

# Switch-mode Power Rectifier

## NRVBB1060, NRVBB1060W1

This switch-mode power rectifier uses the Schottky Barrier principle with a platinum barrier metal. This state-of-the-art device has the following features:

### Features

- Low Forward Voltage
- 175°C Operating Junction Temperature
- Low Power Loss/High Efficiency
- High Surge Capacity
- For Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- This is a Pb-Free Device

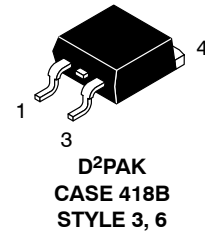
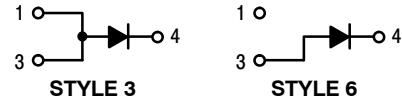
### Applications

- Power Supply – Output Rectification
- Power Management

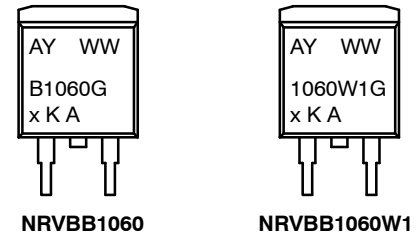
### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 1.7 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

## SCHOTTKY BARRIER RECTIFIER 10 AMPERES, 60 VOLTS



### MARKING DIAGRAMS



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
xKA = Diode Polarity  
x = N or A

### ORDERING INFORMATION

| Device         | Package                      | Shipping <sup>†</sup> |
|----------------|------------------------------|-----------------------|
| NRVBB1060T4G   | D <sup>2</sup> PAK (Pb-Free) | 800/Tape & Reel       |
| NRVBB1060W1T4G | D <sup>2</sup> PAK (Pb-Free) | 800/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 Specification Brochure, BRD8011/D.

## 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>$V_R$ | 60          | V                |
| Average Rectified Forward Current (Rated $V_R$ ) $T_C = 133^\circ\text{C}$                                 | $I_{F(AV)}$                     | 10          | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz) $T_C = 133^\circ\text{C}$           | $I_{FRM}$                       | 20          | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 150         | A                |
| Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)                                        | $I_{RRM}$                       | 0.5         | A                |
| Operating Junction Temperature (Note 1)                                                                    | $T_J$                           | -65 to +175 | $^\circ\text{C}$ |
| Storage Temperature                                                                                        | $T_{stg}$                       | -65 to +175 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )                                                                      | $dv/dt$                         | 10,000      | V/ $\mu\text{s}$ |

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, Junction-to-Case    | $R_{\theta JC}$ | 2.0   | $^\circ\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 60    | $^\circ\text{C}/\text{W}$ |

## ELECTRICAL CHARACTERISTICS

| Rating                                                                                                                                                                                                                                                                   | Symbol | Value                      | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $I_F = 10\text{ A}$ , $T_C = 125^\circ\text{C}$ )<br>( $I_F = 10\text{ A}$ , $T_C = 25^\circ\text{C}$ )<br>( $I_F = 20\text{ A}$ , $T_C = 125^\circ\text{C}$ )<br>( $I_F = 20\text{ A}$ , $T_C = 25^\circ\text{C}$ ) | $V_F$  | 0.7<br>0.8<br>0.85<br>0.95 | V    |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_C = 125^\circ\text{C}$ )<br>(Rated dc Voltage, $T_C = 25^\circ\text{C}$ )                                                                                                                        | $i_R$  | 25<br>0.10                 | 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  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# NRVBB1060, NRVBB1060W1

