

# MURS120T3G Series, SURS8120T3G Series

## Surface Mount Ultrafast Power Rectifiers

MURS105T3G, MURS110T3G, MURS115T3G,  
MURS120T3G, MURS140T3G, MURS160T3G,  
SURS8105T3G, SURS8110T3G, SURS8115T3G,  
SURS8120T3G, SURS8140T3G, SURS8160T3G

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 (0.71 to 1.05 V Max @ 1.0 A,  $T_J = 150^\circ\text{C}$ )
- AEC-Q101 Qualified and PPAP Capable
- SURS8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- These are Pb-Free Packages

### 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
- Polarity: Polarity Band Indicates Cathode Lead
- ESD Rating:
  - ♦ Human Body Model = 3B (> 8 kV)
  - ♦ Machine Model = C (> 400 V)



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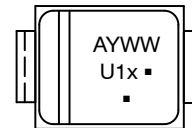
<http://onsemi.com>

ULTRAFAST RECTIFIERS  
1.0 AMPERE, 50–600 VOLTS



SMB  
CASE 403A

### MARKING DIAGRAM



A = Assembly Location\*  
Y = Year  
WW = Work Week  
U1 = Device Code  
x = A, B, C, D, G, or J  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\* The Assembly Location code (A) is front side optional. In cases where the Assembly Location is stamped in the package bottom (molding ejector pin), the front side assembly code may be blank.

### ORDERING INFORMATION

See detailed ordering and shipping information in the table on page 2 of this data sheet.

### DEVICE MARKING INFORMATION

See general marking information in the device marking table on page 2 of this data sheet.

# MURS120T3G Series, SURS8120T3G Series

## MAXIMUM RATINGS

| Rating                                                                                                    | Symbol                          | MURS/SURS8                                                             |       |       |       |                                                                        |       | Unit               |
|-----------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------|-------|-------|-------|------------------------------------------------------------------------|-------|--------------------|
|                                                                                                           |                                 | 105T3                                                                  | 110T3 | 115T3 | 120T3 | 140T3                                                                  | 160T3 |                    |
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                    | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50                                                                     | 100   | 150   | 200   | 400                                                                    | 600   | V                  |
| Average Rectified Forward Current                                                                         | $I_{F(AV)}$                     | 1.0 @ $T_L = 155^{\circ}\text{C}$<br>2.0 @ $T_L = 145^{\circ}\text{C}$ |       |       |       | 1.0 @ $T_L = 150^{\circ}\text{C}$<br>2.0 @ $T_L = 125^{\circ}\text{C}$ |       | A                  |
| Non-Repetitive Peak Surge Current, (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 40                                                                     |       |       |       | 35                                                                     |       | A                  |
| Operating Junction Temperature                                                                            | $T_J$                           | - 65 to +175                                                           |       |       |       |                                                                        |       | $^{\circ}\text{C}$ |

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

| Rating                                                              | Symbol          | MURS/SURS8 |       |       |       |       |       | Unit               |
|---------------------------------------------------------------------|-----------------|------------|-------|-------|-------|-------|-------|--------------------|
|                                                                     |                 | 105T3      | 110T3 | 115T3 | 120T3 | 140T3 | 160T3 |                    |
| Thermal Resistance<br>Junction-to-Lead ( $T_L = 25^\circ\text{C}$ ) | $R_{\theta JL}$ | 13         |       |       |       |       |       | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

|                                                                                                                                                                   |          |               |  |  |  |              |  |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------|--|--|--|--------------|--|---------------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 1.0\text{ A}$ , $T_J = 150^\circ\text{C}$ )     | $V_F$    | 0.875<br>0.71 |  |  |  | 1.25<br>1.05 |  | V             |
| 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     |  |  |  | 5.0<br>150   |  | $\mu\text{A}$ |
| 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 A) | $t_{rr}$ | 35<br>25      |  |  |  | 75<br>50     |  | ns            |
| Maximum Forward Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , Rec. to 1.0 V)                                                     | $t_{fr}$ | 25            |  |  |  | 50           |  | ns            |

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

## DEVICE MARKING AND ORDERING INFORMATION

| Device                     | Marking | Package          | Shipping <sup>†</sup>     |
|----------------------------|---------|------------------|---------------------------|
| MURS105T3G,<br>SURS8105T3G | U1A     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS110T3G,<br>SURS8110T3G | U1B     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS115T3G,<br>SURS8115T3G | U1C     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS120T3G,<br>SURS8120T3G | U1D     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS140T3G,<br>SURS8140T3G | U1G     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS160T3G,<br>SURS8160T3G | U1J     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |

<sup>†</sup>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.

