

# MURS220T3G, NRVUS220VT3G, SURS8220T3G

## Surface Mount Ultrafast Power Rectifiers

Ideally suited for high voltage, high frequency rectification, or as free wheeling and protection diodes in surface mount applications where compact size and weight are critical to the system.

### Features

- Small Compact Surface Mountable Package with J-Bend Leads
- Rectangular Package for Automated Handling
- High Temperature Glass Passivated Junction
- Low Forward Voltage Drop  
(0.77 Volts Max @ 2.0 A,  $T_J = 150^\circ\text{C}$ )
- NRVUS and SURS8 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

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 95 mg (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Max. for 10 Seconds
- Shipped in 12 mm Tape and Reel, 2500 units per reel
- Polarity: Polarity Band Indicates Cathode Lead
- Marking: U2D
- ESD Ratings:
  - ◆ Machine Model = C (> 400 V)
  - ◆ Human Body Model = 3B (> 8 kV)



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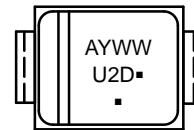
[www.onsemi.com](http://www.onsemi.com)

## ULTRAFAST RECTIFIERS 2 AMPERES 200 VOLTS



SMB  
CASE 403A

### MARKING DIAGRAM



U2D = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device       | Package          | Shipping†              |
|--------------|------------------|------------------------|
| MURS220T3G   | SMB<br>(Pb-Free) | 2,500 /<br>Tape & Reel |
| NRVUS220VT3G | SMB<br>(Pb-Free) | 2,500 /<br>Tape & Reel |
| SURS8220T3G  | 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 Specification Brochure, BRD8011/D.

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## 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>$V_R$ | 200                             | V                |
| Average Rectified Forward Current   | $I_{F(AV)}$                     | 2.0 @ $T_L = 145^\circ\text{C}$ | A                |
| Non-Repetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 40                              | A                |
| Operating Junction Temperature Range  | $T_J$                           | -65 to +175                     | $^\circ\text{C}$ |

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 Lead<br>( $T_L = 25^\circ\text{C}$ ) | $R_{\theta JL}$ | 13    | $^\circ\text{C/W}$ |

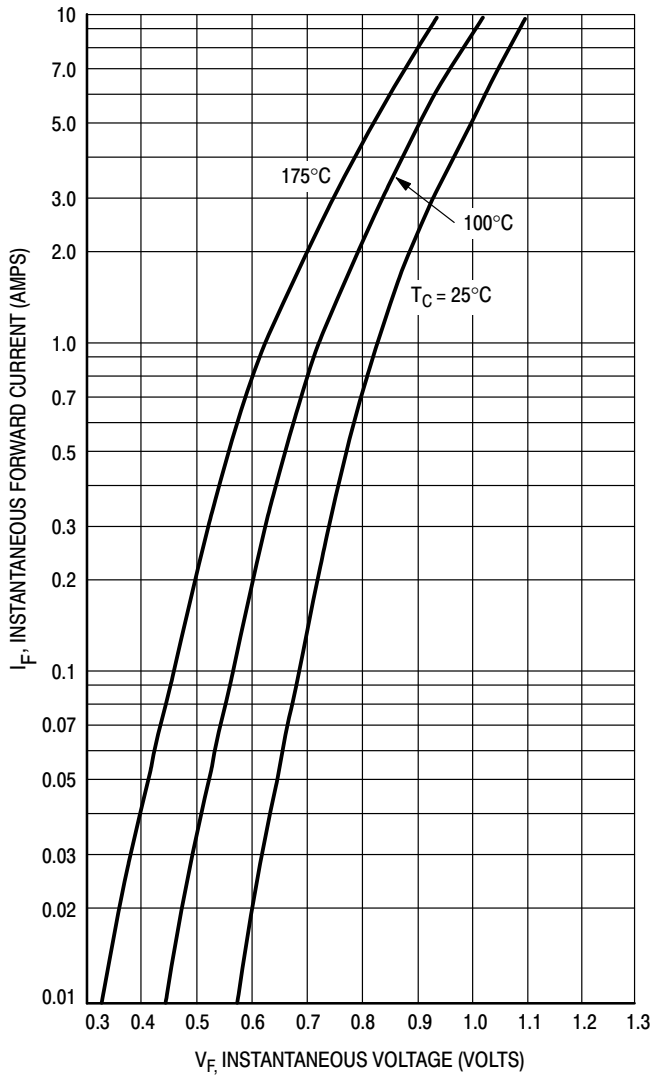
## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol   | Value        | Unit          |
|---|----------|--------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 2.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 2.0\text{ A}$ , $T_J = 150^\circ\text{C}$ )               | $V_F$    | 0.95<br>0.77 | Volts         |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 150^\circ\text{C}$ )                           | $I_R$    | 2.0<br>50    | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )<br>( $I_F = 0.5\text{ A}$ , $i_R = 1.0\text{ A}$ , $I_R$ to $0.25\text{ A}$ ) | $t_{rr}$ | 35<br>25     | ns            |
| Maximum Forward Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , Rec. to $1.0\text{ V}$ )   | $t_{fr}$ | 25           | ns            |

