# MBRF20200CTG

# Switch-mode Schottky Power Rectifier

The Switch−mode Power Rectifier employs the Schottky Barrier principle in a large area metal−to−silicon power diode. State−of−the−art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for use as rectifiers in very low−voltage, high−frequency switching power supplies, free wheeling diodes and polarity protection diodes.

### Features

- Highly Stable Oxide Passivated Junction
- Very Low Forward Voltage Drop
- Matched Dual Die Construction
- High Junction Temperature Capability
- High dv/dt Capability
- Guardring for Stress Protection
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Electrically Isolated. No Isolation Hardware Required.
- These Devices are Pb−Free and are RoHS Compliant

### Mechanical Characteristics:

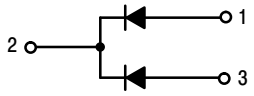
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

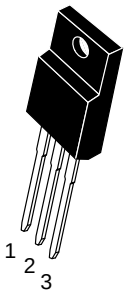
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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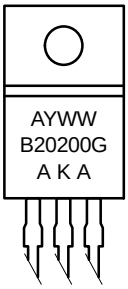
**SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 200 VOLTS**




**TO−220 FULLPAK CASE 221AH**

**MARKING DIAGRAM**




| | |
|---|---|
| A | = Assembly Location |
| Y | = Year |
| WW | = Work Week |
| B20200 | = Device Code |
| G | = Pb−Free Package |
| AKA | = Polarity Designator |

**ORDERING INFORMATION**

| Device | Package | Shipping |
|---|---|---|
| MBRF20200CTG | TO−220 (Pb−Free) | 50 Units/Rail |

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**MAXIMUM RATINGS** (Per Leg)

| Rating | | Symbol | Value | Unit |
|---|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200 | V |
| Average Rectified Forward Current<br>(Rated $V_R$) $T_C$ = 125°C | Per Leg<br>Per Package | $I_{F(AV)}$ | 10<br>20 | A |
| Peak Repetitive Forward Current, Per Leg | (Rated $V_R$, Square Wave, 20 kHz) $T_C$ = 90°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 μs, 1.0 kHz) | | $I_{RRM}$ | 1.0 | A |
| Operating Junction Temperature and Storage Temperature | | $T_J$, $T_{stg}$ | −65 to +150 | °C |
| Voltage Rate of Change (Rated $V_R$) | | dv/dt | 10,000 | V/μs |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

**THERMAL CHARACTERISTICS** (Per Leg)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Case | $R_{\theta JC}$ | 3.5 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Per Leg)

| Rating | Symbol | Max | Unit |
|---|---|---|---|
| Maximum Instantaneous Forward Voltage (Note 1)<br>($i_F$ = 10 Amp, $T_C$ = 25°C)<br>($i_F$ = 10 Amp, $T_C$ = 125°C)<br>($i_F$ = 20 Amp, $T_C$ = 25°C)<br>($i_F$ = 20 Amp, $T_C$ = 125°C) | $v_F$ | <br>0.9<br>0.8<br>1.0<br>0.9 | V |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated dc Voltage, $T_C$ = 25°C)<br>(Rated dc Voltage, $T_C$ = 125°C) | $i_R$ | <br>1.0<br>50 | mA |

**DYNAMIC CHARACTERISTICS** (Per Leg)

| | | | |
|---|---|---|---|
| Capacitance ($V_R$ = −5.0 V, $T_C$ = 25°C, Freq. = 1.0 MHz) | $C_T$ | 500 | pF |

