

# MBRB4030G, NRVBB4030T4G

Preferred Device

## Switch-mode 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
- AEC-Q101 Qualified and PPAP Capable
- NRVBB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### Mechanical Characteristics:

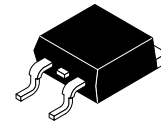
- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads Readily Solderable
- Device Meets MSL1 Requirements
- ESD Ratings:
  - ◆ Machine Model = C (> 400 V)
  - ◆ Human Body Model = 3B (> 8000 V)



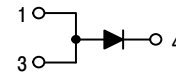
**ON Semiconductor®**

<http://onsemi.com>

**SCHOTTKY BARRIER  
RECTIFIER  
40 AMPERES, 30 VOLTS**



**D<sup>2</sup>PAK  
CASE 418B  
STYLE 3**



### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
B4030 = 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.

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

# MBRB4030G, NRVBB4030T4G

## 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 $V_R$ , $T_C = +115^\circ\text{C}$ (Note 1))                 | $I_{F(AV)}$                     | 40          | A                |
| Peak Repetitive Forward Current<br>(At Rated $V_R$ , Square Wave, 20 kHz), $T_C = +112^\circ\text{C}$       | $I_{FRM}$                       | 80          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 300         | A                |
| Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)   | $I_{RRM}$                       | 2.0         | A                |
| Storage Temperature Range   | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature Range (Note 2)   | $T_J$                           | -65 to +175 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )   | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |
| Reverse Energy (Unclamped Inductive Surge), ( $T_C = 25^\circ\text{C}$ , $L = 3.0\text{ mH}$ )              | W                               | 600         | mJ               |

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.

- Rating applies when pins 1 and 3 are connected.
- The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

## THERMAL CHARACTERISTICS

| Characteristic                                   | Symbol          | Value | Unit                      |
|--|-----------------|-------|---------------------------|
| Thermal Resistance, Junction-to-Case             | $R_{\theta JC}$ | 1.0   | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 3) | $R_{\theta JA}$ | 50    | $^\circ\text{C}/\text{W}$ |

- Rating applies when surface mounted on the minimum pad size recommended.

## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol | Value                        | Unit |
|---|--------|------------------------------|------|
| Maximum Instantaneous Forward Voltage (Notes 4 and 5), per Device<br>( $I_F = 20\text{ A}$ , $T_C = +25^\circ\text{C}$ )<br>( $I_F = 20\text{ A}$ , $T_C = +150^\circ\text{C}$ )<br>( $I_F = 40\text{ A}$ , $T_C = +25^\circ\text{C}$ )<br>( $I_F = 40\text{ A}$ , $T_C = +150^\circ\text{C}$ ) | $V_F$  | 0.46<br>0.34<br>0.55<br>0.45 | V    |
| Maximum Instantaneous Reverse Current (Note 5), per Device<br>(Rated DC Voltage, $T_C = +25^\circ\text{C}$ )<br>(Rated DC Voltage, $T_C = +125^\circ\text{C}$ )   | $I_R$  | 0.35<br>150                  | mA   |

- Rating applies when pins 1 and 3 are connected.
- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## ORDERING INFORMATION

| Device       | Package                         | Shipping <sup>†</sup>   |
|--------------|---------------------------------|-------------------------|
| MBRB4030G    | D <sup>2</sup> PAK<br>(Pb-Free) | 50 Units / Rail         |
| MBRB4030T4G  | D <sup>2</sup> PAK<br>(Pb-Free) | 800 Units / Tape & Reel |
| NRVBB4030T4G | D <sup>2</sup> PAK<br>(Pb-Free) | 800 Units / Tape & Reel |

<sup>†</sup>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.

