AUTOMOTIVE GRADE

Available

RoHS

COMPLIANT

HALOGEN

FREE



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Vishay General Semiconductor

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

Ultra Low $V_F = 0.38 \text{ V}$ at $I_F = 5 \text{ A}$



DESIGN SUPPORT TOOLS





PRIMARY CHARACTERISTICS				
I _{F(AV)}	10.0 A			
V_{RRM}	45 V			
I _{FSM}	180 A			
V _F at I _F = 10.0 A (T _A = 125 °C)	0.46 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 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 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	V10PM45	UNIT	
Device marking code		10M45		
Maximum repetitive peak reverse voltage	V _{RRM}	45	V	
Maximum average forward rectified current (fig. 1)	I _F ⁽¹⁾	10.0		
	I _F ⁽²⁾	4.7	A	
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_{B,IA}



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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⁾	0.49	-	V
	I _F = 10.0 A			0.52	0.60	
	I _F = 5.0 A	T _A = 125 °C		0.38	-	
	I _F = 10.0 A			0.46	0.54	
Reverse current	V - 45 V	$T_A = 45 \text{ V}$ $T_A = 25 \text{ °C}$ $T_A = 125 \text{ °C}$	I _R ⁽²⁾	-	0.3	- mA
	V _R = 45 V			3.0	10	
Typical junction capacitance	4.0 V, 1 MHz		C_{J}	1850	ı	pF

Notes

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

(2) Pulse test: pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V10PM45	UNIT	
Tunical thermal 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

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	
V10PM45-M3/H	0.10	Н	1500	7" diameter plastic tape and reel	
V10PM45-M3/I	0.10	I	6500	13" diameter plastic tape and reel	
V10PM45HM3/H (1)	0.10	Н	1500	7" diameter plastic tape and reel	
V10PM45HM3/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)

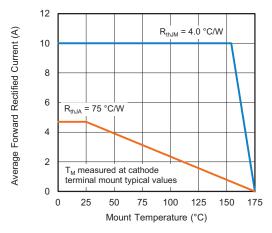


Fig. 1 - Forward Current Derating Curve

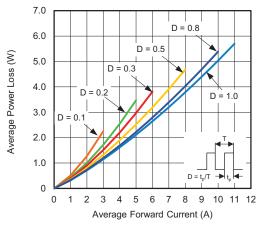


Fig. 2 - Forward Power Loss Characteristics

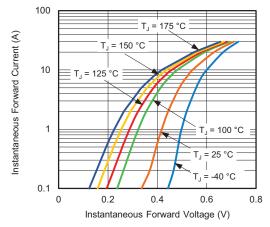


Fig. 3 - Typical Instantaneous Forward Characteristics

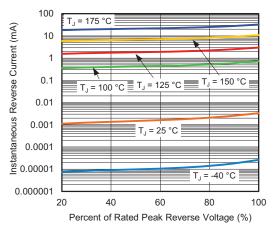


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

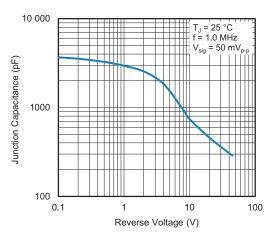


Fig. 5 - Typical Junction Capacitance

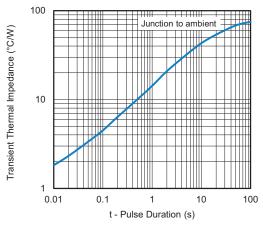
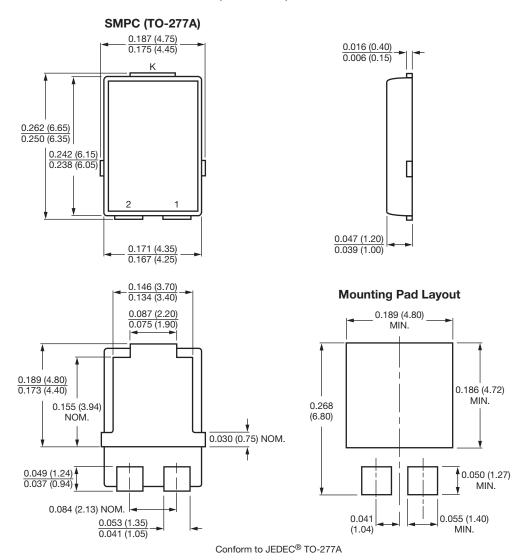


Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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