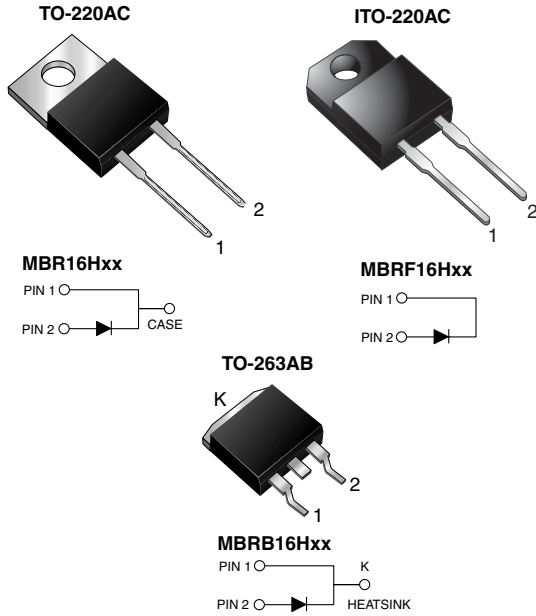


## Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



### FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or 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-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 16 A           |
| $V_{RRM}$               | 35 V to 60 V   |
| $I_{FSM}$               | 150 A          |
| $V_F$                   | 0.56 V, 0.62 V |
| $I_R$                   | 100 $\mu$ A    |
| $T_J$ max.              | 175 °C         |

| MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)  |             |          |          |          |          |            |
|--|-------------|----------|----------|----------|----------|------------|
| PARAMETER  | SYMBOL      | MBR16H35 | MBR16H45 | MBR16H50 | MBR16H60 | UNIT       |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$   | 35       | 45       | 50       | 60       | V          |
| Working peak reverse voltage   | $V_{RWM}$   | 35       | 45       | 50       | 60       | V          |
| Maximum DC blocking voltage  | $V_{DC}$    | 35       | 45       | 50       | 60       | V          |
| Max. average forward rectified current (Fig. 1)  | $I_{F(AV)}$ | 16       |          |          |          | A          |
| Non-repetitive avalanche energy at 25 °C, $I_{AS} = 4$ A, $L = 10$ mH                          | $E_{AS}$    | 80       |          |          |          | mJ         |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load             | $I_{FSM}$   | 150      |          |          |          | A          |
| Peak repetitive reverse surge current at $t_p = 2.0$ $\mu$ s, 1 kHz                            | $I_{RRM}$   | 1.0      |          | 0.5      |          | A          |
| Peak non-repetitive reverse energy (8/20 $\mu$ s waveform)                                     | $E_{RSM}$   | 20       |          |          |          | mJ         |
| Electrostatic discharge capacitor voltage human body model: $C = 100$ pF, $R = 1.5$ k $\Omega$ | $V_C$       | 25       |          |          |          | kV         |
| Voltage rate of change (rated $V_R$ )  | dV/dt       | 10 000   |          |          |          | V/ $\mu$ s |

# MBR(F,B)16H35 thru MBR(F,B)16H60

Vishay General Semiconductor



| MAXIMUM RATINGS (T <sub>C</sub> = 25 °C unless otherwise noted)           |                  |               |          |          |          |      |
|---|------------------|---------------|----------|----------|----------|------|
| PARAMETER   | SYMBOL           | MBR16H35      | MBR16H45 | MBR16H50 | MBR16H60 | UNIT |
| Operating junction temperature range                                      | T <sub>J</sub>   | - 65 to + 175 |          |          |          | °C   |
| Storage temperature range   | T <sub>STG</sub> | - 65 to + 175 |          |          |          | °C   |
| Isolation voltage (ITO-220AC only)<br>from terminal to heatsink t = 1 min | V <sub>AC</sub>  | 1500          |          |          |          | V    |

| ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |  |   |                |                      |              |                      |              |          |
|--|--|---|----------------|----------------------|--------------|----------------------|--------------|----------|
| PARAMETER  | TEST CONDITIONS                                |   | SYMBOL         | MBR16H35<br>MBR16H45 |              | MBR16H50<br>MBR16H60 |              | UNIT     |
|  |  |   |                | TYP.                 | MAX.         | TYP.                 | MAX.         |          |
| Maximum instantaneous forward voltage <sup>(1)</sup>                       | I <sub>F</sub> = 16 A<br>I <sub>F</sub> = 16 A | T <sub>J</sub> = 25 °C<br>T <sub>J</sub> = 125 °C | V <sub>F</sub> | -<br>0.52            | 0.66<br>0.56 | -<br>0.58            | 0.73<br>0.62 | V        |
| Maximum reverse current at rated V <sub>R</sub> <sup>(2)</sup>             |  | T <sub>J</sub> = 25 °C<br>T <sub>J</sub> = 125 °C | I <sub>R</sub> | -<br>6.0             | 100<br>20    | -<br>4.0             | 100<br>20    | μA<br>mA |

