

# MBR0530T1G, NRVB0530T1G, MBR0530T3G, NRVB0530T3G

## Surface Mount Schottky Power Rectifier

### Plastic SOD-123 Package

The MBR0530T1/3 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. These state-of-the-art devices have the following features:

#### 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
- 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

- 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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### SCHOTTKY BARRIER RECTIFIER 0.5 AMPERES 30 VOLTS



SOD-123  
CASE 425  
STYLE 1

#### MARKING DIAGRAM



B3 = Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device      | Package          | Shipping†                   |
|-------------|------------------|-----------------------------|
| MBR0530T1G  | SMB<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| NRVB0530T1G | SMB<br>(Pb-Free) | 3,000 /<br>Tape & Reel **   |
| MBR0530T3G  | SMB<br>(Pb-Free) | 10,000 /<br>Tape & Reel *** |
| NRVB0530T3G | SMB<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 Specifications Brochure, BRD8011/D.

# MBR0530T1G, NRVB0530T1G, MBR0530T3G, NRVB0530T3G

## 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 $V_R$ , $T_L = 100^\circ\text{C}$ )                             | $I_{F(AV)}$                     | 0.5             | 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 +150     | $^\circ\text{C}$ |
| Operating Junction Temperature                                                                              | $T_J$                           | -65 to +125     | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )                                                                       | $dv/dt$                         | 1000            | V/ $\mu\text{s}$ |
| ESD Rating:<br>Machine Model = C<br>Human Body Model = 3B                                                   |                                 | > 400<br>> 8000 | V                |

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) | $R_{\theta JA}$ | 206   | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance – Junction-to-Lead             | $R_{\theta JL}$ | 150   | $^\circ\text{C}/\text{W}$ |

1. 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                     | Symbol | Value         | Unit          |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $i_F = 0.1$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $i_F = 0.5$ Amps, $T_J = 25^\circ\text{C}$ ) | $V_F$  | 0.375<br>0.43 | V             |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated DC Voltage, $T_C = 25^\circ\text{C}$ )<br>( $V_R = 15$ V, $T_C = 25^\circ\text{C}$ )      | $I_R$  | 130<br>20     | $\mu\text{A}$ |

