

# MBR20200CT

## SWITCHMODE™ Power Rectifier Dual Schottky Rectifier

This device uses Schottky Barrier technology with a platinum barrier metal. This state-of-the-art device is designed for use in high frequency switching power supplies and converters with up to 48 V outputs. It blocks up to 200 V and offers improved Schottky performance at frequencies from 250 kHz to 5.0 MHz.

### Features

- 200 V Blocking Voltage
- Low Forward Voltage Drop
- Guard-ring for Stress Protection and High dv/dt Capability (10,000 V/μs)
- Dual Diode Construction; Terminals 1 and 3 Must be Connected for Parallel Operation at Full Rating
- Pb-Free Package is Available\*

### 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 (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 $V_R$ , $T_C = 125^\circ\text{C}$ )<br>Per Leg<br>Per Package      | $I_{F(AV)}$                     | 10<br>20    | A    |
| Peak Repetitive Forward Current<br>per Leg (Rated $V_R$ , Square Wave,<br>20 kHz, $T_C = 90^\circ\text{C}$ )   | $I_{FRM}$                       | 20          | A    |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 150         | A    |
| Peak Repetitive Reverse Surge Current<br>(2.0 μs, 1.0 kHz)   | $I_{RRM}$                       | 1.0         | A    |
| Storage Temperature Range  | $T_{stg}$                       | -65 to +175 | °C   |
| Operating Junction Temperature   | $T_J$                           | -65 to +150 | °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.

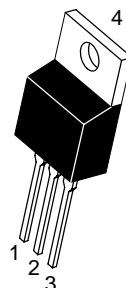
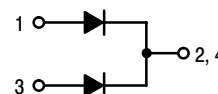
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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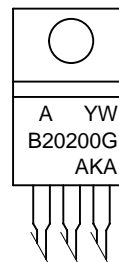
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 200 VOLTS



TO-220AB  
CASE 221A  
PLASTIC

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
W = Work Week  
B20200 = Device Code  
G = Pb-Free Package  
AKA = Diode Polarity

### ORDERING INFORMATION

| Device      | Package             | Shipping        |
|-------------|---------------------|-----------------|
| MBR20200CT  | TO-220              | 50 Units / Rail |
| MBR20200CTG | TO-220<br>(Pb-Free) | 50 Units / Rail |

# MBR20200CT

## THERMAL CHARACTERISTICS (Per Leg)

| Characteristic                       | Symbol          | Value | Unit                        |
|--------------------------------------|-----------------|-------|-----------------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 2.0   | $^{\circ}\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS (Per Leg)

|  |  |       |     |    |
|--|--|-------|-----|----|
| Maximum Instantaneous Forward Voltage (Note 1) | ( $I_F = 10$ Amps, $T_C = 25^{\circ}\text{C}$ )  | $V_F$ | 0.9 | V  |
|  | ( $I_F = 10$ Amps, $T_C = 125^{\circ}\text{C}$ ) |       | 0.8 |    |
|  | ( $I_F = 20$ Amps, $T_C = 25^{\circ}\text{C}$ )  |       | 1.0 |    |
|  | ( $I_F = 20$ Amps, $T_C = 125^{\circ}\text{C}$ ) |       | 0.9 |    |
| Maximum Instantaneous Reverse Current (Note 1) | (Rated dc Voltage, $T_C = 25^{\circ}\text{C}$ )  | $I_R$ | 1.0 | mA |
|  | (Rated dc Voltage, $T_C = 125^{\circ}\text{C}$ ) |       | 50  |    |

## DYNAMIC CHARACTERISTICS (Per Leg)

|   |       |     |    |
|---|-------|-----|----|
| Capacitance ( $V_R = -5.0$ V, $T_C = 25^{\circ}\text{C}$ , Frequency = 1.0 MHz) | $C_T$ | 500 | pF |
|---|-------|-----|----|

