AUTOMOTIVE GRADE

Available

ROHS

HALOGEN

FREE



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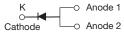
## Vishay General Semiconductor

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

Ultra Low  $V_F = 0.45 \text{ V}$  at  $I_F = 5 \text{ A}$ 



#### **SMPC (TO-277A)**



#### **DESIGN SUPPORT TOOLS**





PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	15 A		
V <sub>RRM</sub>	100 V		
I <sub>FSM</sub>	220 A		
V <sub>F</sub> at I <sub>F</sub> = 15 A (125 °C)	0.61 V		
T <sub>J</sub> max.	175 °C		
Package	SMPC (TO-277A)		
Circuit configuration	Single		

#### **FEATURES**

- Very low profile typical height of 1.1 mm
- 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.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></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 - 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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V15PM10	UNIT	
Device marking code		15M10		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	100	V	
Maximum DC forward current	I <sub>F(AV)</sub> (1)	15	А	
	I <sub>F(AV)</sub> (2)	4.4		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	220	А	
Operating junction temperature range	T <sub>J</sub> <sup>(3)</sup>	-40 to +175	°C	
Storage temperature range	T <sub>STG</sub>	-55 to +175	°C	

#### Notes

- (1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
- (2) Free air, mounted on recommended pad area
- $^{(3)}$  The heat generated must be less than the thermal conductivity from junction to ambient:  $dP_D/dT_J < 1/R_{\theta JA}$



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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> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.52	-	V
	I <sub>F</sub> = 7.5 A			0.57	-	
	I <sub>F</sub> = 15 A			0.69	0.75	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.45	-	
	I <sub>F</sub> = 7.5 A			0.50	-	
	I <sub>F</sub> = 15 A			0.61	0.66	
Reverse current	V <sub>R</sub> = 70 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.02	-	mA
	V <sub>R</sub> = 70 V	T <sub>A</sub> = 125 °C		3	-	
	\/ 100\/	T <sub>A</sub> = 25 °C		-	0.4	IIIA
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 125 °C		6	18	
Typical junction capacitance	4.0 V, 1 MHz		CJ	1600	=	pF

#### Notes

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER	SYMBOL V15PM10			
Typical thormal registance	R <sub>0,JA</sub> (1)(2) 75		°C/W	
Typical thermal resistance	R <sub>0JM</sub> (3)	4	]	

#### 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) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance R<sub>θJA</sub> junction to ambient
- (3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance R<sub>0.IM</sub> junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V15PM10-M3/H	0.10	Н	1500	7" diameter plastic tape and reel
V15PM10-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V15PM10HM3/H (1)	0.10	Н	1500	7" diameter plastic tape and reel
V15PM10HM3/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 specified)

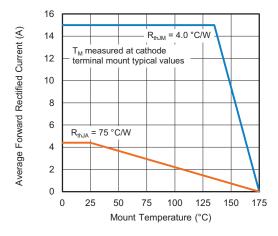


Fig. 1 - Maximum Forward Current Derating Curve

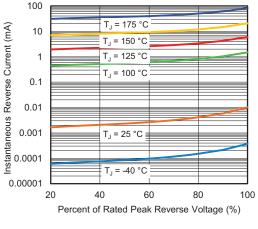


Fig. 4 - Typical Reverse Characteristics

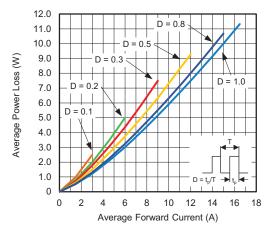


Fig. 2 - Forward Power Loss Characteristics

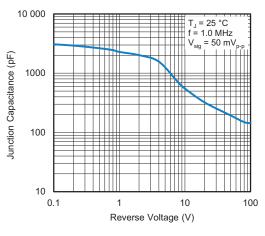


Fig. 5 - Typical Junction Capacitance

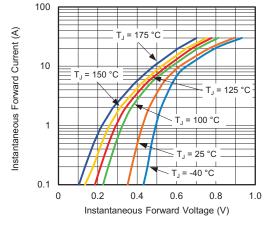


Fig. 3 - Typical Instantaneous Forward Characteristics

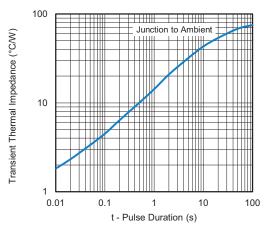
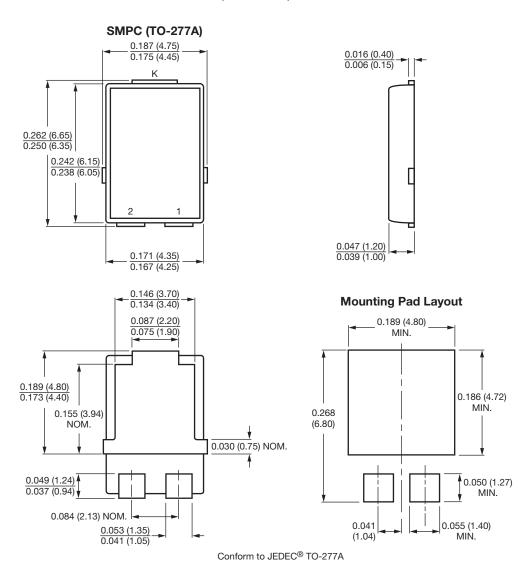


Fig. 6 - Typical Transient Thermal Impedance

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





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