

# MBR1080G, MBR1090G, MBR10100G, NRVB10100G



**ON Semiconductor®**

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## SWITCHMODE Power Rectifiers

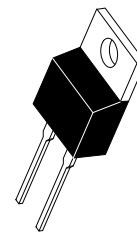
### Features

- Guard-Ring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Low Power Loss/High Efficiency
- High Surge Capacity
- Low Stored Charge Majority Carrier Conduction
- AEC-Q101 Qualified and PPAP Capable
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### 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
- ESD Rating:
  - ◆ Human Body Model = 3B
  - ◆ Machine Model = C

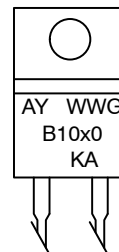
## SCHOTTKY BARRIER RECTIFIERS 10 AMPERES, 80 to 100 VOLTS



**TO-220AC  
CASE 221B**



### MARKING DIAGRAM



- A = Assembly Location
- Y = Year
- WW = Work Week
- G = Pb-Free Package
- B10x0 = Device Code
- x = 8, 9 or 10
- KA = Diode Polarity

### ORDERING INFORMATION

| Device     | Package             | Shipping      |
|------------|---------------------|---------------|
| MBR1080G   | TO-220<br>(Pb-Free) | 50 Units/Rail |
| MBR1090G   | TO-220<br>(Pb-Free) | 50 Units/Rail |
| MBR10100G  | TO-220<br>(Pb-Free) | 50 Units/Rail |
| NRVB10100G | 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.

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## MAXIMUM RATINGS

| Rating   | Symbol                          | MBR/NRVB    |      |       | Unit             |
|--|---------------------------------|-------------|------|-------|------------------|
|  |                                 | 1080        | 1090 | 10100 |                  |
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 80          | 90   | 100   | V                |
| Average Rectified Forward Current (Rated $V_R$ ) $T_C = 133^\circ\text{C}$                                 | $I_{F(AV)}$                     | 10          |      |       | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz) $T_C = 133^\circ\text{C}$           | $I_{FRM}$                       | 20          |      |       | A                |
| Nonrepetitive 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)  | $I_{RRM}$                       | 0.5         |      |       | A                |
| Operating Junction Temperature (Note 1)  | $T_J$                           | -65 to +175 |      |       | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$                       | -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    | $R_{\theta JC}$ | 2.0   | $^\circ\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 60    | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic   | Symbol | Value                      | Unit |
|--|--------|----------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $i_F = 10$ Amps, $T_C = 125^\circ\text{C}$ )<br>( $i_F = 10$ Amps, $T_C = 25^\circ\text{C}$ )<br>( $i_F = 20$ Amps, $T_C = 125^\circ\text{C}$ )<br>( $i_F = 20$ Amps, $T_C = 25^\circ\text{C}$ ) | $V_F$  | 0.7<br>0.8<br>0.85<br>0.95 | V    |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_C = 125^\circ\text{C}$ )<br>(Rated dc Voltage, $T_C = 25^\circ\text{C}$ )  | $i_R$  | 6.0<br>0.10                | mA   |

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

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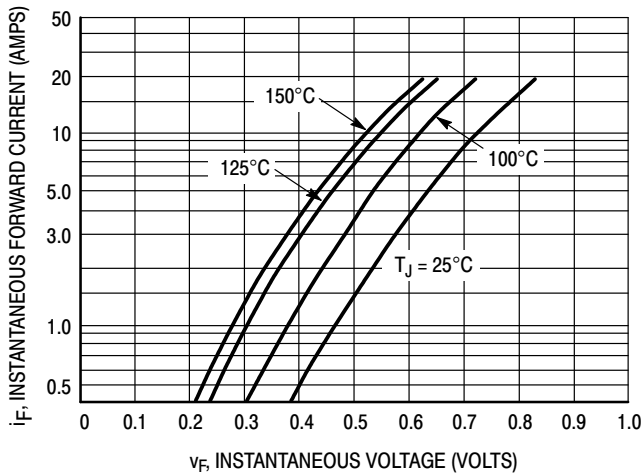


