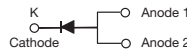


High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

 Ultra Low $V_F = 0.53 \text{ V}$ 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 available
- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE
TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling, 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, RoHS-compliant

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 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

| PRIMARY CHARACTERISTICS | |
|-------------------------------|----------------|
| $I_{F(AV)}$ | 10 A |
| V_{RRM} | 120 V |
| I_{FSM} | 160 A |
| V_F at $I_F = 10 \text{ A}$ | 0.63 V |
| T_J max. | 150 °C |
| Package | TO-277A (SMPC) |
| Diode variation | Single die |

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | |
|---|----------------|-------------|------|
| PARAMETER | SYMBOL | V10PM12 | UNIT |
| Device marking code | | 10M12 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | V |
| Maximum DC forward current | $I_F^{(1)}$ | 10 | A |
| | $I_F^{(2)}$ | 3.9 | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 160 | A |
| 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



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|----------------------|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.60 | - | V |
| | $I_F = 10\text{ A}$ | | | 0.75 | 0.83 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.53 | - | |
| | $I_F = 10\text{ A}$ | | | 0.63 | 0.71 | |
| Reverse current | $V_R = 90\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 2.9 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 2.0 | - | mA |
| | $V_R = 120\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 400 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 4.8 | 28 | mA |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | |
|--|-----------------------|---------|--------------------|
| PARAMETER | SYMBOL | V10PM12 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 62 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 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 aluminum PCB; thermal resistance $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V10PM12-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| V10PM12-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| V10PM12HM3_A/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| V10PM12HM3_A/I ⁽¹⁾ | 0.10 | I | 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)

