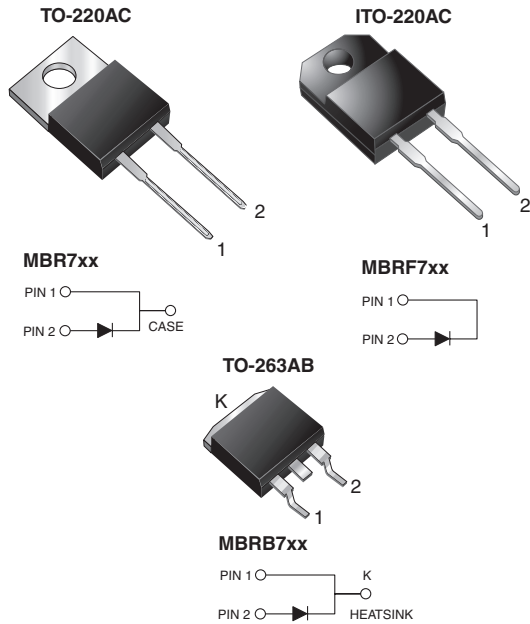


Schottky Barrier Rectifier



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 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

| | |
|--------------------|----------------|
| $I_{F(AV)}$ | 7.5 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 ($T_C = 25 \text{ }^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | MBR735 | MBR745 | MBR750 | MBR760 | 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 |
| Maximum average forward rectified current (Fig. 1) | $I_{F(AV)}$ | 7.5 | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 150 | | | | A |
| Peak repetitive reverse current at $t_p = 2.0 \text{ } \mu\text{s}$, 1 kHz | I_{RRM} | 1.0 | | 0.5 | | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | | | | 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 $t = 1 \text{ min}$ | V_{AC} | 1500 | | | | V |

| ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | | | | |
|----------------------------------------------------------------------------|------------------------|---------------------------------------------------|----------------|-----------|--------|-----------|--------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | MBR735 | MBR745 | MBR750 | MBR760 | UNIT |
| Maximum instantaneous forward voltage ⁽¹⁾ | I _F = 7.5 A | T _C = 25 °C | V _F | - | - | 0.75 | - | V |
| | I _F = 7.5 A | T _C = 125 °C | | 0.57 | - | 0.65 | - | |
| | I _F = 15 A | T _C = 25 °C | | 0.84 | - | - | - | |
| | I _F = 15 A | T _C = 125 °C | | 0.72 | - | - | - | |
| Maximum reverse current at DC blocking voltage | | T _C = 25 °C T _C = 125 °C | I _R | 0.1 15 | | 0.5 50 | | 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 |
| Thermal resistance from junction to case | R _{θJC} | 3.0 | 5.0 | 3.0 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | MBR745-E3/45 | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | MBRF745-E3/45 | 1.94 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB745-E3/45 | 1.33 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB745-E3/81 | 1.33 | 81 | 800/reel | Tape reel |
| TO-220AC | MBR745HE3/45 ⁽¹⁾ | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | MBRF745HE3/45 ⁽¹⁾ | 1.94 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB745HE3/45 ⁽¹⁾ | 1.33 | 45 | 50/Tube | Tube |
| TO-263AB | MBRB745HE3/81 ⁽¹⁾ | 1.33 | 81 | 800/reel | Tape reel |

