

# MBR130T1G, NRVB130T1G, MBR130T3G

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

#### 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



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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  | SOD-123<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| NRVB130T1G | SOD-123<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| MBR130T3G  | 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.

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

# MBR130T1G, NRVB130T1G, MBR130T3G

## 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 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.

## 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       |                   | $\mu\text{A}$ |

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# MBR130T1G, NRVB130T1G, MBR130T3G

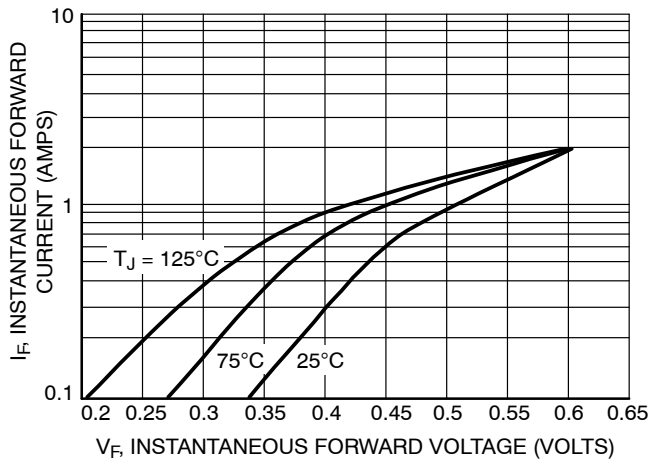


Figure 1. Maximum Forward Voltage

