# MBRB3030CT

**Preferred Device**

# SWITCHMODE™ Power Rectifier

These state−of−the−art devices use the Schottky Barrier principle with a proprietary barrier metal.

### Features

- Guardring for Stress Protection
- Maximum Die Size
- 175°C Operating Junction Temperature
- Short Heat Sink Tab Manufactured − Not Sheared
- Pb−Free Packages are Available

### Mechanical Characteristics:

- Case: Epoxy, Molded, Epoxy Meets UL 94 V−0
- Weight: 1.7 Grams (Approximately)
- 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
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (>400 V)
  Human Body Model, 3B (>8000 V)

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 30 | V |
| Average Rectified Forward Current<br>(At Rated $V_R$, $T_C$ = 134°C) Per Device<br>Per Leg | $I_{F(AV)}$ | <br>30<br>15 | A |
| Peak Repetitive Forward Current<br>(At Rated $V_R$, Square Wave,<br>20 kHz, $T_C$ = +137°C) Per Leg | $I_{FRM}$ | 30 | A |
| Non−Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions,<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$ | 200 | A |
| Peak Repetitive Reverse Surge Current<br>(2.0 μs, 1.0 kHz) | $I_{RRM}$ | 2.0 | A |
| Storage Temperature Range | $T_{stg}$ | −55 to +175 | °C |
| Operating Junction Temperature (Note 1) | $T_J$ | −55 to +175 | °C |
| Voltage Rate of Change (Rated $V_R$) | dv/dt | 10,000 | V/μs |
| Reverse Energy<br>(Unclamped Inductive Surge)<br>(Inductance = 3 mH, $T_C$ = 25°C) | W | 100 | mJ |

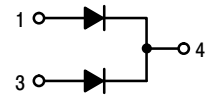
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

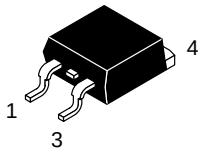
1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

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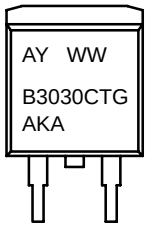
## SCHOTTKY BARRIER RECTIFIER 30 AMPERES, 30 VOLTS




**D²PAK**
**CASE 418B**
**STYLE 3**

### MARKING DIAGRAM




| | |
|---|---|
| A | = Assembly Location |
| Y | = Year |
| WW | = Work Week |
| B3030CT | = 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.

**Preferred** devices are recommended choices for future use and best overall value.

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**THERMAL CHARACTERISTICS** (Per Leg)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, − Junction−to−Case<br>− Junction−to−Ambient (Note 2) | $R_{\theta JC}$<br>$R_{\theta JA}$ | 1.0<br>50 | °C/W |

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), Per Leg<br>($I_F$ = 15 Amps, $T_C$ = +25°C)<br>($I_F$ = 15 Amps, $T_C$ = +150°C)<br>($I_F$ = 30 Amps, $T_C$ = +25°C)<br>($I_F$ = 30 Amps, $T_C$ = +150°C) | $V_F$ | <br>0.54<br>0.47<br>0.67<br>0.66 | V |
| Maximum Instantaneous Reverse Current (Note 3), Per Leg<br>(Rated dc Voltage, $T_C$ = +25°C)<br>(Reverse Voltage = 10 V, $T_C$ = +150°C)<br>(Rated dc Voltage, $T_C$ = +150°C) | $I_R$ | <br>0.6<br>46<br>145 | mA |

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| MBRB3030CT | $D^2$PAK | 50 Units / Rail |
| MBRB3030CTG | $D^2$PAK<br>(Pb−Free) | 50 Units / Rail |
| MBRB3030CTT4 | $D^2$PAK | 800 Units / Tape & Reel |
| MBRB3030CTT4G | $D^2$PAK<br>(Pb−Free) | 800 Units / Tape & Reel |

†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.

