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

eSMP® Series

Top View Bottom View

SlimSMAW (DO-221AD)

Cathode ○—|◀|—○ Anode

DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3 A
V_{RRM}	120 V
I_{FSM}	60 A
V_F at I_F = 3 A (125 °C)	0.61 V
T_J max.	175 °C
Package	SlimSMAW (DO-221AD)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

- Low-profile package
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Compatible to SOD-128 package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb 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: SlimSMAW (DO-221AD)
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

H3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VSS8D3M12**	**UNIT**
Device marking code		3M12	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig.1)	$I_{F(AV)}$ (1)	3	A
	$I_{F(AV)}$ (2)	2	
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) Mounted on 30 mm x 30 mm AL PCB pad area
(2) Free air, mounted on recommended copper pad area
(3) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 1.5 A	T_A = 25 °C	V_F (1)	0.61	-	V
	I_F = 3 A			0.75	0.83	
	I_F = 1.5 A	T_A = 125 °C		0.52	-	
	I_F = 3 A			0.61	0.69	
Reverse current	V_R = 90 V	T_A = 25 °C	I_R (2)	0.01	-	mA
		T_A = 125 °C		0.5	-	
	V_R = 120 V	T_A = 25 °C		-	0.3	
		T_A = 125 °C		1	4	
Typical junction capacitance	4.0 V, 1 MHz		C_J	310	-	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 specified)				
PARAMETER	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	120	150	°C/W
	$R_{\theta JM}$ (3)	12	15	

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) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

(3) Thermal resistance junction-to-mount to follow JEDEC 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSS8D3M12-M3/H	0.033	H	3500	7" diameter plastic tape and reel
VSS8D3M12-M3/I	0.033	I	14 000	13" diameter plastic tape and reel
VSS8D3M12HM3/H (1)	0.033	H	3500	7" diameter plastic tape and reel
VSS8D3M12HM3/I (1)	0.033	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

