

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	
$I_{F(AV)}$	3.0 A
V_{RRM}	120 V
I_{FSM}	60 A
V_F at $I_F = 3$ A ($T_A = 125$ °C)	0.64 V
T_J max.	175 °C
Package	SMF (DO-219AB)
Circuit configuration	Single

FEATURES

- 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

AUTOMOTIVE GRADE Available


RoHS
COMPLIANT
HALOGEN
FREE

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	V3FM12	UNIT
Device marking code		3MS	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig.1)	$I_{F(AV)}^{(1)}$	2.5	A
	$I_{F(AV)}^{(2)}$	3.0	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	60	A
Operating junction temperature range	$T_J^{(3)}$	-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) Mounted on FR4 PCB, 2 oz. 10 mm x 10 mm copper pad area

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



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 1.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.65	-	V
	$I_F = 3.0\text{ A}$			0.84	0.94	
	$I_F = 1.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.55	-	
	$I_F = 3.0\text{ A}$			0.64	0.72	
Reverse current	$V_R = 90\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	0.7	-	μA
		$T_A = 125\text{ }^\circ\text{C}$		550	-	
	$V_R = 120\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	100	
		$T_A = 125\text{ }^\circ\text{C}$		950	3000	
Typical junction capacitance	4.0 V, 1 MHz		C_J	220	-	pF

Notes

- (1) Pulse test: 300 μs 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	V3FM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	125	$^\circ\text{C/W}$
	$R_{\theta JM}^{(3)}$	22	

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
(3) Device mounted on 10 mm x 10 mm pad size area footprint; thermal resistance $R_{\theta JM}$ – junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V3FM12-M3/H	0.015	H	3000	7" diameter plastic tape and reel
V3FM12-M3/I	0.015	I	10 000	13" diameter plastic tape and reel
V3FM12HM3/H ⁽¹⁾	0.015	H	3000	7" diameter plastic tape and reel
V3FM12HM3/I ⁽¹⁾	0.015	I	10 000	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