# MBRB4030G, NRVBB4030T4G

## ELECTRICAL CHARACTERISTICS

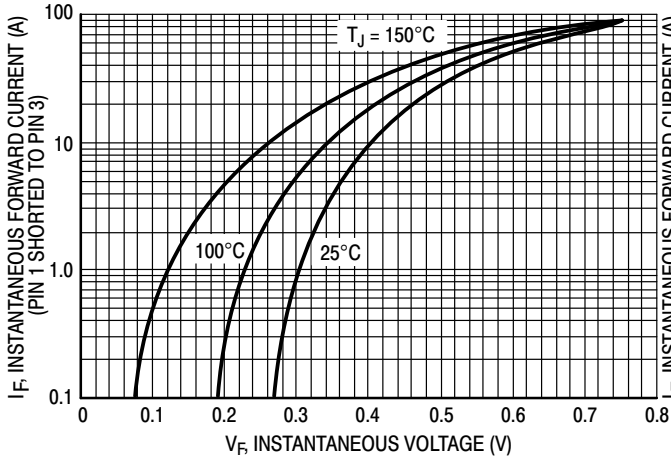


Figure 1. Maximum Forward Voltage

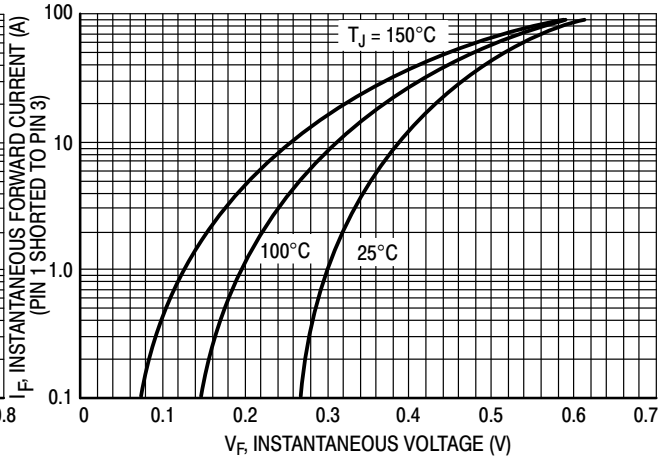


Figure 2. Typical Forward Voltage

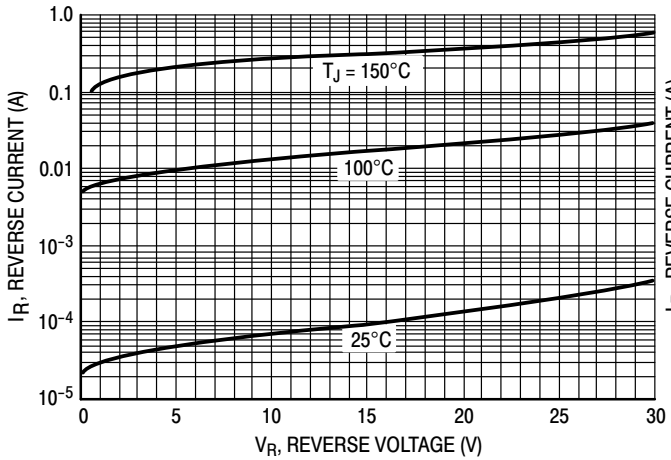


Figure 3. Maximum Reverse Current

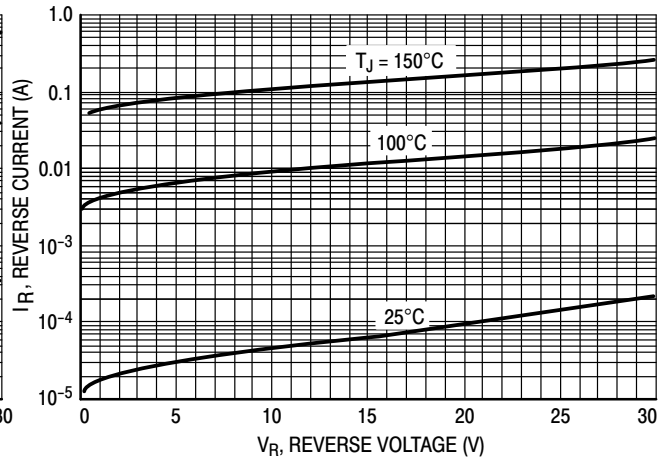


Figure 4. Typical Reverse Current

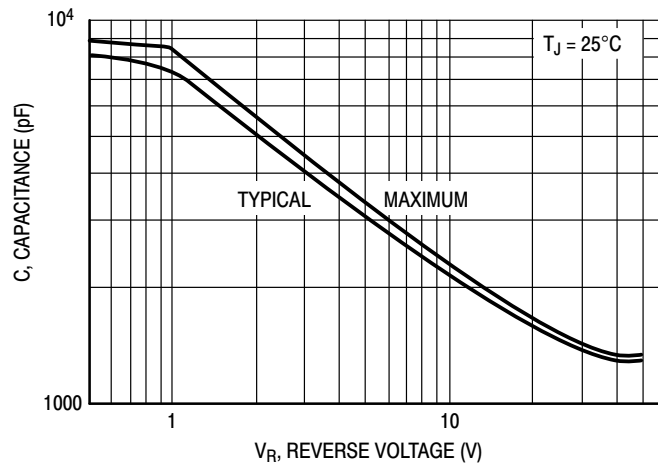


Figure 5. Maximum and Typical Capacitance

# MRB4030G, NRVBB4030T4G

## ELECTRICAL CHARACTERISTICS

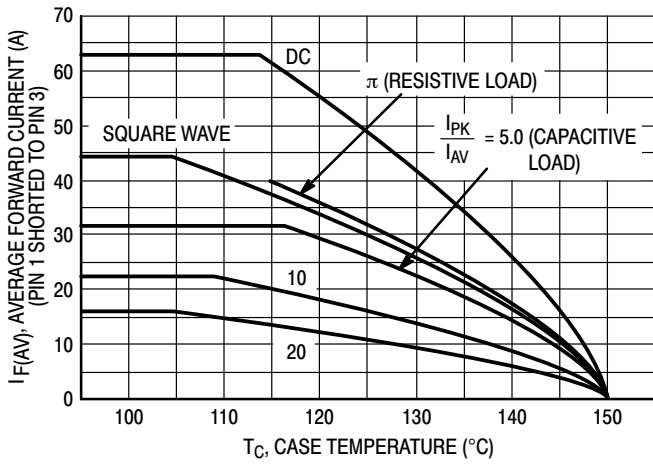


Figure 6. Current Derating, Infinite Heatsink

