

MBR735, MBR745

MBR745 is a Preferred Device

SWITCHMODE™ Power Rectifiers

The MBR735/45 series uses the Schottky Barrier principle with a platinum barrier metal. These state-of-the-art devices have the following features:

Features

- Pb-Free Packages are Available*
- Guardring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94, V-0 @ 0.125 in

Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:
260°C Max. for 10 Seconds

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 35 45 | V |
| Average Rectified Forward Current (Rated V_R , $T_C = 105^\circ\text{C}$) | $I_{F(AV)}$ | 7.5 | A |
| Peak Repetitive Forward Current, (Rated V_R , Square Wave, 20 kHz, $T_C = 105^\circ\text{C}$) | I_{FRM} | 15 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I_{FSM} | 150 | A |
| Peak Repetitive Reverse Surge Current (2.0 μs , 1.0 kHz) | I_{RRM} | 1.0 | A |
| Storage Temperature Range | T_{stg} | -65 to +175 | °C |
| Operating Junction Temperature (Note 1) | T_J | -65 to +175 | °C |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10,000 | V/ μs |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP/dT_J < 1/R_{\theta JA}$.

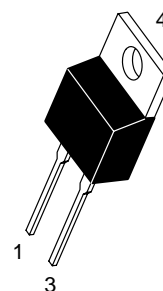
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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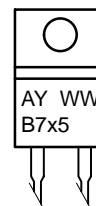
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SCHOTTKY BARRIER RECTIFIERS 7.5 AMPERES 35 and 45 VOLTS



TO-220AC
CASE 221B
PLASTIC

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
B7x5 = Device Code
x = 3 or 4

ORDERING INFORMATION

| Device | Package | Shipping |
|---------|---------------------|---------------|
| MBR735 | TO-220 | 50 Units/Rail |
| MBR735G | TO-220 (Pb-Free) | 50 Units/Rail |
| MBR745 | TO-220 | 50 Units/Rail |
| MBR745G | TO-220 (Pb-Free) | 50 Units/Rail |

Preferred devices are recommended choices for future use and best overall value.

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THERMAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------|----------------------|
| Maximum Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.0 | $^{\circ}\text{C/W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 60 | $^{\circ}\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

| | | | |
|--|-------|----------------------|----|
| Maximum Instantaneous Forward Voltage (Note 2) ($i_F = 7.5$ Amps, $T_C = 125^{\circ}\text{C}$) ($i_F = 15$ Amps, $T_C = 125^{\circ}\text{C}$) ($i_F = 15$ Amps, $T_C = 25^{\circ}\text{C}$) | V_F | 0.57 0.72 0.84 | V |
| Maximum Instantaneous Reverse Current (Note 2) (Rated dc Voltage, $T_C = 125^{\circ}\text{C}$) (Rated dc Voltage, $T_C = 25^{\circ}\text{C}$) | i_R | 15 0.1 | mA |

2. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

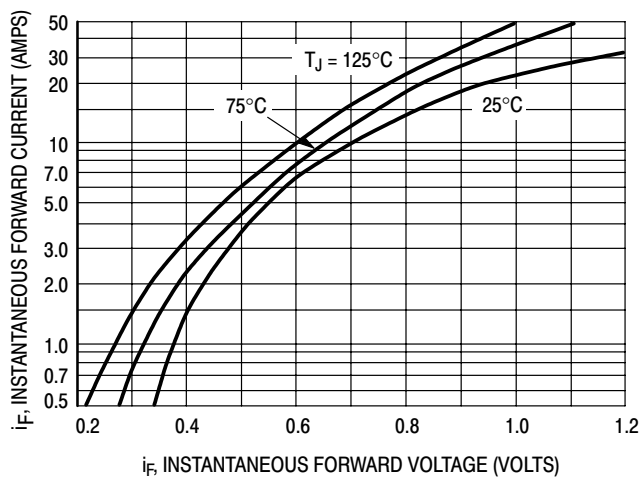


Figure 1. Typical Forward Voltage

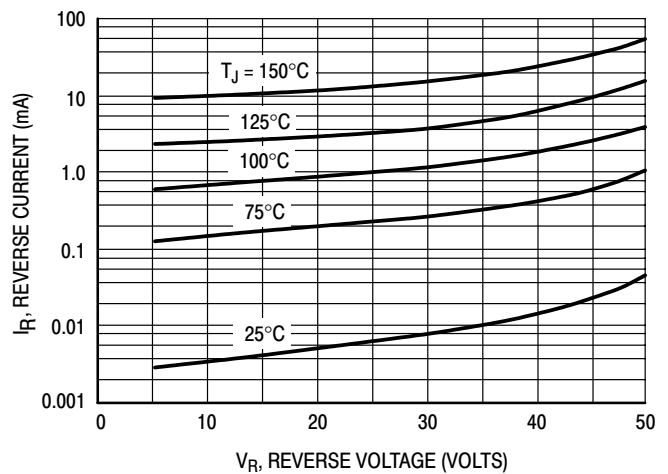


Figure 2. Typical Reverse Current

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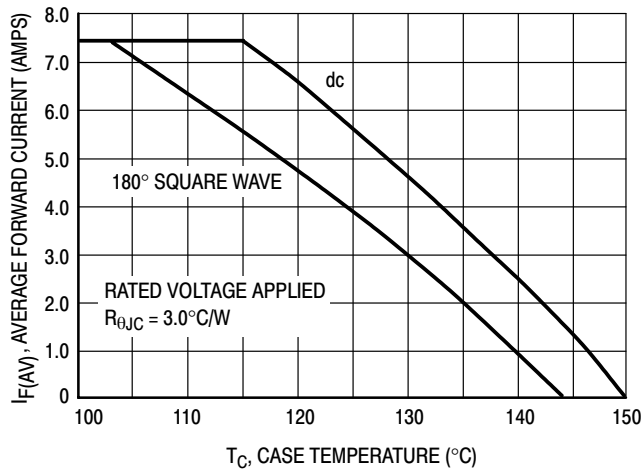


Figure 3. Current Derating, Case

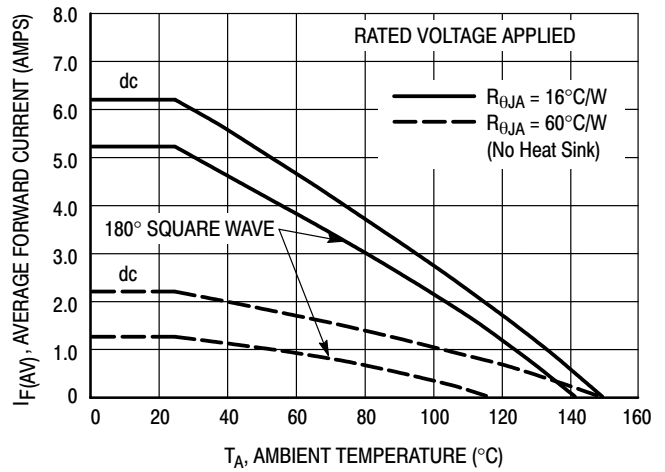


Figure 4. Current Derating, Ambient

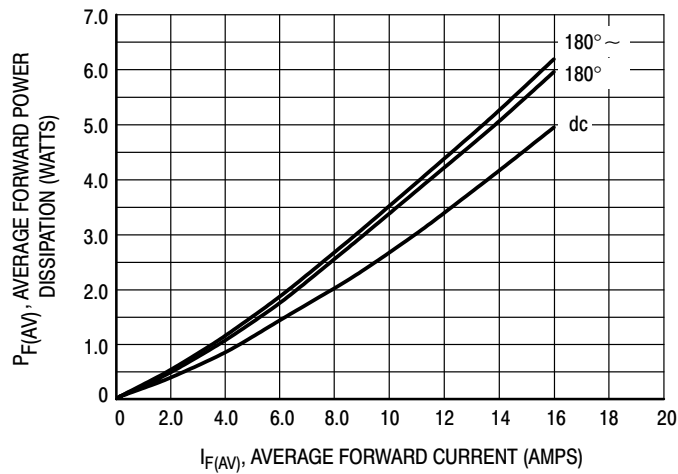
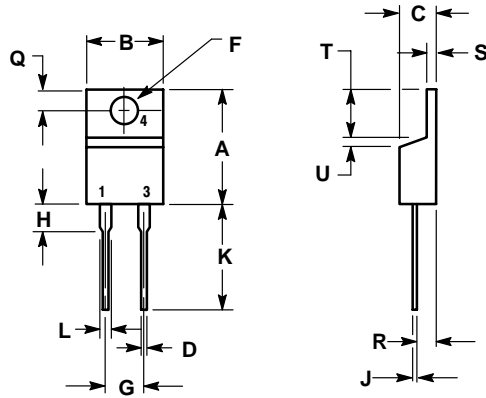


Figure 5. Power Dissipation

MBR735, MBR745

PACKAGE DIMENSIONS

TO-220 PLASTIC CASE 221B-04 ISSUE D




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.595 | 0.620 | 15.11 | 15.75 |
| B | 0.380 | 0.405 | 9.65 | 10.29 |
| C | 0.160 | 0.190 | 4.06 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.89 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.190 | 0.210 | 4.83 | 5.33 |
| H | 0.110 | 0.130 | 2.79 | 3.30 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.14 | 1.52 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.14 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.48 |
| U | 0.000 | 0.050 | 0.000 | 1.27 |

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