

Switch-mode Power Rectifier 150 V, 20 A

MBRF20H150CTG, MBR20H150CTG

Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capability
- 20 A Total (10 A Per Diode Leg)
- Guard-Ring for Stress Protection
- These Devices are Pb-Free and are RoHS Compliant

Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

Mechanical Characteristics:

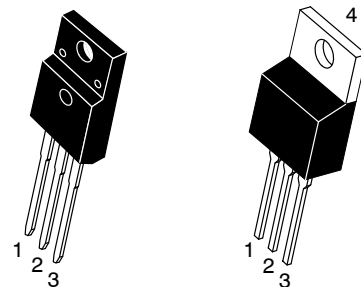
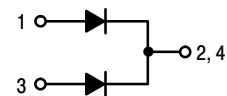
- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight (Approximately): 1.9 Grams (TO-220 & TO-220FP)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



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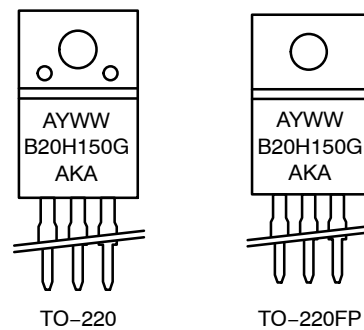
SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 150 VOLTS



TO-220 FULLPAK™
CASE 221D

TO-220
CASE 221A
STYLE 6

MARKING DIAGRAMS



A = Assembly Location
Y = Year
WW = Work Week
B20H150 = Device Code
G = Pb-Free Device
AKA = Polarity Designator

ORDERING INFORMATION

See detailed ordering and shipping information on page 1 of this data sheet.

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MAXIMUM RATINGS (Per Diode Leg)

| Rating | Symbol | Value | Unit |
|--|--|-----------------|--------------------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 150 | V |
| Average Rectified Forward Current (Rated V_R) $T_C = 134^\circ\text{C}$ | $I_{F(AV)}$ | 10 20 | A (Per Leg) (Per Device) |
| Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | I_{FSM} | 180 | A |
| Operating Junction Temperature (Note 1) | T_J | -20 to +150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -65 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10,000 | V/ μs |
| ESD Ratings: | Machine Model = C Human Body Model = 3B | > 400 > 8000 | 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.

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

THERMAL CHARACTERISTICS

| Rating | Symbol | Value | Unit |
|--|-----------------------|-------|---------------------------|
| Maximum Thermal Resistance (MBR20H150CTG) | $R_{\theta JC}$ | 2.0 | $^\circ\text{C}/\text{W}$ |
| | - Junction-to-Case | | |
| | $R_{\theta JA}$ | 45 | |
| | - Junction-to-Ambient | | |
| (MBRF20H150CTG) | $R_{\theta JC}$ | 2.5 | |
| | - Junction-to-Case | | |

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

| Rating | Symbol | Typ | Max | Unit |
|--|--------|------------------------------|----------|---------------------|
| Maximum Instantaneous Forward Voltage (Note 2) ($I_F = 5\text{ A}$, $T_C = 25^\circ\text{C}$) ($I_F = 5\text{ A}$, $T_C = 125^\circ\text{C}$) ($I_F = 10\text{ A}$, $T_C = 25^\circ\text{C}$) ($I_F = 10\text{ A}$, $T_C = 125^\circ\text{C}$) | V_F | 0.72 0.57 0.87 0.65 | 0.60 | V |
| Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, $T_C = 25^\circ\text{C}$) (Rated DC Voltage, $T_C = 125^\circ\text{C}$) | i_R | | 50 30 | μA mA |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

ORDERING INFORMATION

| Device Order Number | Package Type | Shipping |
|---------------------|-----------------------|-----------------|
| MBRF20H150CTG | TO-220FP (Pb-Free) | 50 Units / Rail |
| MBR20H150CTG | TO-220 (Pb-Free) | 50 Units / Rail |