## ELECTRICAL CHARACTERISTICS

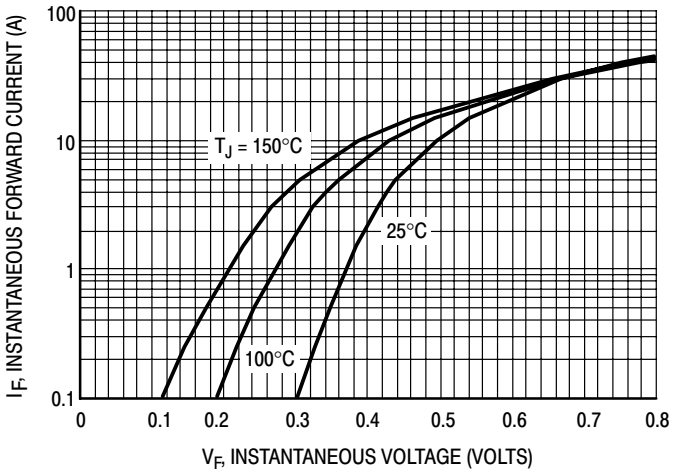



**Figure 1. Maximum Forward Voltage, Per Leg**

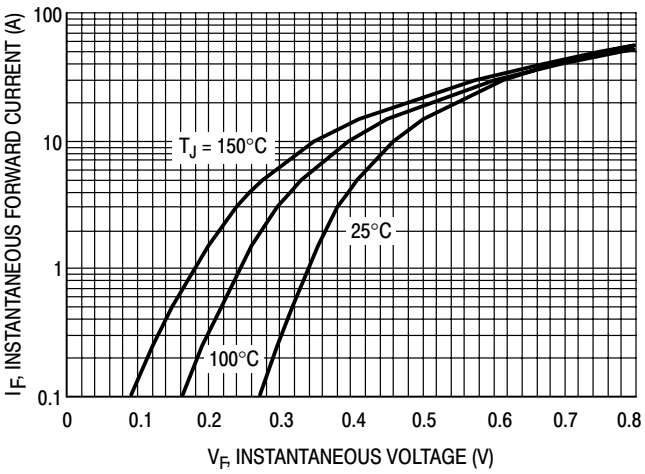



**Figure 2. Typical Forward Voltage, Per Leg**

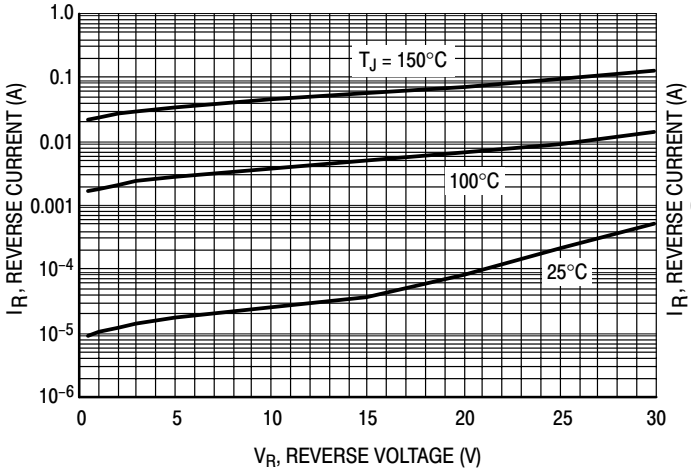



**Figure 3. Maximum Reverse Current, Per Leg**

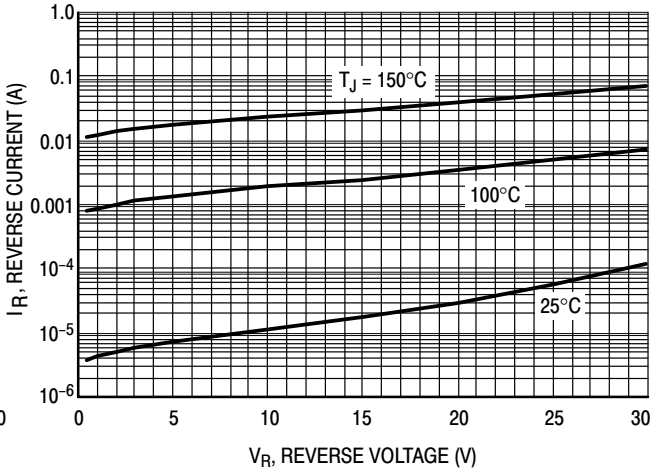



