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Vishay General Semiconductor

# Low-Voltage TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.28$  V at  $I_F = 5$  A





## ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	30 A			
V <sub>RRM</sub>	45 V			
I <sub>FSM</sub>	240 A			
$V_F$ at $I_F$ = 30 A ( $T_A$ = 125 °C)	0.51 V			
T <sub>J</sub> max.	150 °C			
Package	SMPD (TO-263AC)			
Circuit configuration	Single			

### FEATURES

- Trench MOS Schottky technology
- Very low profile typical height of 1.7 mm
- Ideal for automated placement
- 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 <u>www.vishay.com/doc?99912</u>

## **TYPICAL APPLICATIONS**

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

### **MECHANICAL DATA**

Case: SMPD (TO-263AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("\_X" denotes revision code e.g. A, B,....)

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

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	V30DL45	UNIT	
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	45	V	
Maximum average forward rectified current (fig. 1)	ximum average forward rectified current (fig. 1) I <sub>F(AV)</sub> <sup>(1)</sup> 30		А	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	half sine-wave I <sub>FSM</sub>		А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +150	°C	

Note

(1) With heatsink



ROHS COMPLIANT HALOGEN FREE

V30DL45



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ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C		0.39	-	V
	I <sub>F</sub> = 15 A			0.47	-	
	I <sub>F</sub> = 30 A			0.57	0.65	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.28	-	
	I <sub>F</sub> = 15 A			0.38	-	
	I <sub>F</sub> = 30 A			0.51	0.60	
Reverse current	V <sub>B</sub> = 45 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	3000	μA
	v <sub>R</sub> = 45 v	T <sub>A</sub> = 125 °C		27	70	mA

#### Notes

<sup>(1)</sup> Pulse test: 300 µs pulse width, 1 % duty cycle

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	V30DL45	UNIT	
Typical thermal resistance	R <sub>θJC</sub>	1.1	°C/W	
	R <sub>0JA</sub> (1)(2)	45	C/W	

#### Notes

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

(2) Free air, without heatsink

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V30DL45-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel	
V30DL45HM3_A/I (1)	0.54	I	2000/reel	13" diameter plastic tape and reel	

#### Note

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

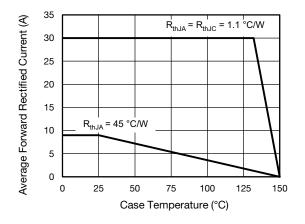


Fig. 1 - Forward Current Derating Curve

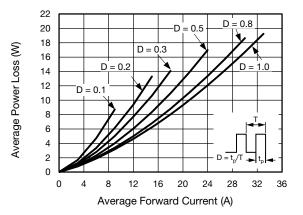


Fig. 2 - Forward Power Loss Characteristics

Revision: 22-Jan-2020

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Document Number: 87788

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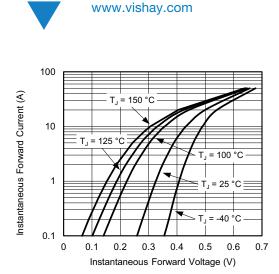


Fig. 3 - Typical Instantaneous Forward Characteristics

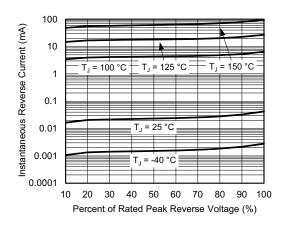


Fig. 4 - Typical Reverse Characteristics

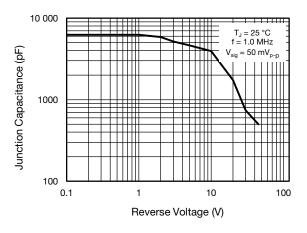


Fig. 5 - Typical Junction Capacitance

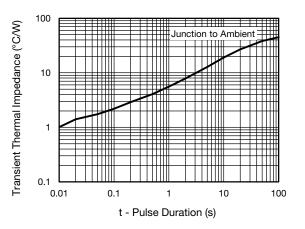


Fig. 6 - Typical Transient Thermal Impedance

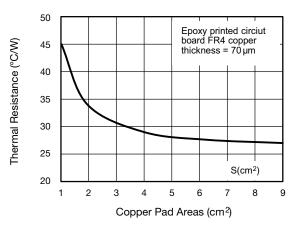


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

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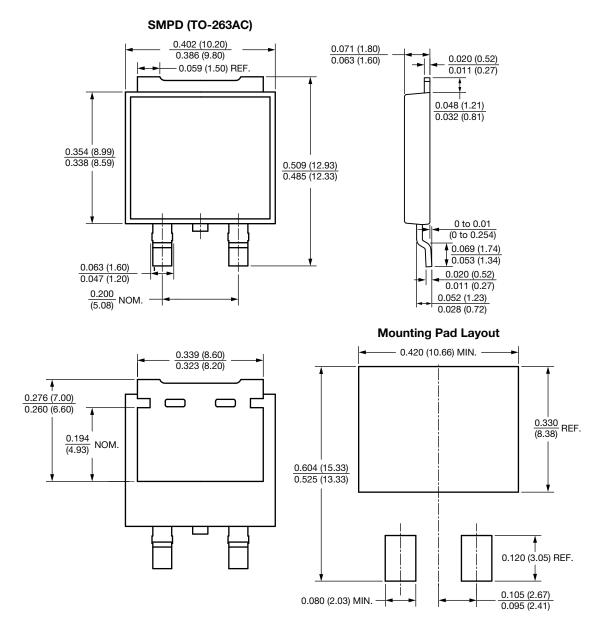
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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