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

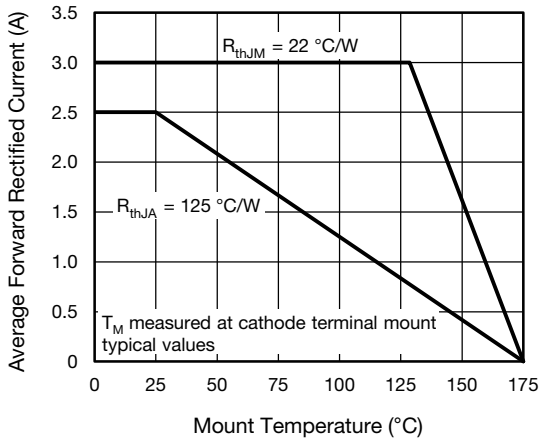


Fig. 1 - Maximum Forward Current Derating Curve

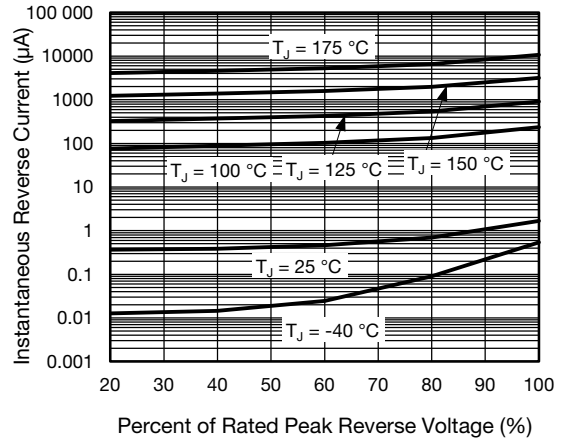


Fig. 4 - Typical Reverse Leakage Characteristics

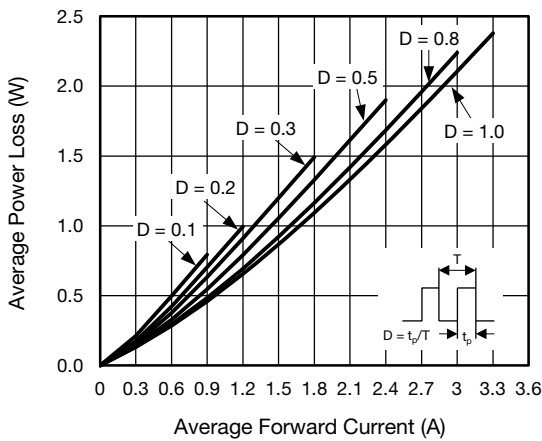


Fig. 2 - Average Power Loss Characteristics

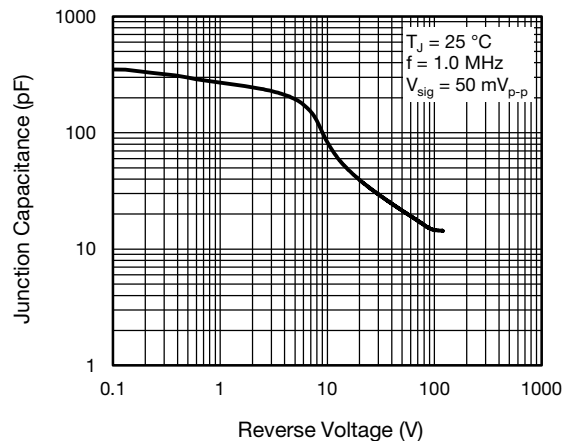


Fig. 5 - Typical Junction Capacitance

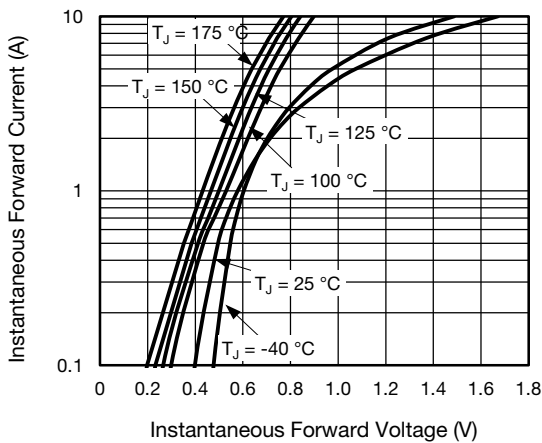


Fig. 3 - Typical Instantaneous Forward Characteristics

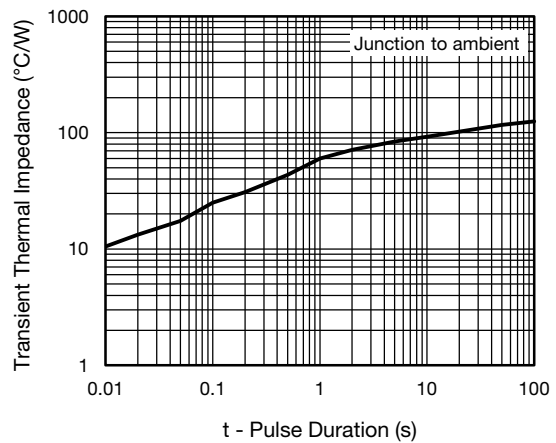
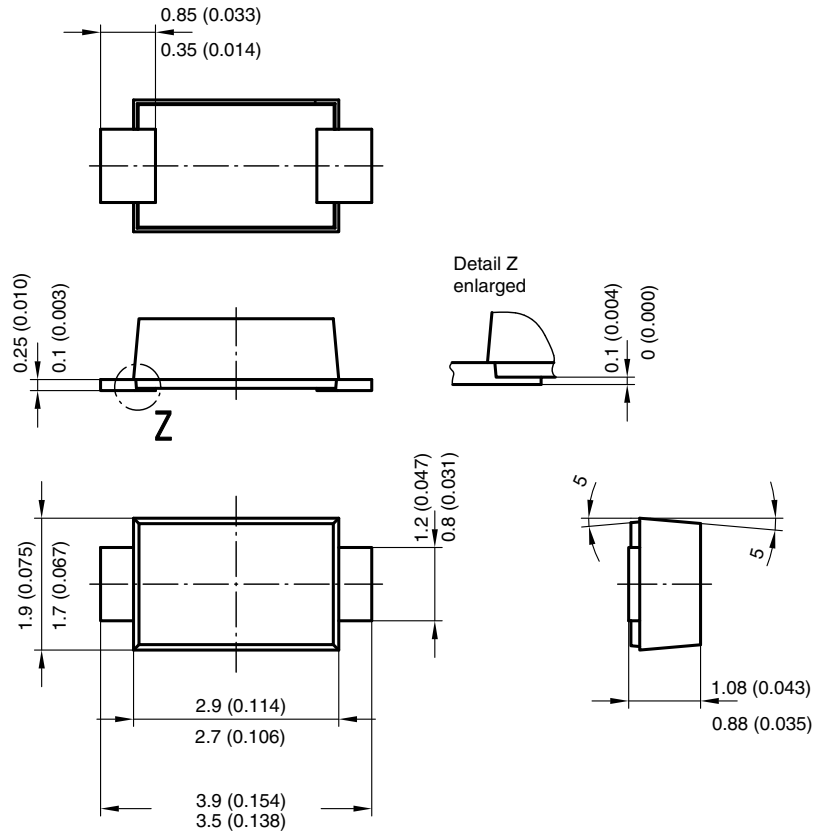
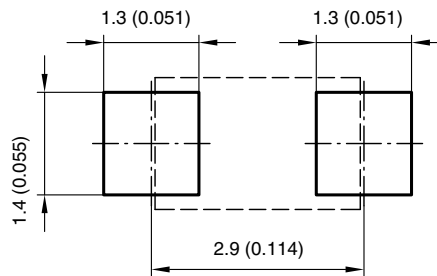


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



Created - Date: 15. February 2005
 Rev. 3 - Date: 13. March 2007
 Document no.:S8-V-3915.01-001 (4)
 17247



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