**Notes:**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted) |                  |     |      |      |      |  |
|---|------------------|-----|------|------|------|--|
| PARAMETER   | SYMBOL           | MBR | MBRF | MBRB | UNIT |  |
| Thermal resistance, junction to case                                    | R <sub>θJC</sub> | 1.5 | 3.0  | 1.5  | °C/W |  |

| ORDERING INFORMATION (Example) |                                |                 |              |               |               |
|--------------------------------|--------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N                  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                       | MBR16H45-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                      | MBRF16H45-E3/45                | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB16H45-E3/45                | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB16H45-E3/81                | 1.33            | 81           | 800/reel      | Tape and reel |
| TO-220AC                       | MBR16H45HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                      | MBRF16H45HE3/45 <sup>(1)</sup> | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB16H45HE3/45 <sup>(1)</sup> | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                       | MBRB16H45HE3/81 <sup>(1)</sup> | 1.33            | 81           | 800/reel      | Tape and reel |

**Note:**

- (1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

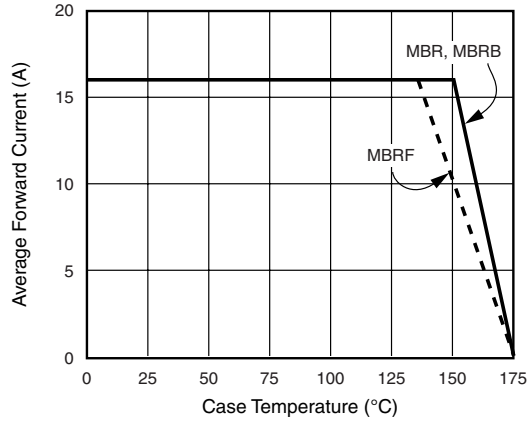


Figure 1. Forward Current Derating Curve

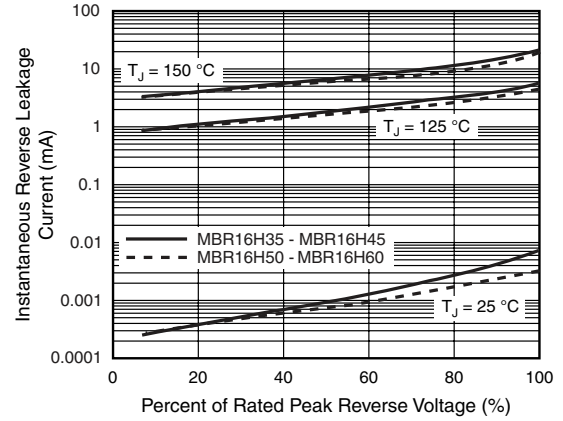


Figure 4. Typical Reverse Characteristics

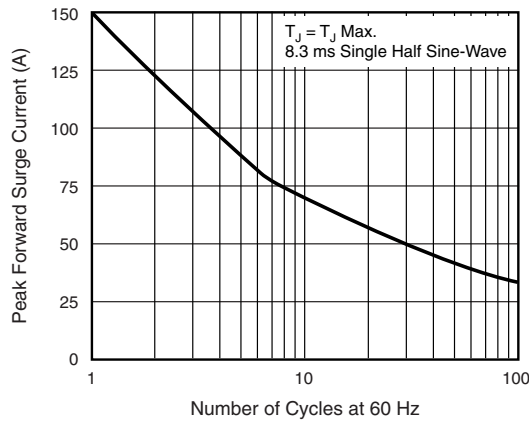


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

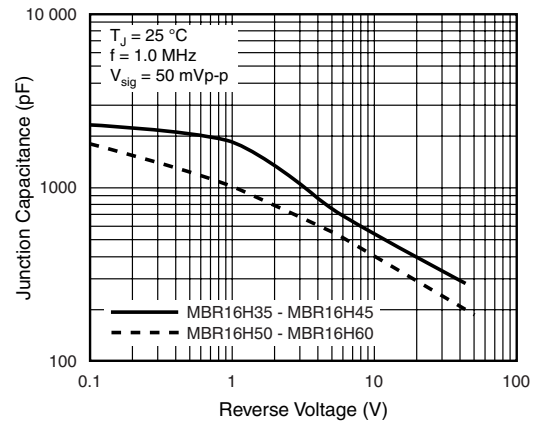


Figure 5. Typical Junction Capacitance

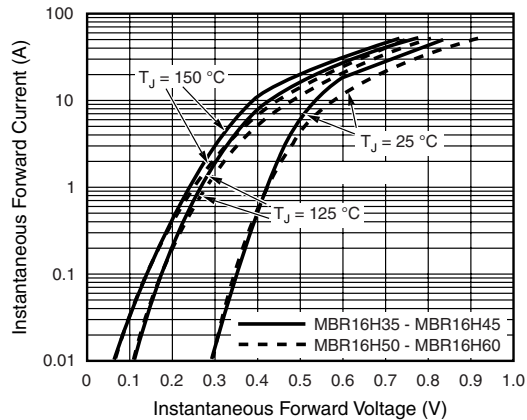


Figure 3. Typical Instantaneous Forward Characteristics

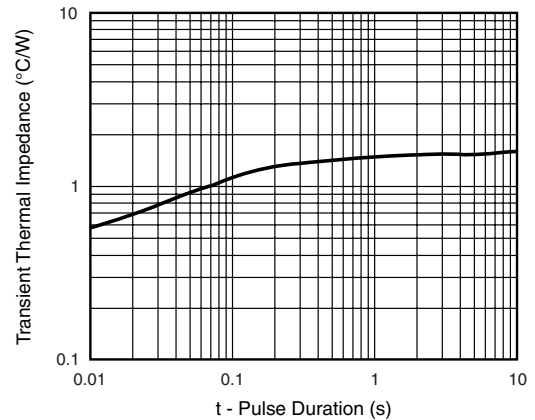


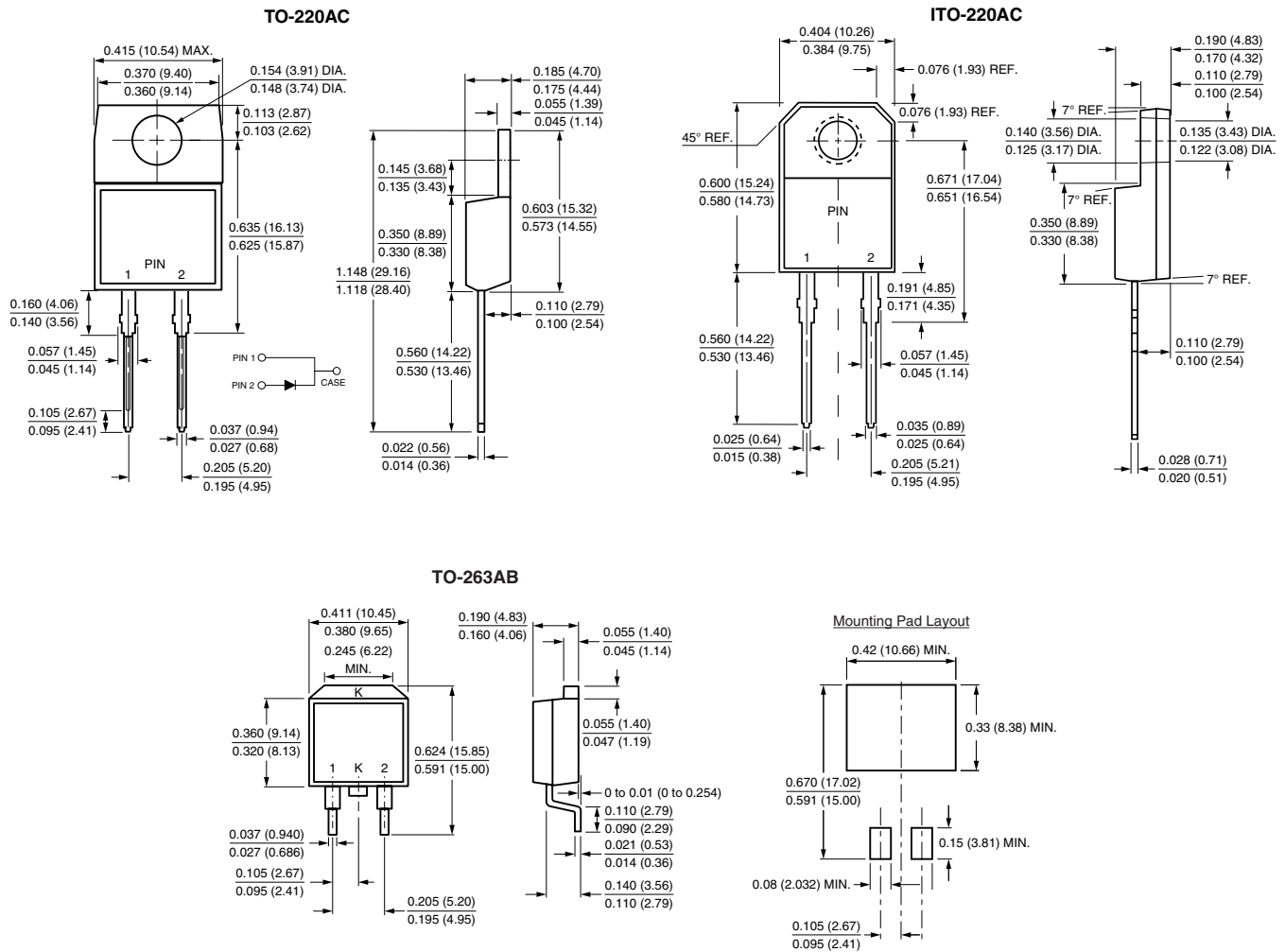
Figure 6. Typical Transient Thermal Impedance

# MBR(F,B)16H35 thru MBR(F,B)16H60

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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