

# MBRA130LT3G, NRVBA130LT3G

## Surface Mount Schottky Power Rectifier

### SMA Power Surface Mount Package

This device employs the Schottky Barrier principle in a metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

#### Features

- Compact Package with J-Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over-Voltage Protection
- Low Forward Voltage Drop
- AEC-Q101 Qualified and PPAP Capable
- NRVBA Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

#### Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 70 mg (approximately)
- 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
- Polarity: Cathode Lead Indicated by Either Notch in Plastic Body or Polarity Band
- Device Meets MSL1 Requirements
- ESD Ratings:
  - ◆ Machine Model = C (> 400 V)
  - ◆ Human Body Model = 3B (> 8000 V)



ON Semiconductor®

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



**SMA  
CASE 403D  
PLASTIC**

#### MARKING DIAGRAM



B1L3 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

#### ORDERING INFORMATION

| Device       | Package          | Shipping†                 |
|--------------|------------------|---------------------------|
| MBRA130LT3G  | SMA<br>(Pb-Free) | 5,000 /<br>Tape & Reel ** |
| NRVBA130LT3G | SMA<br>(Pb-Free) | 5,000 /<br>Tape & Reel ** |

\*\* 12 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.

# MBRA130LT3G, NRVBA130LT3G

## 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 $V_R$ , $T_C = 105^\circ\text{C}$ )                          | $I_O$                           | 1.0         | A                |
| Peak Repetitive Forward Current<br>(At Rated $V_R$ , Square Wave, 100 kHz, $T_C = 105^\circ\text{C}$ )      | $I_{FRM}$                       | 2.0         | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 25          | A                |
| Storage Temperature   | $T_{stg}$                       | -55 to +150 | $^\circ\text{C}$ |
| Operating Junction Temperature  | $T_J$                           | -55 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change, (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )   | dv/dt                           | 10,000      | 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-Lead (Note 1)    | $R_{\theta JL}$ | 35    | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance — Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 86    |                           |

1. Mounted on 2" Square PC Board with 1" Square Total Pad Size, PC Board FR4.

## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol | Value                    |                           | Unit  |
|---|--------|--------------------------|---------------------------|-------|
|   |        | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ |       |
| Maximum Instantaneous Forward Voltage (Note 2)<br><br>( $I_F = 1.0\text{ A}$ ) see Figure 2<br>( $I_F = 2.0\text{ A}$ ) | $V_F$  | 0.41                     | 0.35                      | Volts |
|   |        | 0.47                     | 0.43                      |       |
| Maximum Instantaneous Reverse Current<br><br>( $V_R = 30\text{ V}$ ) see Figure 4<br>( $V_R = 15\text{ V}$ )            | $I_R$  | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ | mA    |
|   |        | 1.0                      | 25                        |       |
|   |        | 0.4                      | 12                        |       |

2. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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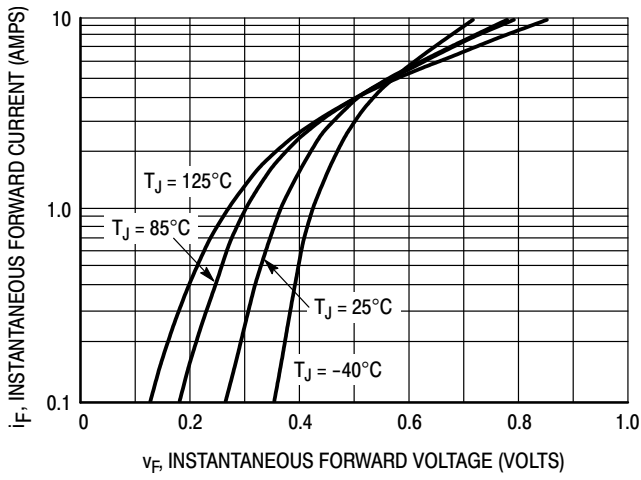