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%

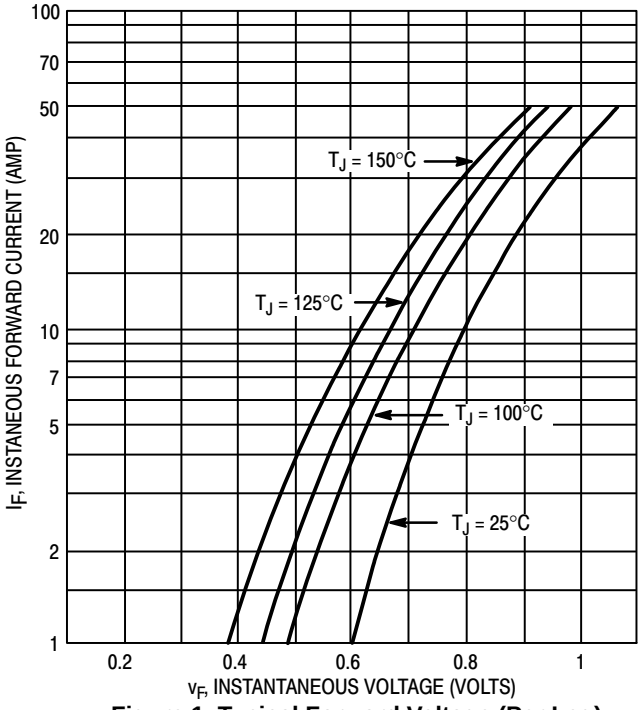



**Figure 1. Typical Forward Voltage (Per Leg)**

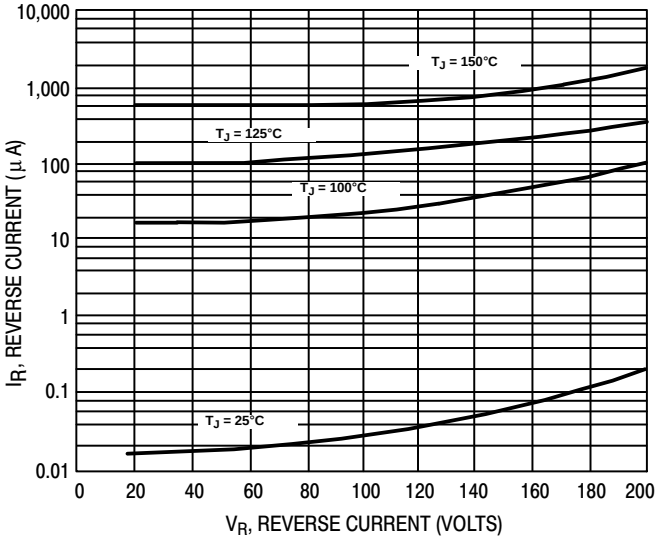



**Figure 2. Typical Reverse Current (Per Leg)**

## TEST CONDITION FOR ISOLATION TEST*

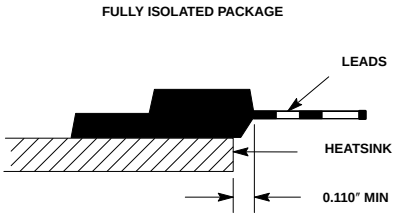
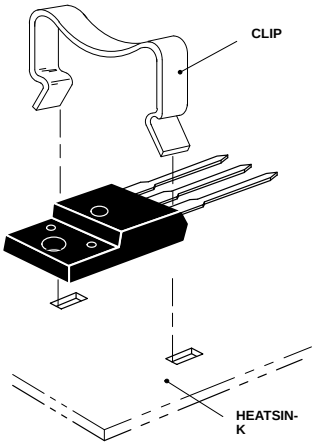



**Figure 3. Mounting Position**

*Measurement made between leads and heatsink with all leads shorted together.

## MOUNTING INFORMATION



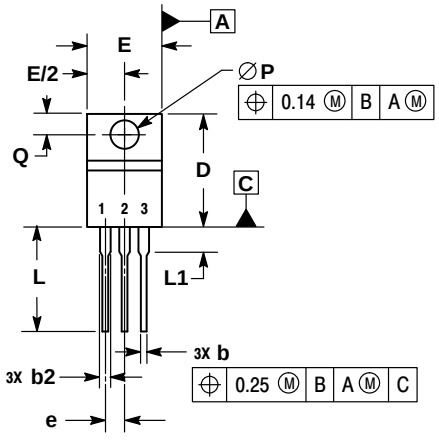

**Clip−Mounted**

**Figure 4. Typical Mounting Technique**

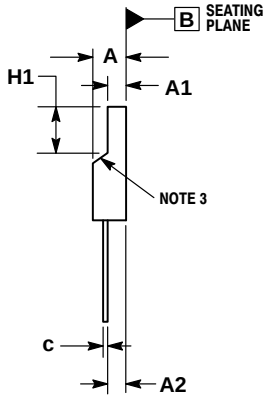
# MBRF20200CTG

## PACKAGE DIMENSIONS

**TO−220 FULLPACK, 3−LEAD**
CASE 221AH
ISSUE F



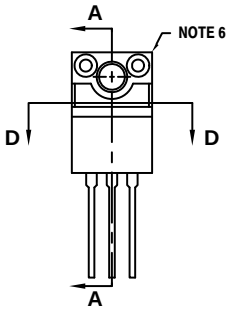

FRONT VIEW



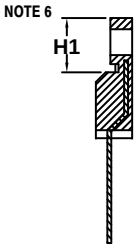

SIDE VIEW



SECTION D−D




ALTERNATE CONSTRUCTION




SECTION A−A

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.
6. CONTOURS AND FEATURES OF THE MOLDED PACKAGE BODY MAY VARY WITHIN THE ENVELOP DEFINED BY DIMENSIONS A1 AND H1 FOR MANUFACTURING PURPOSES.

| | MILLIMETERS | |
|---|---|---|
| DIM | MIN | MAX |
| A | 4.30 | 4.70 |
| A1 | 2.50 | 2.90 |
| A2 | 2.50 | 2.90 |
| b | 0.54 | 0.84 |
| b2 | 1.10 | 1.40 |
| c | 0.49 | 0.79 |
| D | 14.70 | 15.30 |
| E | 9.70 | 10.30 |
| e | 2.54 BSC | |
| H1 | 6.60 | 7.10 |
| L | 12.50 | 14.73 |
| L1 | --- | 2.80 |
| P | 3.00 | 3.40 |
| Q | 2.80 | 3.20 |


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