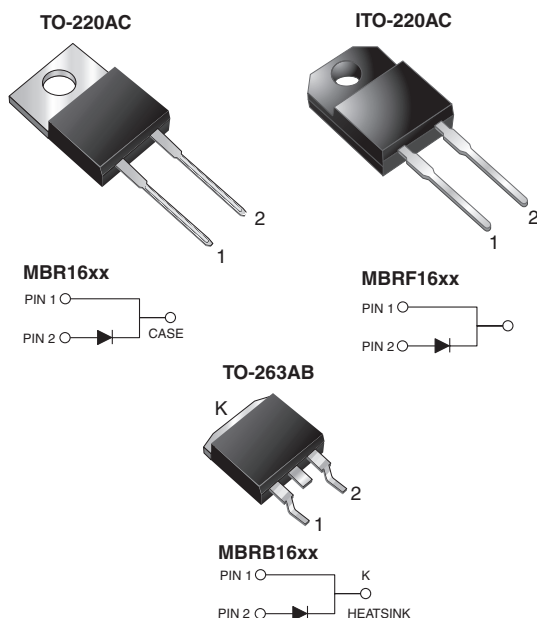


## Schottky Barrier Rectifier



### FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- 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 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-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          |
| $V_F$              | 0.57 V, 0.65 V |
| $T_J \text{ max.}$ | 150 °C         |

### MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

| MAXIMUM RATINGS (T <sub>C</sub> = 25 °C unless otherwise noted)                    |                    |               |         |         |         |      |
|------------------------------------------------------------------------------------|--------------------|---------------|---------|---------|---------|------|
| PARAMETER                                                                          | SYMBOL             | MBR1635       | MBR1645 | MBR1650 | MBR1660 | UNIT |
| Maximum repetitive peak reverse voltage                                            | V <sub>RRM</sub>   | 35            | 45      | 50      | 60      | V    |
| Working peak reverse voltage                                                       | V <sub>RWM</sub>   | 35            | 45      | 50      | 60      | V    |
| Maximum DC blocking voltage                                                        | V <sub>DC</sub>    | 35            | 45      | 50      | 60      | V    |
| Maximum average forward rectified current at T <sub>C</sub> = 125 °C               | I <sub>F(AV)</sub> | 16            |         |         |         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I <sub>FSM</sub>   | 150           |         |         |         | A    |
| Peak repetitive reverse current at t <sub>p</sub> = 2.0 μs, 1 kHz                  | I <sub>RRM</sub>   | 1.0           |         | 0.5     |         | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                     | dV/dt              | 10 000        |         |         |         | V/μs |
| Operating junction temperature range                                               | T <sub>J</sub>     | - 65 to + 150 |         |         |         | °C   |
| Storage temperature range                                                          | T <sub>STG</sub>   | - 65 to + 175 |         |         |         | °C   |
| Isolation voltage (ITO-220AC only) 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         | MBR1635      | MBR1645 | MBR1650      | MBR1660 | UNIT |
| Maximum instantaneous forward voltage <sup>(1)</sup>                              | I <sub>F</sub> = 16 A<br>I <sub>F</sub> = 16 A | T <sub>C</sub> = 25 °C<br>T <sub>C</sub> = 125 °C | V <sub>F</sub> | 0.63<br>0.57 |         | 0.75<br>0.65 |         | V    |
| Maximum instantaneous reverse current at rated DC blocking voltage <sup>(1)</sup> |                                                | T <sub>C</sub> = 25 °C<br>T <sub>C</sub> = 125 °C | I <sub>R</sub> | 0.2<br>40    |         | 1.0<br>50    |         | mA   |

**Note:**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

| <b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |     |      |      |                      |  |
|---------------------------------------------------------------------------------------------|-----------------|-----|------|------|----------------------|--|
| PARAMETER                                                                                   | SYMBOL          | MBR | MBRF | MBRB | UNIT                 |  |
| Typical thermal resistance from junction to case                                            | $R_{\theta JC}$ | 1.5 | 3.0  | 1.5  | $^{\circ}\text{C/W}$ |  |

| <b>ORDERING INFORMATION</b> (Example) |                               |                 |              |               |               |
|---------------------------------------|-------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N                 | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC                              | MBR1645-E3/45                 | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | MBRF1645-E3/45                | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1645-E3/45                | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1645-E3/81                | 1.33            | 81           | 800/reel      | Tape reel     |
| TO-220AC                              | MBR1645HE3/45 <sup>(1)</sup>  | 1.80            | 45           | 50/tube       | Tube          |
| ITO-220AC                             | MBRF1645HE3/45 <sup>(1)</sup> | 1.94            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1645HE3/45 <sup>(1)</sup> | 1.33            | 45           | 50/tube       | Tube          |
| TO-263AB                              | MBRB1645HE3/81 <sup>(1)</sup> | 1.33            | 81           | 800/reel      | Tape reel     |