MBRF20H150CTG, MBR20H150CTG

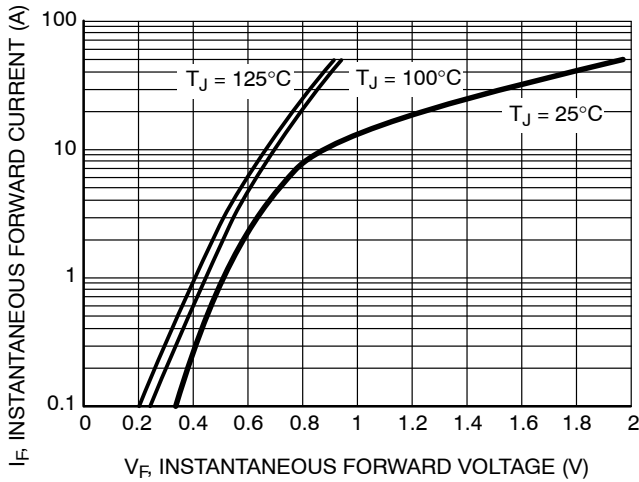


Figure 1. Typical Forward Voltage

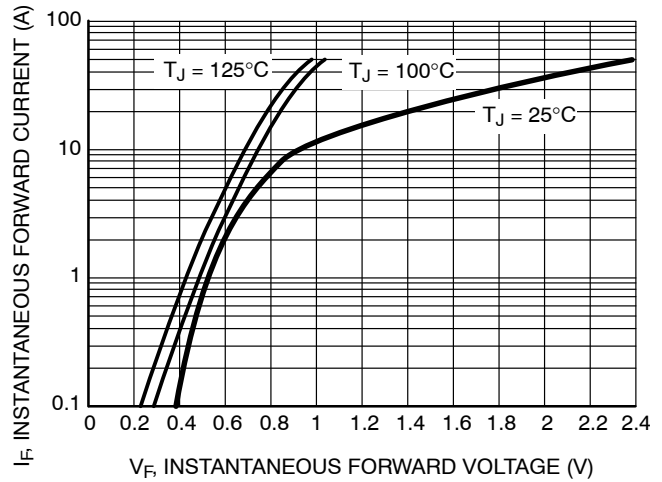


Figure 2. Maximum Forward Voltage

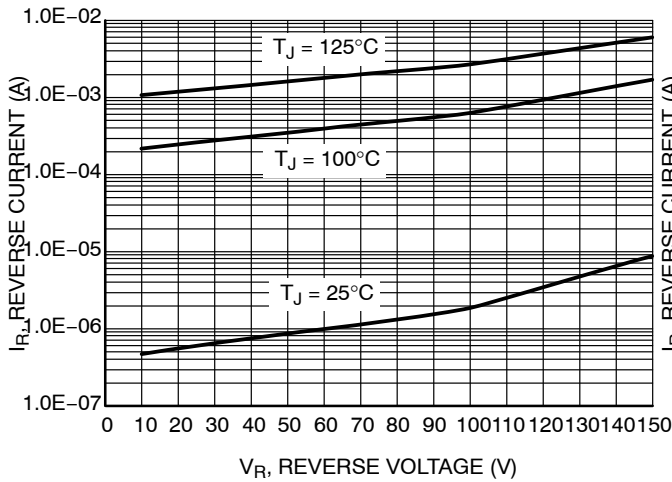


Figure 3. Typical Reverse Current

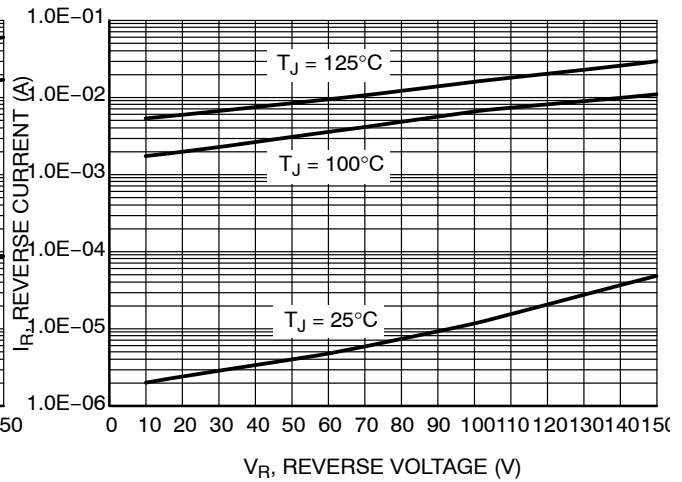