Figure 1. Typical Forward Voltage

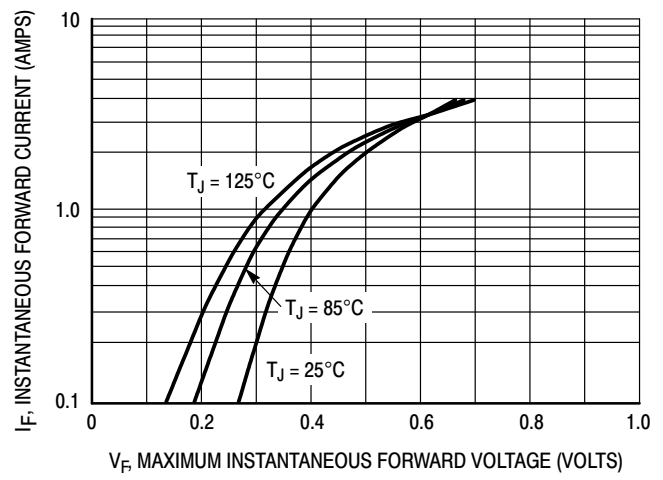


Figure 2. Maximum Forward Voltage

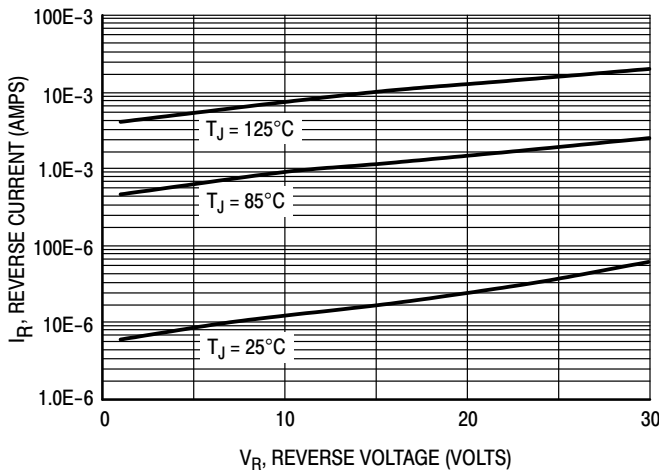


Figure 3. Typical Reverse Current

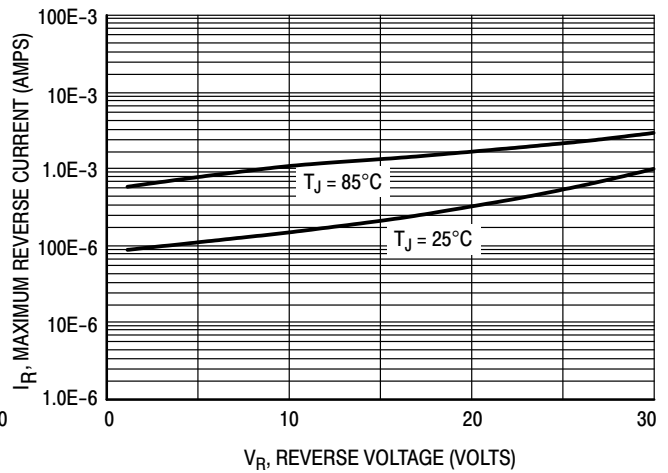


Figure 4. Maximum Reverse Current

# MBRA130LT3G, NRVBA130LT3G

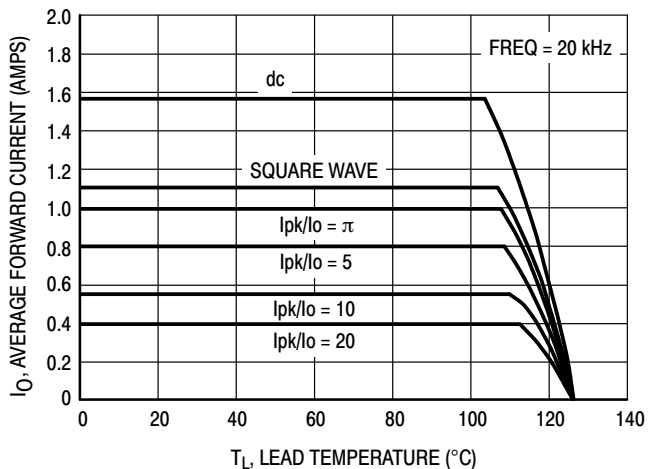


Figure 5. Current Derating

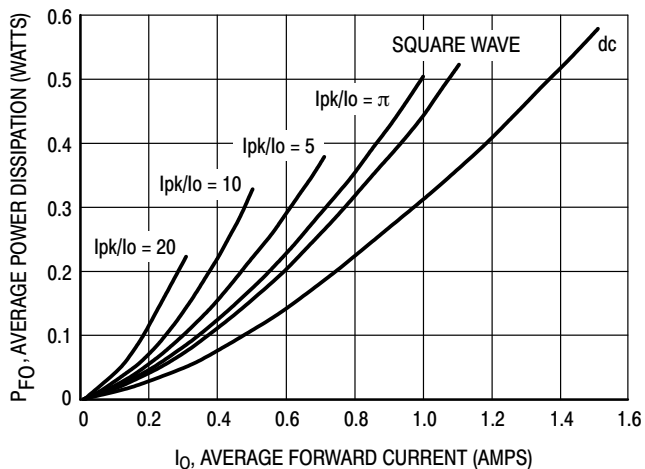


Figure 6. Forward Power Dissipation

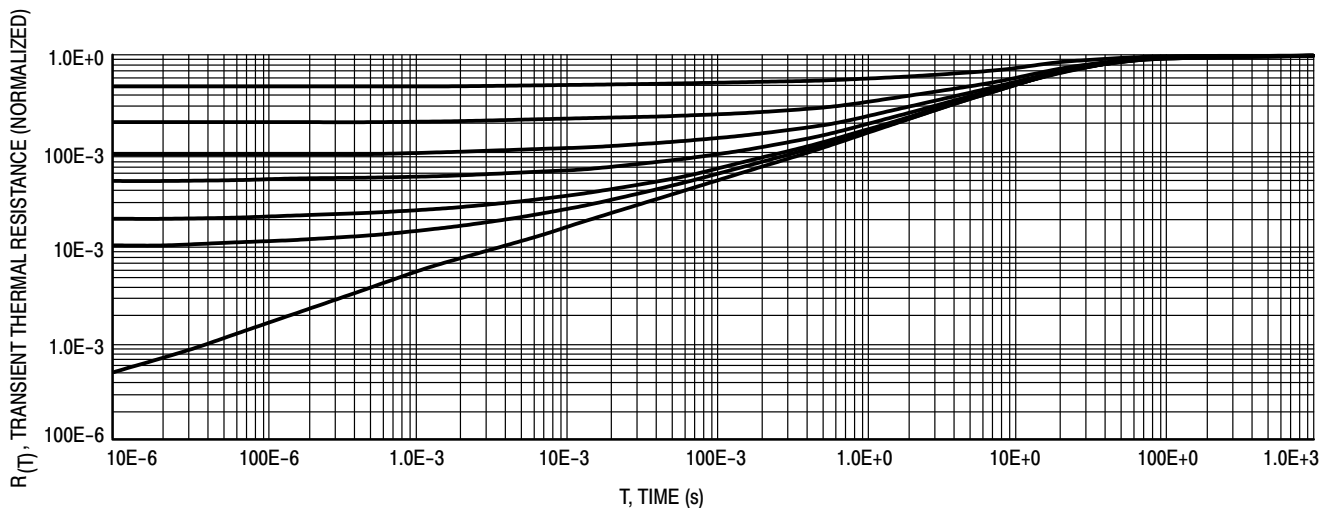


Figure 7. Thermal Response

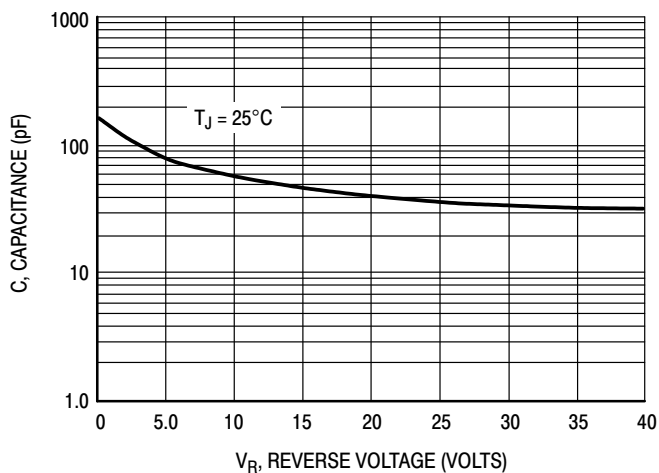
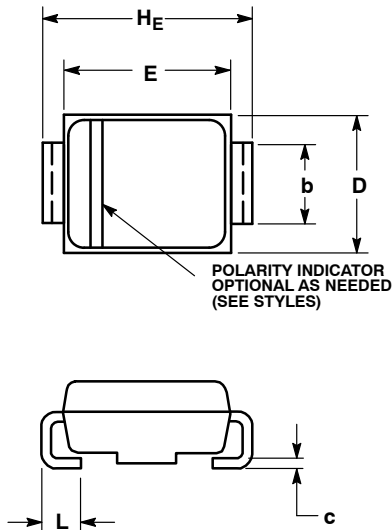


Figure 8. Capacitance

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## PACKAGE DIMENSIONS

SMA  
CASE 403D-02  
ISSUE F

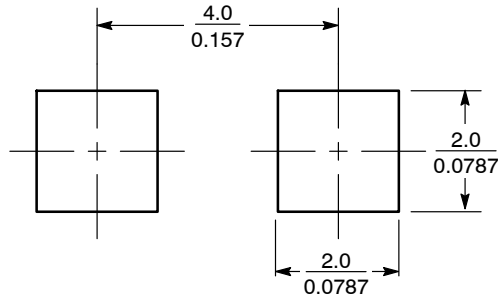


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 403D-01 OBSOLETE, NEW STANDARD IS 403D-02.

| DIM | MILLIMETERS |      |      | INCHES |       |       |
|-----|-------------|------|------|--------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A   | 1.97        | 2.10 | 2.20 | 0.078  | 0.083 | 0.087 |
| A1  | 0.05        | 0.10 | 0.15 | 0.002  | 0.004 | 0.006 |
| b   | 1.27        | 1.45 | 1.63 | 0.050  | 0.057 | 0.064 |
| c   | 0.15        | 0.28 | 0.41 | 0.006  | 0.011 | 0.016 |
| D   | 2.29        | 2.60 | 2.92 | 0.090  | 0.103 | 0.115 |
| E   | 4.06        | 4.32 | 4.57 | 0.160  | 0.170 | 0.180 |
| HE  | 4.83        | 5.21 | 5.59 | 0.190  | 0.205 | 0.220 |
| L   | 0.76        | 1.14 | 1.52 | 0.030  | 0.045 | 0.060 |

- STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

### SOLDERING FOOTPRINT\*



SCALE 8:1 (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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