

MBRB2060CTG, MBR2060CTG, NRVBB2060CTT4G

Switch-mode Power Rectifiers

TO-220/D²PAK Surface Mount Power Package

These state-of-the-art devices employ the use of the Schottky Barrier principle with a platinum barrier metal.

Features

- Package Designed for Power Surface Mount Applications (D²PAK)
- Center-Tap Configuration (D²PAK)
- Guardring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Short Heat Sink Tab Manufactured – Not Sheared (D²PAK)
- Similar in Size to Industry Standard TO-220 Package
- NRVBB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices

Mechanical Characteristics:

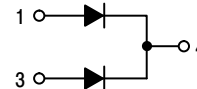
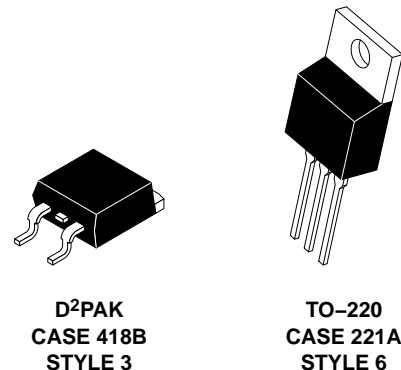
- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 Grams (Approximately) – D²PAK, 1.9 Grams (Approximately) – TO-220
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds (D²PAK)
- Device Meets MSL1 Requirements (D²PAK)
- ESD Ratings:
 - ♦ Machine Model = C (> 400 V)
 - ♦ Human Body Model = 3B (> 8000 V)



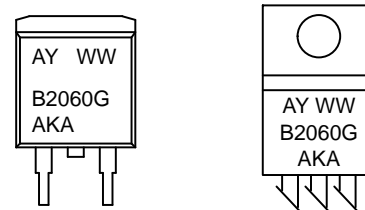
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<http://onsemi.com>

SCHOTTKY BARRIER RECTIFIERS 20 AMPERES, 60 VOLTS



MARKING DIAGRAMS



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

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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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 , $T_C = 110^\circ\text{C}$) Total Device | $I_{F(AV)}$ | 10 20 | A |
| Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz, $T_C = 100^\circ\text{C}$) | I_{FRM} | 20 | A |
| Non-Repetitive 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 |
| Storage Temperature Range | T_{stg} | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1) | T_J | -65 to +175 | $^\circ\text{C}$ |
| 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.

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 (Per Leg)

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------|--------------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 2.0 | $^\circ\text{C/W}$ |
| Junction-to-Ambient (Note 2) MBRB2060CTG | $R_{\theta JA}$ | 50 | |
| Junction-to-Ambient (Note 2) MBR2060CTG | $R_{\theta JA}$ | 60 | |

2. When mounted using minimum recommended pad size on FR-4 board.

ELECTRICAL CHARACTERISTICS (Per Leg)

| Characteristic | Symbol | Value | Unit |
|---|--------|--------------|------|
| Maximum Instantaneous Forward Voltage (Note 3) ($I_F = 20$ Amps, $T_J = 125^\circ\text{C}$) ($I_F = 20$ Amps, $T_J = 25^\circ\text{C}$) | V_F | 0.85 0.95 | V |
| Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, $T_J = 125^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) | I_R | 35 0.15 | 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.

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

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------------|---------------------------------|-------------------------|
| MBRB2060CTG | D ² PAK (Pb-Free) | 50 Units / Rail |
| MBRB2060CTT4G | D ² PAK (Pb-Free) | 800 Units / Tape & Reel |
| NRVBB2060CTT4G* | D ² PAK (Pb-Free) | 800 Units / Tape & Reel |
| MBR2060CTG | TO-220 (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.

*NRVBB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable

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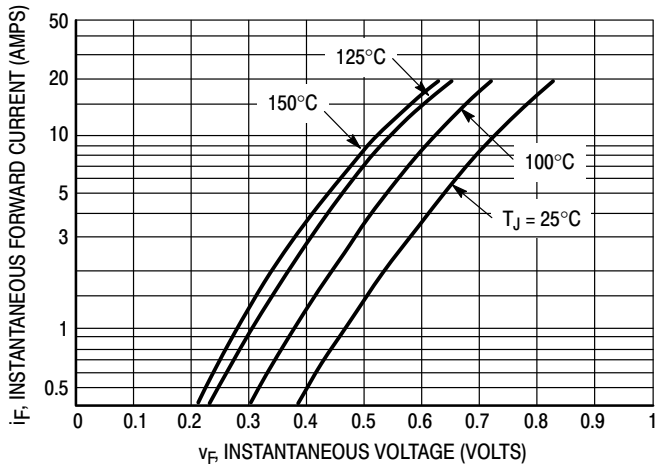