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

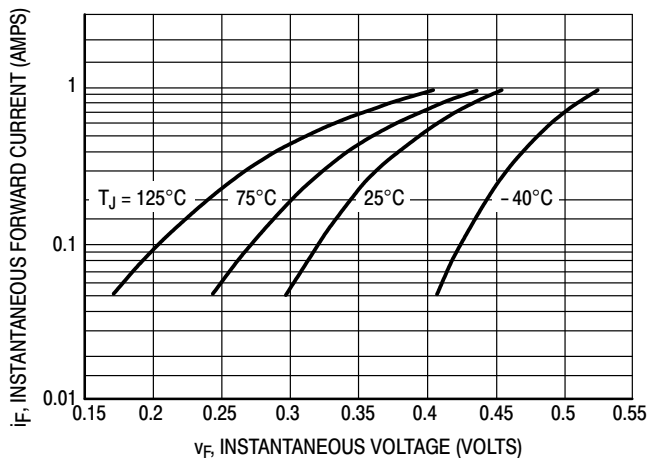


Figure 1. Typical Forward Voltage

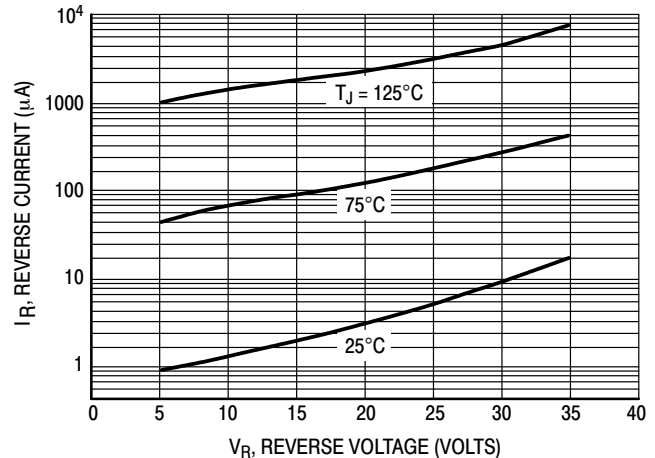


Figure 2. Typical Reverse Current

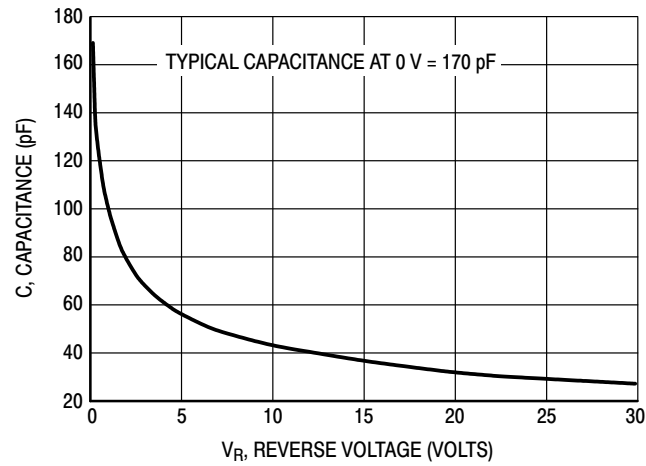


Figure 3. Typical Capacitance

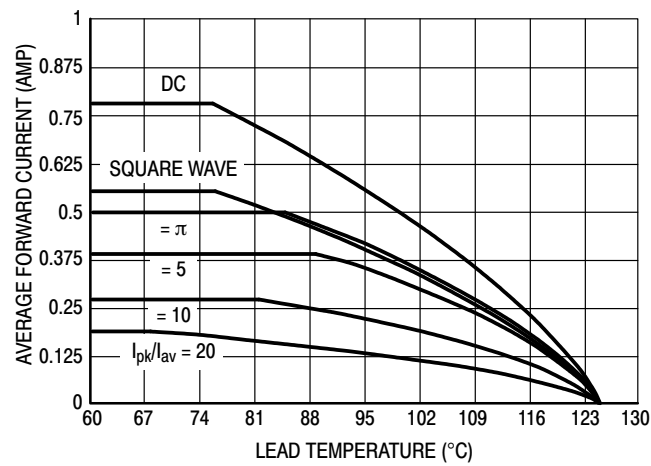


Figure 4. Current Derating (Lead)

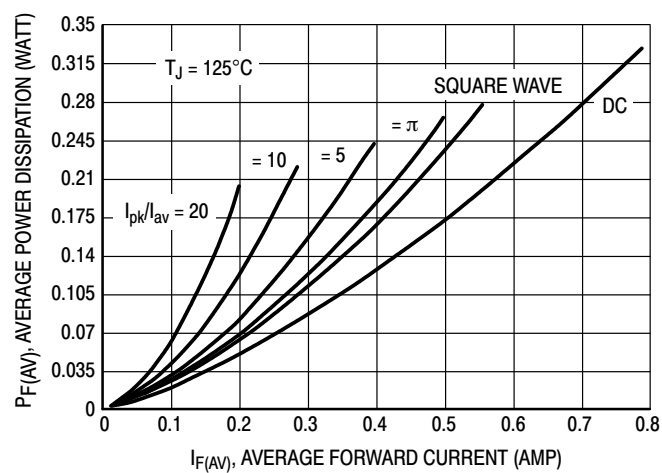
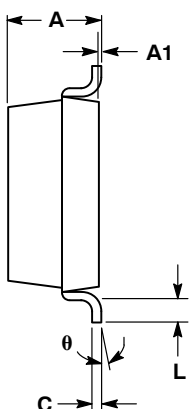
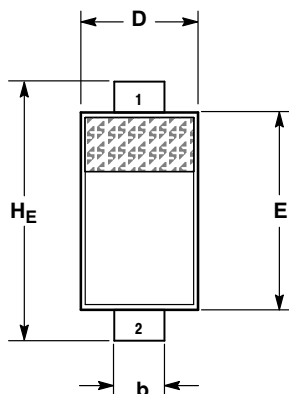


Figure 5. Power Dissipation

# MBR0530T1G, NRVB0530T1G, MBR0530T3G, NRVB0530T3G

## PACKAGE DIMENSIONS

SOD-123  
CASE 425-04  
ISSUE G

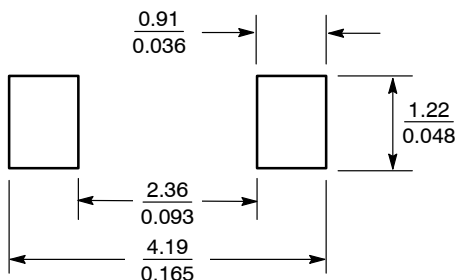


NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI  
Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| 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)

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MBR0530T1/D

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