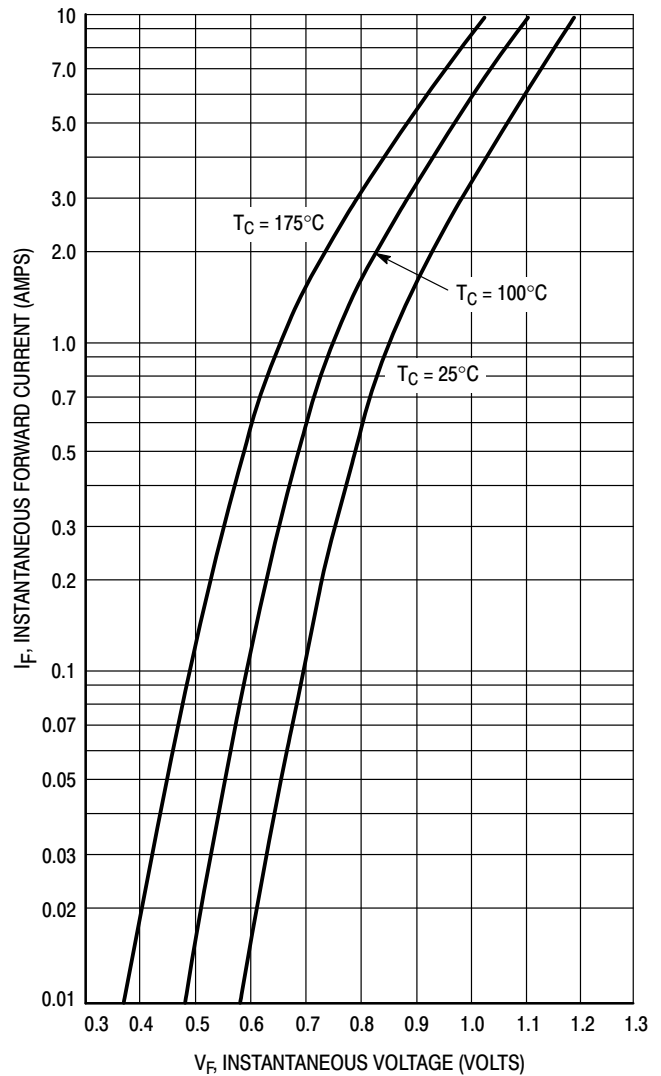
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

