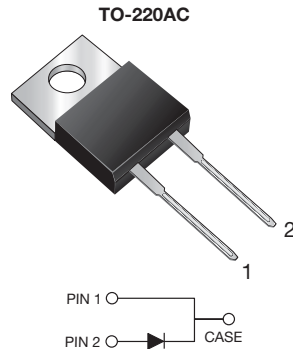


High Voltage TMBS[®] (Trench MOS Barrier Schottky) Rectifier



FEATURES

- Trench MOS Schottky technology
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AC

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 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|-------------------------|-------------|
| $I_{F(AV)}$ | 10 A |
| V_{RRM} | 90 V, 100 V |
| I_{FSM} | 150 A |
| V_F | 0.65 V |
| T_J max. | 150 °C |
| Package | TO-220AC |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_C = 25\text{ °C}$ unless otherwise noted) | | | | |
|--|----------------|---------------|----------|------------|
| PARAMETER | SYMBOL | MBR1090 | MBR10100 | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 90 | 100 | V |
| Working peak reverse voltage | V_{RWM} | 90 | 100 | V |
| Maximum DC blocking voltage | V_{DC} | 90 | 100 | V |
| Maximum average forward rectified current at $T_C = 133\text{ °C}$ | $I_{F(AV)}$ | 10 | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 150 | | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | | V/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | - 65 to + 150 | | °C |

| ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ °C}$ unless otherwise noted) | | | | |
|---|---------------------|-------------|-----------------------|------|
| PARAMETER | TEST CONDITIONS | SYMBOL | VALUE | UNIT |
| Maximum instantaneous forward voltage | $I_F = 10\text{ A}$ | $V_F^{(1)}$ | $T_C = 25\text{ °C}$ | 0.80 |
| | | | $T_C = 125\text{ °C}$ | 0.65 |
| | $I_F = 20\text{ A}$ | | $T_C = 125\text{ °C}$ | 0.75 |
| Maximum reverse current per diode at working peak reverse voltage | | $I_R^{(2)}$ | $T_J = 25\text{ °C}$ | 100 |
| | | | $T_J = 100\text{ °C}$ | 6.0 |

Notes

(1) Pulse test: 300 μ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width \leq 40 ms



| THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | |
|--|-----------------|---------|----------|---------------------------|
| PARAMETER | SYMBOL | MBR1090 | MBR10100 | UNIT |
| Typical thermal resistance | $R_{\theta JA}$ | | 60 | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JC}$ | | 2.0 | |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | MBR10100-M3/4W | 1.845 | 4W | 50/tube | Tube |