**Figure 4. Typical Reverse Current, Per Leg**

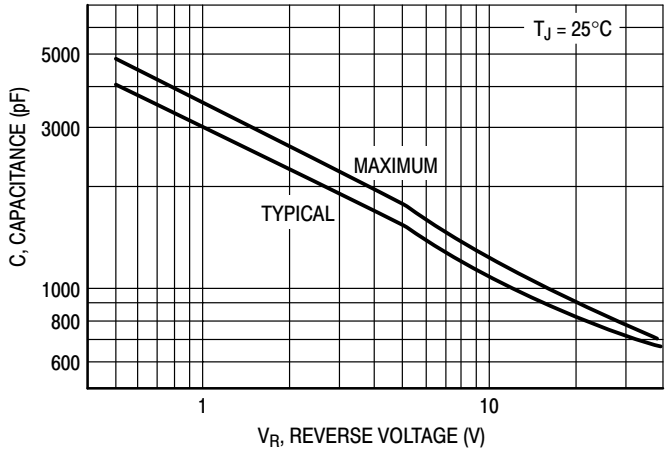



**Figure 5. Capacitance**

## TYPICAL CHARACTERISTICS

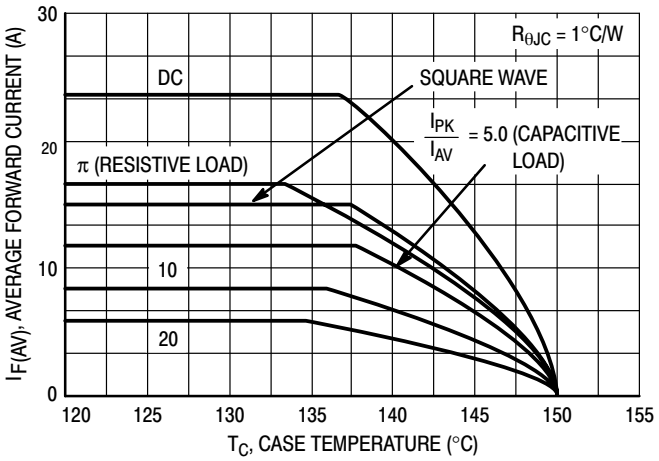



**Figure 6. Current Derating, Infinite Heatsink**

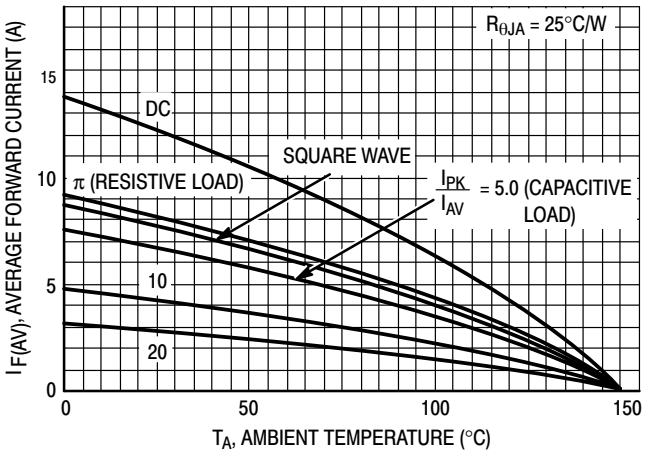



