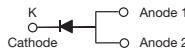


# High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.59$  V at  $I_F = 5$  A

**TMBS<sup>®</sup> eSMP<sup>®</sup> Series**

**TO-277A (SMPC)**

**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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**
**TYPICAL APPLICATIONS**

For use in low voltage high frequency inverters, freewheeling, DC/DC converters and polarity protection applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
$V_{RRM}$	200 V
$I_{FSM}$	180 A
$V_F$ at $I_F = 10$ A	0.67 V
$T_J$ max.	150 °C
Package	TO-277A
Diode variation	Single

**MECHANICAL DATA**
**Case:** TO-277A (SMPC)

 Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V10P20	UNIT
Device marking code		V1020	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum average forward rectified current (fig. 1)	$I_F^{(1)}$	10	A
	$I_F^{(2)}$	2.4	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	180	A
Voltage rate of change (rated $V_R$ )	dV/dt	10 000	V/ $\mu$ s
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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.78	-	V
	$I_F = 10\text{ A}$			0.98	1.34	
	$I_F = 5.0\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.59	-	
	$I_F = 10\text{ A}$			0.67	0.75	
Reverse current	$V_R = 180\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	3.6	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		3.5	-	mA
	$V_R = 200\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		8.6	400	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		5.8	30	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 noted)			
PARAMETER	SYMBOL	V10P20	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	80	$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	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 Al PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10P20-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V10P20-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

