

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

eSMP® Series



Top View

Bottom View

SlimSMAW (DO-221AD)

Cathode Anode

DESIGN SUPPORT TOOLS



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FEATURES

- 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

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
 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 cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5 A
V_{RRM}	120 V
I_{FSM}	100 A
V_F at $I_F = 5$ A ($T_A = 125$ °C)	0.64 V
T_J max.	175 °C
Package	SlimSMAW (DO-221AD)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	VSS8D5M12	UNIT
Device marking code		5M12	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current (fig.1)	$I_{F(AV)}^{(1)}$	5	A
	$I_{F(AV)}^{(2)}$	2.2	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	100	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 aluminum PCB pad areas

(2) Free air, mounted on recommended copper pad area

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 2.5 \text{ A}$	$T_A = 25^\circ\text{C}$	V_F ⁽¹⁾	0.62	-	V	
	$I_F = 5 \text{ A}$			0.81	0.89		
	$I_F = 2.5 \text{ A}$	$T_A = 125^\circ\text{C}$		0.53	-		
	$I_F = 5 \text{ A}$			0.64	0.74		
Reverse current	$V_R = 90 \text{ V}$	$T_A = 25^\circ\text{C}$	I_R ⁽²⁾	0.01	-	mA	
		$T_A = 125^\circ\text{C}$		0.9	-		
	$V_R = 120 \text{ V}$	$T_A = 25^\circ\text{C}$		-	0.35		
		$T_A = 125^\circ\text{C}$		1.6	6		
Typical junction capacitance	4.0 V, 1 MHz		C_J	460	-	pF	

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)					
PARAMETER	SYMBOL	TYP.	MAX.	UNIT	
Typical thermal resistance	$R_{\theta JA}$ ⁽¹⁾⁽²⁾	120	150	$^\circ\text{C/W}$	
	$R_{\theta JM}$ ⁽³⁾	10	12		

Notes

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

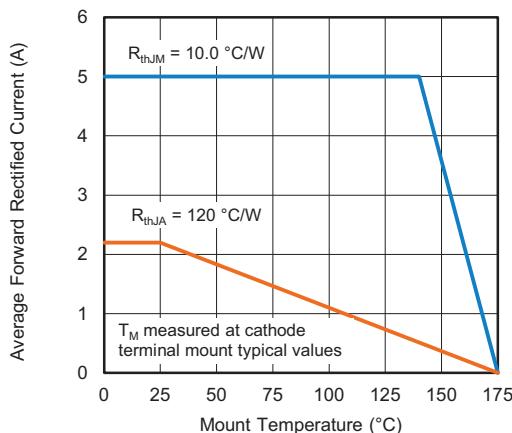
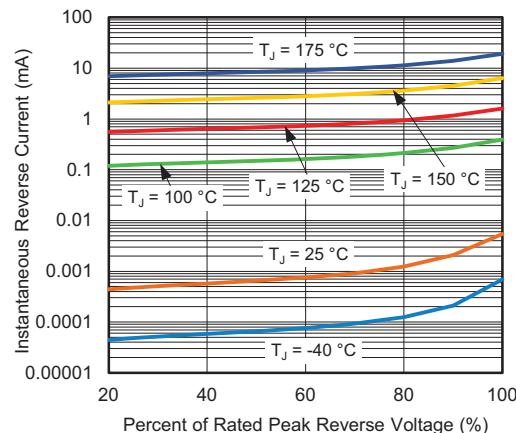
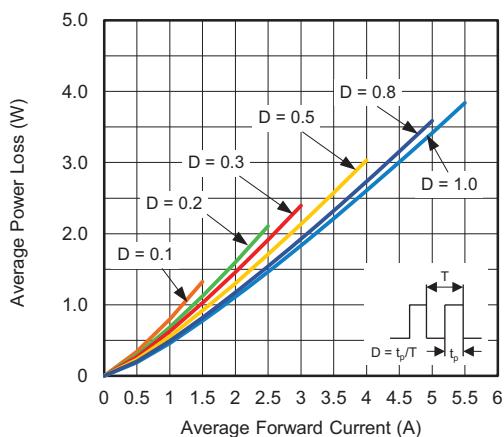
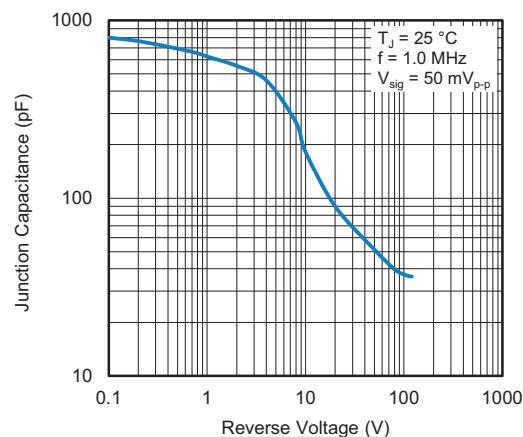
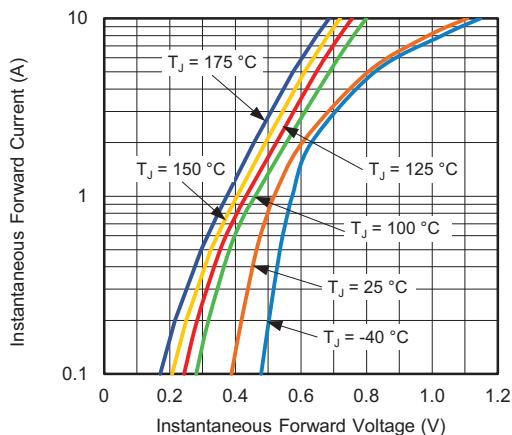
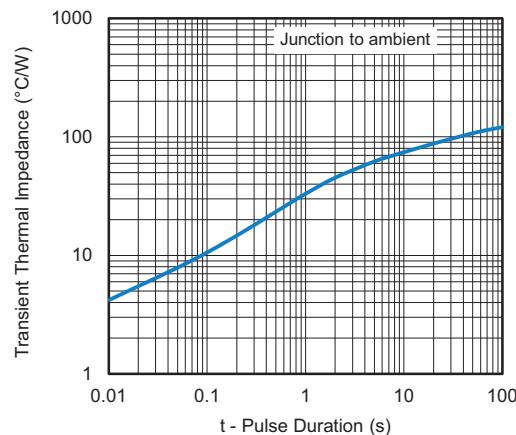
(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

