



**THE DATASHEET OF  
NRVUHS160VT3G**



# 600 V, 1.0 A Ultrafast Rectifier

## MURHS160T3, NRVUHS160V, SURHS8160

### ULTRAFAST RECTIFIER 1.0 AMPERES 600 VOLTS

#### Features and Benefits

- Ultrafast 35 Nanosecond Recovery Times
- 175°C Operating Junction Temperature
- High Temperature Glass Passivated Junction
- High Voltage Capability to 600 V
- NRVUHS and SURHS8 Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

#### Applications

- Power Supplies
- Inverters
- Free Wheeling Diodes

#### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 95 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Cathode Polarity Band

#### 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>$V_R$ | 600              | V    |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_L = 145^\circ\text{C}$ )                               | $I_{F(AV)}$                     | 1.0              | A    |
| Nonrepetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions<br>Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 15               | A    |
| Operating Junction and Storage<br>Temperature Range   | $T_J, T_{stg}$                  | -65 to +175      | °C   |
| ESD Ratings:<br>Charged Device Model<br>Human Body Model = 3B   |                                 | > 1000<br>> 8000 | V    |

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.



SMB  
CASE 403A  
PLASTIC



#### MARKING DIAGRAM



- UH16 = Specific Device Code
  - AL = Assembly Location
  - Y = Year
  - WW = Work Week
  - = Pb-Free Package
- (Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device  | Package          | Shipping†              |
|---|------------------|------------------------|
| MURHS160T3G<br>NRVUHS160VT3G<br>NRVUHS160VT3G-GA01<br>SURHS8160T3G<br>SURHS8160T3G-GA01 | SMB<br>(Pb-Free) | 2,500 /<br>Tape & 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](#).

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## THERMAL CHARACTERISTICS

| Rating   | Symbol          | Value | Unit                        |
|--|-----------------|-------|-----------------------------|
| Maximum Thermal Resistance, Junction-to-Lead (Note 1)    | $R_{\theta JL}$ | 24    | $^{\circ}\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 80    | $^{\circ}\text{C}/\text{W}$ |

1. Mounted with minimum recommended pad size, PC Board FR4.
2. 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.

## ELECTRICAL CHARACTERISTICS

| Rating   | Symbol   | Typ         | Max        | Unit          |
|--|----------|-------------|------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 3)<br>( $I_F = 1.0\text{ A}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $I_F = 1.0\text{ A}$ , $T_C = 125^{\circ}\text{C}$ )            | $V_F$    | 1.5<br>1.2  | 2.4<br>1.7 | V             |
| Maximum Instantaneous Reverse Current (Note 3)<br>(Rated dc Voltage, $T_C = 25^{\circ}\text{C}$ )<br>(Rated dc Voltage, $T_C = 125^{\circ}\text{C}$ )                        | $I_R$    | 0.18<br>5.0 | 20<br>200  | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )<br>( $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{REC} = 0.25\text{ A}$ ) | $t_{rr}$ | 25<br>16    | 35<br>30   | ns            |

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.

3. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

TYPICAL CHARACTERISTICS

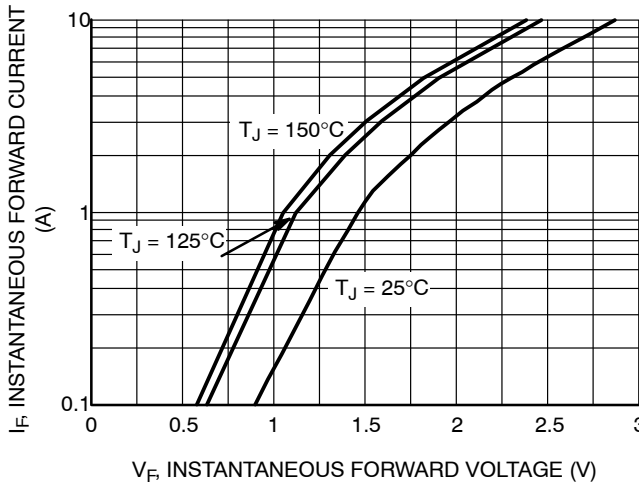


Figure 1. Typical Forward Voltage

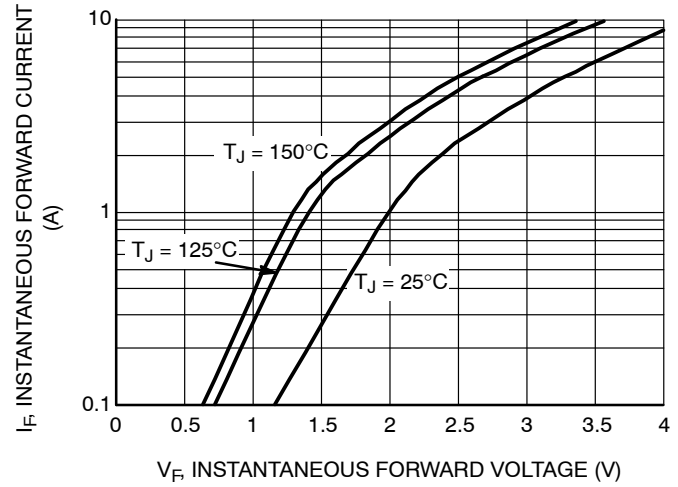


Figure 2. Maximum Forward Voltage

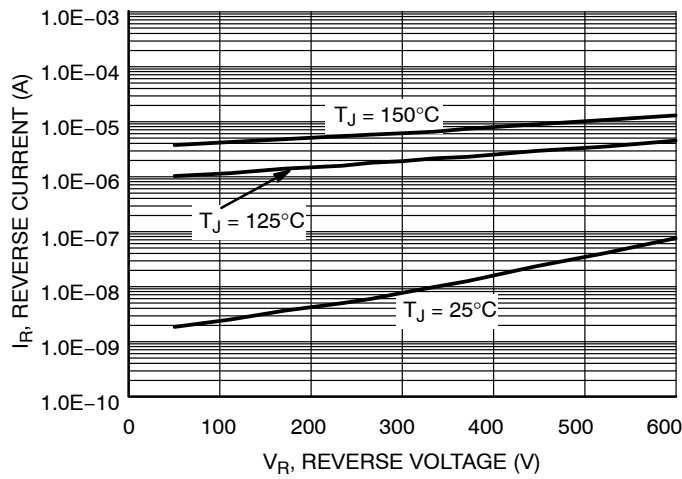


Figure 3. Typical Reverse Current

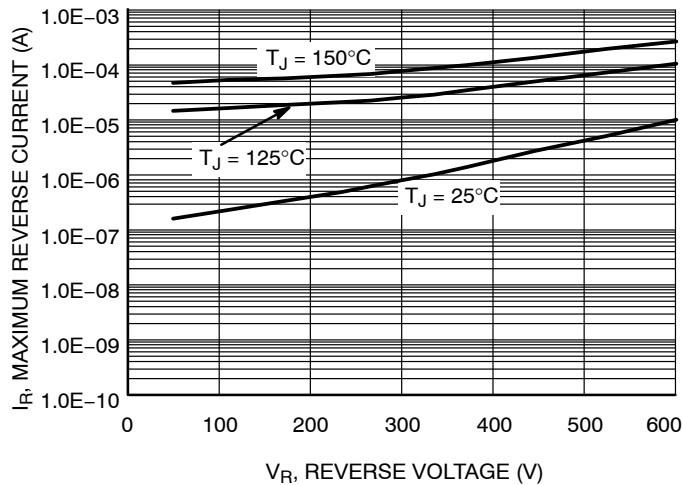


Figure 4. Maximum Reverse Current

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## TYPICAL CHARACTERISTICS

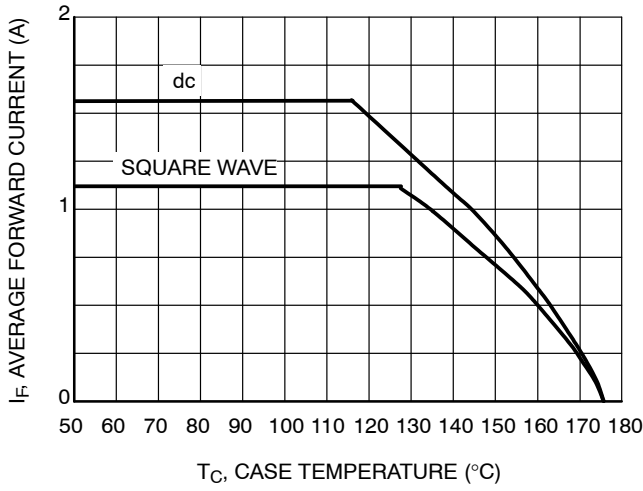


Figure 5. Current Derating

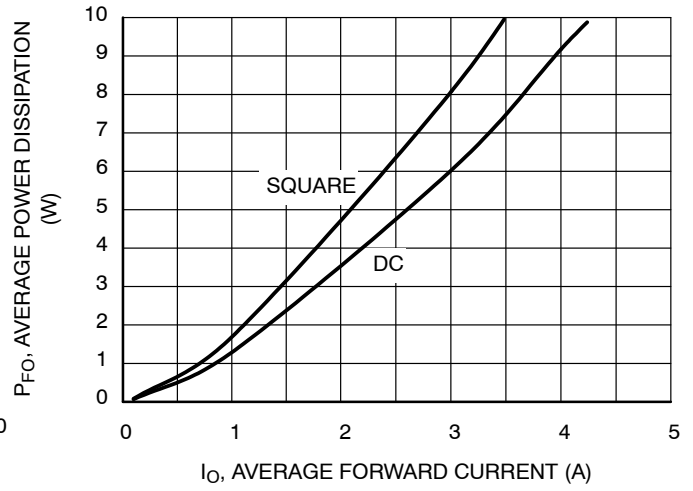


Figure 7. Forward Power Dissipation

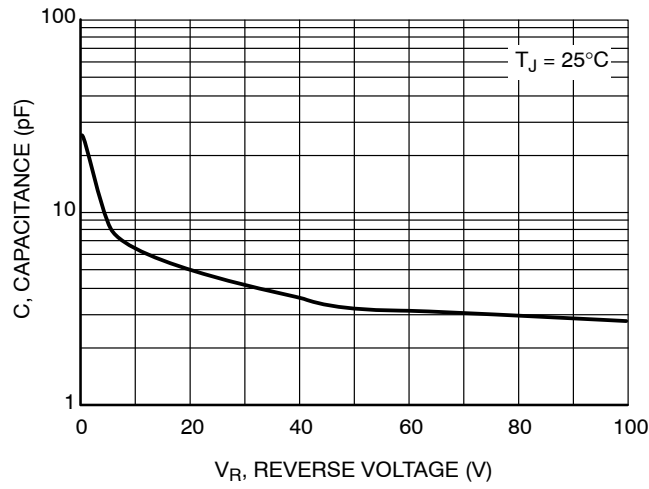


Figure 6. Capacitance

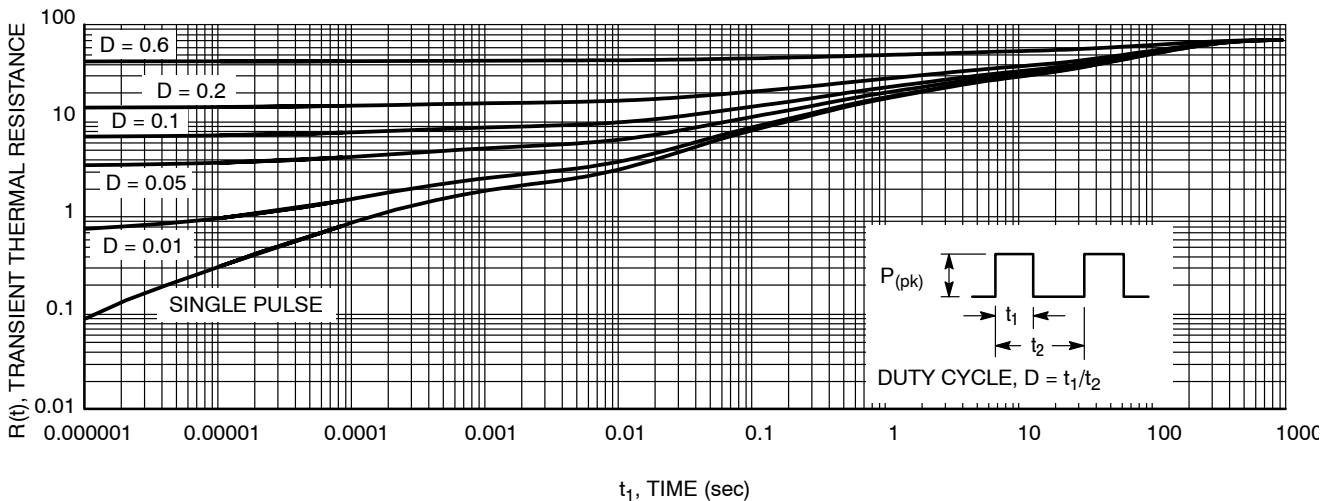


