

# MBR130, NRVB130

## Surface Mount Schottky Power Rectifier

### Plastic SOD-123 Package

This device uses the Schottky Barrier principle with a large area metal-to-silicon power diode. Ideally suited for low voltage, high frequency rectification or as free wheeling and polarity protection diodes in surface mount applications where compact size and weight are critical to the system. This package also provides an easy to work with alternative to leadless 34 package style.

#### Features

- Guardring for Stress Protection
- Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Package Designed for Optimal Automated Board Assembly
- ESD Rating:
  - ◆ Human Body Model = 3
  - ◆ Machine Model = C
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Packages\*

#### Mechanical Characteristics

- Device Marking: S3
- Polarity Designator: Cathode Band
- Weight: 11.7 mg (approximately)
- Case: Epoxy, Molded
- 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

\*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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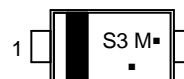
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**SCHOTTKY BARRIER  
RECTIFIER  
1.0 AMPERES  
30 VOLTS**



**SOD-123  
CASE 425  
STYLE 1**

#### MARKING DIAGRAM



S3 = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device                   | Package              | Shipping†                   |
|--------------------------|----------------------|-----------------------------|
| MBR130T1G,<br>NRVB130T1G | SOD-123<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| MBR130T3G,<br>NRVB130T3G | SOD-123<br>(Pb-Free) | 10,000 /<br>Tape & Reel *** |

\*\* 8 mm Tape, 7" Reel

\*\*\* 8 mm Tape, 13" Reel

†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.

# MBR130, NRVB130

## 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>(Rated $V_R$ ) $T_L = 65^\circ\text{C}$                                 | $I_{F(AV)}$                     | 1.0         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions, Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 5.5         | A                |
| Storage Temperature Range  | $T_{stg}$                       | -65 to +125 | $^\circ\text{C}$ |
| Operating Junction Temperature   | $T_J$                           | -65 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | dv/dt                           | 1000        | 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.

## THERMAL CHARACTERISTICS

| Characteristic                                   | Symbol          | Value | Unit               |
|--|-----------------|-------|--------------------|
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 230   | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Lead (Note 1)    | $R_{\theta JL}$ | 108   | $^\circ\text{C/W}$ |

1. FR-4 or FR-5 = 3.5 × 1.5 inches using a 1 inch Cu pad.

## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol | Typ            | Max               | Unit          |
|---|--------|----------------|-------------------|---------------|
| Instantaneous Forward Voltage (Note 2)<br>( $I_F = 0.1\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 0.7\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ ) | $V_F$  | -<br>-<br>0.47 | 0.35<br>0.45<br>- | V             |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated DC Voltage, $T_C = 25^\circ\text{C}$ )<br>( $V_R = 5\text{ V}$ , $T_C = 25^\circ\text{C}$ )  | $I_R$  |                | 60<br>10          | $\mu\text{A}$ |

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  $\leq 2\%$ .

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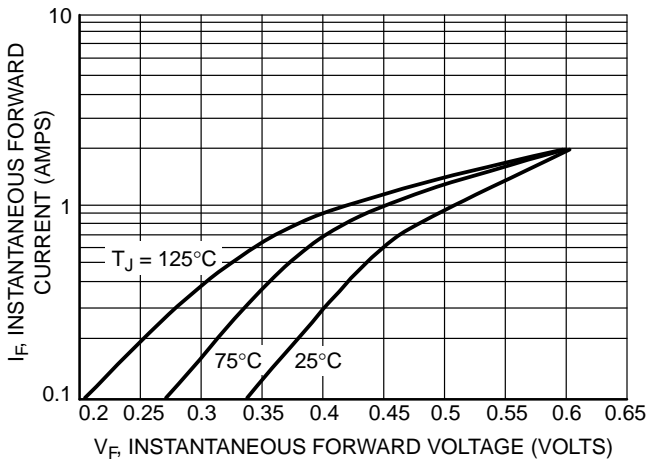