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

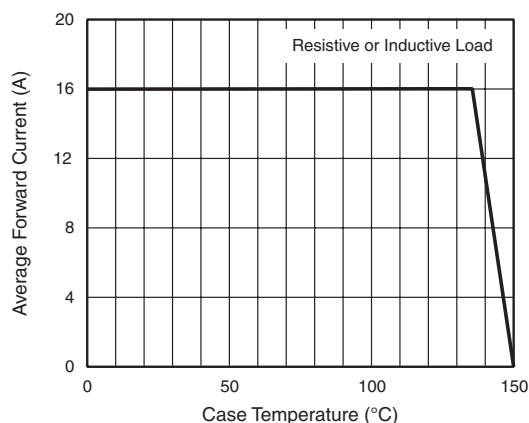


Figure 1. Forward Current Derating Curve

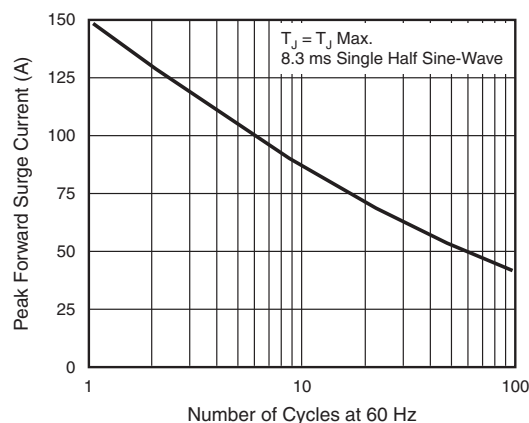


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

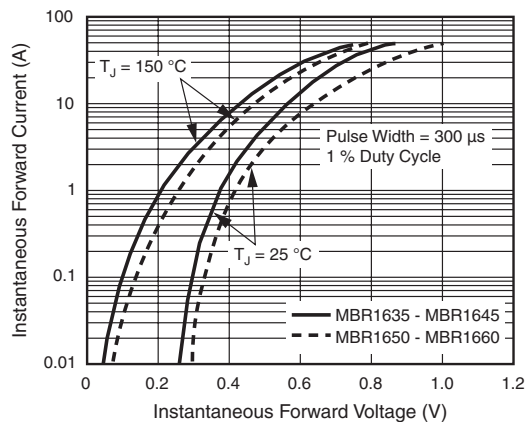


Figure 3. Typical Instantaneous Forward Characteristics

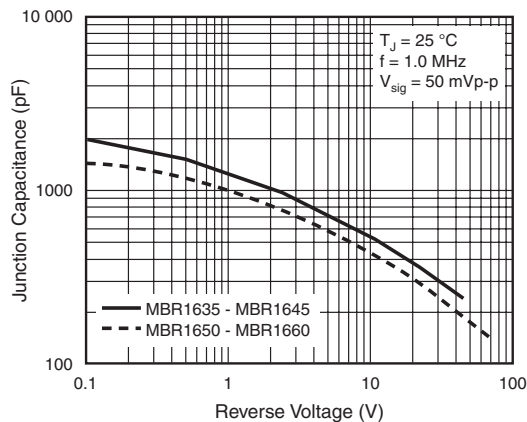


Figure 5. Typical Junction Capacitance