Figure 4. Maximum Reverse Current

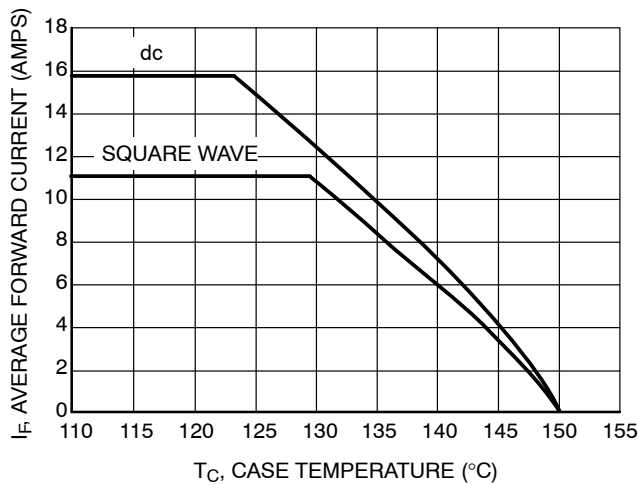


Figure 5. Current Derating

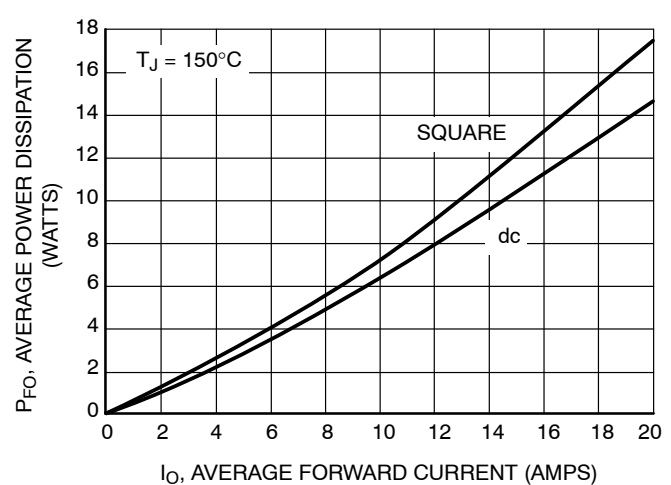


Figure 6. Forward Power Dissipation

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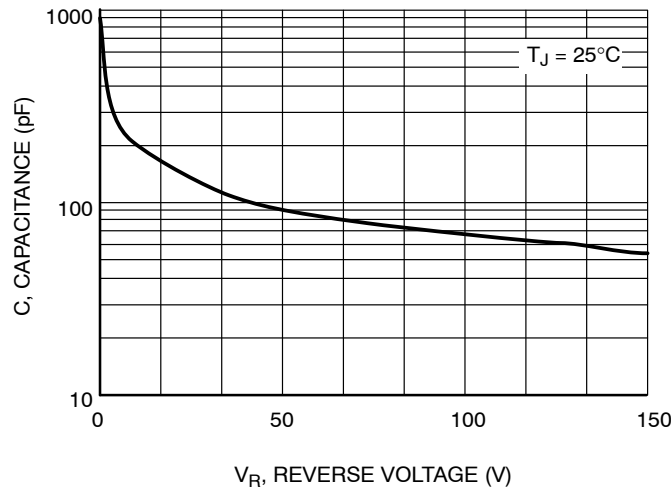


