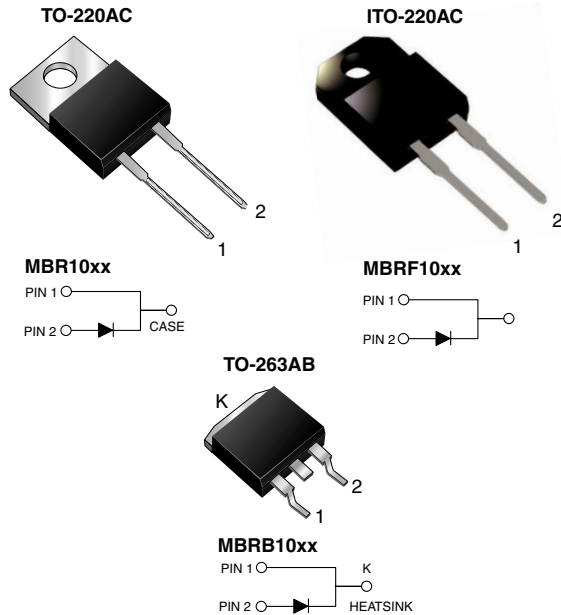


Schottky Barrier Rectifier



FEATURES

- Low power loss, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020C, LF max peak of 245 °C (for TO-263AB package)
- Solder Dip 260 °C, 40 seconds (for TO-220AC & ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, free-wheeling diodes, dc-to-dc converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

| MAJOR RATINGS AND CHARACTERISTICS | |
|-----------------------------------|----------------|
| $I_{F(AV)}$ | 10 A |
| V_{RRM} | 35 V to 60 V |
| I_{FSM} | 150 A |
| V_F | 0.57 V, 0.70 V |
| T_j max. | 150 °C |

| MAXIMUM RATINGS ($T_C = 25\text{ °C}$ unless otherwise noted) | | | | | | |
|--|-------------|---------------|---------|---------|---------|------------------|
| PARAMETER | SYMBOL | MBR1035 | MBR1045 | MBR1050 | MBR1060 | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 35 | 45 | 50 | 60 | V |
| Maximum average forward rectified current (see Fig. 1) | $I_{F(AV)}$ | 10 | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per leg | I_{FSM} | 150 | | | | A |
| Peak repetitive reverse current per leg at $t_p = 2.0\ \mu\text{s}$, 1 kHz | I_{RRM} | 1.0 | | 0.5 | | A |
| Voltage rate of change (rated V_R) | dv/dt | 10000 | | | | V/ μs |
| Operating junction temperature range | T_J | - 65 to + 150 | | | | °C |
| Storage temperature range | T_{STG} | - 65 to + 175 | | | | °C |
| Isolation voltage (ITO-220AC only) From terminal to heatsink $t = 1$ minute | V_{AC} | 1500 | | | | V |



| ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | | | |
|---|---|----------------|------------|---------|---------|---------|------|
| PARAMETER | TEST CONDITIONS | SYMBOL | MBR1035 | MBR1045 | MBR1050 | MBR1060 | UNIT |
| Maximum instantaneous forward voltage per leg ⁽¹⁾ | at I _F = 10 A, T _j = 25 °C | V _F | - | | 0.80 | | V |
| | at I _F = 10 A, T _j = 125 °C | | 0.57 | | 0.70 | | |
| | at I _F = 20 A, T _j = 25 °C | | 0.84 | | 0.95 | | |
| | at I _F = 20 A, T _j = 125 °C | | 0.72 | | 0.85 | | |
| Maximum instantaneous reverse current at rated DC blocking voltage ⁽¹⁾ | T _j = 25 °C T _j = 125 °C | I _R | 0.10 15 | | | | mA |

Note:

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

| THERMAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | |
|---|------------------|-----|------|------|------|
| PARAMETER | SYMBOL | MBR | MBRF | MBRB | UNIT |
| Maximum thermal resistance, junction to case | R _{θJC} | 2.0 | 4.0 | 2.0 | °C/W |

| ORDERING INFORMATION | | | | | |
|----------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | MBR1045-E3/45 | 1.80 | 45 | 50/Tube | Tube |
| ITO-220AC | MBRF1045-E3/45 | 1.94 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB1045-E3/45 | 1.33 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB1045-E3/81 | 1.33 | 81 | 800/Reel | Tape Reel |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