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

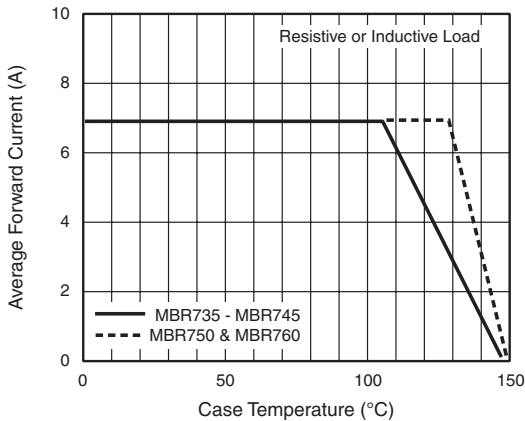


Figure 1. Forward Current Derating Curve

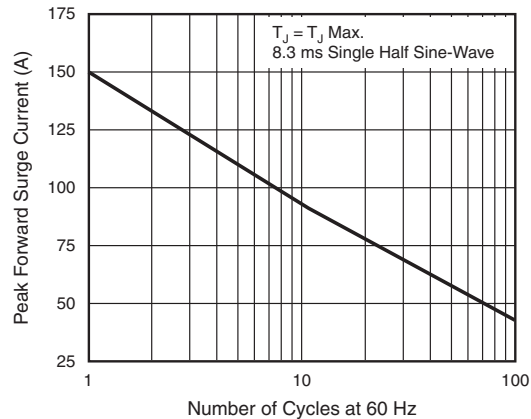


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

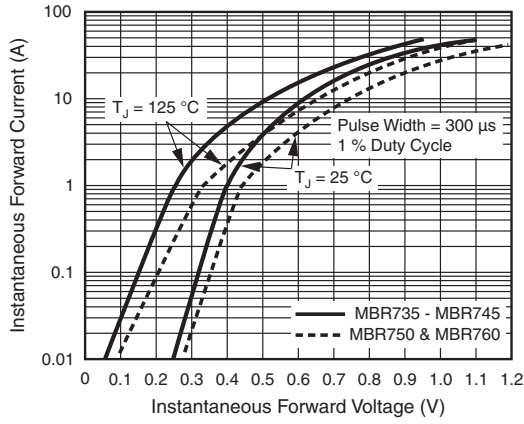


Figure 3. Typical Instantaneous Forward Characteristics

