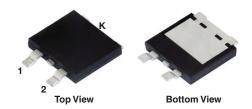


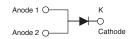
## Vishay General Semiconductor

# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.43 \text{ V}$  at  $I_F = 5 \text{ A}$ 

## eSMP® Series SMPD (TO-263AC)



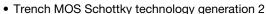


### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	35 A		
V <sub>RRM</sub>	120 V		
I <sub>FSM</sub>	320 A		
V <sub>F</sub> at I <sub>F</sub> = 35 A (T <sub>A</sub> = 125 °C)	0.73 V		
T <sub>J</sub> max.	175 °C		
Package	SMPD (TO-263AC)		
Circuit configuration	Single		

#### **FEATURES**





COMPLIANT

HALOGEN FREE

- 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 <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### TYPICAL APPLICATIONS

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

#### **MECHANICAL DATA**

Case: SMPD (TO-263AC)

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 meets JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V35DM120	UNIT		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	120	V		
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub> (1)	35	A		
	I <sub>F(AV)</sub> (2)	6.3			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	320	А		
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +175	°C		

### Notes

- (1) With infinite heatsink
- (2) With recommended pad size, 2 oz FR4 PCB



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	- V <sub>F</sub> <sup>(1)</sup>	0.53	-	. v
	I <sub>F</sub> = 17.5 A			0.73	-	
	I <sub>F</sub> = 35 A			0.97	1.05	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.43	-	
	I <sub>F</sub> = 17.5 A			0.61	-	
	I <sub>F</sub> = 35 A			0.73	0.81	
Reverse current at rated V <sub>R</sub> per diode	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.01	-	- mA
		T <sub>A</sub> = 125 °C		5	-	
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C		-	1.2	
	v <sub>R</sub> = 120 v	T <sub>A</sub> = 125 °C		10	30	

#### Notes

 $^{(1)}$  Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V35DM120	UNIT	
Typical thermal registance	$R_{ heta JC}$	1.1	°C/W	
Typical thermal resistance	R <sub>0</sub> JA (1)(2)	48		

#### Notes

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

(2) Free air, without heatsink

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V35DM120-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel	
V35DM120HM3/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel	

#### Note

(1) AEC-Q101 qualified



# Vishay General Semiconductor

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

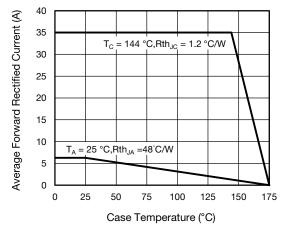


Fig. 1 - Forward Current Derating Curve

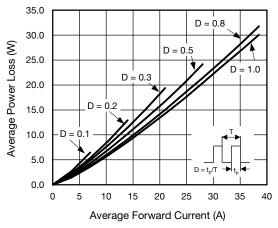


Fig. 2 - Forward Power Loss Characteristics

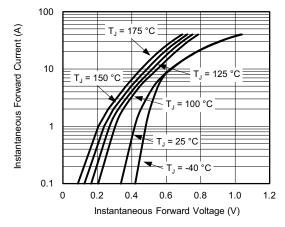


Fig. 3 - Typical Instantaneous Forward Characteristics

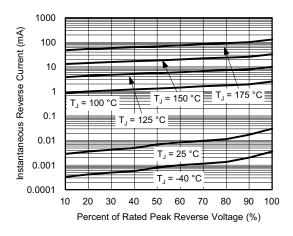


Fig. 4 - Typical Reverse Characteristics

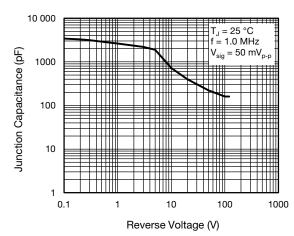


Fig. 5 - Typical Junction Capacitance

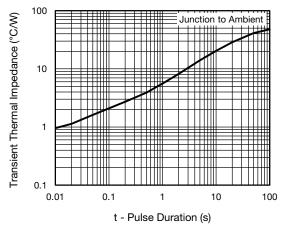


Fig. 6 - Typical Transient Thermal Impedance



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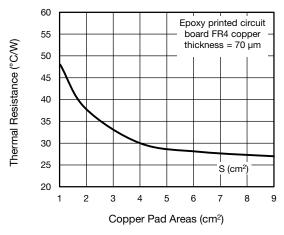
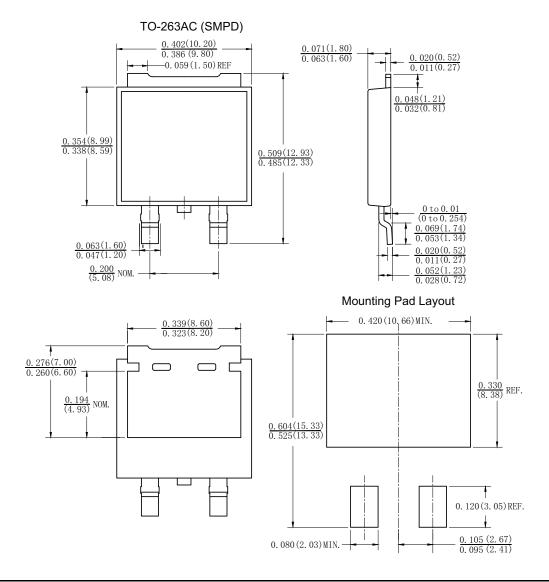


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

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





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