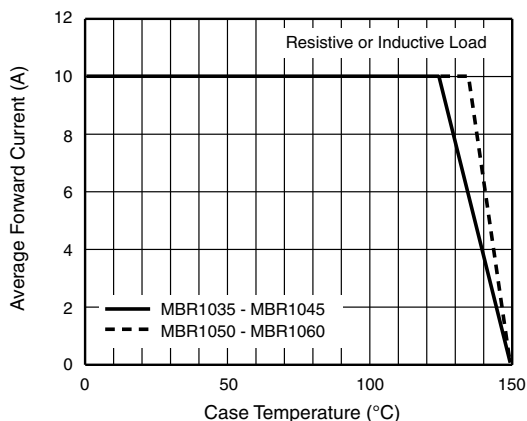


Figure 1. Forward Current Derating Curve

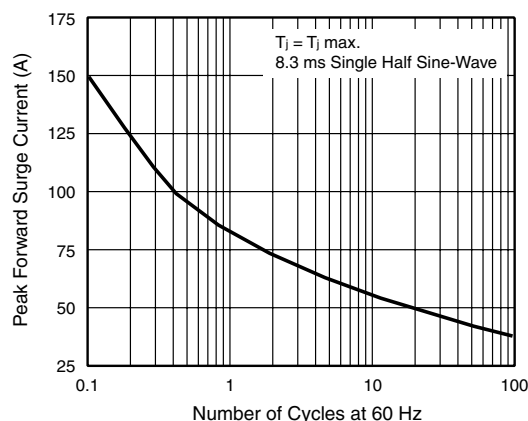


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

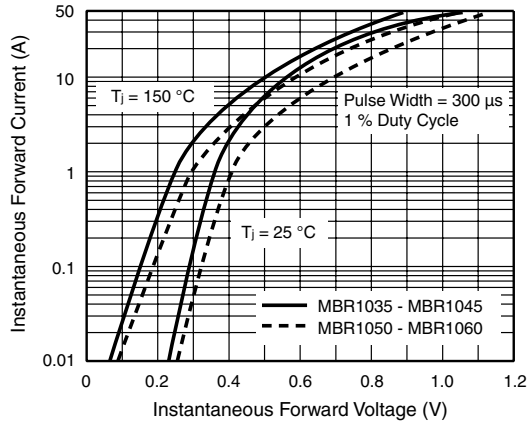


Figure 3. Typical Instantaneous Forward Characteristics

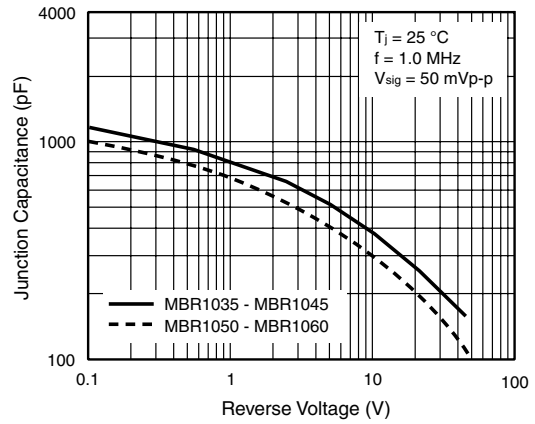


Figure 5. Typical Junction Capacitance

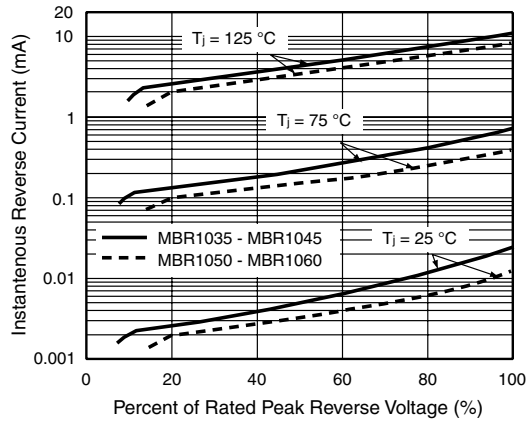


Figure 4. Typical Reverse Characteristics

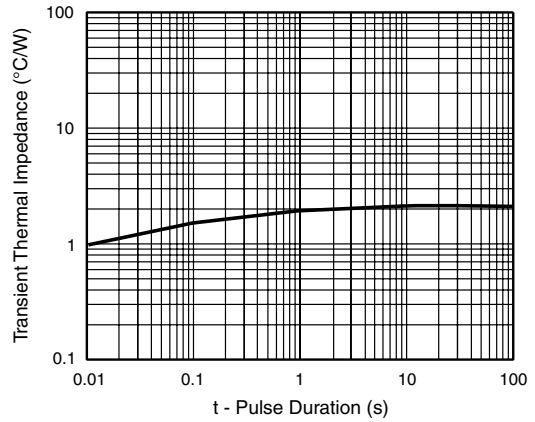