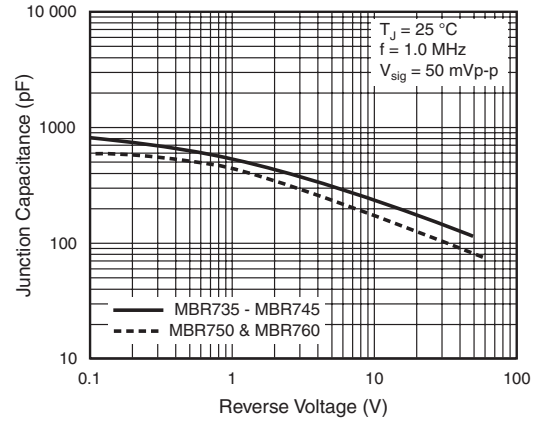


Figure 5. Typical Junction Capacitance

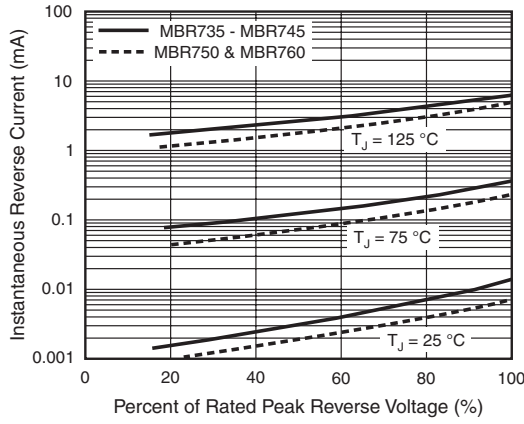


Figure 4. Typical Reverse Characteristics

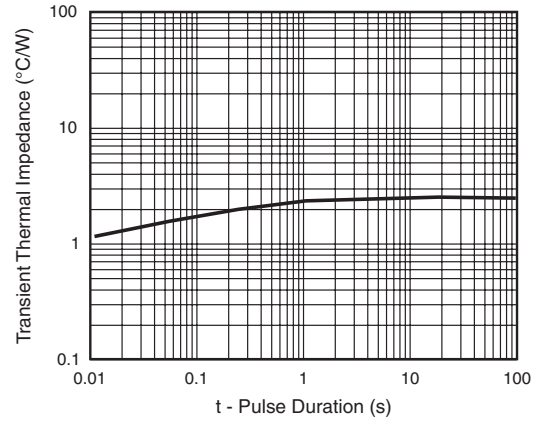
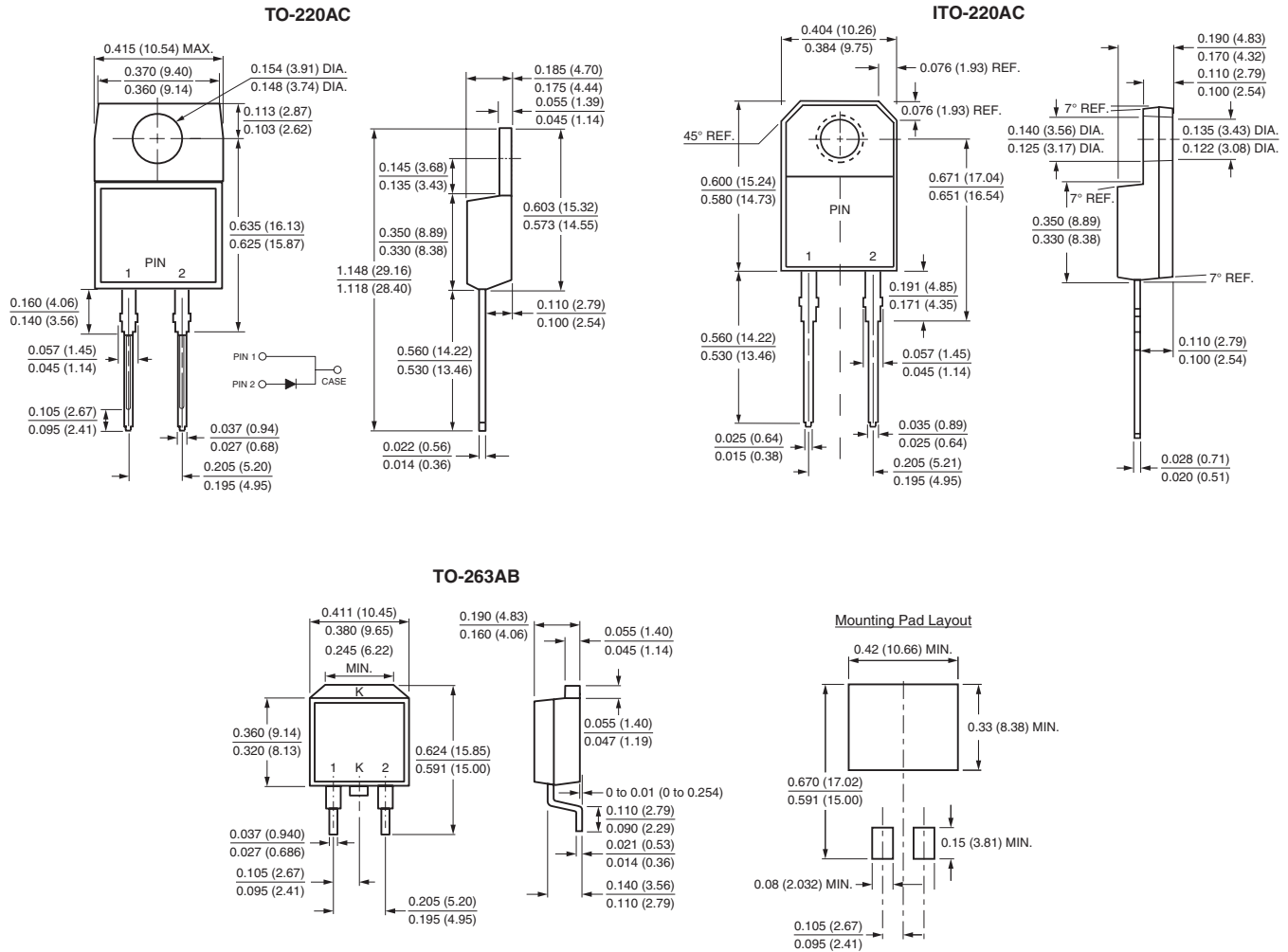


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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