**Figure 7. Current Derating**

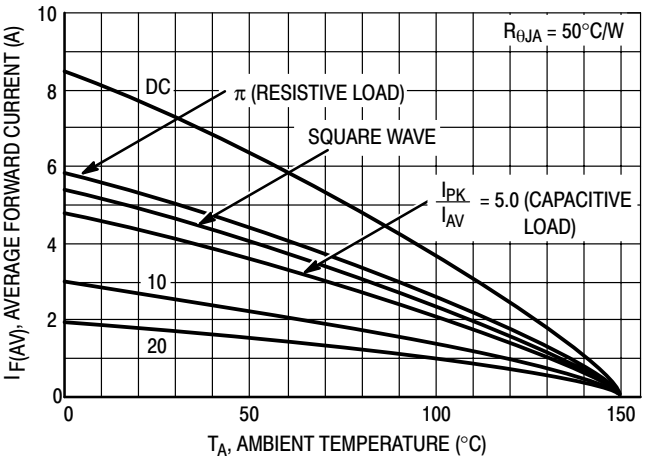



**Figure 8. Current Derating, Free Air**

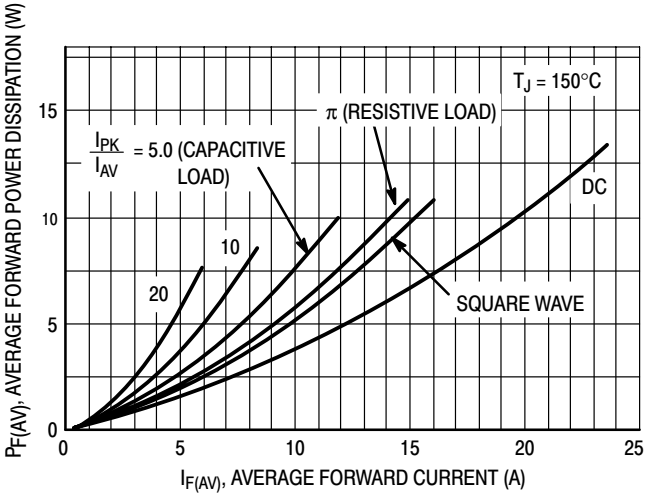



**Figure 9. Forward Power Dissipation**

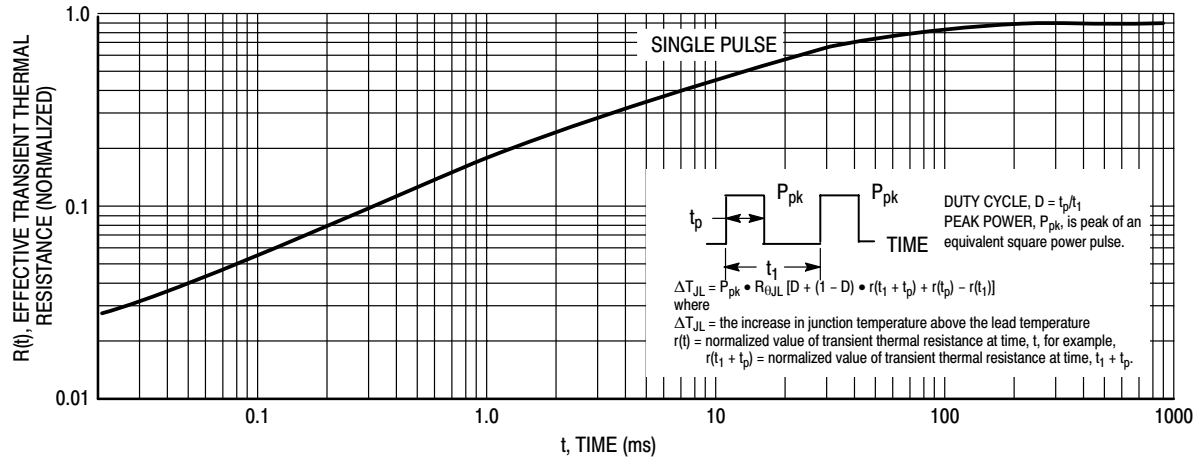
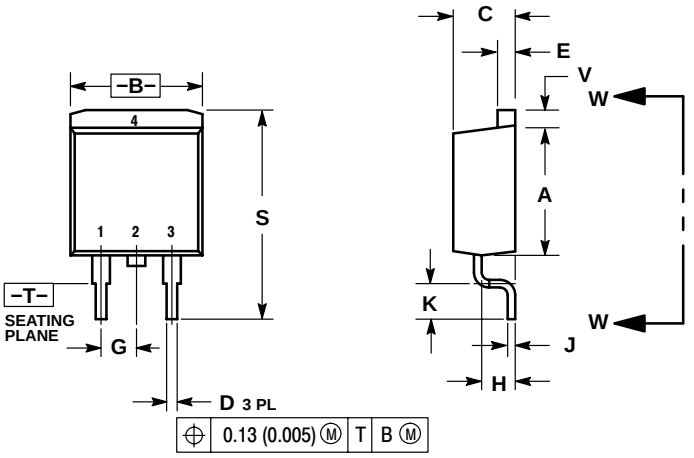