Figure 6. Typical Transient Thermal Impedance

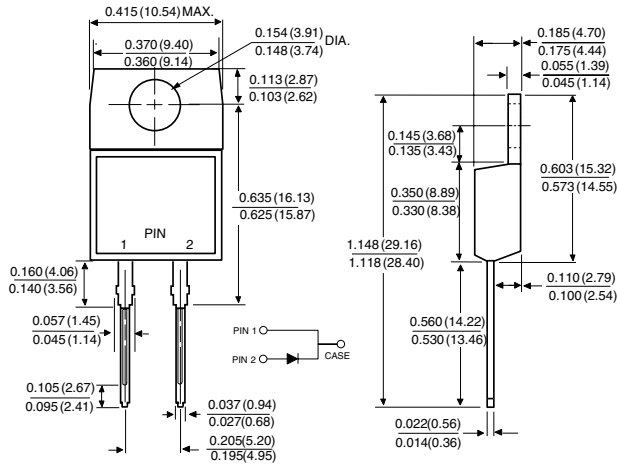
MBR(F,B)1035 thru MBR(F,B)1060

Vishay General Semiconductor

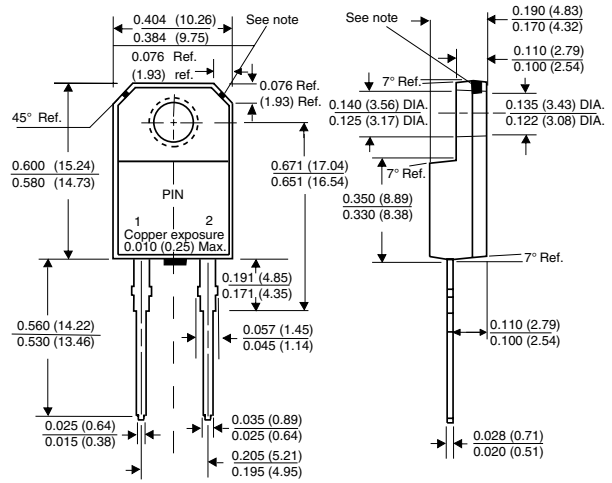


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC

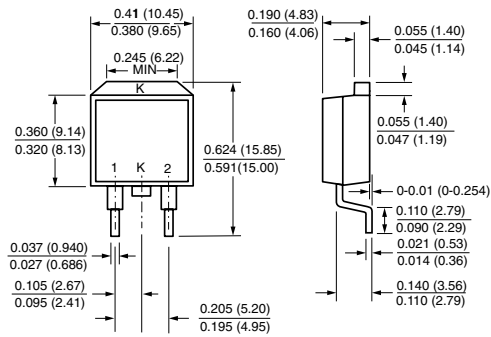


ITO-220AC

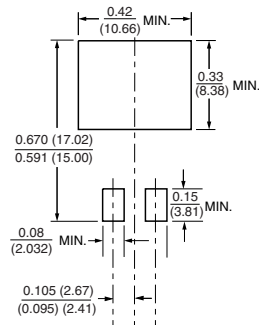


Note: Copper exposure is allowable for 0.005 (0.13) Max. from the body

TO-263AB



Mounting Pad Layout





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