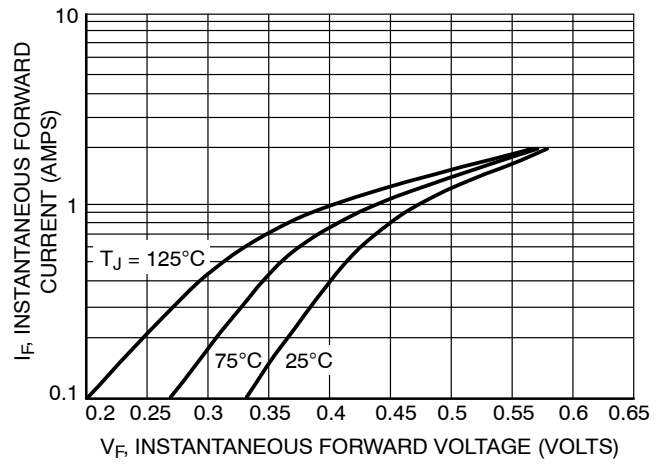


Figure 2. Typical Forward Voltage

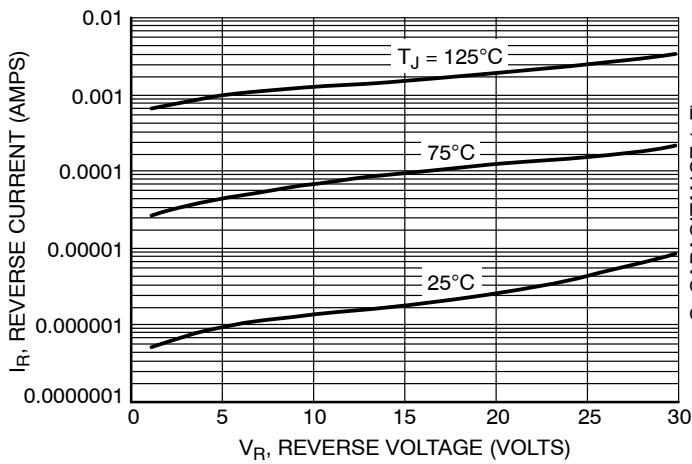


Figure 3. Typical Reverse Current

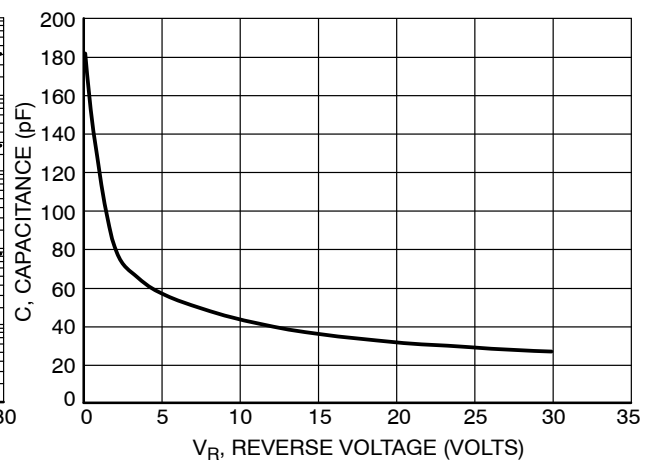


Figure 4. Typical Capacitance

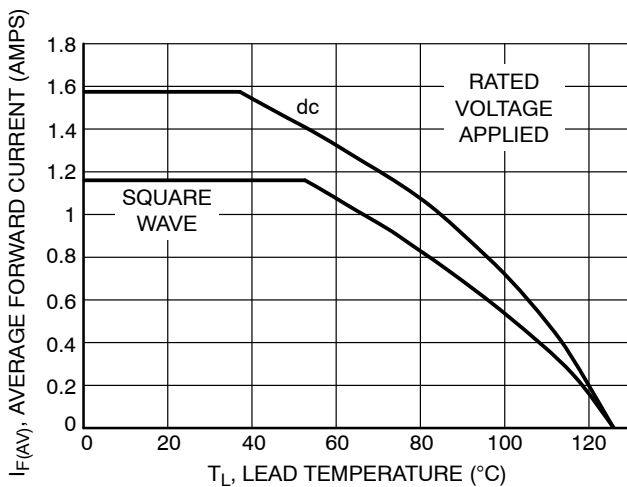


Figure 5. Current Derating, Lead,  $R_{\theta JL} = 108^{\circ}\text{C/W}$

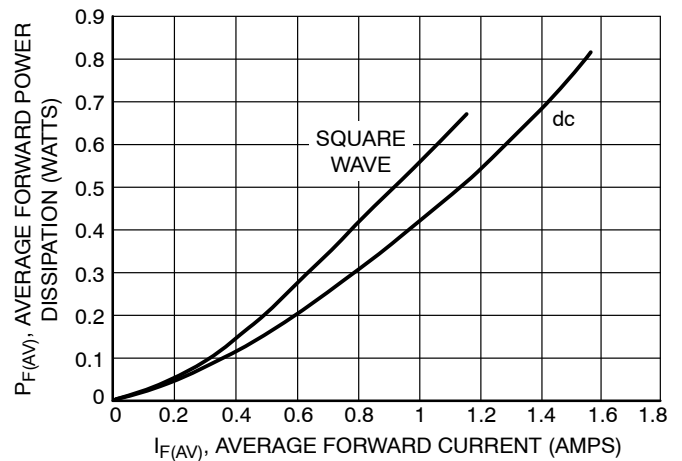
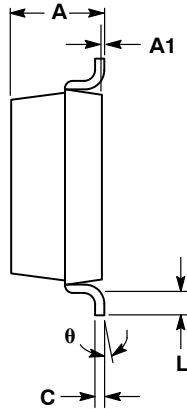
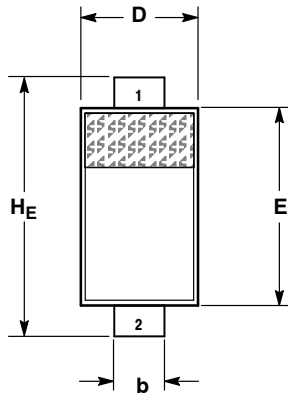


Figure 6. Forward Power Dissipation

# MBR130T1G, NRVB130T1G, MBR130T3G

## PACKAGE DIMENSIONS

SOD-123  
CASE 425-04  
ISSUE G

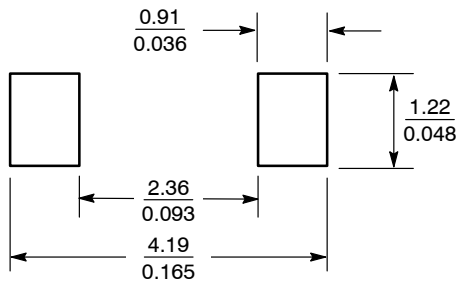


NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| 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_E | 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 (mm/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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