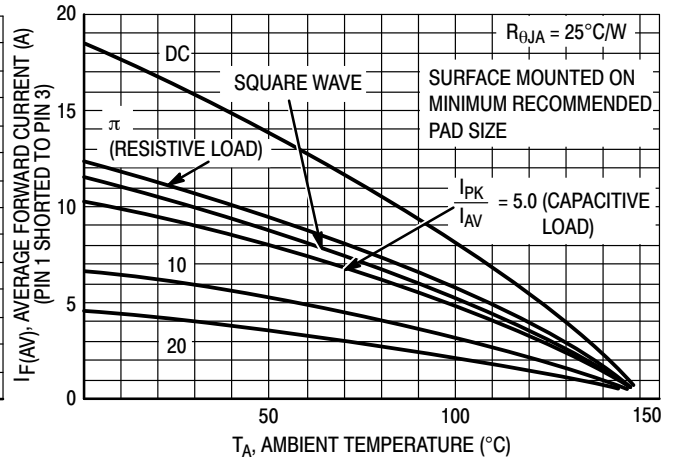


Figure 7. Current Derating

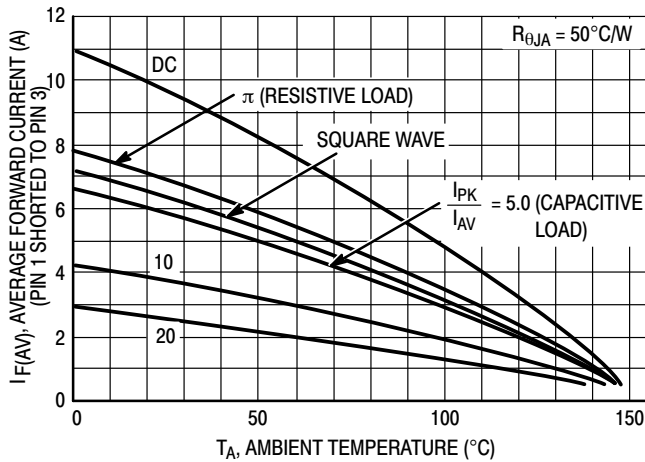


Figure 8. Current Derating, Free Air

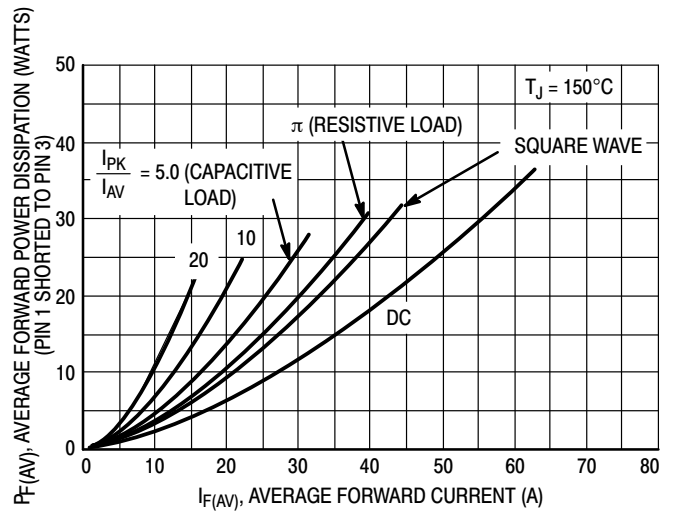


Figure 9. Forward Power Dissipation

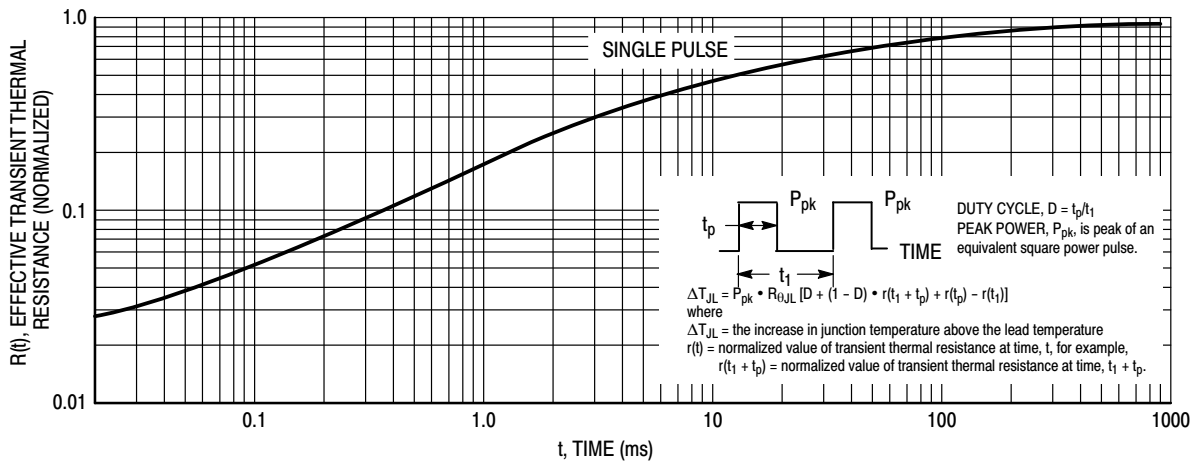


Figure 10. Thermal Response

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

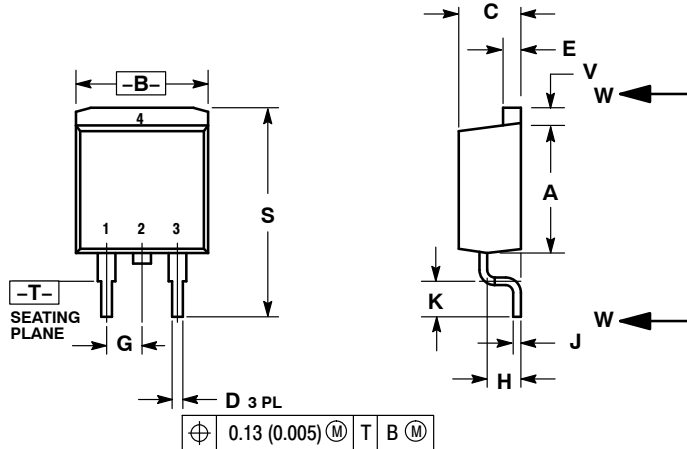
ON Semiconductor®



**D<sup>2</sup>PAK 3**  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

SCALE 1:1

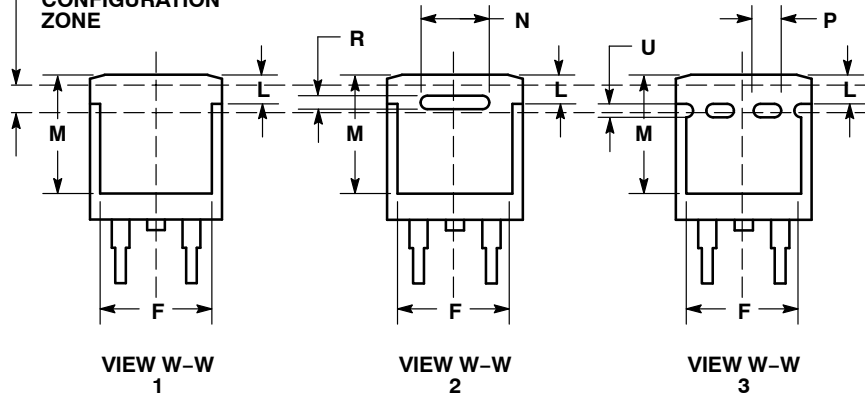


**NOTES:**

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  |