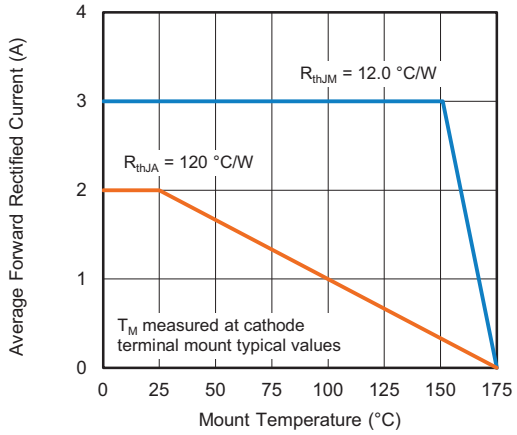

Fig. 1 - Maximum Forward Current Derating Curve

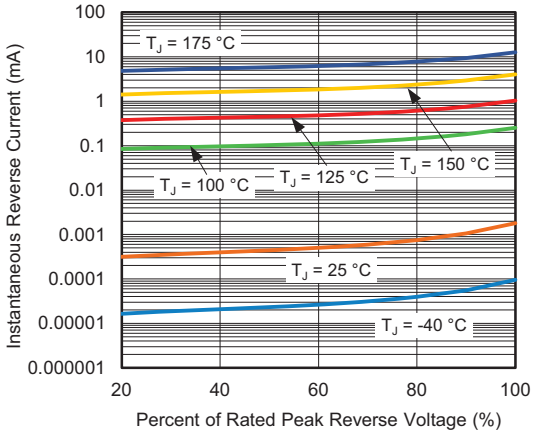

Fig. 4 - Typical Reverse Leakage Characteristics

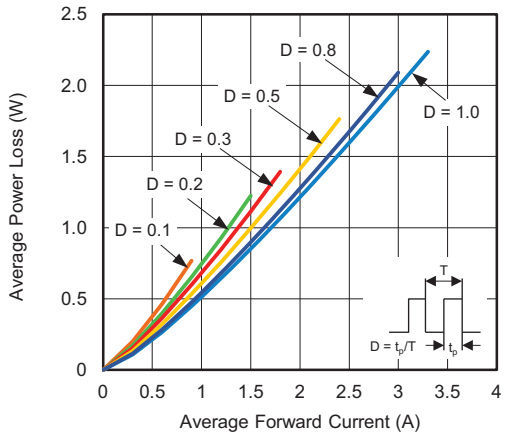

Fig. 2 - Forward Power Loss Characteristics

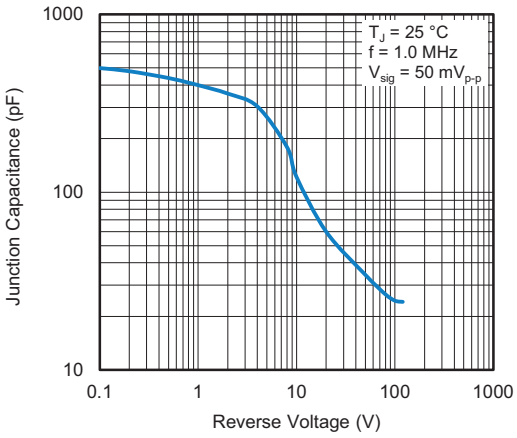

Fig. 5 - Typical Junction Capacitance

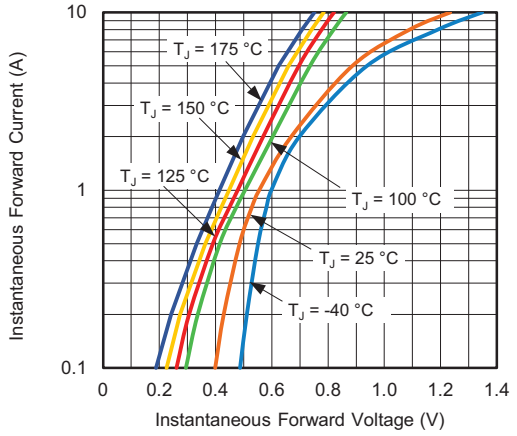

Fig. 3 - Typical Instantaneous Forward Characteristics

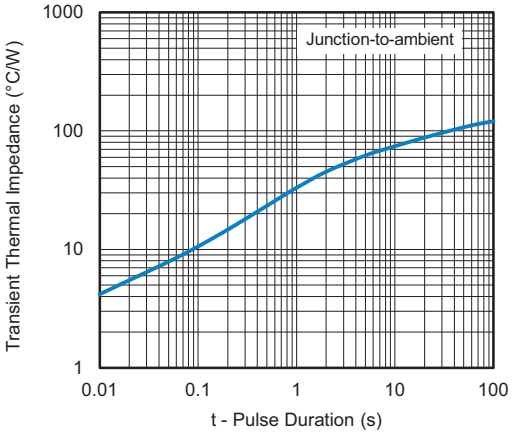

Fig. 6 - Typical Transient Thermal Impedance

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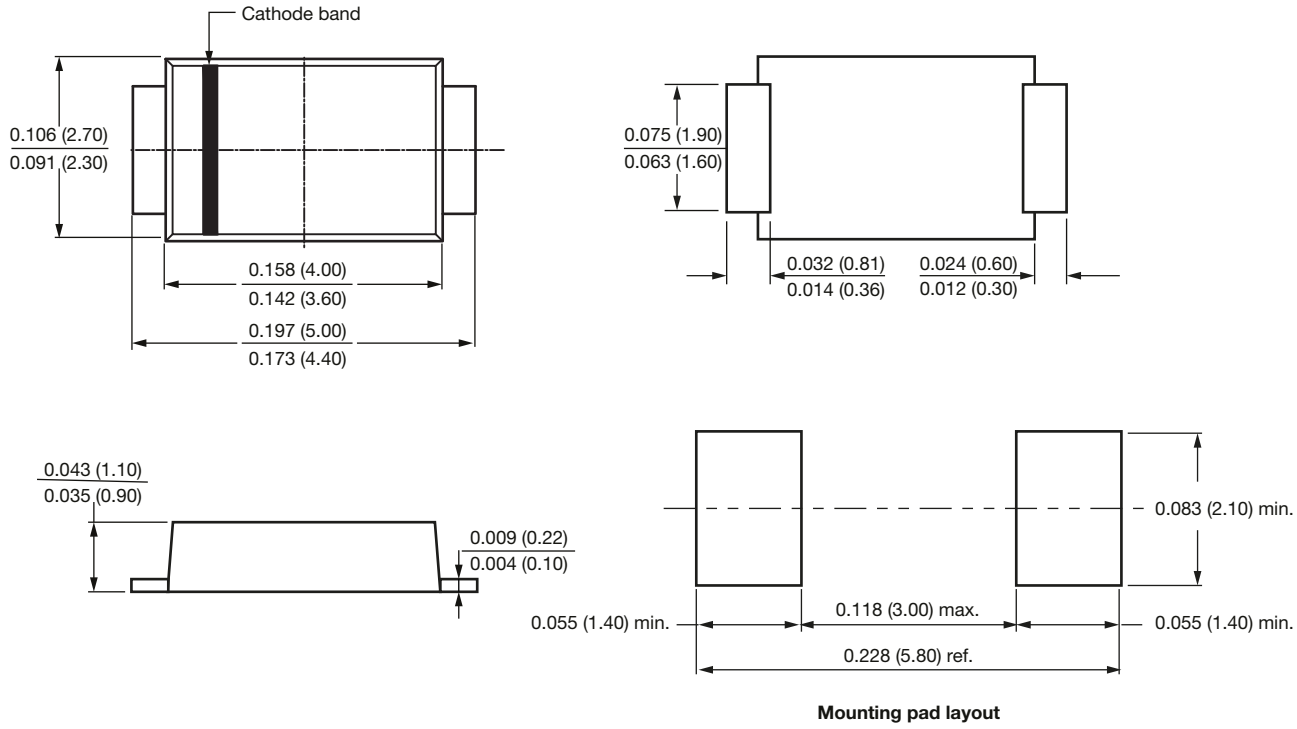
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)



Mounting pad layout

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