

# MBR735, MBR745

## SWITCHMODE™ Power Rectifiers

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- Pb-Free Packages are Available\*

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

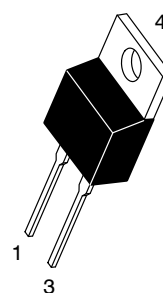
- Case: Epoxy, Molded
- Epoxy Meets UL 94, V-0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperatures for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine Model C



**ON Semiconductor®**

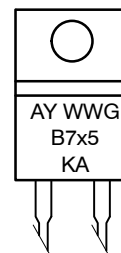
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIERS 7.5 AMPERES 35 and 45 VOLTS



TO-220AC  
CASE 221B  
STYLE 1

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
B7x5 = Device Code  
x = 3 or 4  
KA = Diode A Polarity  
G = Pb-Free Package

### ORDERING INFORMATION

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

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

# MBR735, MBR745

## MAXIMUM RATINGS

| Rating                                                                                                      | Symbol                          | Value       | Unit             |
|-------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage<br>MBR735<br>MBR745  | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 35<br>45    | V                |
| Average Rectified Forward Current<br>( $T_C = 164^\circ\text{C}$ )<br>Per Device                            | $I_{F(AV)}$                     | 7.5         | A                |
| Peak Repetitive Forward Current, (Square Wave, 20 kHz, $T_C = 168^\circ\text{C}$ )                          | $I_{FRM}$                       | 7.5         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 150         | A                |
| Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)                                         | $I_{RRM}$                       | 1.0         | A                |
| Storage Temperature Range                                                                                   | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)                                                                     | $T_J$                           | -65 to +175 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )                                                                       | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

## 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

| Characteristic                                                                                                                                                                                       | Symbol | Min         | Typ                  | Max                  | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------|----------------------|----------------------|------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $i_F = 7.5$ Amps, $T_J = 125^\circ\text{C}$ )<br>( $i_F = 15$ Amps, $T_J = 125^\circ\text{C}$ )<br>( $i_F = 15$ Amps, $T_J = 25^\circ\text{C}$ ) | $V_F$  | –<br>–<br>– | 0.48<br>0.61<br>0.68 | 0.57<br>0.72<br>0.84 | V    |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )                                                    | $i_R$  | –<br>–      | 10<br>0.03           | 15<br>0.1            | mA   |

- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MBR735, MBR745

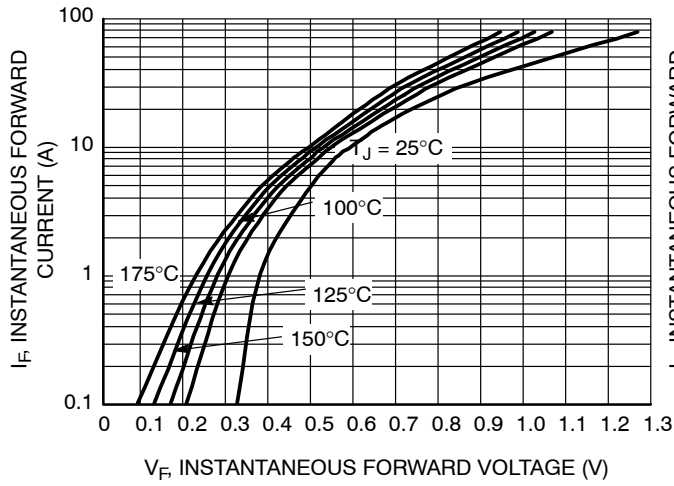


Figure 1. Typical Forward Voltage

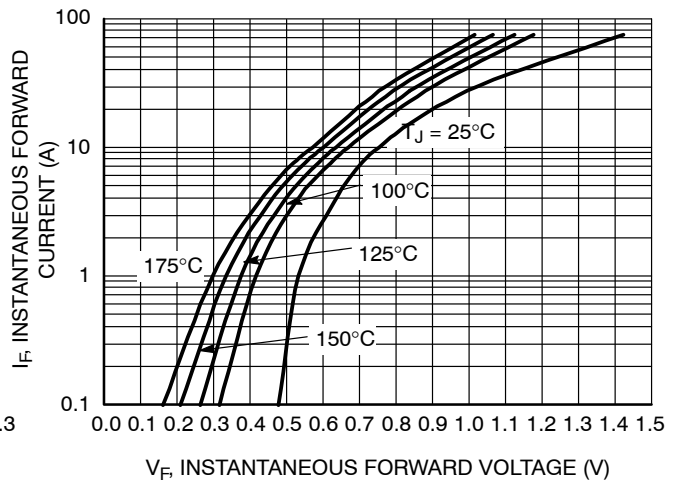


Figure 2. Maximum Forward Voltage

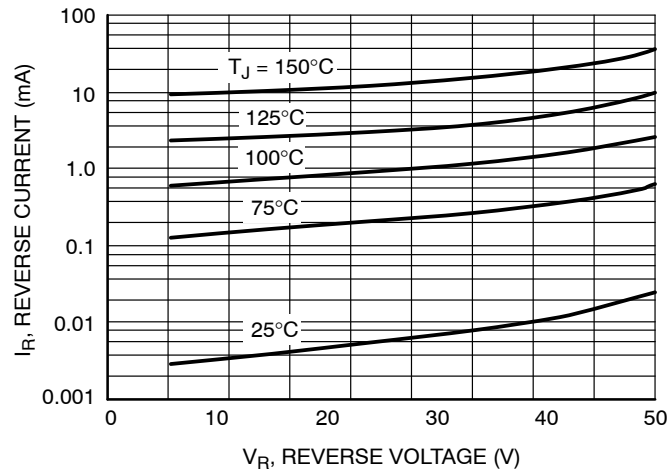


Figure 3. Typical Reverse Current

# MBR735, MBR745

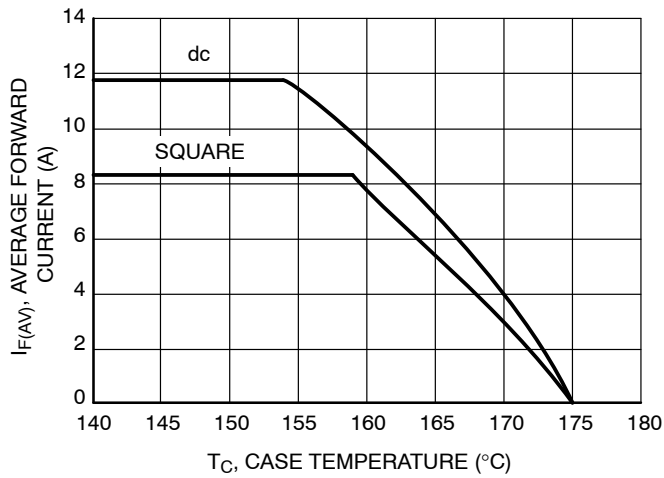


Figure 4. Current Derating, Case, Per Leg

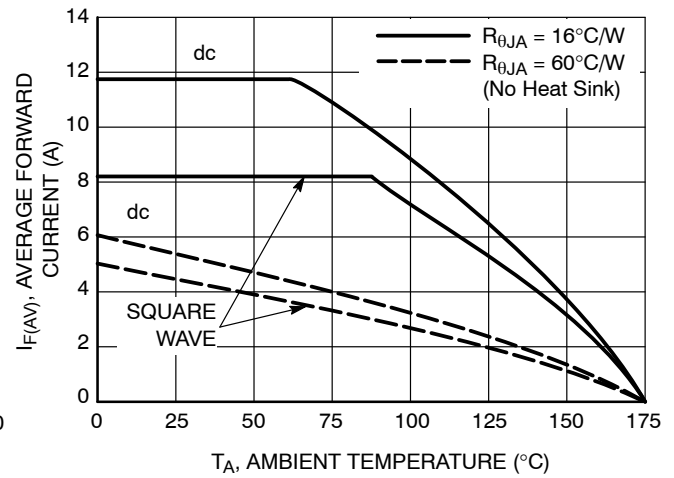


Figure 5. Current Derating, Ambient, Per Leg

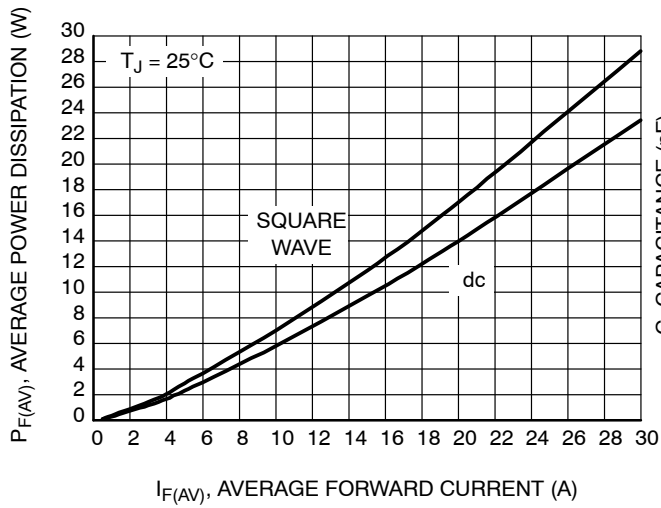


Figure 6. Forward Power Dissipation

