

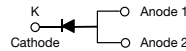
# High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.453$  V at  $I_F = 5$  A

TMBS® eSMP™ Series



TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
$V_{RRM}$	100 V
$I_{FSM}$	180 A
$E_{AS}$	100 mJ
$V_F$ at $I_F = 10$ A	0.574 V
$T_J$ max.	150 °C

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters and polarity protection applications.

## 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

AUTOMOTIVE  
GRADE  
Available



RoHS  
COMPLIANT  
HALOGEN  
FREE

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, automotive grade

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

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS ( $T_A = 25$ °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 $I_{AS} = 2.0$ A, $T_J = 25$ °C	$E_{AS}$	100	mJ
Peak repetitive reverse current at $t_p = 2$ $\mu$ s, 1 kHz, $T_J = 38$ °C $\pm$ 2 °C	$I_{RRM}$	1.0	A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 40 to + 150	°C



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 1.0\text{ mA}$	$T_A = 25\text{ }^\circ\text{C}$	$V_{BR}$	100 (minimum)	-	V
Instantaneous forward voltage <sup>(1)</sup>	$I_F = 5\text{ A}$ $I_F = 10\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F$	0.512 0.625	- 0.68	V
	$I_F = 5\text{ A}$ $I_F = 10\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.453 0.574	- 0.62	
Reverse current <sup>(2)</sup>	$V_R = 70\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$	$I_R$	7.1 4.5	- -	$\mu\text{A}$ mA
	$V_R = 100\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$		30.4 10.4	150 20	$\mu\text{A}$ mA

**Notes**<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle<sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$ 

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

**Note**<sup>(1)</sup> Units mounted on recommended P.C.B. 1 oz. pad layout

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED 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
V10P10HM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
V10P10HM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel

