Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifiers

eSMP® Series

Top view Bottom view

SMF (DO-219AB)

Cathode ○—|◀—○ Anode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	120 V
I_{FSM}	30 A
V_F at I_F = 1 A (T_A = 125 °C)	0.61 V
T_J max.	175 °C
Package	SMF (DO-219AB)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Trench MOS Schottky technology
- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial, industrial, and automotive applications.

MECHANICAL DATA

Case: SMF (DO-219AB)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant
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 meet JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V1FM12**	**UNIT**
Device marking code		1MS	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig.1)	$I_{F(AV)}$ (1)	1.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30	A
Operating junction temperature range	T_J (2)	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	

Notes

(1) Free air, mounted on FR4 PCB, 2 oz. standard footprint

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 0.5 A	T_A = 25 °C	V_F (1)	0.62	-	V
	I_F = 1.0 A			0.77	0.87	
	I_F = 0.5 A	T_A = 125 °C		0.52	-	
	I_F = 1.0 A			0.61	0.69	
Reverse current	V_R = 90 V	T_A = 25 °C	I_R (2)	0.30	-	µA
		T_A = 125 °C		180	-	
	V_R = 120 V	T_A = 25 °C		-	65	
		T_A = 125 °C		300	1500	
Typical junction capacitance	4.0 V, 1 MHz		C_J	95	-	pF

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**	**V1FM12**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	125	°C/W
	$R_{\theta JM}$ (2)	30	

Notes

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Device mounted on FR4 PCB, 2 oz. standard footprint, thermal resistance $R_{\theta JA}$ – junction-to-ambient; thermal resistance $R_{\theta JM}$ – junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V1FM12-M3/H	0.015	H	3000	7" diameter plastic tape and reel
V1FM12-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
V1FM12HM3/H (1)	0.015	H	3000	7" diameter plastic tape and reel
V1FM12HM3/I (1)	0.015	I	10 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

