AUTOMOTIVE GRADE

Available

COMPLIANT

HALOGEN FREE



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## Vishay General Semiconductor

# **High Current Density Surface-Mount** TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.53 \text{ V}$  at  $I_F = 4 \text{ A}$ 



### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	8.0 A			
V <sub>RRM</sub>	120 V			
I <sub>FSM</sub>	140 A			
E <sub>AS</sub>	100 mJ			
$V_{F}$ at $I_{F} = 8.0 A$	0.63 V			
T <sub>J</sub> max.	150 °C			
Package	SMPC (TO-277A)			
Circuit configuration	Single			

#### **FEATURES**

- Very low profile typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- 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 www.vishay.com/doc?99912

#### TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters and polarity protection applications.

### **MECHANICAL DATA**

Case: SMPC (TO-277A)

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 1A whisker test. HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V8P12	UNIT	
Device marking code		V812		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	120	V	
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub>	8.0	А	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	I <sub>FSM</sub> 140		
Non-repetitive avalanche energy at I <sub>AS</sub> = 2.0 A, T <sub>J</sub> = 25 °C	E <sub>AS</sub> 100		mJ	
Peak repetitive reverse current at $t_p$ = 2 $\mu$ s, 1 kHz, $T_J$ = 38 °C $\pm$ 2 °C	I <sub>RRM</sub>	0.5	А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +150	°C	



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 1.0 mA	T <sub>A</sub> = 25 °C	$V_{BR}$	120 (minimum)	-	V
Instantaneous forward voltage	I <sub>F</sub> = 4 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.59	=	V
	I <sub>F</sub> = 8 A			0.77	0.84	
	I <sub>F</sub> = 4 A	T <sub>A</sub> = 125 °C		0.53	-	
	I <sub>F</sub> = 8 A			0.63	0.71	
Reverse current	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C	T <sub>A</sub> = 25 °C	5	-	μΑ
	v <sub>R</sub> = 90 v	T <sub>A</sub> = 125 °C	I <sub>R</sub> <sup>(2)</sup>	3	-	mA
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C		15	300	μΑ
		T <sub>A</sub> = 125 °C		6	20	mA

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL V8P12			
Typical thermal resistance	R <sub>0JA</sub> (1)	60	°C/W	
Typical trieffial resistance	$R_{\theta JL}$	4		

#### Note

(1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V8P12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel	
V8P12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel	
V8P12HM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel	
V8P12HM3 A/I (1)	0.10	I	6500	13" diameter plastic tape and reel	

#### Note

(1) AEC-Q101 qualified

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

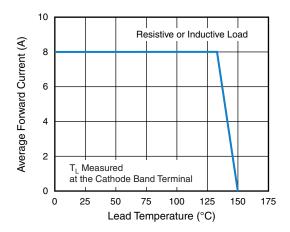


Fig. 1 - Maximum Forward Current Derating Curve

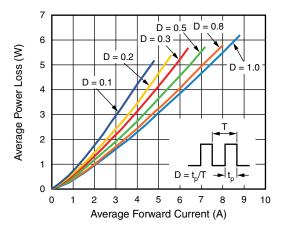


Fig. 2 - Forward Power Loss Characteristics

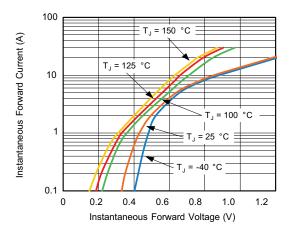


Fig. 3 - Typical Instantaneous Forward Characteristics

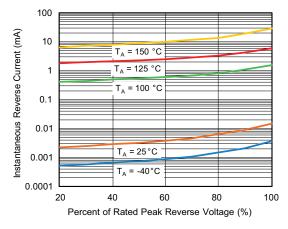


Fig. 4 - Typical Reverse Characteristics

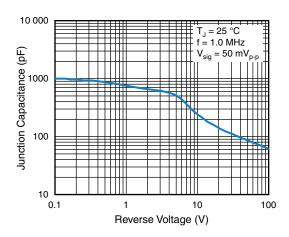


Fig. 5 - Typical Junction Capacitance

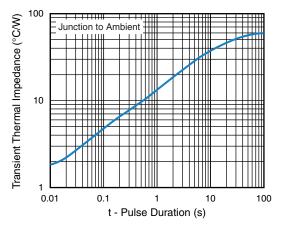
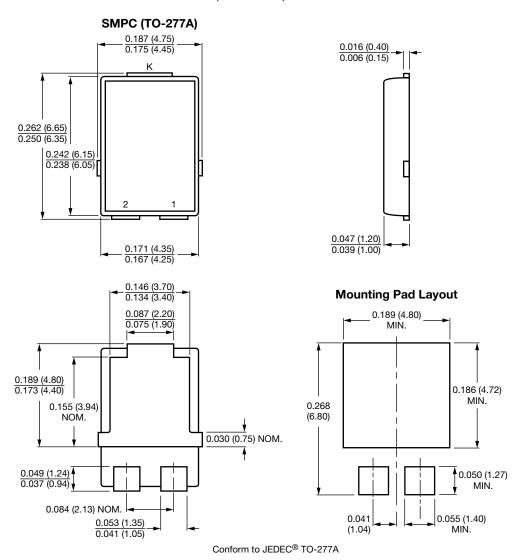


Fig. 6 - Typical Transient Thermal Impedance



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





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