

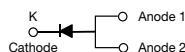
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.43\text{ V}$ 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

| | |
|------------------------------|--------|
| $I_{F(AV)}$ | 12 A |
| V_{RRM} | 100 V |
| I_{FSM} | 200 A |
| E_{AS} | 100 mJ |
| V_F at $I_F = 12\text{ A}$ | 0.58 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.

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

| PARAMETER | SYMBOL | V12P10 | UNIT |
|---|----------------|---------------|------|
| Device marking code | | V1210 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 12 | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 200 | 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 | $I_R = 1.0\text{ mA}$ | $T_A = 25\text{ }^\circ\text{C}$ | V_{BR} | 100 (minimum) | - | V |
| Instantaneous forward voltage ⁽¹⁾ | $I_F = 5\text{ A}$ $I_F = 12\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | V_F | 0.50 0.65 | - 0.70 | V |
| | $I_F = 5\text{ A}$ $I_F = 12\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.43 0.58 | - 0.64 | |
| Reverse current ⁽²⁾ | $V_R = 70\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$ | I_R | 7.0 4.4 | - - | μA mA |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$ | | 21.3 11.8 | 250 20 | μA 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 noted) | | | |
|---|--------------------------------|--------|--------------------|
| PARAMETER | SYMBOL | V12P10 | UNIT |
| Typical thermal resistance | $R_{\theta JA}$ ⁽¹⁾ | 60 | $^\circ\text{C/W}$ |
| | $R_{\theta JL}$ | 3 | |

Note⁽¹⁾ Units mounted on recommended P.C.B. 1 oz. pad layout

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V12P10-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| V12P10-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| V12P10HM3/86A ⁽¹⁾ | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| V12P10HM3/87A ⁽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)