**VARIABLE CONFIGURATION ZONE**



- |  |   |   |  |   |  |
|--|---|---|--|---|--|
| <b>STYLE 1:</b><br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 2:</b><br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN | <b>STYLE 3:</b><br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | <b>STYLE 4:</b><br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | <b>STYLE 5:</b><br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE | <b>STYLE 6:</b><br>PIN 1. NO CONNECT<br>2. CATHODE<br>3. ANODE<br>4. CATHODE |
|--|---|---|--|---|--|

**MARKING INFORMATION AND FOOTPRINT ON PAGE 2**

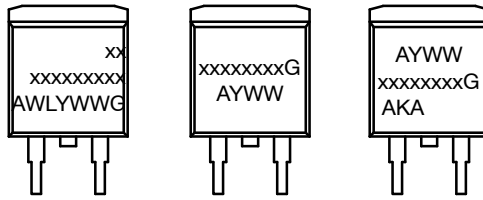
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**D<sup>2</sup>PAK 3**  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

**GENERIC  
MARKING DIAGRAM\***

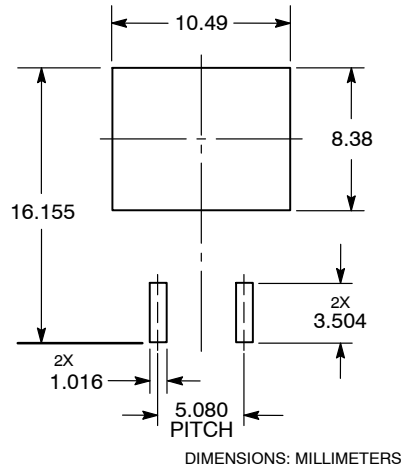


**IC                      Standard                      Rectifier**

- xx        = Specific Device Code
- A        = Assembly Location
- WL      = Wafer Lot
- Y        = Year
- WW     = Work Week
- G        = Pb-Free Package
- AKA     = Polarity Indicator

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

**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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