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

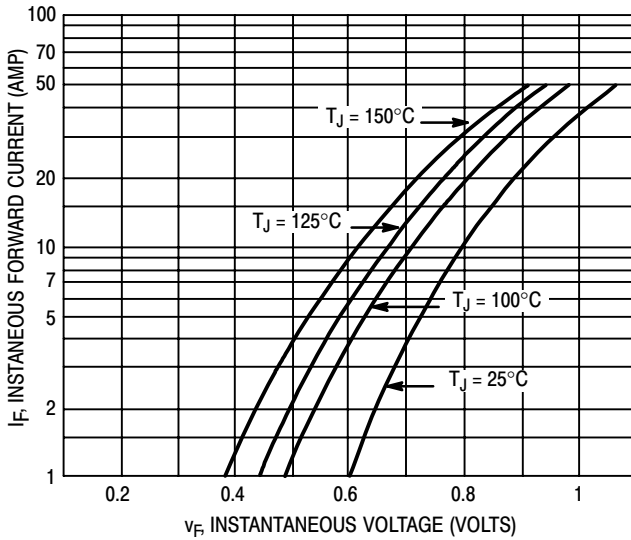


Figure 1. Typical Forward Voltage (Per Leg)

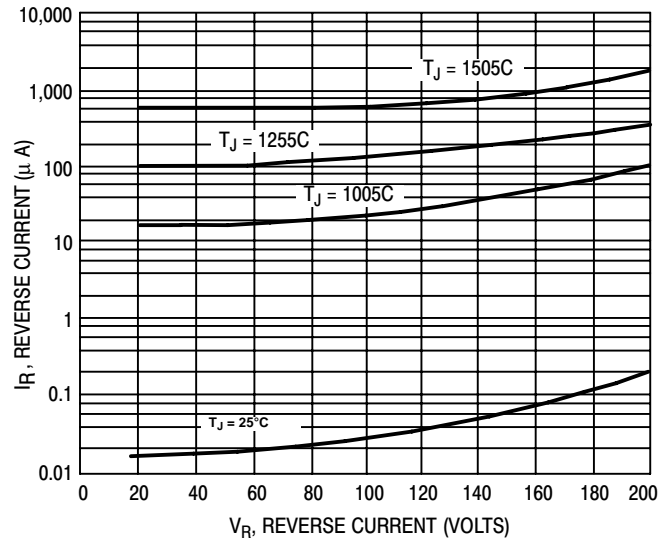


Figure 2. Typical Reverse Current (Per Leg)