Figure 8. Thermal Response Junction-to-Ambient

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

Polarity Band



SCALE 1:1

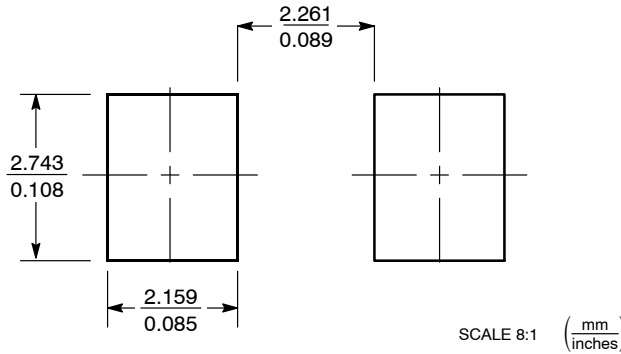
Non-Polarity Band

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CASE 403A-03  
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**SOLDERING FOOTPRINT\***

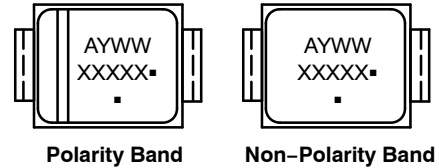


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L1.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.95        | 2.30 | 2.47 | 0.077     | 0.091 | 0.097 |
| A1  | 0.05        | 0.10 | 0.20 | 0.002     | 0.004 | 0.008 |
| b   | 1.96        | 2.03 | 2.20 | 0.077     | 0.080 | 0.087 |
| c   | 0.15        | 0.23 | 0.31 | 0.006     | 0.009 | 0.012 |
| D   | 3.30        | 3.56 | 3.95 | 0.130     | 0.140 | 0.156 |
| E   | 4.06        | 4.32 | 4.60 | 0.160     | 0.170 | 0.181 |
| HE  | 5.21        | 5.44 | 5.60 | 0.205     | 0.214 | 0.220 |
| L   | 0.76        | 1.02 | 1.60 | 0.030     | 0.040 | 0.063 |
| L1  | 0.51 REF    |      |      | 0.020 REF |       |       |

**GENERIC MARKING DIAGRAM\***



- XXXXX = Specific Device Code
  - A = Assembly Location
  - Y = Year
  - WW = Work Week
  - = Pb-Free Package
- (Note: Microdot may be in either location)

\*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.

|                         |                    |  |
|-------------------------|--------------------|--|
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