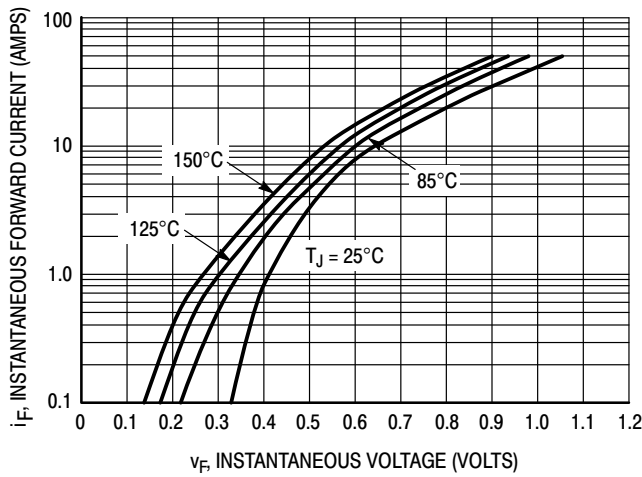


Figure 1. Typical Forward Voltage

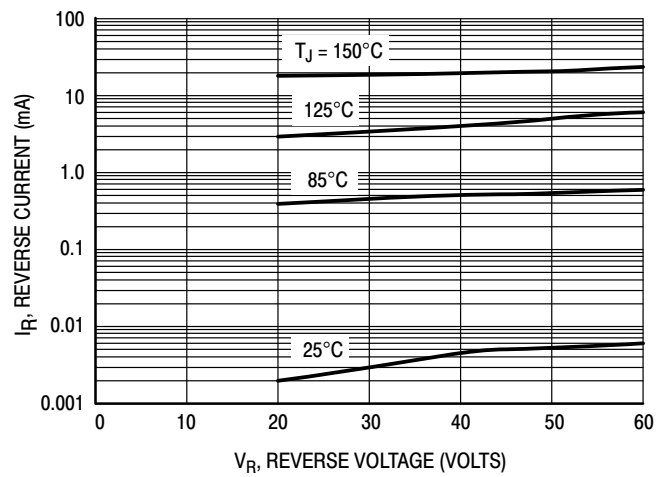


Figure 2. Typical Reverse Current

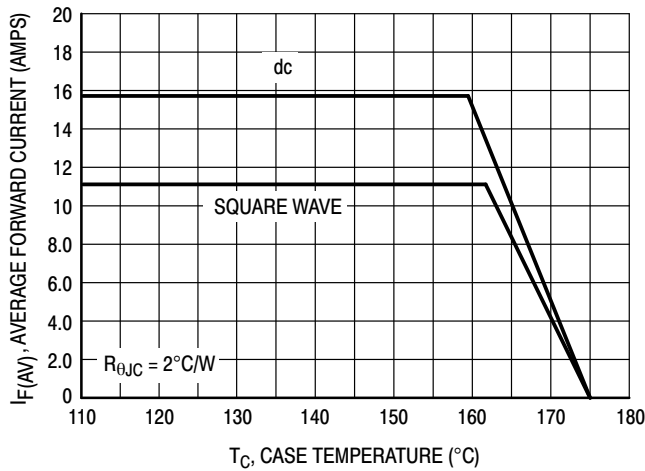


Figure 3. Current Derating, Case

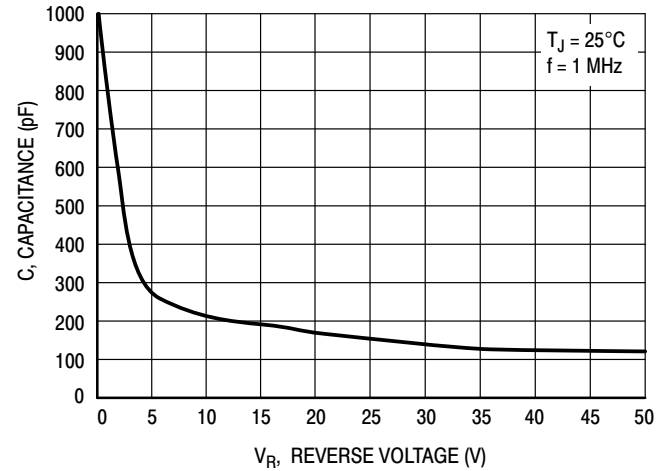


Figure 4. Typical Capacitance

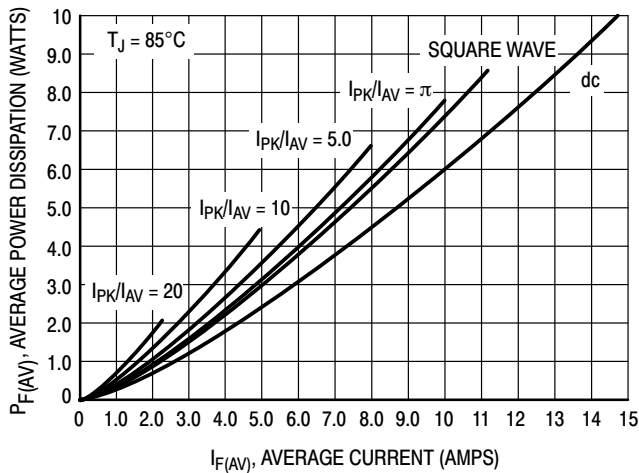


Figure 5. Typical Forward Power Dissipation

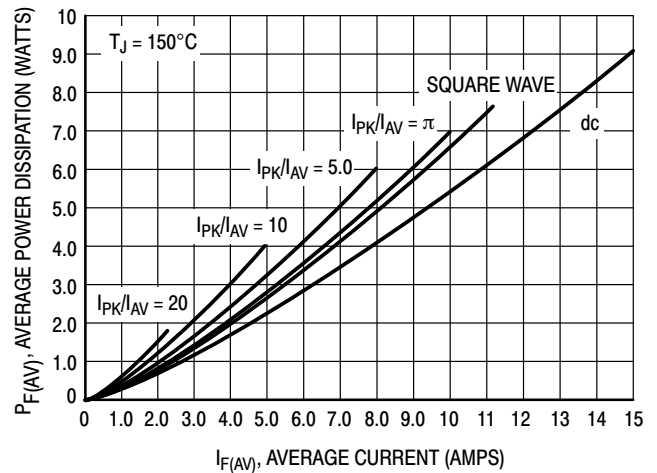
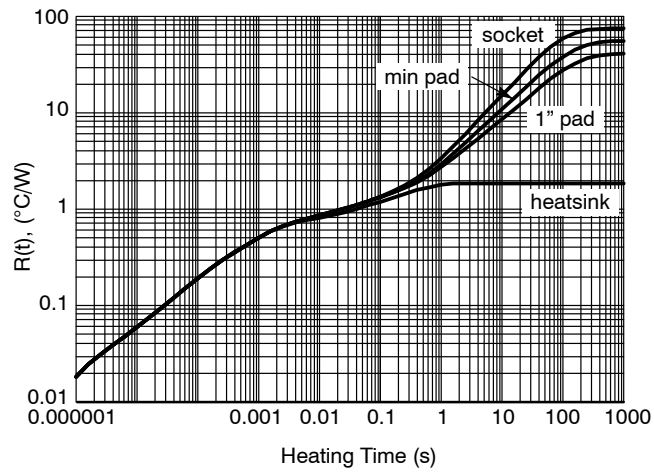
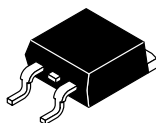