# MBR2020CT

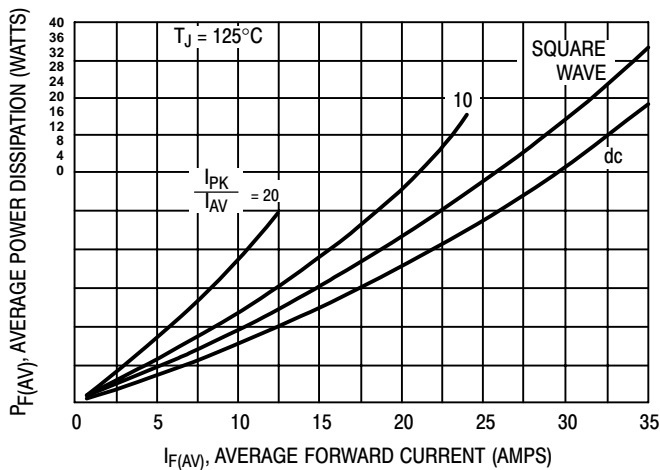


Figure 3. Forward Power Dissipation

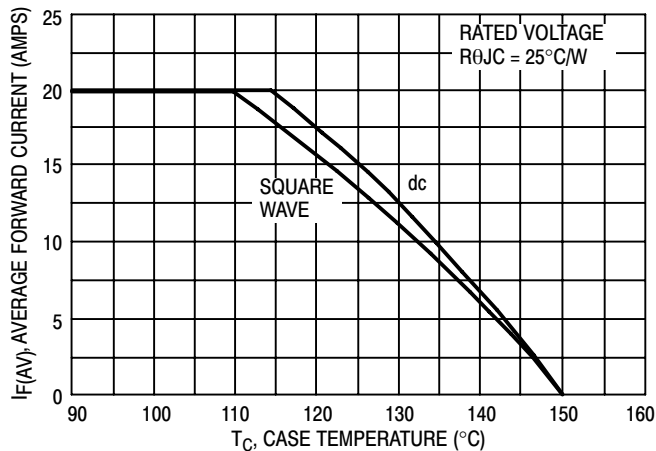


Figure 4. Current Derating, Case

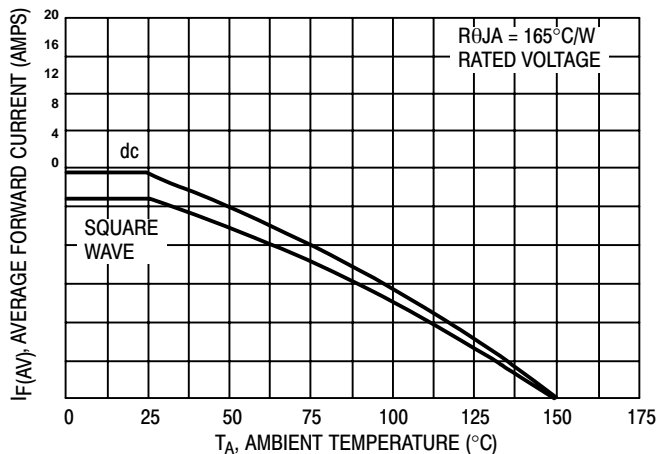


Figure 5. Current Derating, Ambient

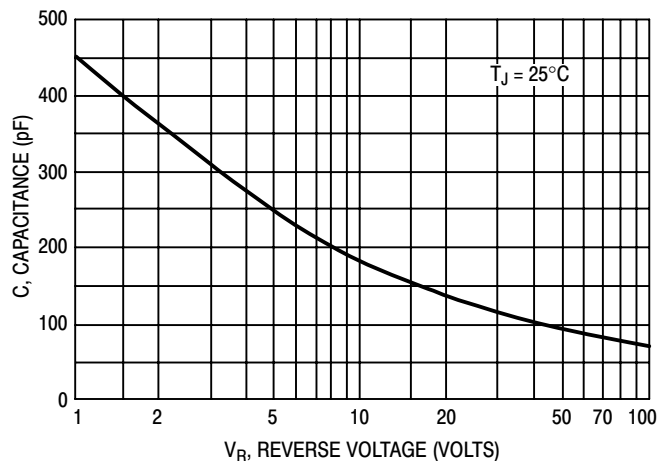
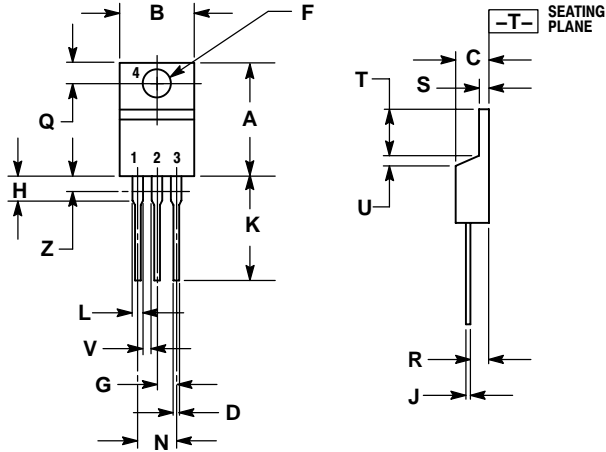


Figure 6. Typical Capacitance (Per Leg)

# MBR20200CT

## PACKAGE DIMENSIONS

TO-220  
CASE 221A-09  
ISSUE AA




**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.570  | 0.620 | 14.48       | 15.75 |
| B   | 0.380  | 0.405 | 9.66        | 10.28 |
| C   | 0.160  | 0.190 | 4.07        | 4.82  |
| D   | 0.025  | 0.035 | 0.64        | 0.88  |
| F   | 0.142  | 0.147 | 3.61        | 3.73  |
| G   | 0.095  | 0.105 | 2.42        | 2.66  |
| H   | 0.110  | 0.155 | 2.80        | 3.93  |
| J   | 0.018  | 0.025 | 0.46        | 0.64  |
| K   | 0.500  | 0.562 | 12.70       | 14.27 |
| L   | 0.045  | 0.060 | 1.15        | 1.52  |
| N   | 0.190  | 0.210 | 4.83        | 5.33  |
| Q   | 0.100  | 0.120 | 2.54        | 3.04  |
| R   | 0.080  | 0.110 | 2.04        | 2.79  |
| S   | 0.045  | 0.055 | 1.15        | 1.39  |
| T   | 0.235  | 0.255 | 5.97        | 6.47  |
| U   | 0.000  | 0.050 | 0.00        | 1.27  |
| V   | 0.045  | ---   | 1.15        | ---   |
| Z   | ---    | 0.080 | ---         | 2.04  |

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