AUTOMOTIVI GRADE

RoHS

COMPLIANT

HALOGEN FREE



# Vishay General Semiconductor

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

Ultra Low  $V_F = 0.37 \text{ V}$  at  $I_F = 4 \text{ A}$ 



### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	8.0 A			
$V_{RRM}$	60 V			
I <sub>FSM</sub>	140 A			
$V_F$ at $I_F = 8.0$ A $(T_A = 125  ^{\circ}C)$	0.46 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 <a href="https://www.vishav.com/doc?99912">www.vishav.com/doc?99912</a>

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

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V8P6	UNIT	
Device marking code		V86		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	60	V	
Maximum average forward rectified current (fig. 1)	I <sub>F</sub> <sup>(1)</sup>	8.0	A	
	I <sub>F</sub> <sup>(2)</sup>	4.2	^	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	140	А	
Voltage rate of change (rated V <sub>R</sub> )	dV/dt	10 000	V/µs	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +150	°C	

### Notes

- (1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
- (2) Free air, mounted on recommended copper pad area



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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	I <sub>F</sub> = 4.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.46	-	V
	I <sub>F</sub> = 8.0 A			0.53	0.61	
	I <sub>F</sub> = 4.0 A	T <sub>A</sub> = 125 °C		0.37	-	
	I <sub>F</sub> = 8.0 A			0.46	0.55	
Reverse current	V <sub>R</sub> = 60 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	0.6	- mA
	v <sub>R</sub> = 60 v	T <sub>A</sub> = 125 °C		7.0	25	

### Notes

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

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V8P6	UNIT	
Typical thermal registance	R <sub>0</sub> JA (1)(2)	75	°C/W	
Typical thermal resistance	R <sub>0JM</sub> (3)	4		

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

Free air mounted on recommended copper pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V8P6-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V8P6-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V8P6HM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel
V8P6HM3_A/I (1)	0.10	1	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)

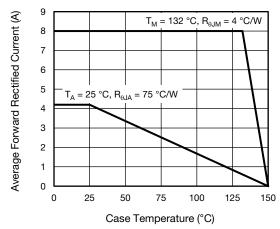


Fig. 1 - Forward Current Derating Curve

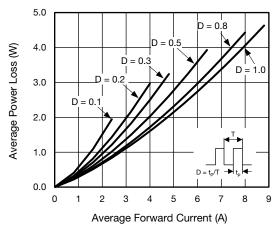


Fig. 2 - Forward Power Loss Characteristics

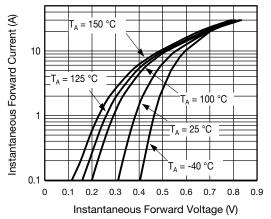


Fig. 3 - Typical Instantaneous Forward Characteristics

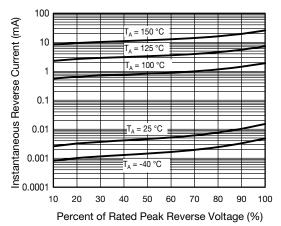


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

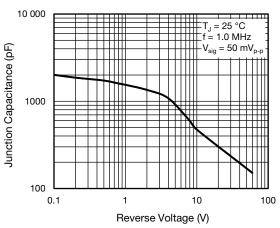


Fig. 5 - Typical Junction Capacitance

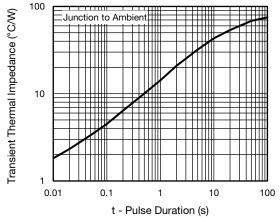
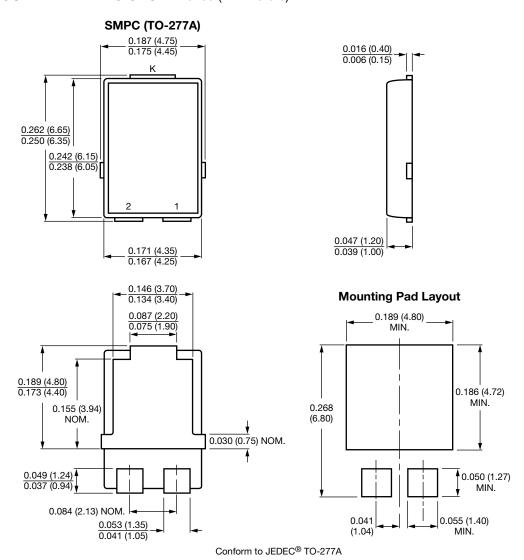


Fig. 6 - Typical Transient Thermal Impedance



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





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