Figure 6. Typical Forward Power Dissipation

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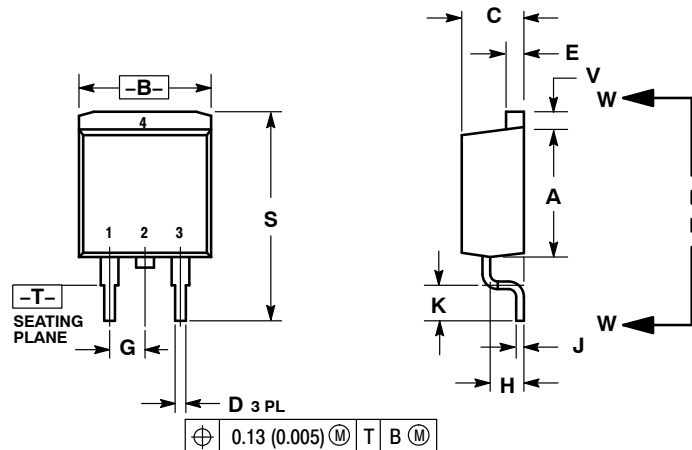
**Figure 7. Single-Pulse Transient Response Curves, Various Mounting Conditions**



D<sup>2</sup>PAK 3  
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ISSUE L

DATE 17 FEB 2015

SCALE 1:1

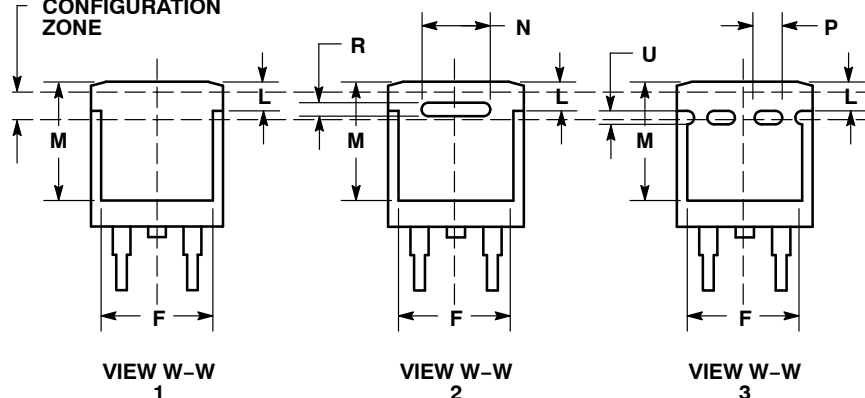


NOTES:

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



STYLE 1:

- PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:

- PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 3:

- PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

STYLE 4:

- PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 5:

- PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. ANODE

STYLE 6:

- PIN 1. NO CONNECT  
2. CATHODE  
3. ANODE  
4. CATHODE

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

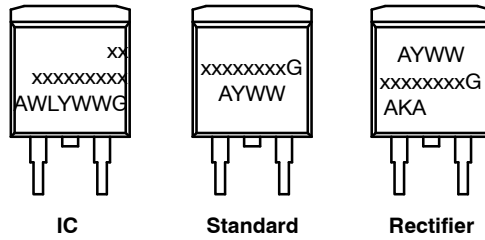
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CASE 418B-04  
ISSUE L

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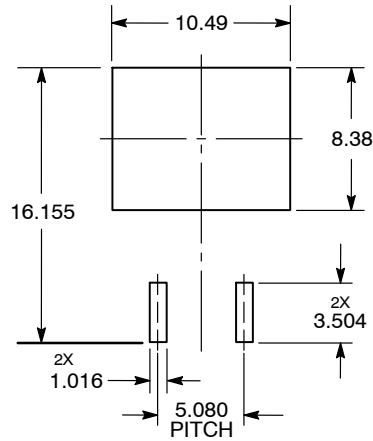
**GENERIC  
MARKING DIAGRAM\***



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. Some products may not follow the Generic Marking.

**SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

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

|                         |                           |                                                                                                                                                                                     |
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