**Note**<sup>(1)</sup> Automotive grade



**RATINGS AND CHARACTERISTICS CURVES**

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

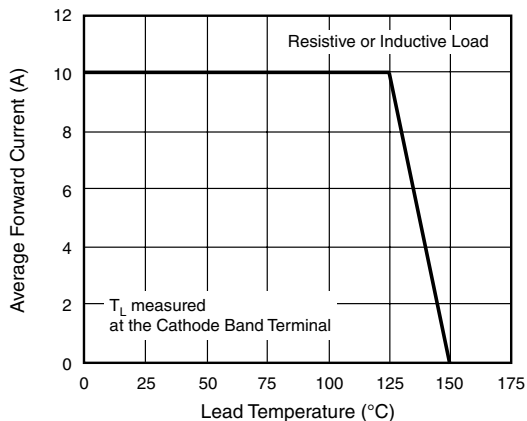


Figure 1. Maximum Forward Current Derating Curve

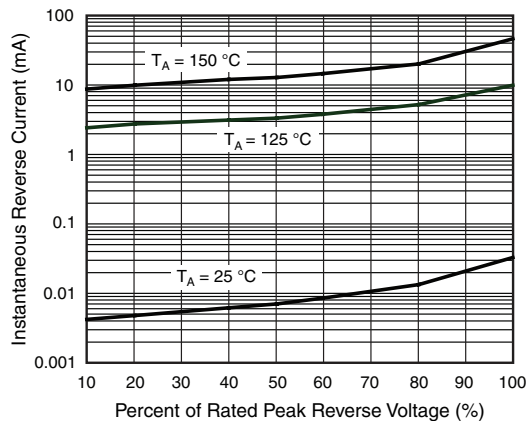


Figure 4. Typical Reverse Characteristics

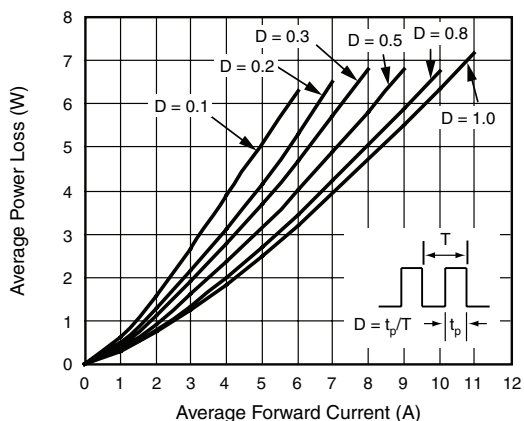


Figure 2. Forward Power Loss Characteristics

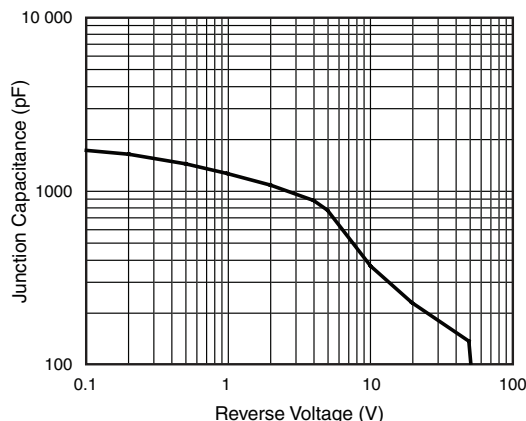


Figure 5. Typical Junction Capacitance

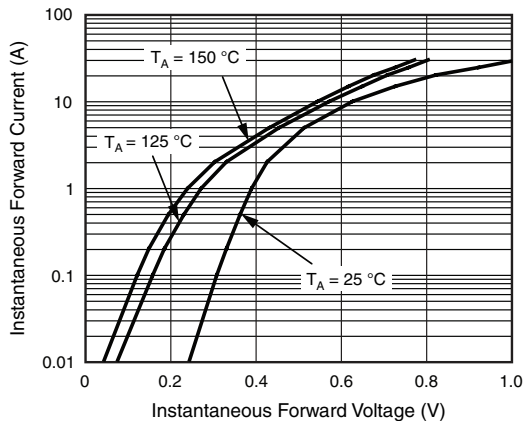


Figure 3. Typical Instantaneous Forward Characteristics

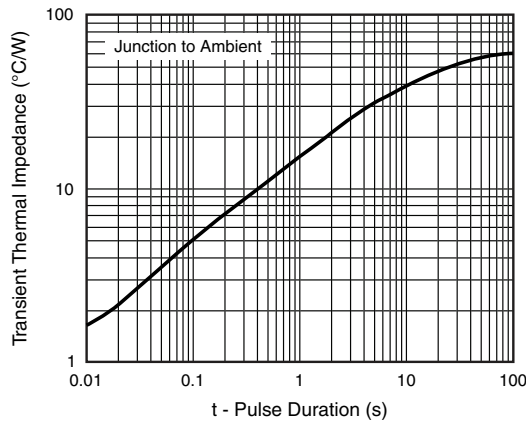
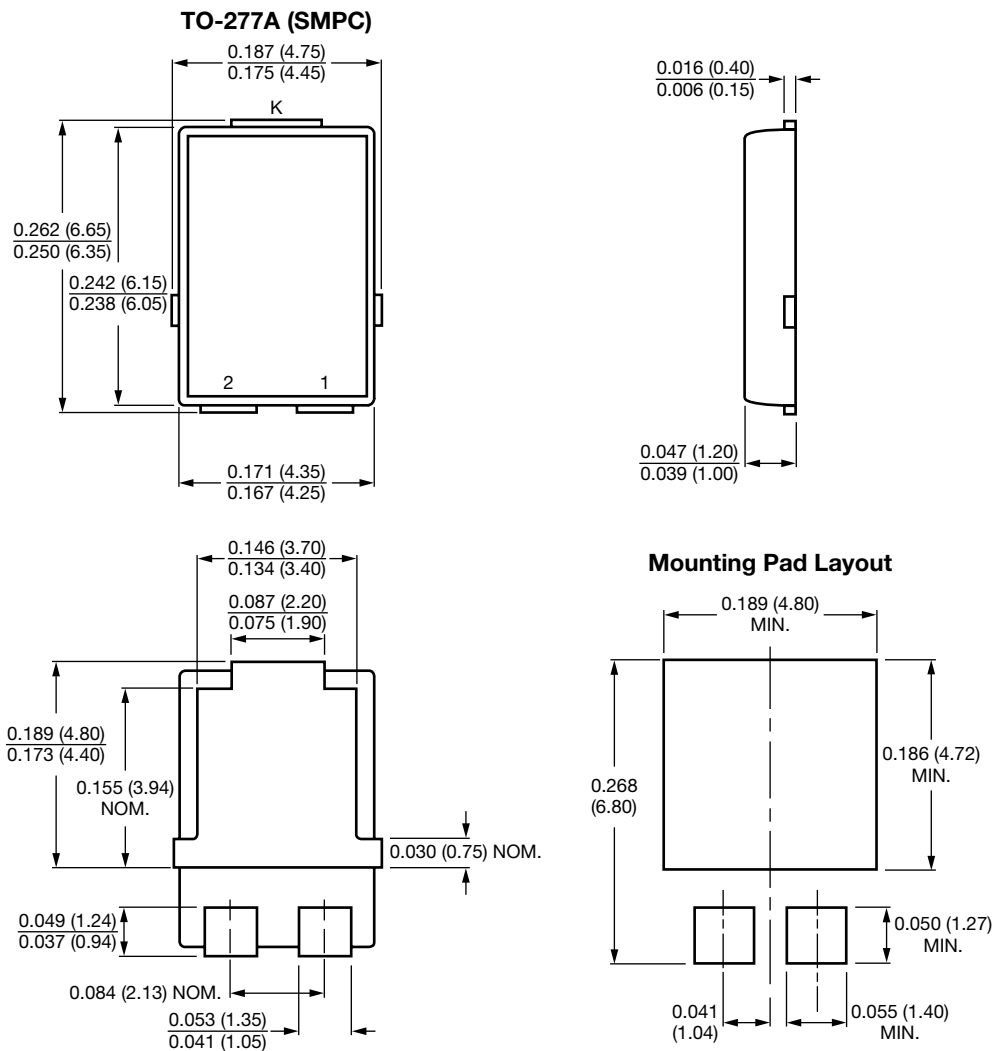


Figure 6. Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



Conform to JEDEC TO-277A



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