Figure 7. Capacitance

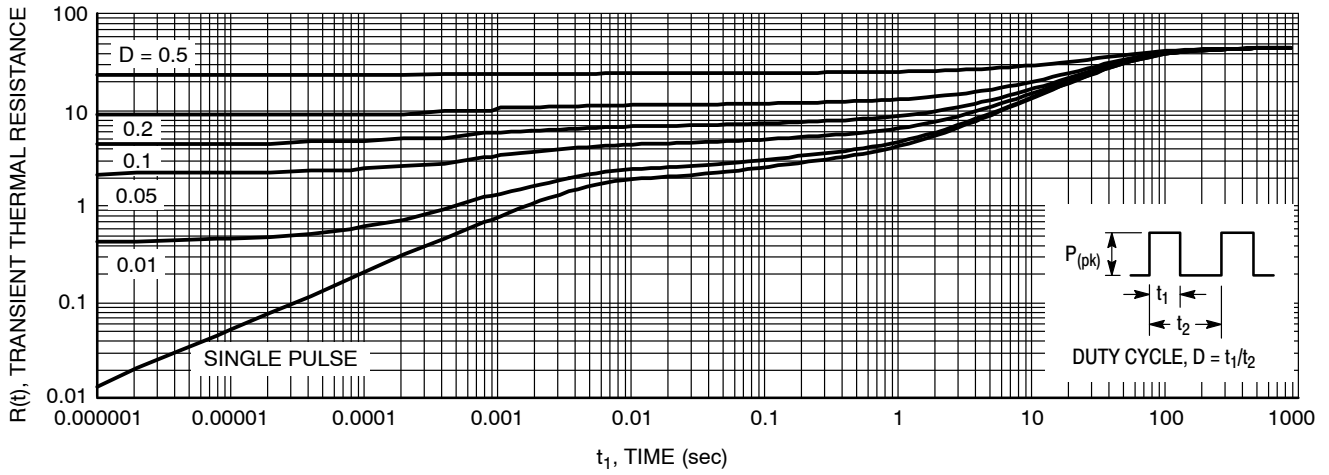


Figure 8. Thermal Response Junction-to-Ambient for MBR20H150CTG

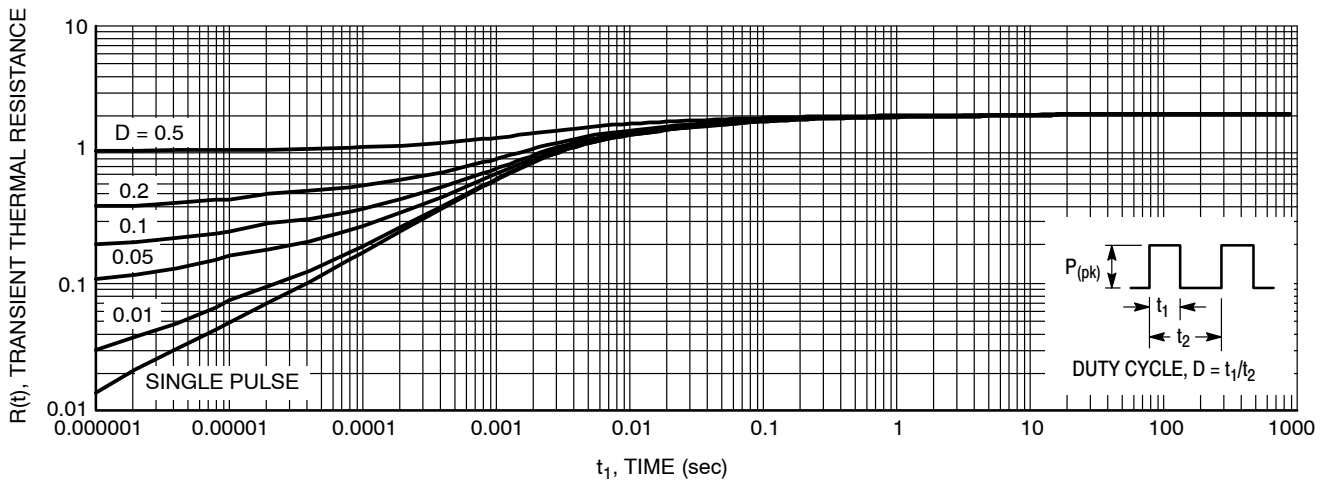


Figure 9. Thermal Response Junction-to-Case for MBR20H150CTG

MBRF20H150CTG, MBR20H150CTG

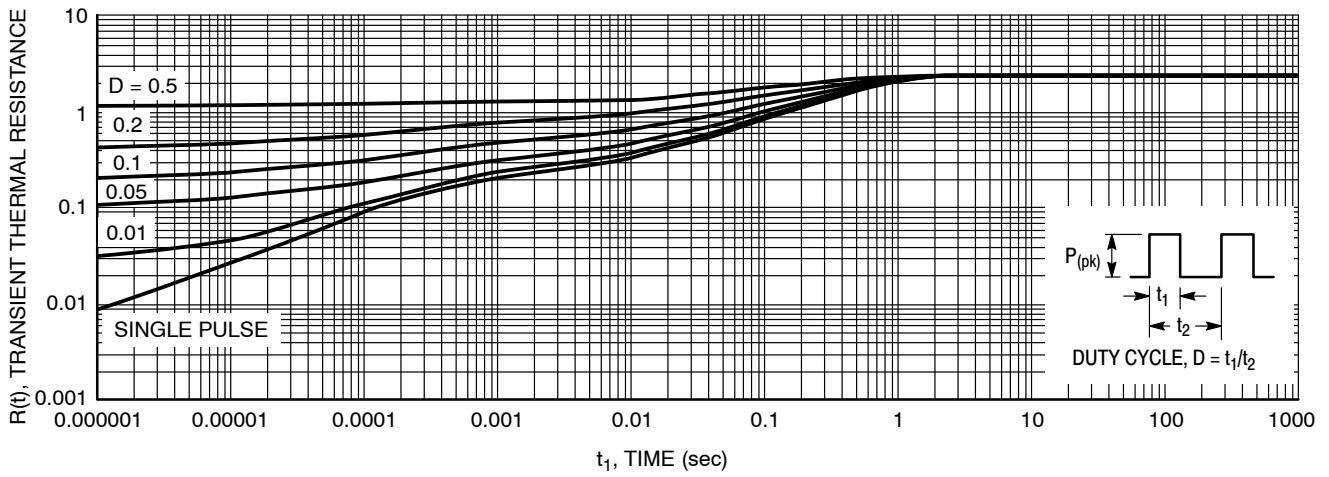
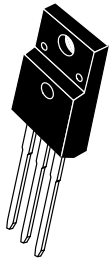


Figure 10. Thermal Response Junction-to-Case for MBRF20H150CTG

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

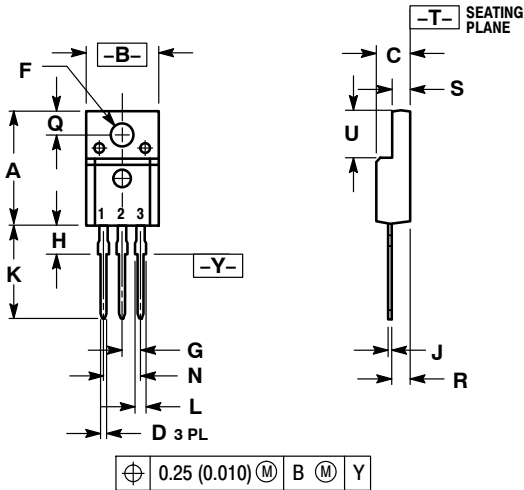
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SCALE 1:1

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.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | 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 |

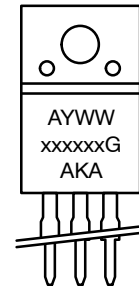
⊕ 0.25 (0.010) M B M Y

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

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

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