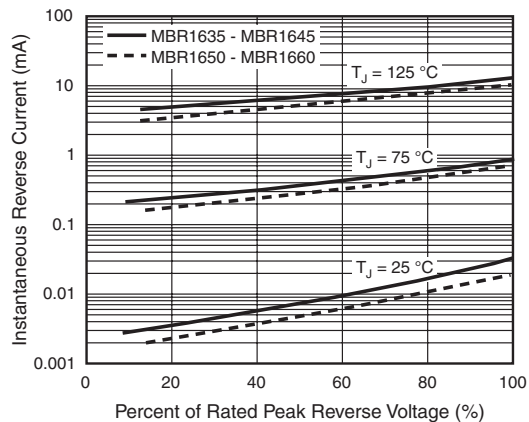


Figure 4. Typical Reverse Characteristics

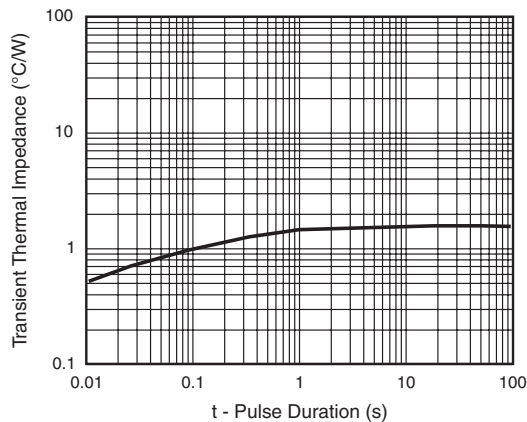
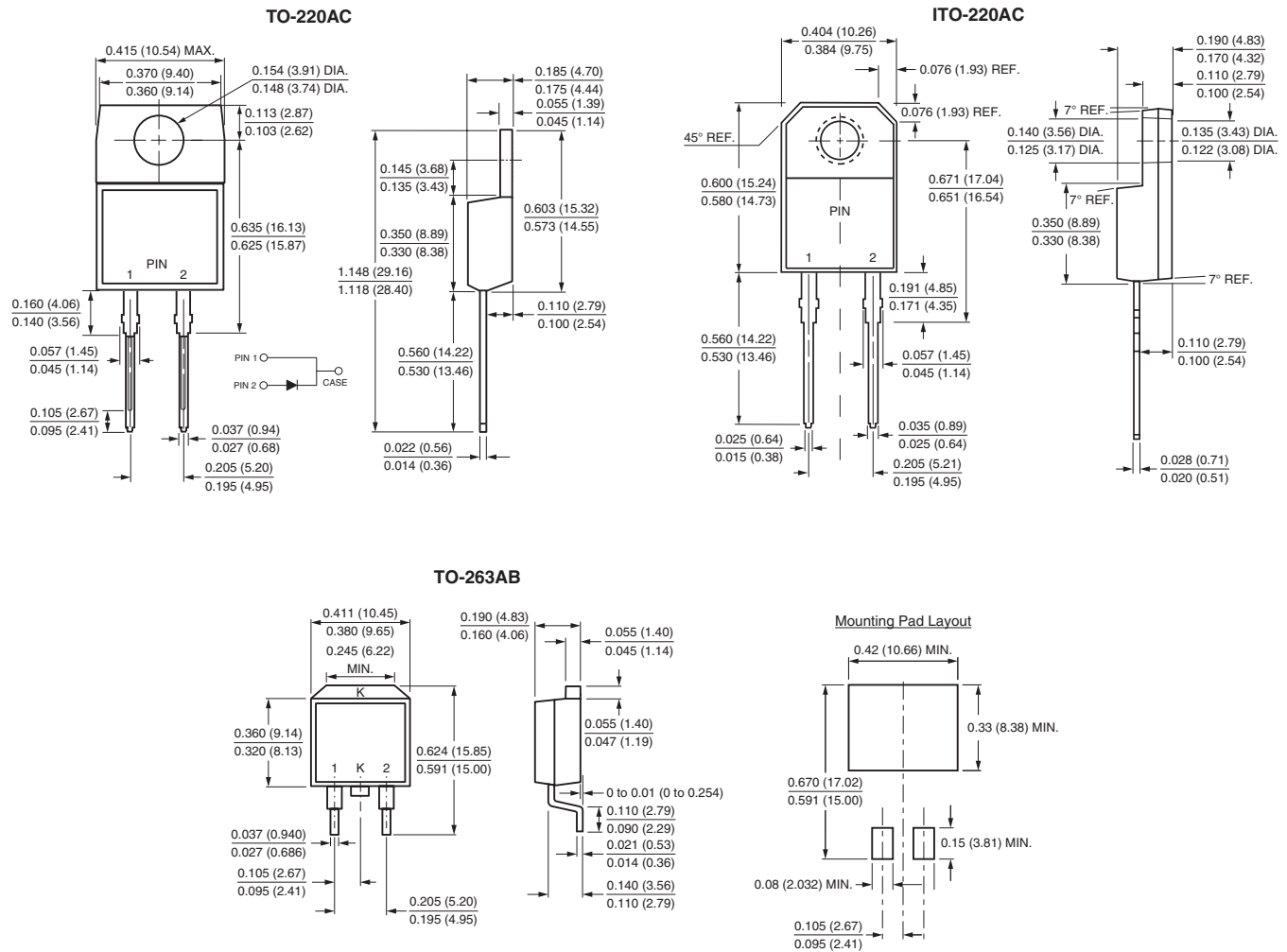


Figure 6. Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





### Disclaimer

All product specifications and data are subject to change without notice.

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