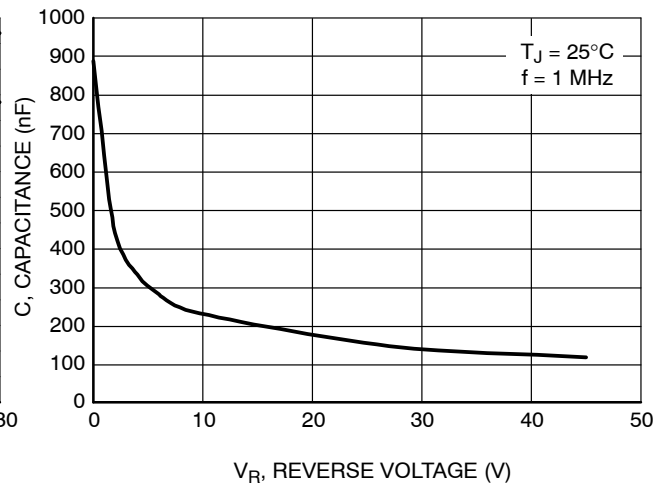
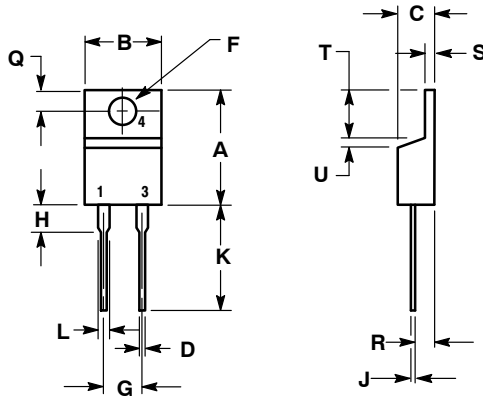


Figure 7. Typical Capacitance

# MBR735, MBR745

## PACKAGE DIMENSIONS

### TO-220 PLASTIC CASE 221B-04 ISSUE E



- 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  | 0.161 | 3.61        | 4.09  |
| G   | 0.190  | 0.210 | 4.83        | 5.33  |
| H   | 0.110  | 0.130 | 2.79        | 3.30  |
| J   | 0.014  | 0.025 | 0.36        | 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  |

- STYLE 1:
1. CATHODE
  2. N/A
  3. ANODE
  4. CATHODE

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