Figure 1. Maximum Forward Voltage

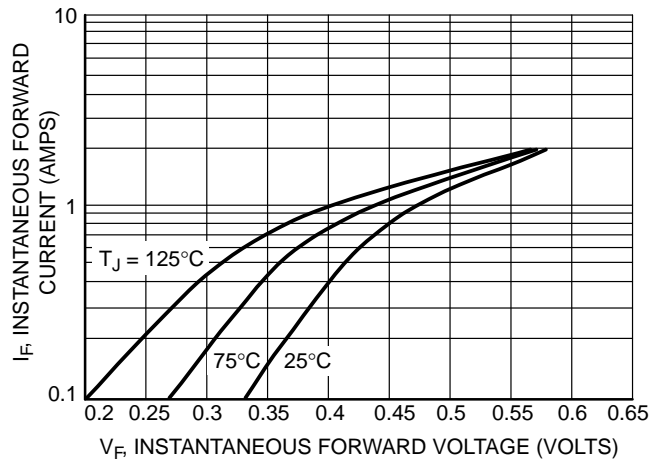


Figure 2. Typical Forward Voltage

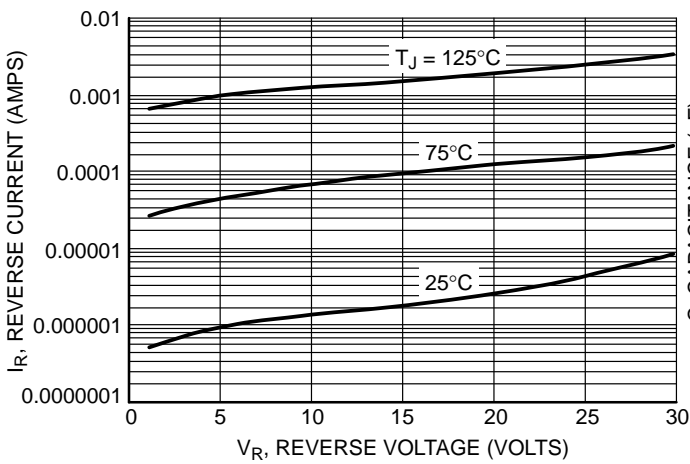


Figure 3. Typical Reverse Current

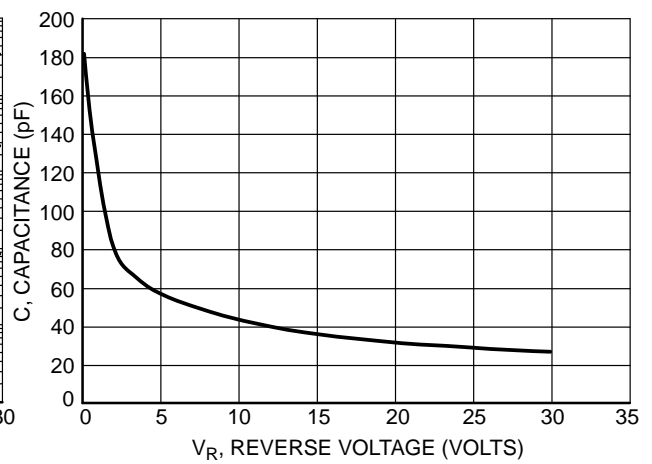


Figure 4. Typical Capacitance

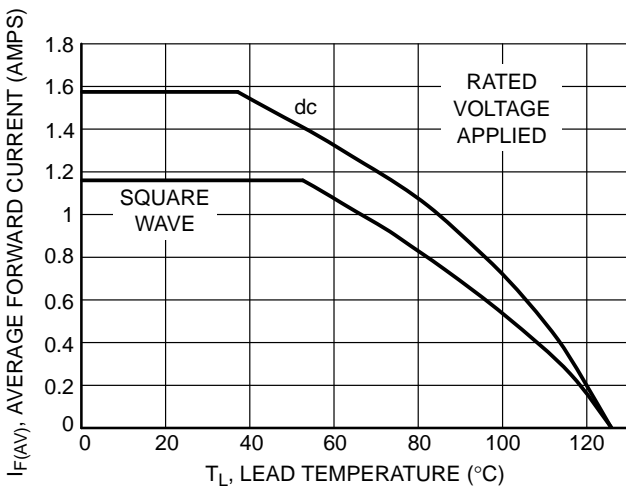


Figure 5. Current Derating, Lead,  $R_{\theta JL} = 108^{\circ}\text{C/W}$

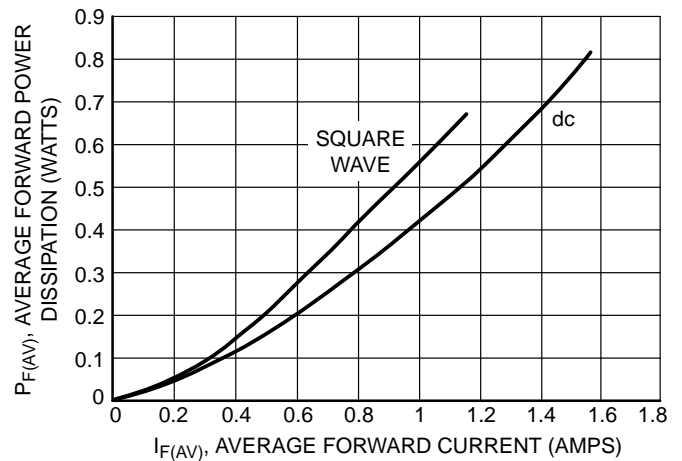
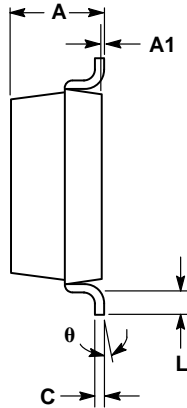
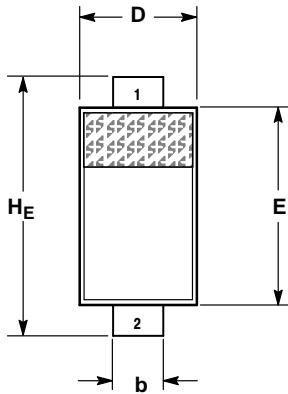


Figure 6. Forward Power Dissipation

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## PACKAGE DIMENSIONS

SOD-123  
CASE 425-04  
ISSUE G



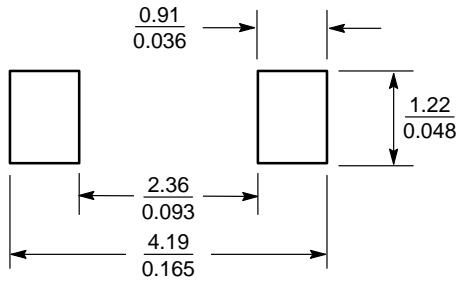
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM            | MILLIMETERS |      |      | INCHES |       |       |
|----------------|-------------|------|------|--------|-------|-------|
|                | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A              | 0.94        | 1.17 | 1.35 | 0.037  | 0.046 | 0.053 |
| A1             | 0.00        | 0.05 | 0.10 | 0.000  | 0.002 | 0.004 |
| b              | 0.51        | 0.61 | 0.71 | 0.020  | 0.024 | 0.028 |
| c              | ---         | ---  | 0.15 | ---    | ---   | 0.006 |
| D              | 1.40        | 1.60 | 1.80 | 0.055  | 0.063 | 0.071 |
| E              | 2.54        | 2.69 | 2.84 | 0.100  | 0.106 | 0.112 |
| H <sub>E</sub> | 3.56        | 3.68 | 3.86 | 0.140  | 0.145 | 0.152 |
| L              | 0.25        | ---  | ---  | 0.010  | ---   | ---   |
| θ              | 0°          | ---  | 10°  | 0°     | ---   | 10°   |


STYLE 1:  
PIN 1. CATHODE  
2. ANODE

### SOLDERING FOOTPRINT\*



SCALE 10:1 ( $\frac{\text{mm}}{\text{inches}}$ )

\*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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