

MBRF2060CT

SWITCHMODE™ Schottky Power Rectifier

The SWITCHMODE 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.
- Pb-Free Package is Available*

Mechanical Characteristics:

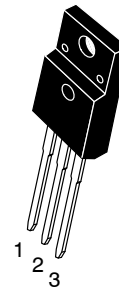
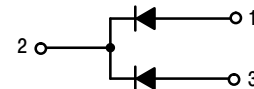
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:
260°C Max. for 10 Seconds



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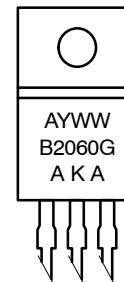
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**SCHOTTKY BARRIER
RECTIFIER
20 AMPERES, 60 VOLTS**



**ISOLATED TO-220
CASE 221D
STYLE 3**

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
B2060 = Device Code
G = Pb-Free Package
AKA = Polarity Designator

ORDERING INFORMATION

| Device | Package | Shipping |
|-------------|-----------------------|---------------|
| MBRF2060CT | TO-220FP | 50 Units/Rail |
| MBRF2060CTG | TO-220FP (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 (Per Leg)

| Rating | Symbol | Value | Unit |
|--|---------------------------------|--------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 60 | V |
| Average Rectified Forward Current (Rated V_R), $T_C = 133^\circ\text{C}$ | $I_{F(AV)}$ | 10 20 | A |
| Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz), $T_C = 133^\circ\text{C}$ | I_{FRM} | 20 | A |
| Nonrepetitive Peak Surge Current (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 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R) | dv/dt | 10000 | V/ μs |
| RMS Isolation Voltage (t = 0.3 second, R.H. \leq 30%, $T_A = 25^\circ\text{C}$) (Note 2) | V_{iso1} | 4500 | V |

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.

THERMAL CHARACTERISTICS (Per Leg)

| Rating | Symbol | Value | Unit |
|---|-----------------|-------|---------------------------|
| Maximum Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 4.0 | $^\circ\text{C}/\text{W}$ |
| Lead Temperature for Soldering Purposes: 1/8 in from Case for 5 Seconds | T_L | 260 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS (Per Leg)

| Characteristic | Symbol | Max | Unit |
|--|--------|------------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3) ($i_F = 10$ Amp, $T_C = 25^\circ\text{C}$) ($i_F = 10$ Amp, $T_C = 125^\circ\text{C}$) ($i_F = 20$ Amp, $T_C = 25^\circ\text{C}$) ($i_F = 20$ Amp, $T_C = 125^\circ\text{C}$) | V_F | 0.85 0.75 0.95 0.85 | V |
| Maximum Instantaneous Reverse Current (Note 3) (Rated DC Voltage, $T_C = 25^\circ\text{C}$) (Rated DC Voltage, $T_C = 125^\circ\text{C}$) | i_R | 0.15 150 | mA |

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

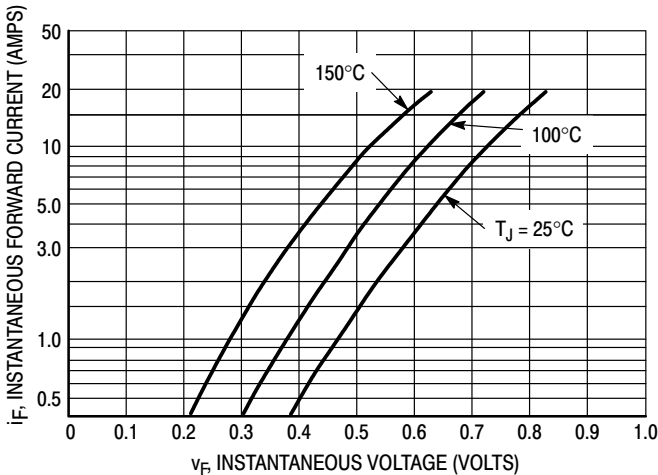


Figure 1. Typical Forward Voltage Per Diode

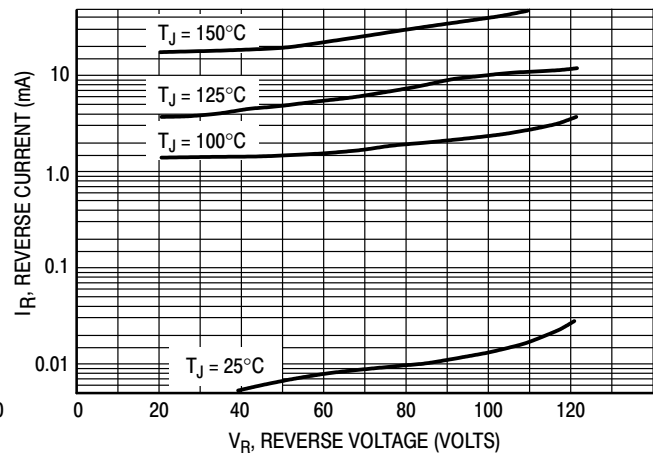


Figure 2. Typical Reverse Current Per Diode

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TEST CONDITION FOR ISOLATION TEST*

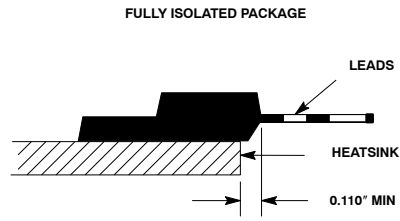
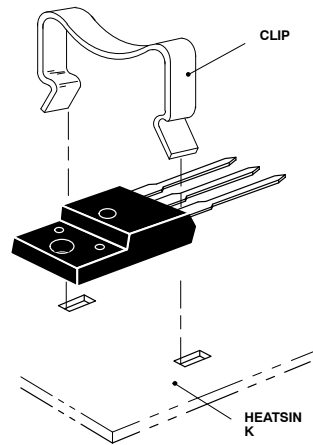


Figure 3. Mounting Position

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

MOUNTING INFORMATION



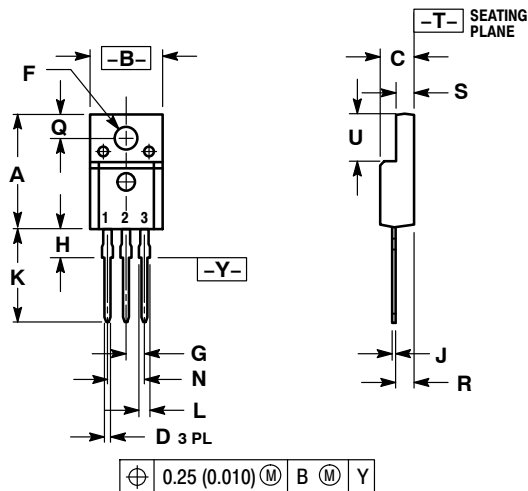
Clip-Mounted

Figure 4. Typical Mounting Technique

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PACKAGE DIMENSIONS

TO-220 FULLPAK
CASE 221D-03
ISSUE K




- 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 |

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

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