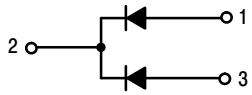
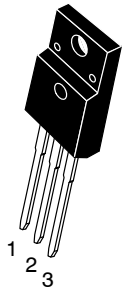
# Switch-mode Schottky Power Rectifier

# MBRF20100CTG

**SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 100 VOLTS**




**TO−220 FULLPAK™**
**CASE 221D**

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
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guardring for Stress Protection
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Electrically Isolated. No Isolation Hardware Required.
- These are Pb−Free Devices

### 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

### ORDERING AND MARKING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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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>$V_R$ | 100 | V |
| Average Rectified Forward Current<br>(Rated $V_R$), $T_C$ = 133°C Total Device | $I_{F(AV)}$ | 10<br>20 | A |
| Peak Repetitive Forward Current<br>(Rated $V_R$, Square Wave, 20 kHz), $T_C$ = 133°C | $I_{FRM}$ | 20 | 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 μs, 1.0 kHz) | $I_{RRM}$ | 0.5 | A |
| Operating Junction and Storage Temperature Range (Note 1) | $T_J$, $T_{stg}$ | − 65 to +175 | °C |
| Voltage Rate of Change (Rated $V_R$) | dv/dt | 10000 | V/μs |
| RMS Isolation Voltage (t = 0.3 second, R.H. ≤ 30%, $T_A$ = 25°C) (Note 2) | $V_{iso1}$ | 4500 | V |

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 |
|---|---|---|---|
| Maximum Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 3.5 | °C/W |
| Lead Temperature for Soldering Purposes: 1/8″ from Case for 5 Seconds | $T_L$ | 260 | °C |

## ELECTRICAL CHARACTERISTICS (Per Leg)

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Maximum Instantaneous Forward Voltage (Note 3)<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>0.85<br>0.75<br>0.95<br>0.85 | V |
| Maximum Instantaneous Reverse Current (Note 3)<br>(Rated DC Voltage, $T_C$ = 25°C)<br>(Rated DC Voltage, $T_C$ = 125°C) | $i_R$ | <br>0.15<br>6 | mA |

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.
2. Proper strike and creepage distance must be provided.
3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

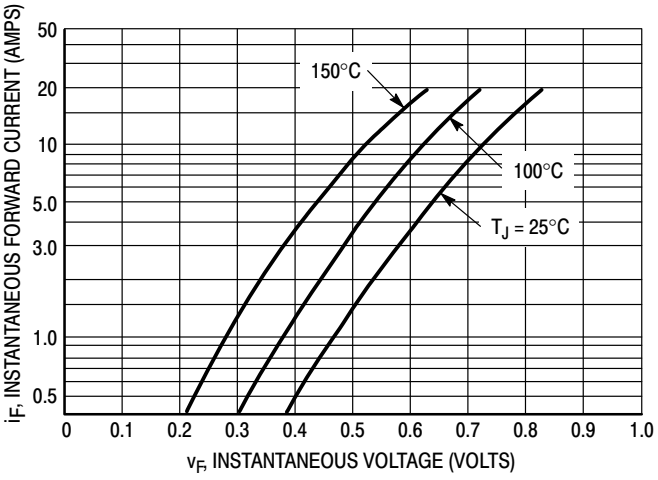


**Figure 1. Typical Forward Voltage Per Diode**

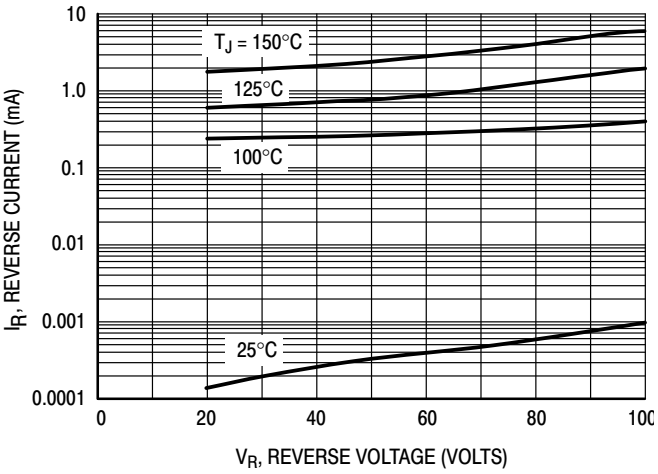


**Figure 2. Typical Reverse Current Per Diode**



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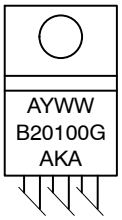
## MARKING DIAGRAMS