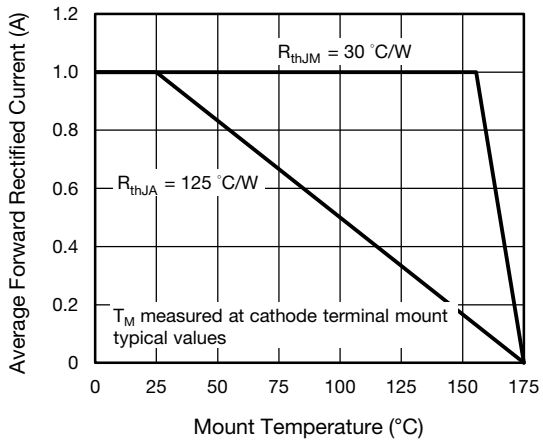


Fig. 1 - Maximum Forward Current Derating Curve

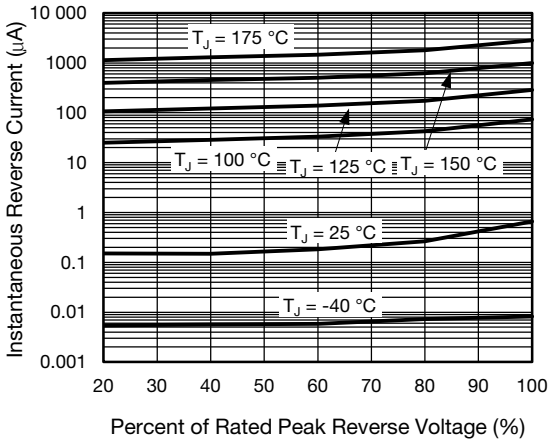


Fig. 4 - Typical Reverse Leakage Characteristics

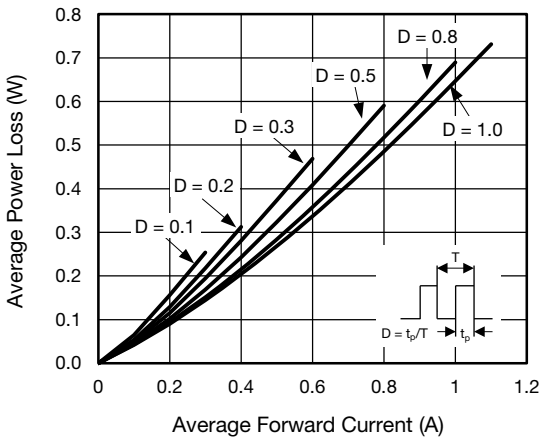


Fig. 2 - Average Power Loss Characteristics

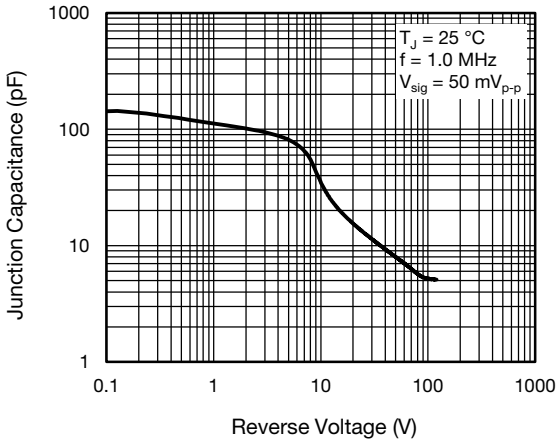


Fig. 5 - Typical Junction Capacitance

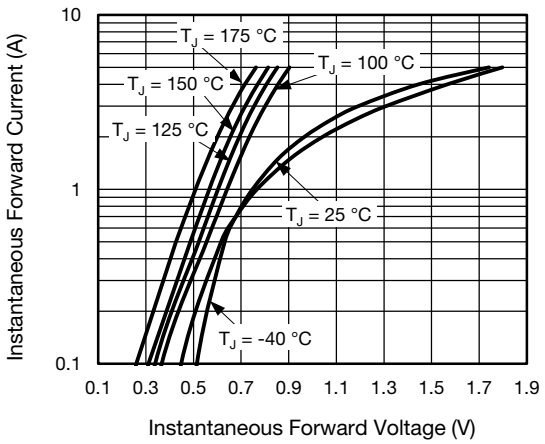


Fig. 3 - Typical Instantaneous Forward Characteristics

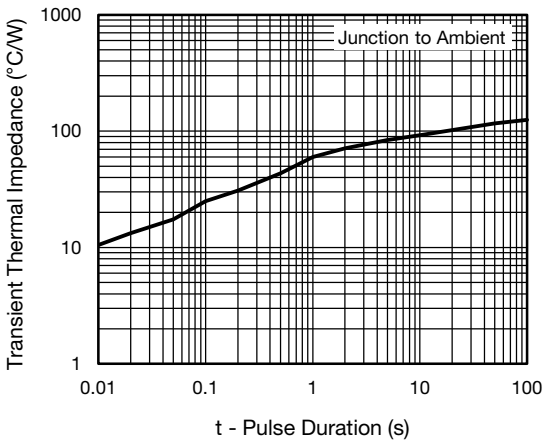
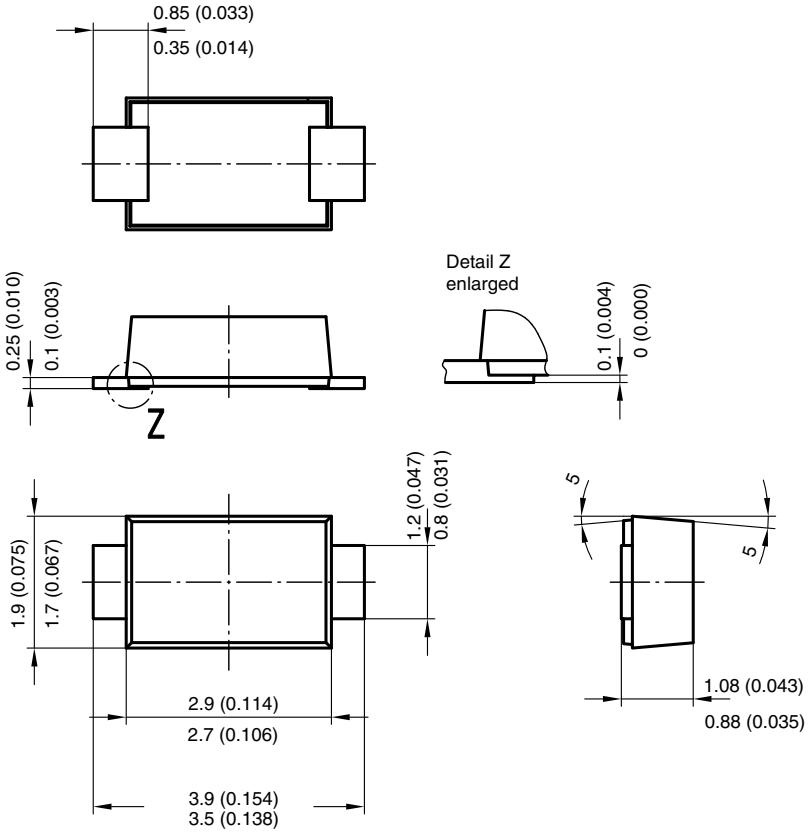
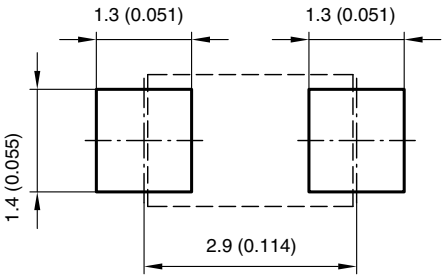


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



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