

# High Current Density Surface Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier Ultra Low

$$V_F = 0.453 \text{ V at } I_F = 5 \text{ A}$$



## 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE  
Available

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

## 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 and HM3 suffix meet JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
$V_{RRM}$	100 V
$I_{FSM}$	180 A
$E_{AS}$	100 mJ
$V_F$ at $I_F = 10 \text{ A}$	0.574 V
$T_J$ max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V10P10	UNIT
Device marking code		V1010	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	180	A
Non-repetitive avalanche energy at $I_{AS} = 2.0 \text{ A}$ , $T_J = 25 \text{ °C}$	$E_{AS}$	100	mJ
Peak repetitive reverse current at $t_p = 2 \text{ } \mu\text{s}$ , 1 kHz, $T_J = 38 \text{ °C} \pm 2 \text{ °C}$	$I_{RRM}$	1.0	A
Operating junction temperature range	$T_J$ <sup>(1)</sup>	-40 to +150	°C
Storage temperature range	$T_{STG}$	-55 to +150	°C

### Note

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



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 1\text{ mA}$	$T_A = 25\text{ }^\circ\text{C}$	$V_{BR}$	100 (minimum)	-	V
Instantaneous forward voltage	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.512	-	V
	$I_F = 10\text{ A}$			0.625	0.68	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.453	-	
	$I_F = 10\text{ A}$			0.574	0.62	
Reverse current	$V_R = 70\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	7.1	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		4.5	-	mA
	$V_R = 100\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		30.4	150	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		10.4	20	mA

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width  $\leq 40\text{ ms}$

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V10P10	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	60	$^\circ\text{C/W}$
	$R_{\theta JL}$	3	

**Note**

- (1) Units mounted on recommended PCB 1 oz. pad layout

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V10P10HM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
V10P10HM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise specified)

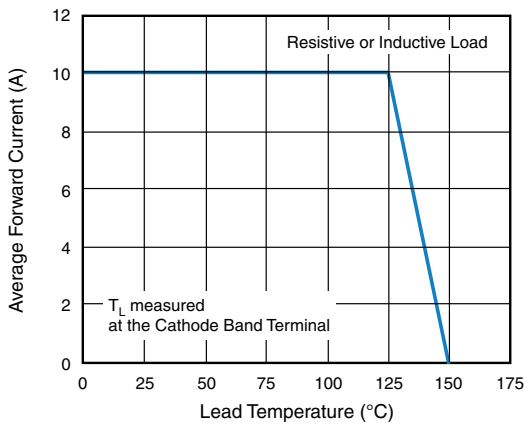


Fig. 1 - Maximum Forward Current Derating Curve

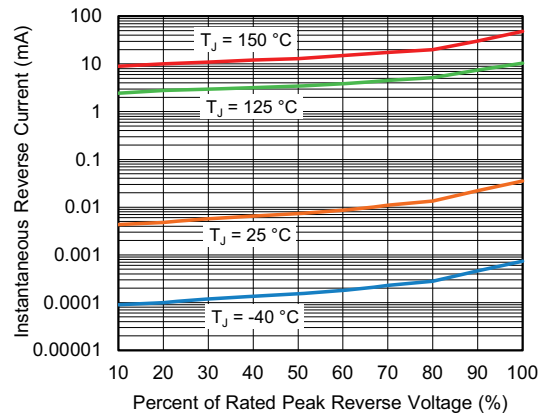


Fig. 4 - Typical Reverse Characteristics

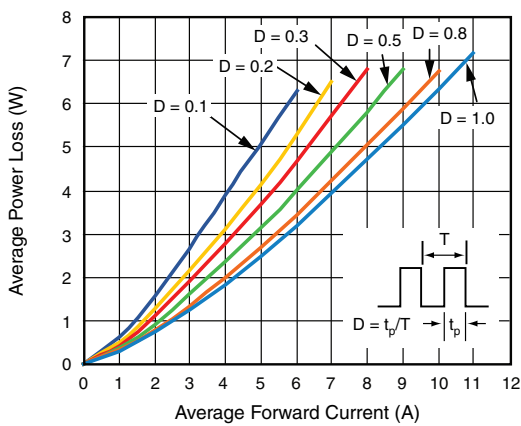


Fig. 2 - Forward Power Loss Characteristics

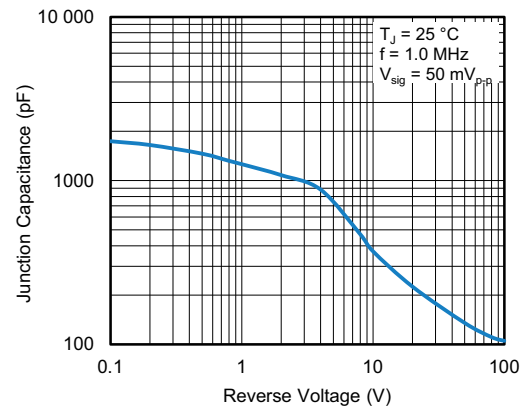


Fig. 5 - Typical Junction Capacitance

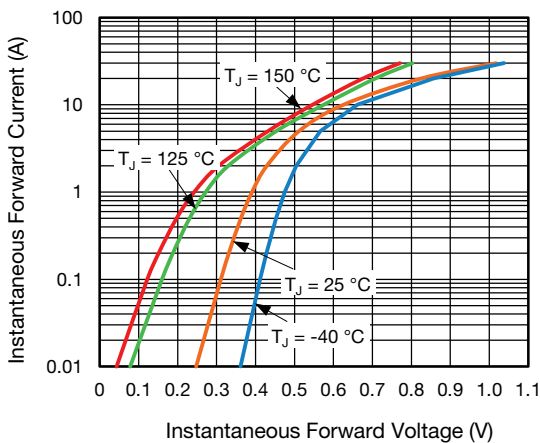


Fig. 3 - Typical Instantaneous Forward Characteristics

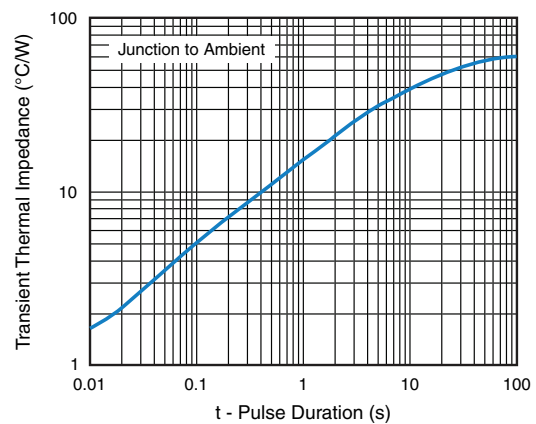


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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