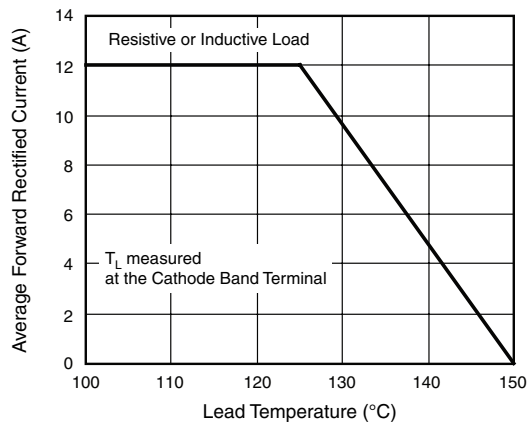


Figure 1. Maximum Forward Current Derating Curve

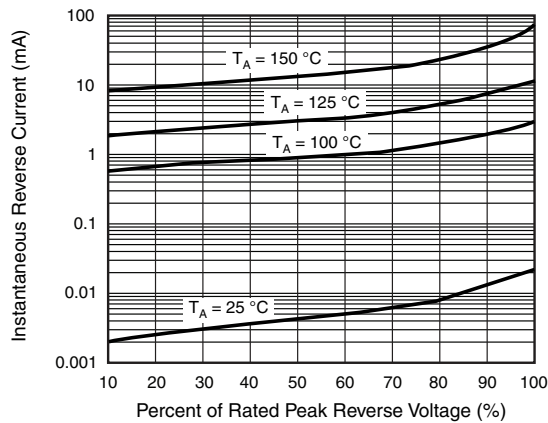


Figure 4. Typical Reverse Characteristics

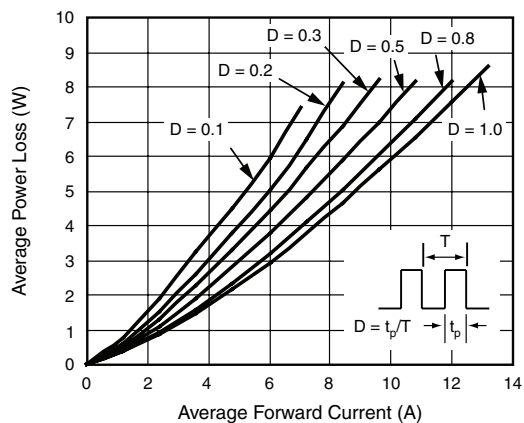


Figure 2. Forward Power Loss Characteristics

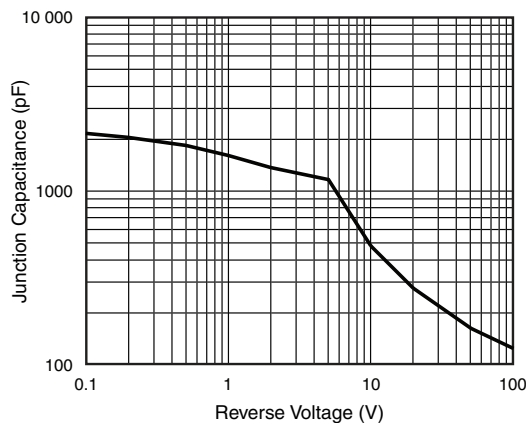


Figure 5. Typical Junction Capacitance

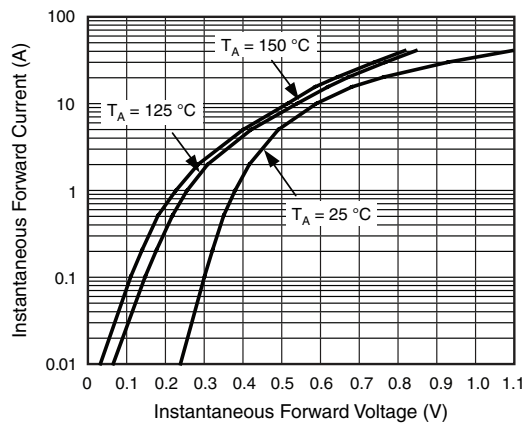


Figure 3. Typical Instantaneous Forward Characteristics

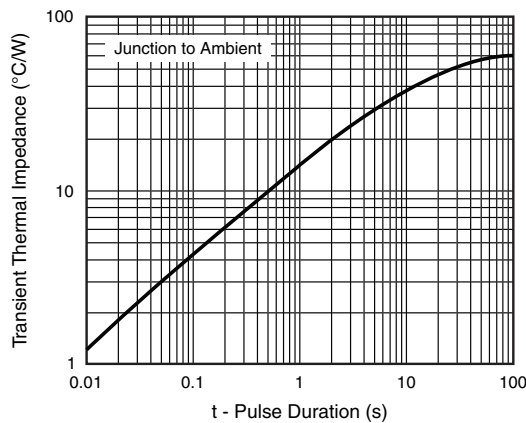
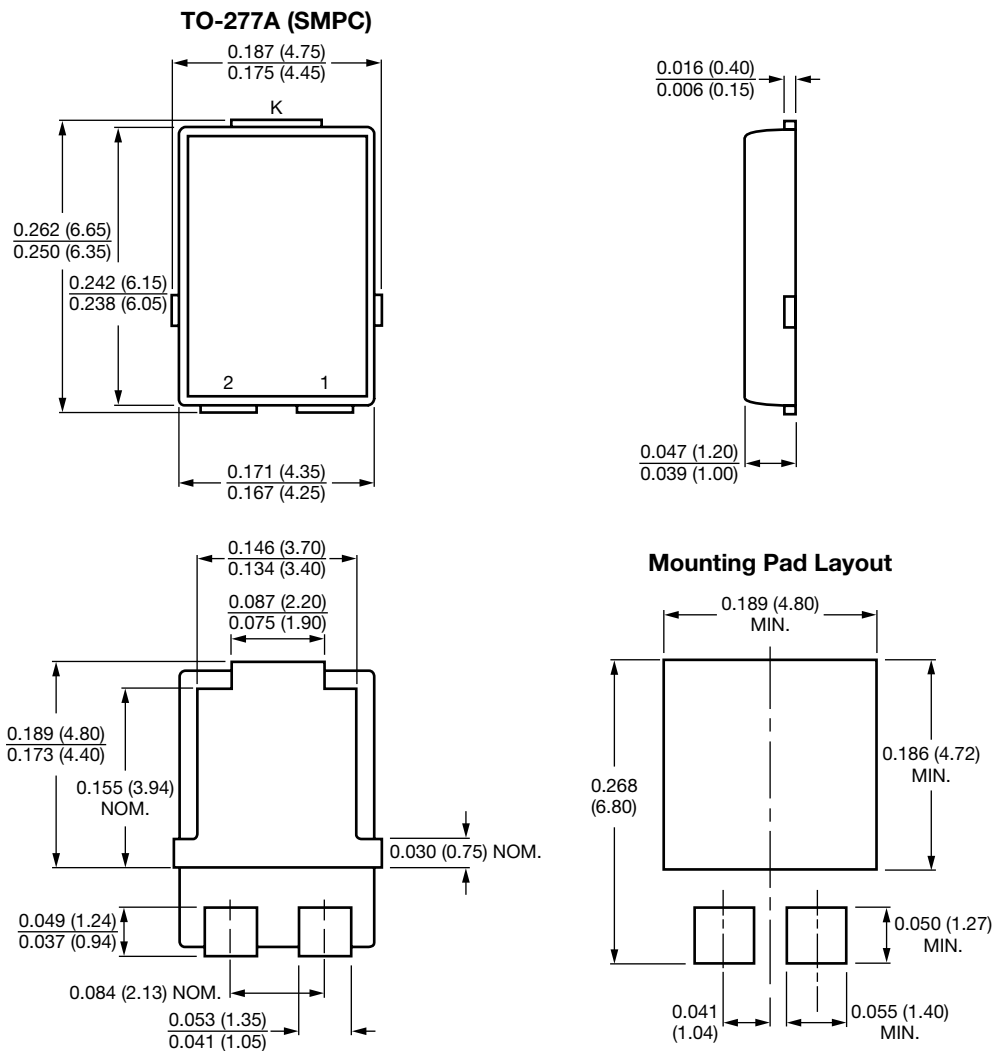


Figure 6. Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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