**Figure 10. Thermal Response**

## PACKAGE DIMENSIONS

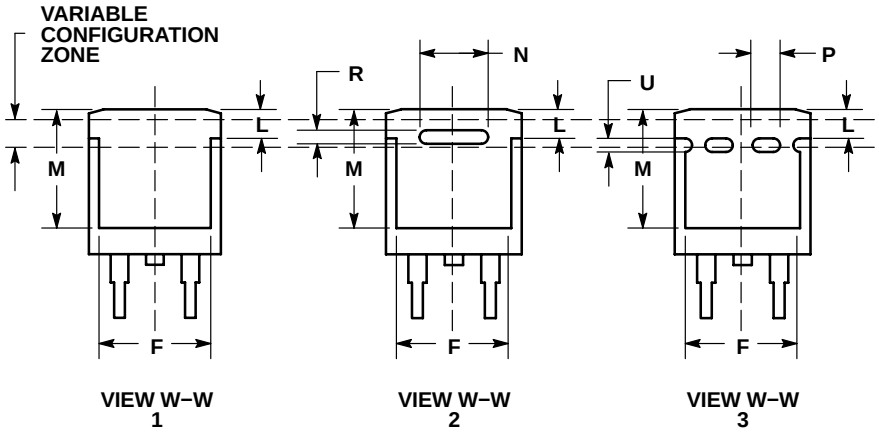
**D²PAK 3**
CASE 418B−04
ISSUE J




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.

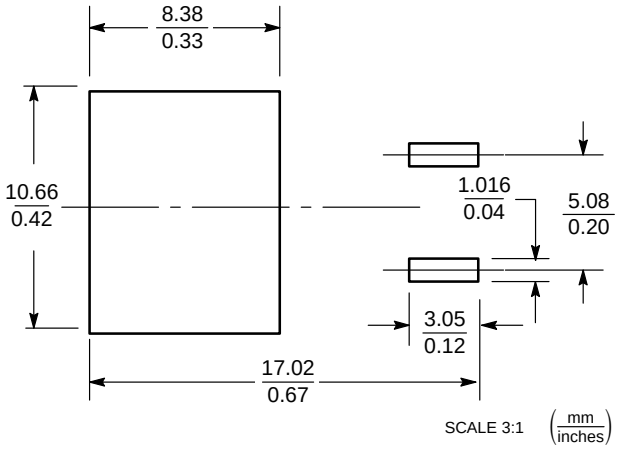
| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.340 | 0.380 | 8.64 | 9.65 |
| B | 0.380 | 0.405 | 9.65 | 10.29 |
| C | 0.160 | 0.190 | 4.06 | 4.83 |
| D | 0.020 | 0.035 | 0.51 | 0.89 |
| E | 0.045 | 0.055 | 1.14 | 1.40 |
| F | 0.310 | 0.350 | 7.87 | 8.89 |
| 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
2. CATHODE
3. ANODE
4. CATHODE




VIEW W−W 1 | VIEW W−W 2 | VIEW W−W 3

### SOLDERING FOOTPRINT*




*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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