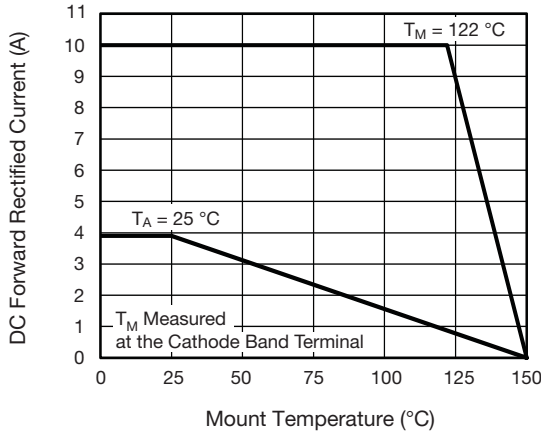


Fig. 1 - Forward Current Derating Curve

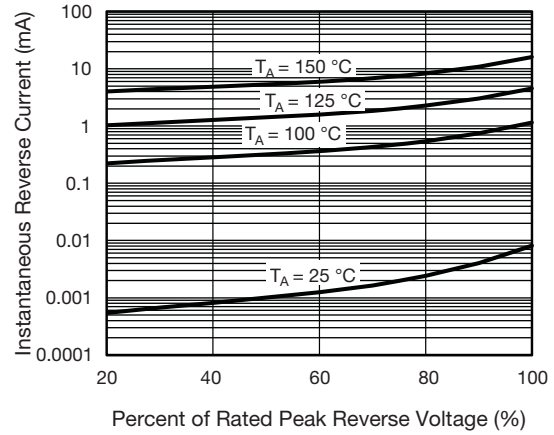


Fig. 4 - Typical Reverse Leakage Characteristics

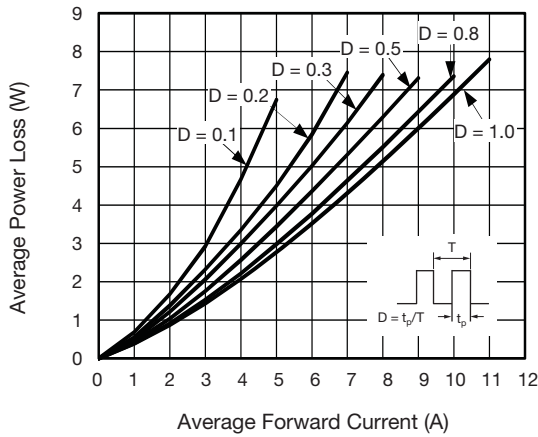


Fig. 2 - Forward Power Loss Characteristics

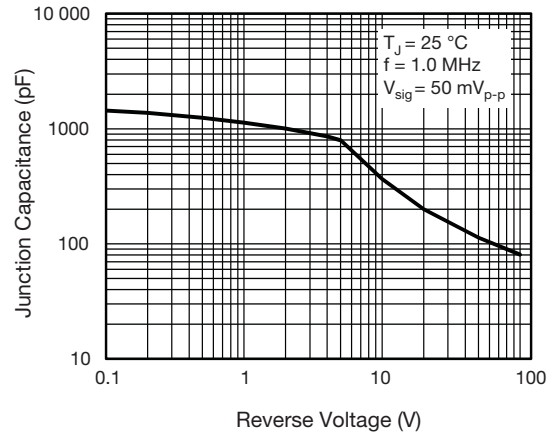


Fig. 5 - Typical Junction Capacitance

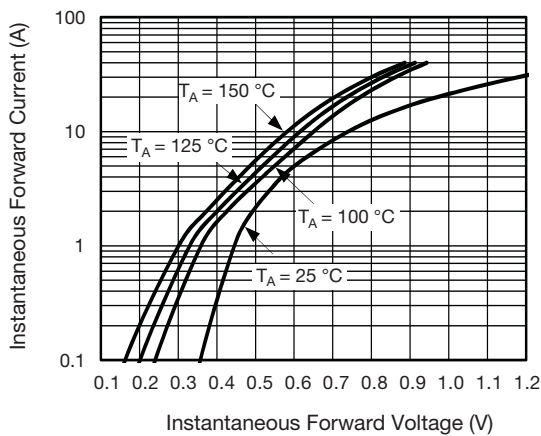


Fig. 3 - Typical Instantaneous Forward Characteristics

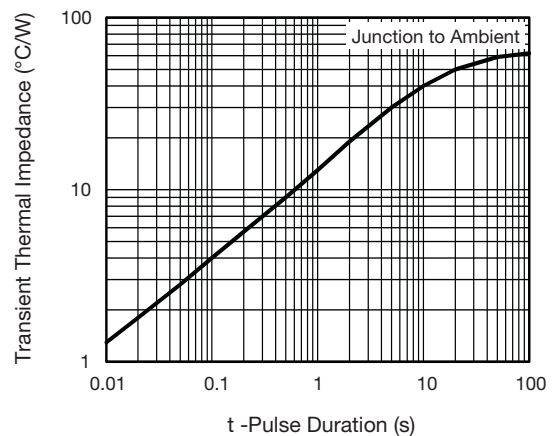
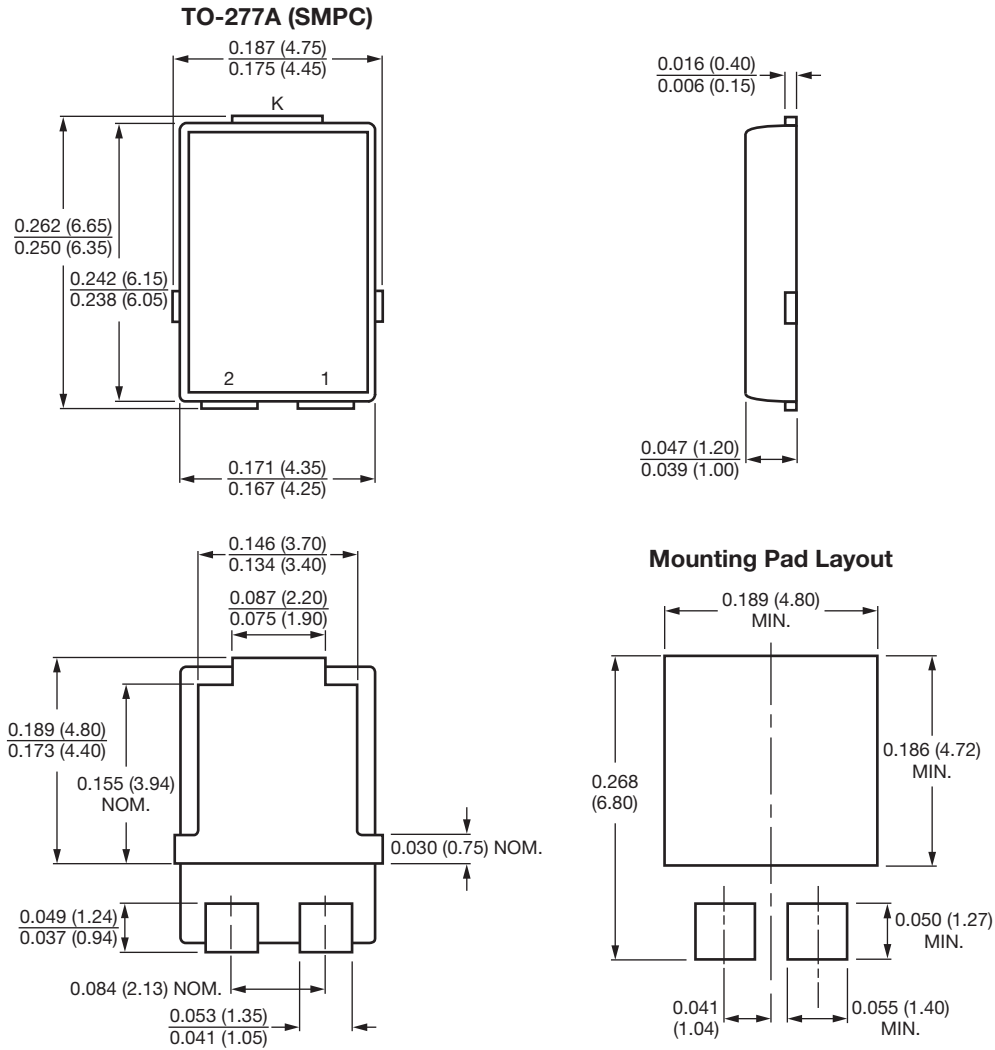


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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