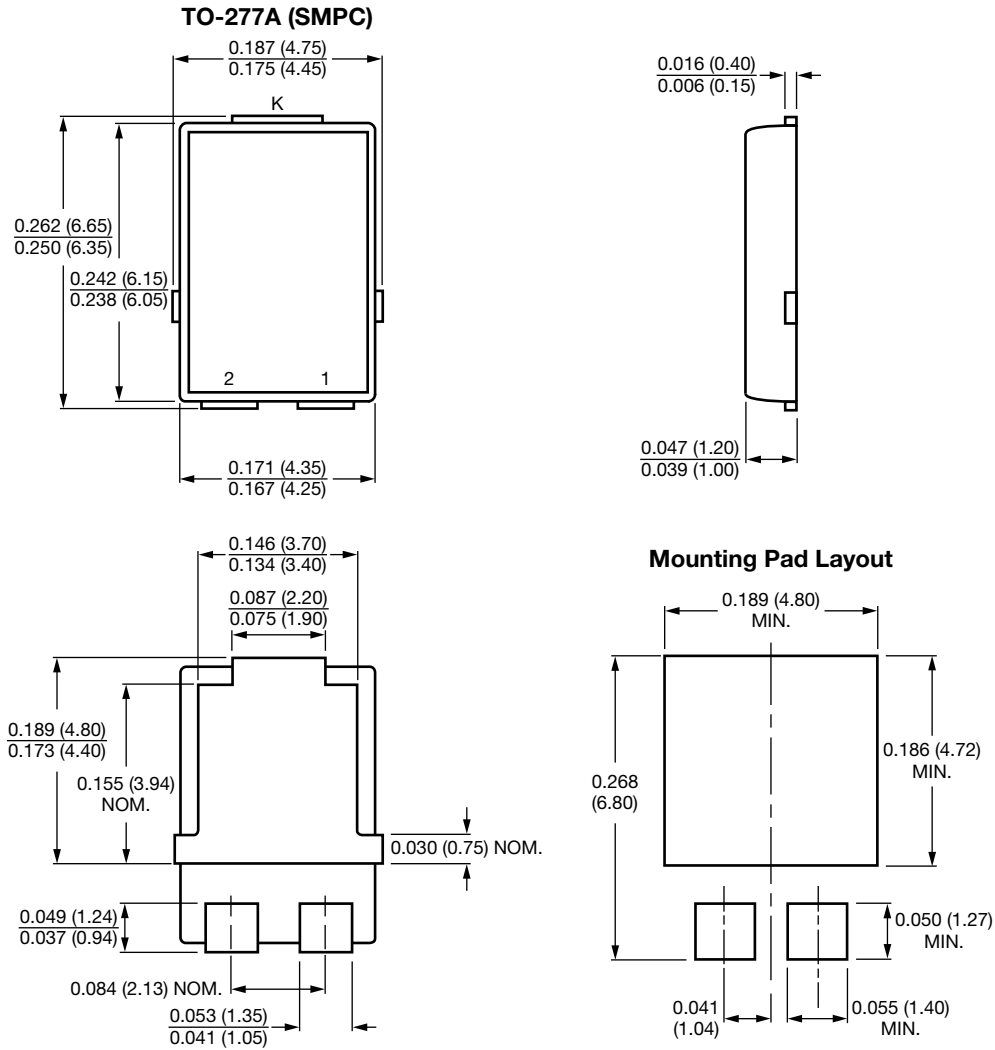


Fig. 6 - Typical Transient Thermal Impedance



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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