

High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.50\text{ V}$ at $I_F = 6\text{ A}$

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
- AEC-Q101 qualified available
- Automotive ordering code; base P/NHM3
- 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 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 AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	100 V
I_{FSM}	200 A
V_F at $I_F = 15\text{ A}$ (125 °C)	0.61 V
T_J max.	150 °C
Package	TO-277A (SMPC)
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V12PM10	UNIT
Device marking code		12M10	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	12	A
	$I_{F(AV)}^{(2)}$	3.8	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	200	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 pad area



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 6 A	T _A = 25 °C	V _F ⁽¹⁾	0.57	-	V
	I _F = 12 A			0.69	0.75	
	I _F = 6 A	T _A = 125 °C		0.50	-	
	I _F = 12 A			0.61	0.66	
Reverse current	V _R = 70 V	T _A = 25 °C	I _R ⁽²⁾	0.02	-	mA
		T _A = 125 °C		2.5	-	
	V _R = 100 V	T _A = 25 °C		-	0.20	
		T _A = 125 °C		5	16	

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 specified)			
PARAMETER	SYMBOL	V12PM10	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	75	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	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 pad areas aluminum PCB, thermal resistance $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V12PM10-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V12PM10-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V12PM10HM3/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V12PM10HM3/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note⁽¹⁾ AEC-Q101 qualified

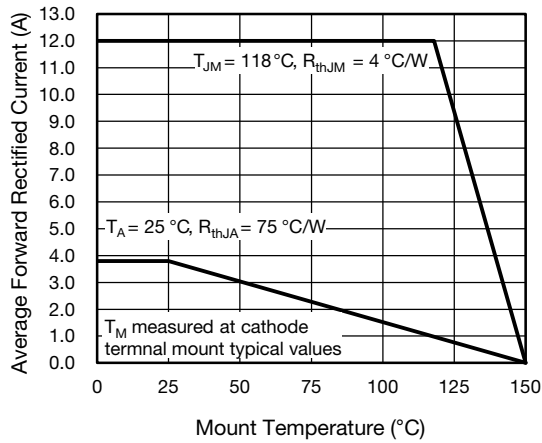
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

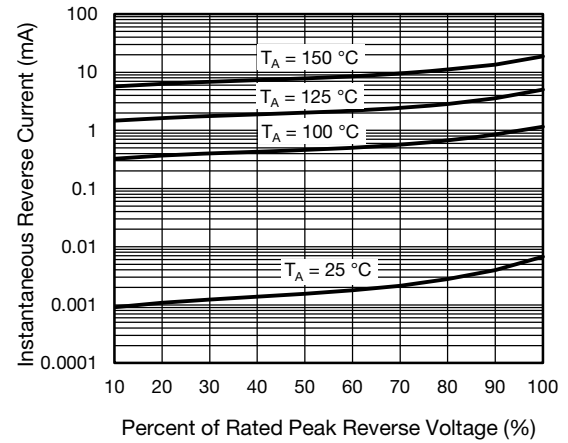


Fig. 4 - Typical Reverse Characteristics

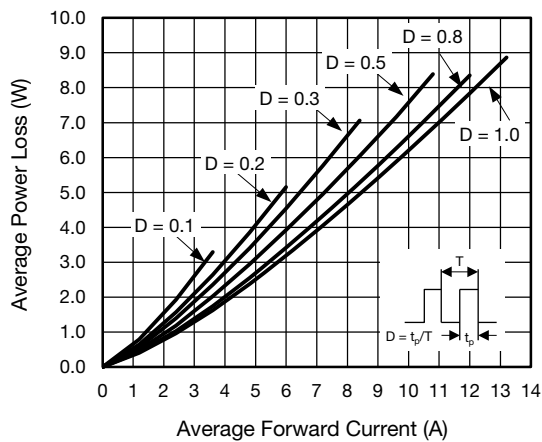


Fig. 2 - Forward Power Loss Characteristics

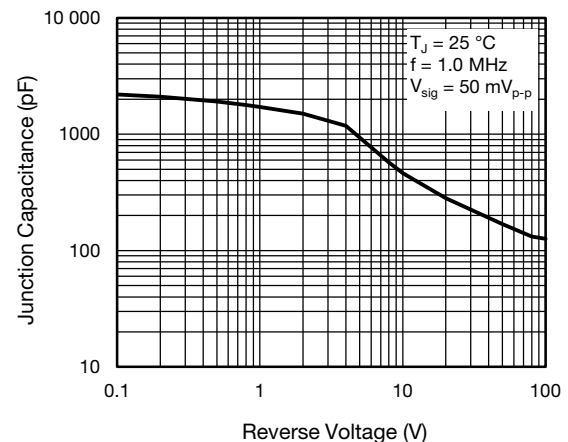


Fig. 5 - Typical Junction Capacitance

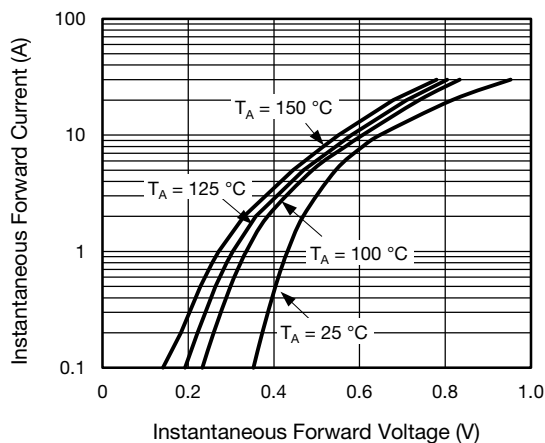


Fig. 3 - Typical Instantaneous Forward Characteristics

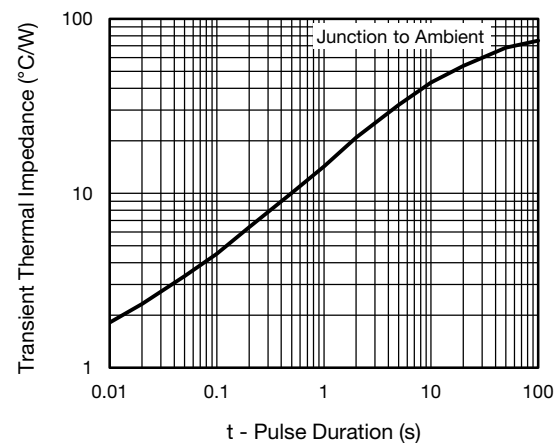


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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