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 $V_F = 0.54 \text{ V}$ at $I_F = 5 \text{ A}$



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	10.0 A		
V_{RRM}	150 V		
I _{FSM}	180 A		
V _F at I _F = 10.0 A (T _J = 125 °C)	0.61 V		
T _J 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 <u>www.vishay.com/doc?99912</u>

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 meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V10PM153	UNIT	
Device marking code		10MP		
Maximum repetitive peak reverse voltage	V _{RRM}	150	V	
Maximum average forward rectified current (fig. 1)	I _F ⁽¹⁾	10.0	Α	
	I _F ⁽²⁾	3.6		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	180	А	
Operating junction temperature range	T _J ⁽³⁾	-40 to +175	°C	
Storage temperature range	T _{STG}	-55 to +175	°C	

Notes

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



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ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 5.0 A	T _J = 25 °C	V _F ⁽¹⁾	0.67	-	V
	I _F = 10.0 A			0.78	0.84	
	I _F = 5.0 A	T _J = 125 °C		0.54	-	
	I _F = 10.0 A			0.61	0.66	
Reverse current	V 100 V	T _J = 25 °C	I _R ⁽²⁾	0.0009	-	mA
	V _R = 100 V	T _J = 125 °C		1.5	-	
Reverse current	$V_R = 150 \text{ V}$ $T_J = 25 ^{\circ}\text{C}$ $T_J = 125 ^{\circ}\text{C}$	T _J = 25 °C	I _R ⁽²⁾	-	0.1	- mA
		T _J = 125 °C		3.4	10	
Typical junction capacitance	4.0 V, 1 MHz		CJ	650	-	pF

Notes

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

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

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V10PM153	UNIT		
Typical thormal registance	R _{0JA} (1)(2)	75	°C/W		
Typical thermal resistance	R _{0JM} (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 copper pad area; thermal resistance $R_{\theta JA}$ junction to ambient (3) 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	
V10PM153-M3/H	0.10	Н	1500	7" diameter plastic tape and reel	
V10PM153-M3/I	0.10	1	6500	13" diameter plastic tape and reel	
V10PM153HM3/H (1)	0.10	Н	1500	7" diameter plastic tape and reel	
V10PM153HM3/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_A = 25 °C unless otherwise noted)

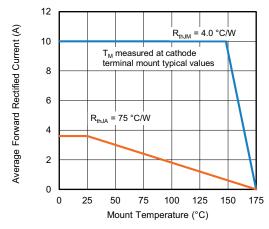


Fig. 1 - Forward Current Derating Curve

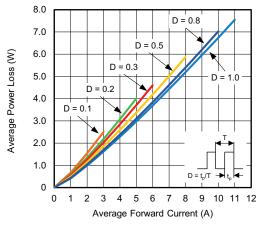


Fig. 2 - Forward Power Loss Characteristics

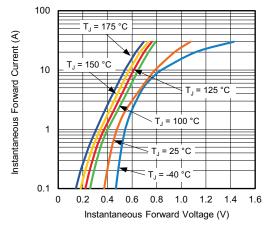


Fig. 3 - Typical Instantaneous Forward Characteristics

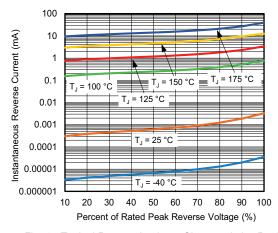


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

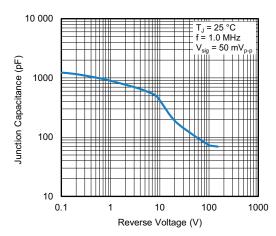


Fig. 5 - Typical Junction Capacitance

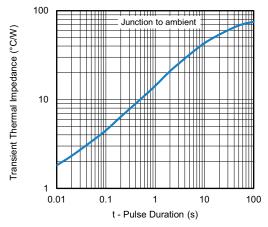
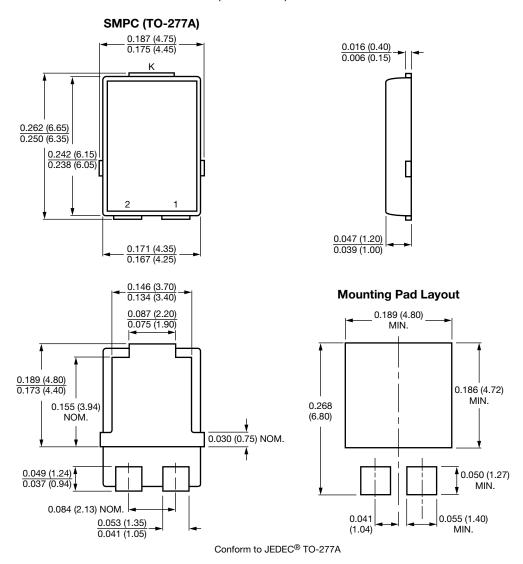


Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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