Figure 1. Typical Forward Voltage Per Diode

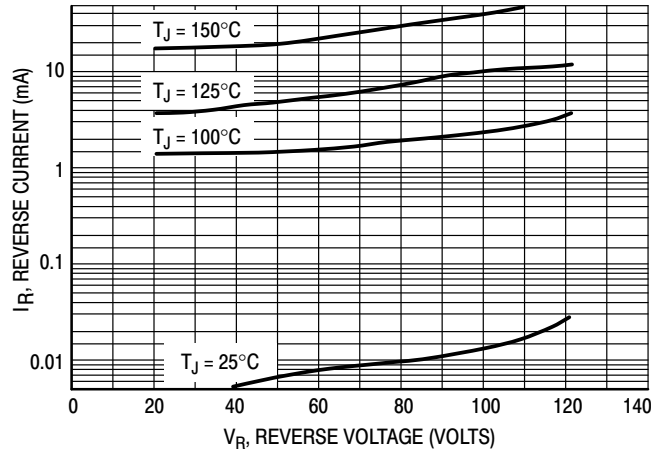


Figure 2. Typical Reverse Current Per Diode

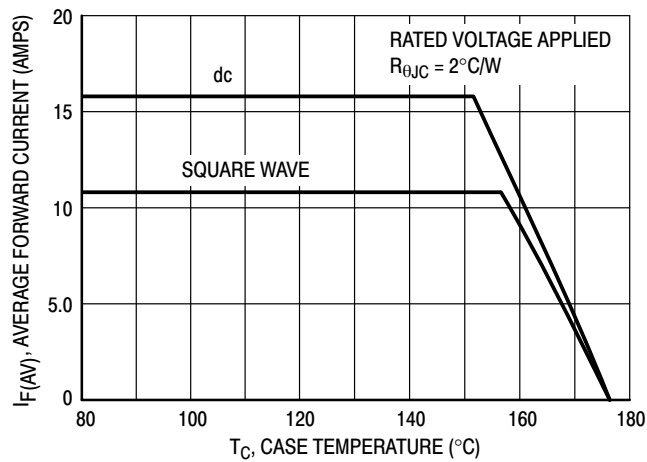


Figure 3. Typical Current Derating, Case, Per Leg

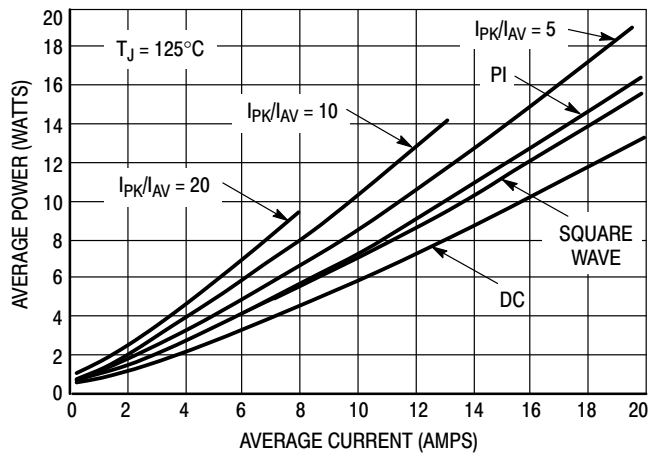
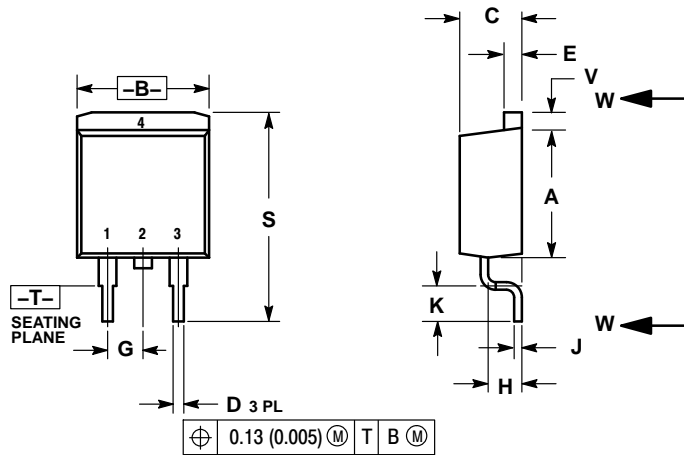