**RATINGS AND CHARACTERISTICS CURVES**

( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

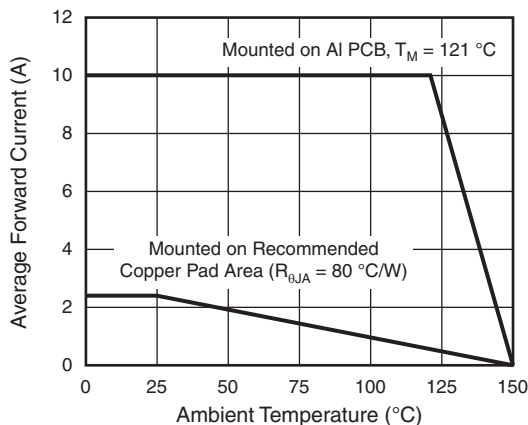


Fig. 1 - Maximum Forward Current Derating Curve

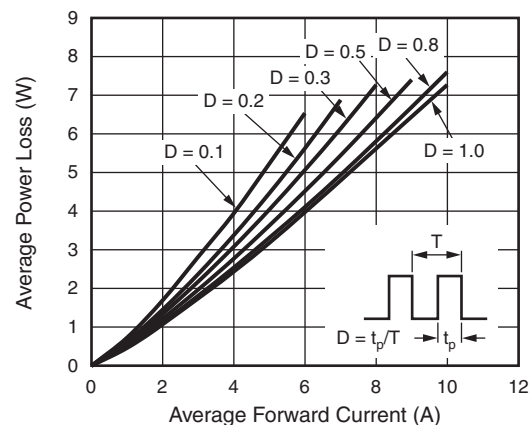


Fig. 2 - Forward Power Loss Characteristics

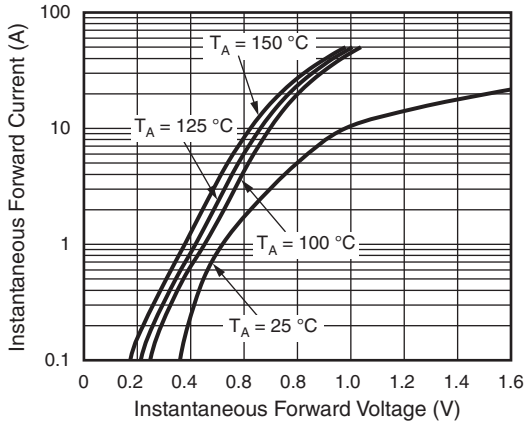


Fig. 3 - Typical Instantaneous Forward Characteristics

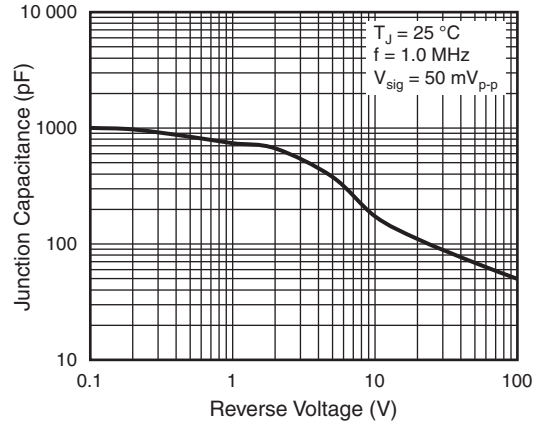


Fig. 5 - Typical Junction Capacitance

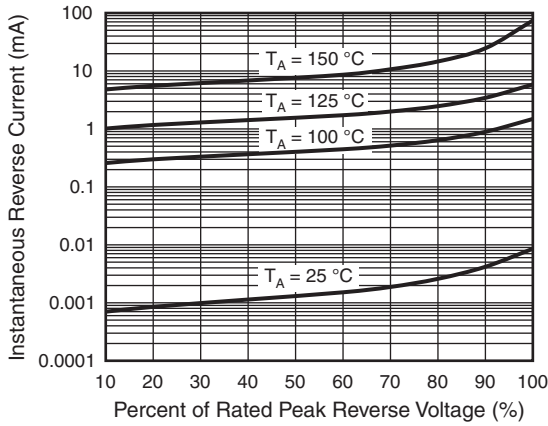


Fig. 4 - Typical Reverse Characteristics

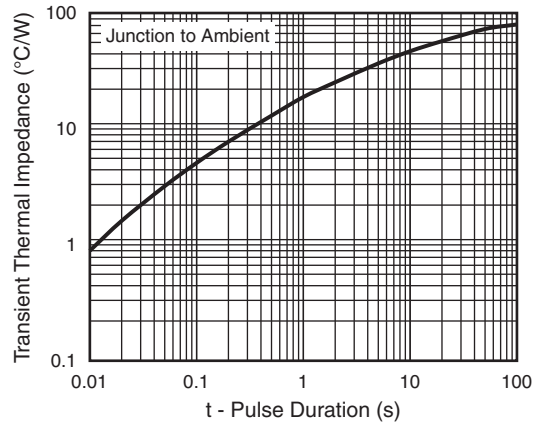
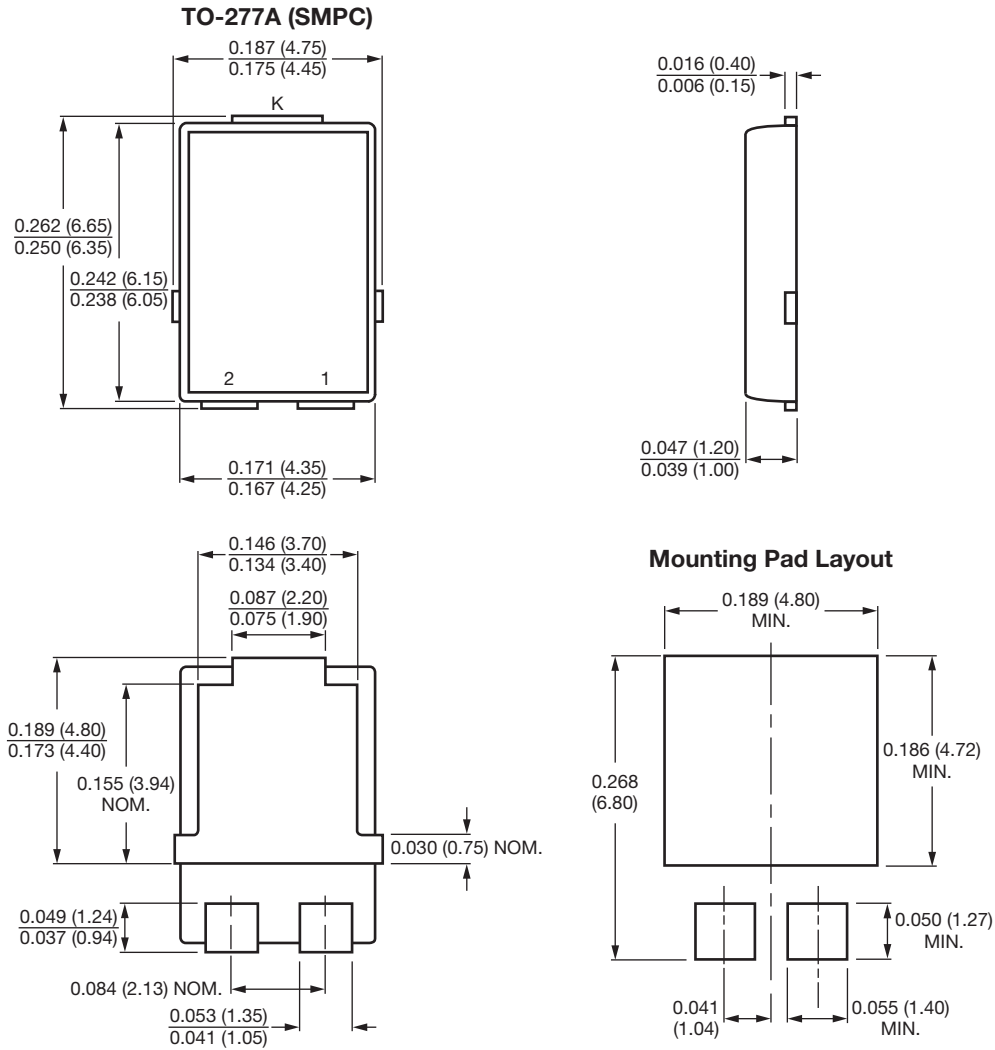


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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