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

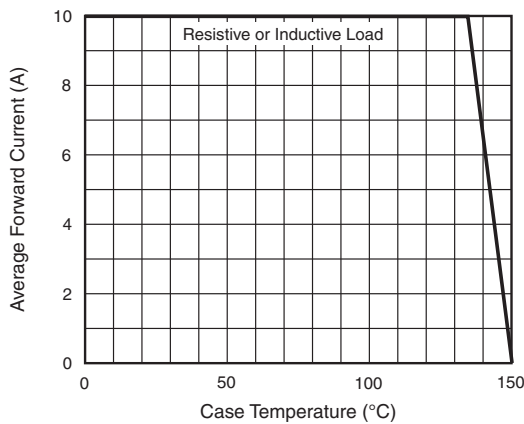


Fig. 1 - Forward Current Derating Curve

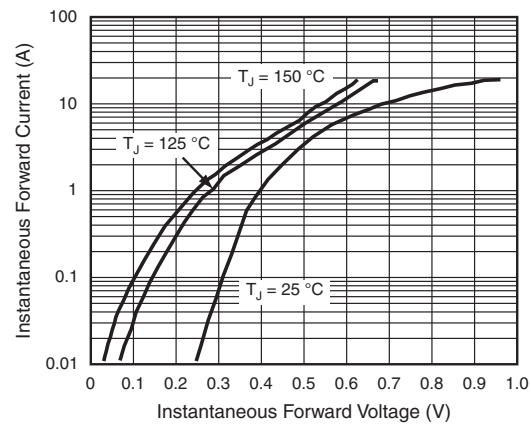


Fig. 3 - Typical Instantaneous Forward Characteristics

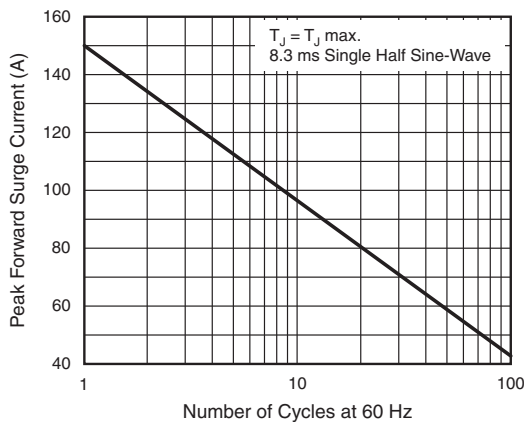


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

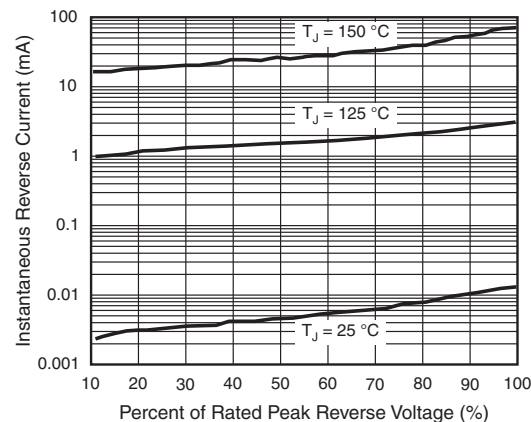


Fig. 4 - Typical Reverse Characteristics

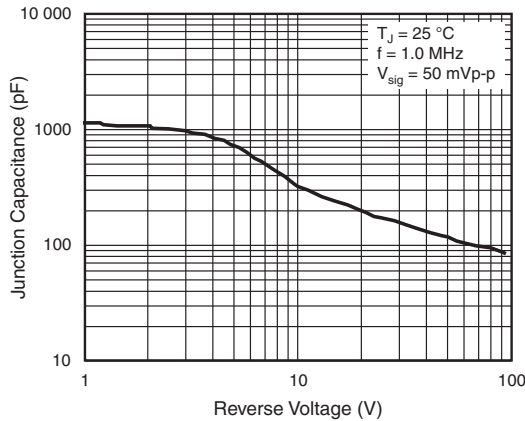


Fig. 5 - Typical Junction Capacitance

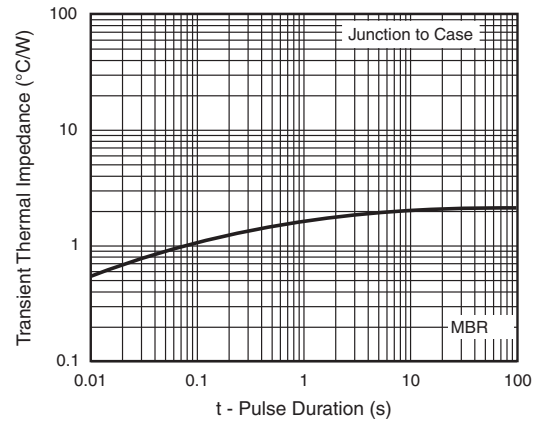
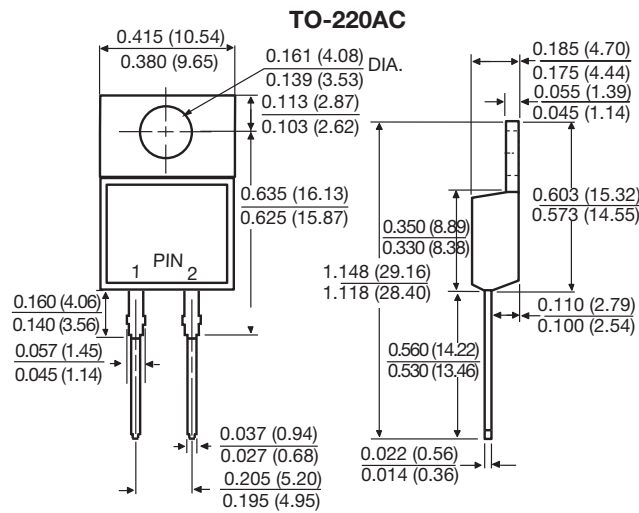


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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