AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE



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Vishay General Semiconductor

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

Ultra Low $V_F = 0.34 \text{ V}$ at $I_F = 5 \text{ A}$



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 <u>www.vishay.com/doc?99912</u>

ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	10 A		
V_{RRM}	45 V		
I _{FSM}	180 A		
V_F at $I_F = 10 A$	0.41 V		
T _J max.	150 °C		
Package	SMPC (TO-277A)		
Circuit configuration	Single		

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling, 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 _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V10P45	UNIT	
Device marking code		V1045		
Maximum repetitive peak reverse voltage	V_{RRM}	45	V	
Maximum DC familiard accurant	I _F ⁽¹⁾	10	Α	
Maximum DC forward current	I _F ⁽²⁾	4.4		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	180	А	
Operating junction and storage temperature range	T _J , T _{STG}	-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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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 5.0 A	T _A = 25 °C	V _F ⁽¹⁾	0.42	-	V
	I _F = 10 A			0.48	0.57	
	I _F = 5.0 A	T _A = 125 °C		0.34	-	
	I _F = 10 A			0.41	0.50	
Reverse current	V _R = 45 V	T _A = 25 °C	I _R ⁽²⁾	21	800	μA
	V _R = 45 V T _A = 125 °C	¹R ^(−)	9	35	mA	

Notes

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

(2) Pulse test: pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V10P45	UNIT	
Tuning the word vesictors	R _{0JA} (1)	75	- °C/W	
Typical thermal resistance	R _{0JM} (2)	4		

Notes

 $^{(1)}$ Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient

 $^{(2)}$ 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
V10P45-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P45-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P45HM3_A/H ⁽¹⁾	0.10	Н	1500	7" diameter plastic tape and reel
V10P45HM3_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_A = 25 °C unless otherwise noted)

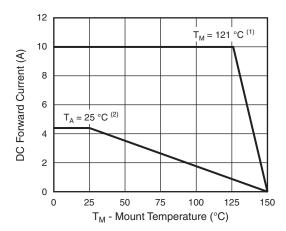


Fig. 1 - Maximum Forward Current Derating Curve

Notes

- $^{(1)}$ Mounted on 30 mm x 30 mm aluminum PCB; T_M measured at the terminal of cathode band (R_{0JM} = 4 $^{\circ}\text{C/W})$
- (2) Free air, mounted on recommended copper pad area $(R_{\theta JA} = 75 \, ^{\circ}\text{C/W})$

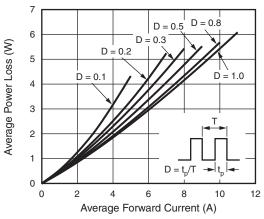


Fig. 2 - Forward Power Loss Characteristics

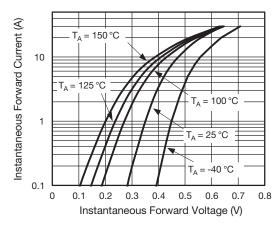


Fig. 3 - Typical Instantaneous Forward Characteristics

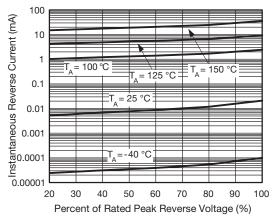


Fig. 4 - Typical Reverse Leakage Characteristics

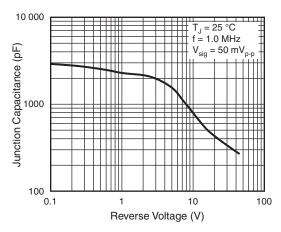


Fig. 5 - Typical Junction Capacitance

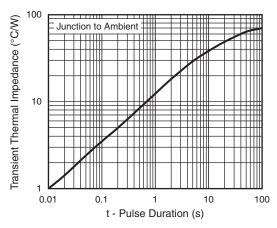
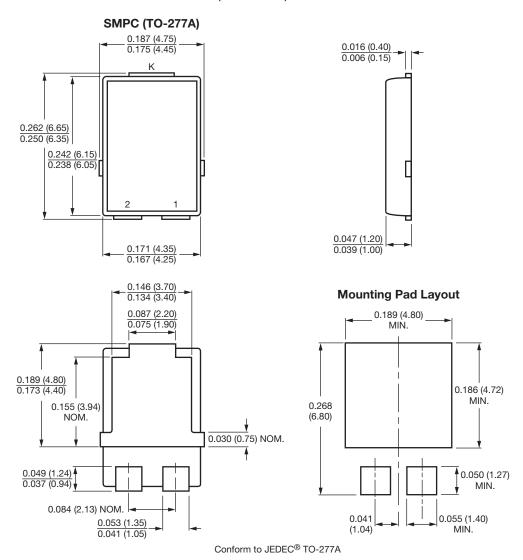


Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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