

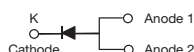
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

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

TMBS® eSMP® 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
- 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

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 |

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

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

TYPICAL APPLICATIONS

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

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 and storage temperature range | T_J, T_{STG} | - 40 to + 150 | °C |



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ 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 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 4.5 | - | mA |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | 30.4 | 150 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 10.4 | 20 | mA |

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

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ 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

| ORDERING INFORMATION (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 |
| V10P10HM3/86A ⁽¹⁾ | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| V10P10HM3/87A ⁽¹⁾ | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |

Note

(1) Automotive grade



RATINGS AND CHARACTERISTICS CURVES

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

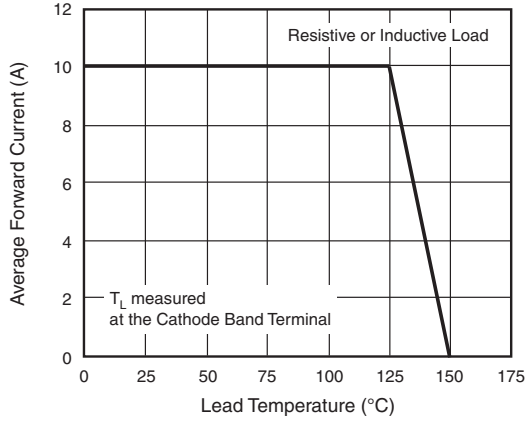


Fig. 1 - Maximum Forward Current Derating Curve

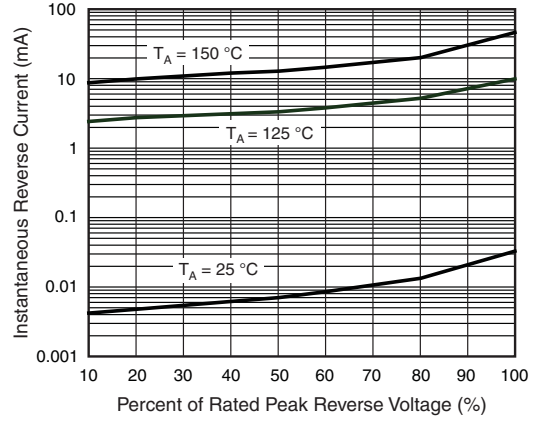


Fig. 4 - Typical Reverse Characteristics

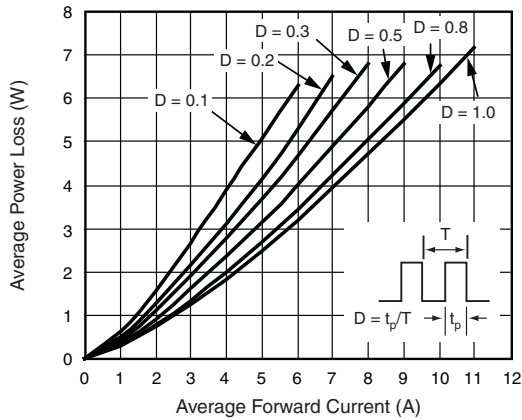


Fig. 2 - Forward Power Loss Characteristics

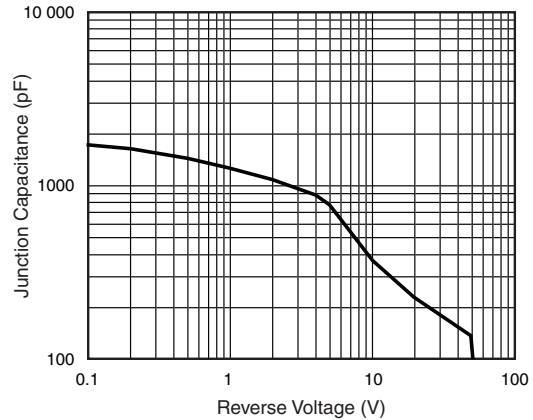


Fig. 5 - Typical Junction Capacitance

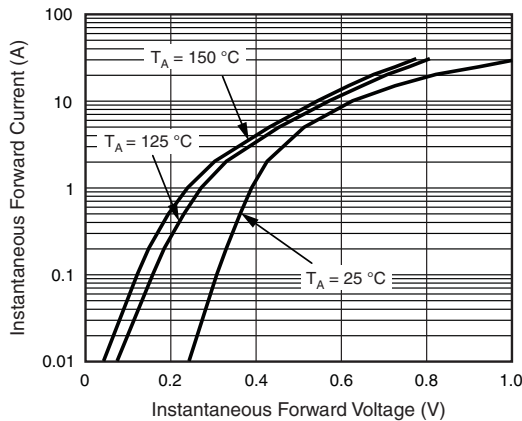


Fig. 3 - Typical Instantaneous Forward Characteristics

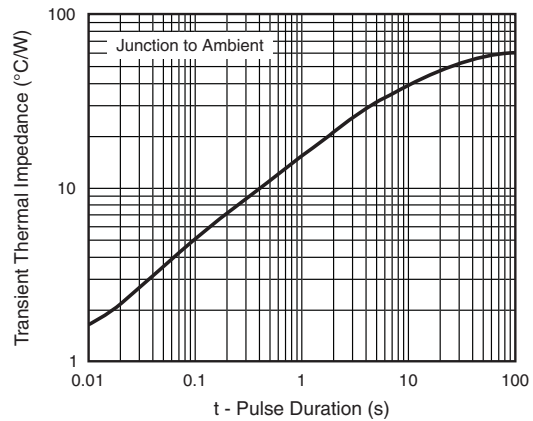
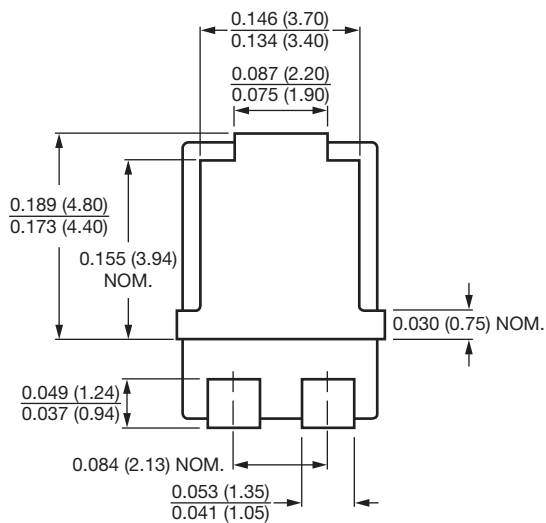
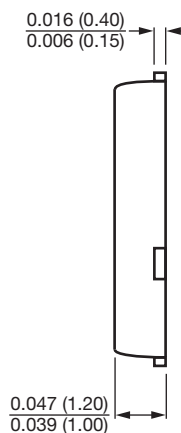
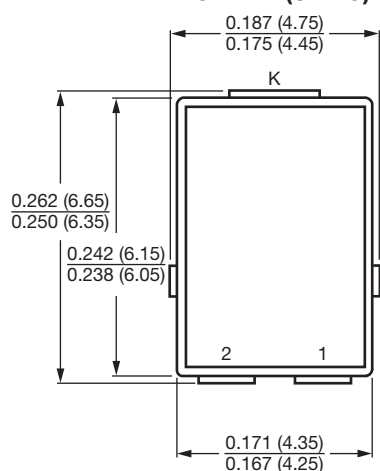


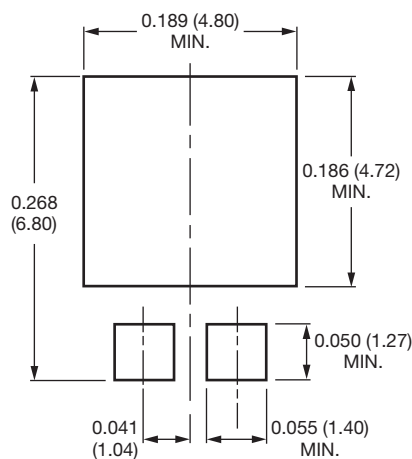
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-277A (SMPC)



Mounting Pad Layout



Conform to JEDEC TO-277A



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