Figure 1. Typical Forward Voltage

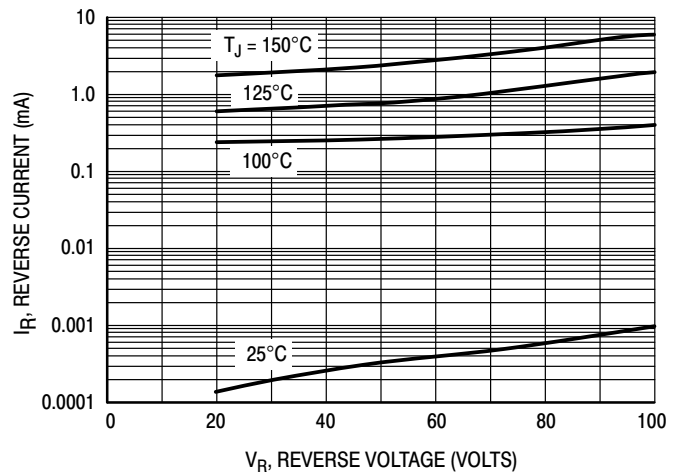


Figure 2. Typical Reverse Current

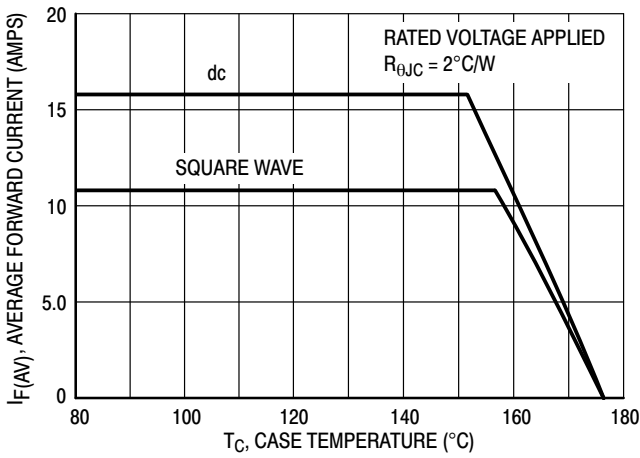


Figure 3. Typical Current Derating, Case

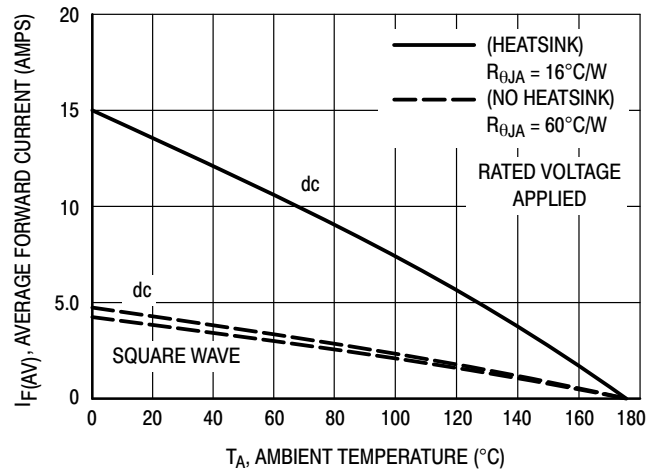


Figure 4. Typical Current Derating, Ambient

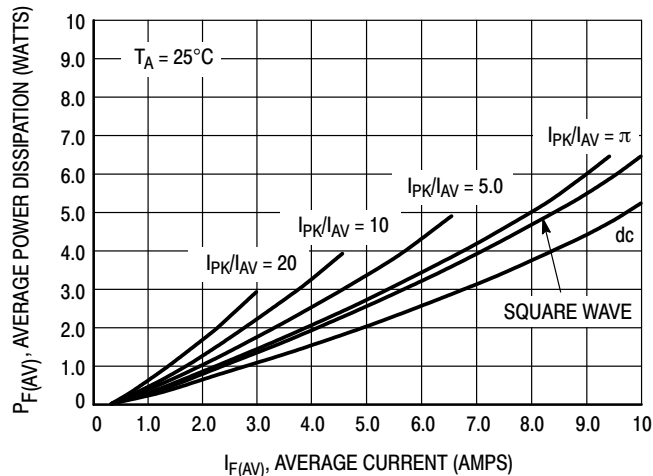


Figure 5. Forward Power Dissipation

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS



### TO-220, 2-LEAD CASE 221B-04 ISSUE F

DATE 12 APR 2013



SCALE 1:1



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  | 0.039 | 0.64        | 1.00  |
| 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:  
PIN 1. CATHODE  
2. N/A  
3. ANODE  
4. CATHODE

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

|                         |                       |  |
|-------------------------|-----------------------|--|
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| <b>DESCRIPTION:</b>     | <b>TO-220, 2-LEAD</b> | <b>PAGE 1 OF 1</b>   |

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