TO−220

B20100 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package
AKA = Polarity Designator

## ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MBRF20100CTG | TO−220<br>(Pb−Free) | 50 Units / Rail |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

## REVISION HISTORY

| Revision | Description of Changes | Date |
|---|---|---|
| 12 | Change the iR table value and replace figure 2 | 6/6/2025 |

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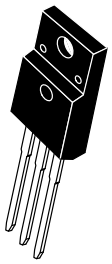
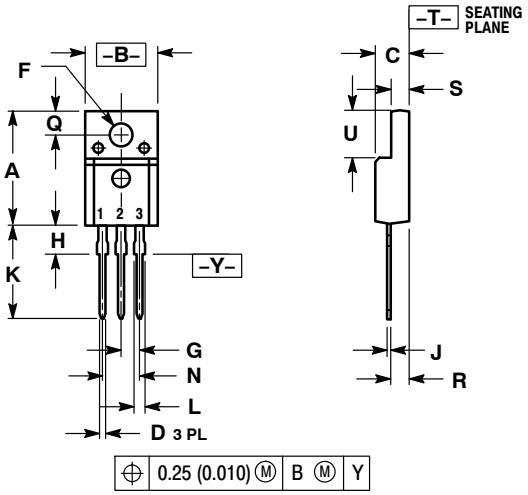


SCALE 1:1

## TO−220 FULLPAK
CASE 221D−03
ISSUE K

DATE 27 FEB 2009




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D−01 THRU 221D−02 OBSOLETE, NEW STANDARD 221D−03.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.617 | 0.635 | 15.67 | 16.12 |
| B | 0.392 | 0.419 | 9.96 | 10.63 |
| C | 0.177 | 0.193 | 4.50 | 4.90 |
| D | 0.024 | 0.039 | 0.60 | 1.00 |
| F | 0.116 | 0.129 | 2.95 | 3.28 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.118 | 0.135 | 3.00 | 3.43 |
| J | 0.018 | 0.025 | 0.45 | 0.63 |
| K | 0.503 | 0.541 | 12.78 | 13.73 |
| L | 0.048 | 0.058 | 1.23 | 1.47 |
| N | 0.200 BSC | | 5.08 BSC | |
| Q | 0.122 | 0.138 | 3.10 | 3.50 |
| R | 0.099 | 0.117 | 2.51 | 2.96 |
| S | 0.092 | 0.113 | 2.34 | 2.87 |
| U | 0.239 | 0.271 | 6.06 | 6.88 |

STYLE 1:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 2:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

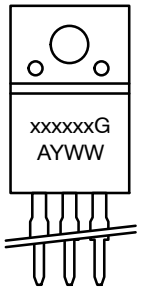
STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. CATHODE

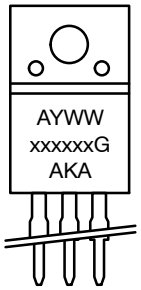
STYLE 5:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 6:
PIN 1. MT 1
2. MT 2
3. GATE

## MARKING DIAGRAMS




**Bipolar**




**Rectifier**

| | |
|---|---|
| xxxxxx | = Specific Device Code |
| G | = Pb−Free Package |
| A | = Assembly Location |
| Y | = Year |
| WW | = Work Week |

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

| | | |
|---|---|---|
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| **DESCRIPTION:** | **TO−220 FULLPAK** | **PAGE 1 OF 1** |

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