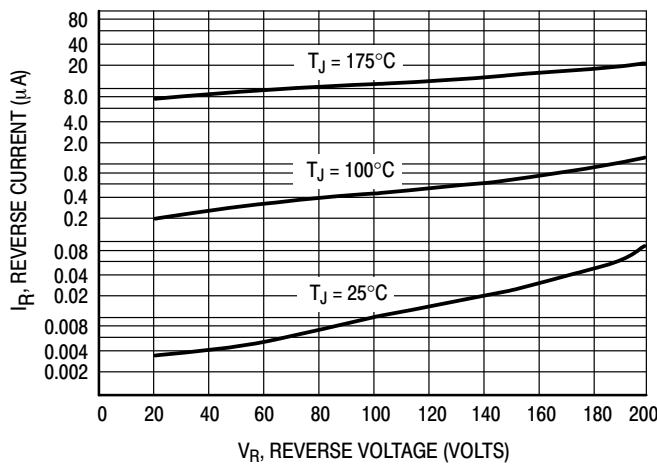
# MURS220T3G, NRVUS220VT3G, SURS8220T3G



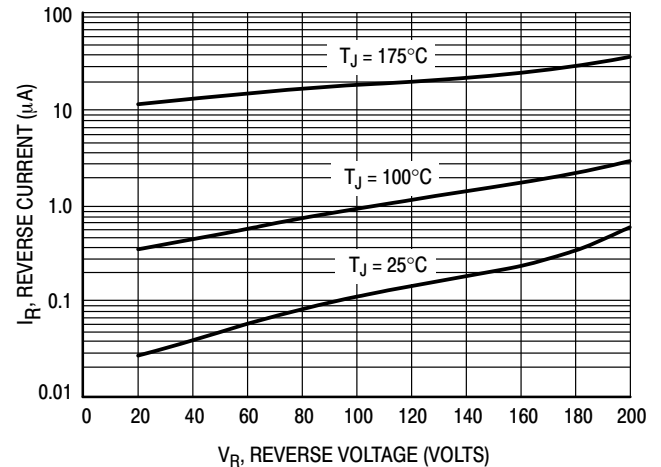
**Figure 1. Typical Forward Voltage**



**Figure 2. Maximum Forward Voltage**



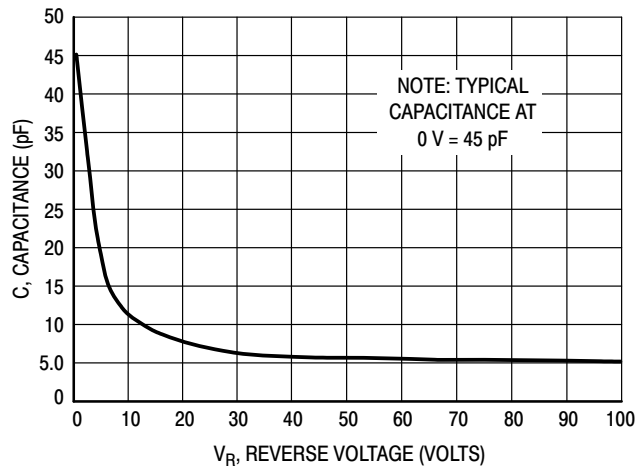
**Figure 3. Typical Reverse Current\***



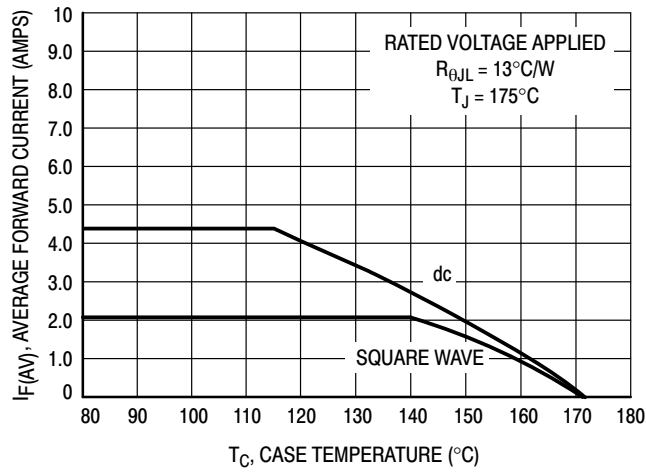
**Figure 4. Maximum Reverse Current**

\* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if applied  $V_R$  is sufficiently below rated  $V_R$ .

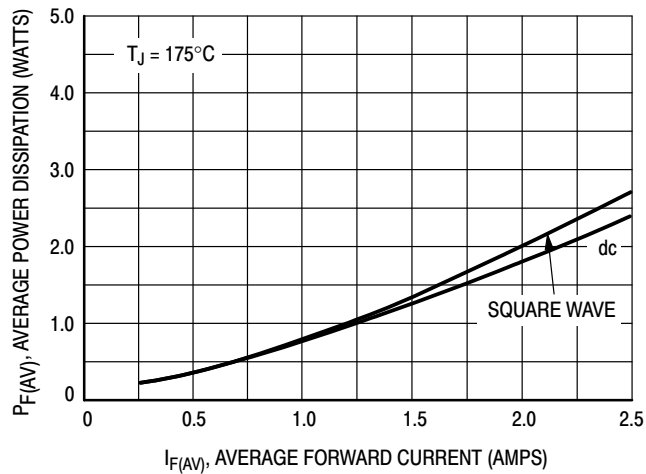
**MURS220T3G, NRVUS220VT3G, SURS8220T3G**



**Figure 5. Typical Capacitance**



**Figure 6. Current Derating, Case**



**Figure 7. Power Dissipation**

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

Polarity Band



SCALE 1:1

Non-Polarity Band

**SMB**  
CASE 403A-03  
ISSUE J

DATE 19 JUL 2012



**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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