Figure 4. Average Power Dissipation and Average Current

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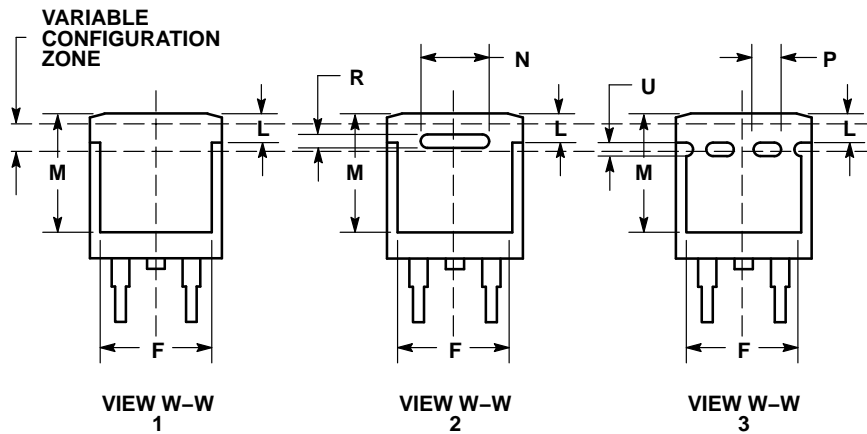
PACKAGE DIMENSIONS

D²PAK 3
CASE 418B-04
ISSUE K



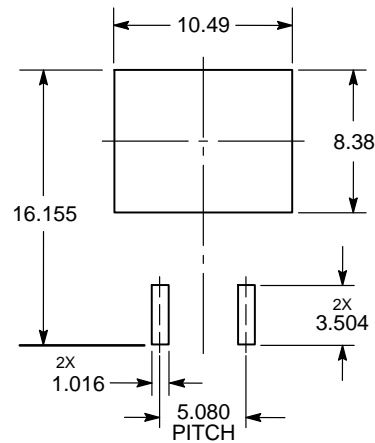
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.340 | 0.380 | 8.64 | 9.65 |
| B | 0.380 | 0.405 | 9.65 | 10.29 |
| C | 0.160 | 0.190 | 4.06 | 4.83 |
| D | 0.020 | 0.035 | 0.51 | 0.89 |
| E | 0.045 | 0.055 | 1.14 | 1.40 |
| F | 0.310 | 0.350 | 7.87 | 8.89 |
| G | 0.100 BSC | | 2.54 BSC | |
| H | 0.080 | 0.110 | 2.03 | 2.79 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.090 | 0.110 | 2.29 | 2.79 |
| L | 0.052 | 0.072 | 1.32 | 1.83 |
| M | 0.280 | 0.320 | 7.11 | 8.13 |
| N | 0.197 REF | | 5.00 REF | |
| P | 0.079 REF | | 2.00 REF | |
| R | 0.039 REF | | 0.99 REF | |
| S | 0.575 | 0.625 | 14.60 | 15.88 |
| V | 0.045 | 0.055 | 1.14 | 1.40 |



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

SOLDERING FOOTPRINT*



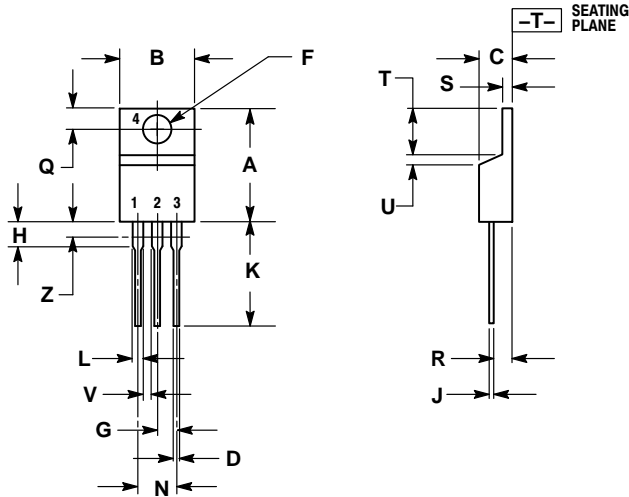
DIMENSIONS: MILLIMETERS

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

MBRB2060CTG, MBR2060CTG, NRVBB2060CTT4G

PACKAGE DIMENSIONS


TO-220
CASE 221A-09
ISSUE AH



- 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 | 0.415 | 9.66 | 10.53 |
| C | 0.160 | 0.190 | 4.07 | 4.83 |
| D | 0.025 | 0.038 | 0.64 | 0.96 |
| F | 0.142 | 0.161 | 3.61 | 4.09 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.161 | 2.80 | 4.10 |
| J | 0.014 | 0.024 | 0.36 | 0.61 |
| 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 |

- STYLE 6:
- PIN 1. ANODE
 2. CATHODE
 3. ANODE
 4. CATHODE

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MBRB2060CT/D

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