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

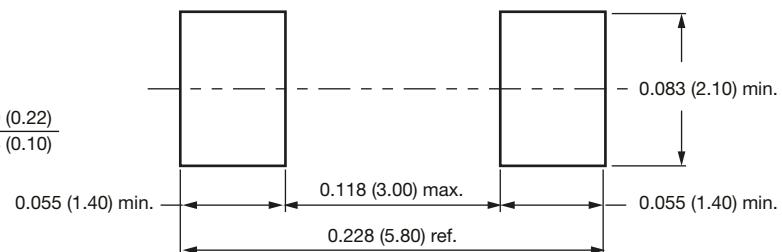
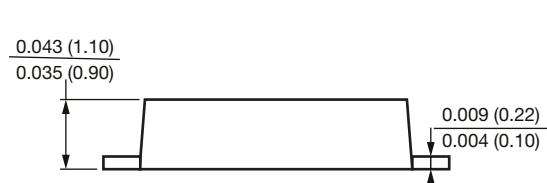
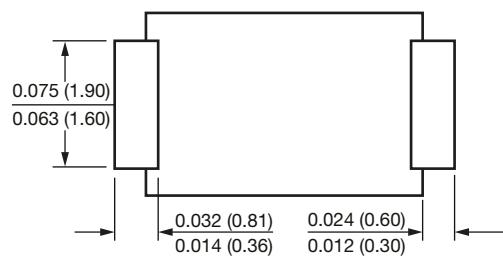
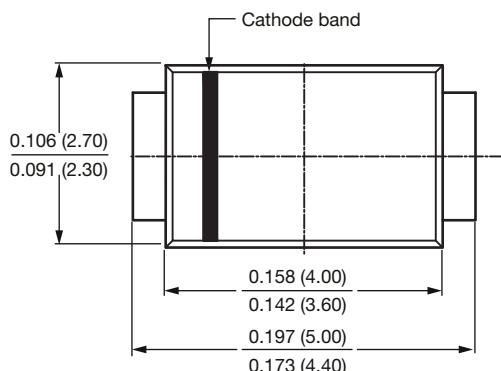
ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
VSS8D5M12-M3/H	0.033	H	3500	7" diameter plastic tape and reel	
VSS8D5M12-M3/I	0.033	I	14 000	13" diameter plastic tape and reel	
VSS8D5M12HM3/H ⁽¹⁾	0.033	H	3500	7" diameter plastic tape and reel	
VSS8D5M12HM3/I ⁽¹⁾	0.033	I	14 000	13" diameter plastic tape and reel	

Note

(1) AEC-Q101 qualified

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

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMAW (DO-221AD)

Mounting pad layout

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