# MURS120T3G Series, SURS8120T3G Series

MURS105T3G, MURS110T3G, MURS115T3G, MURS120T3G,  
SURS8105T3G, SURS8110T3G, SURS8115T3G, SURS8120T3G

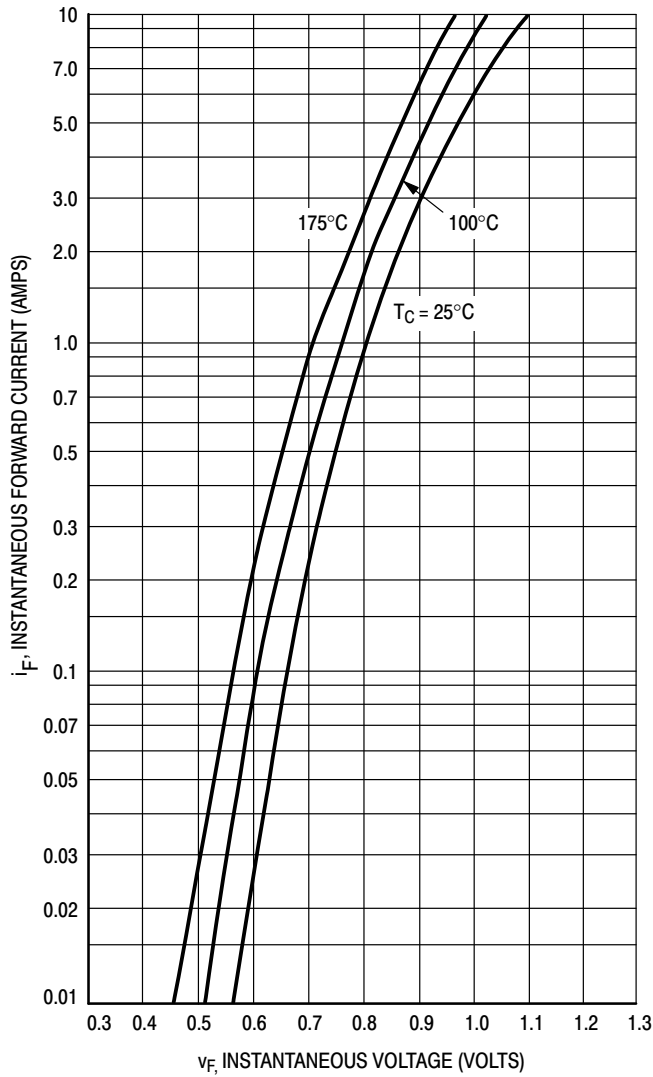


Figure 1. Typical Forward Voltage

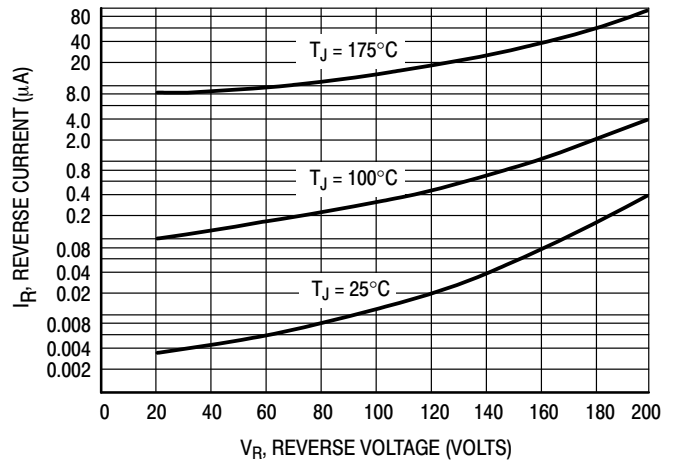


Figure 2. Typical Reverse Current\*

\*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  $V_R$ .

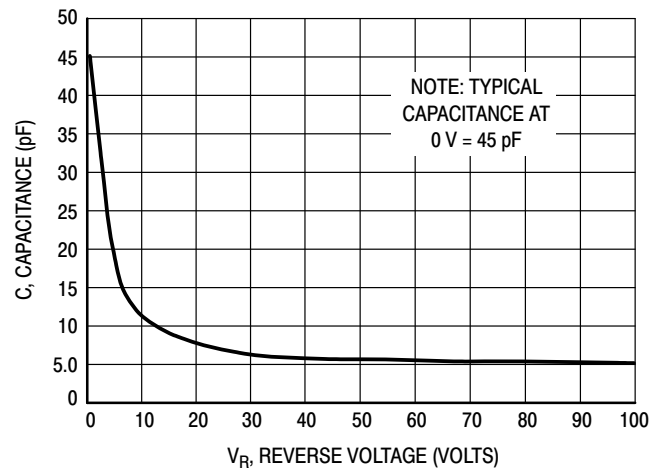


Figure 3. Typical Capacitance

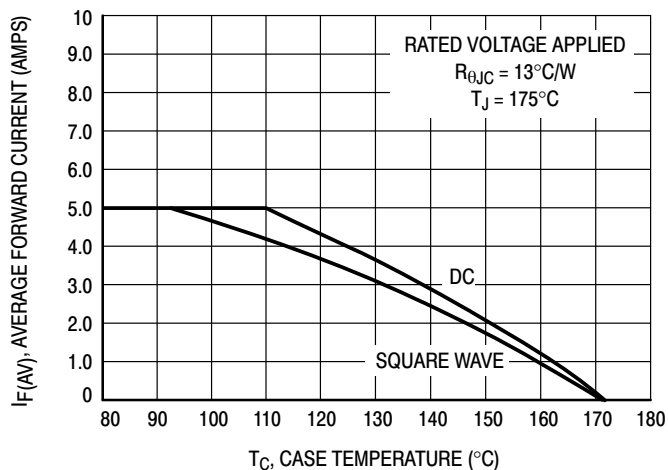


Figure 4. Current Derating, Case

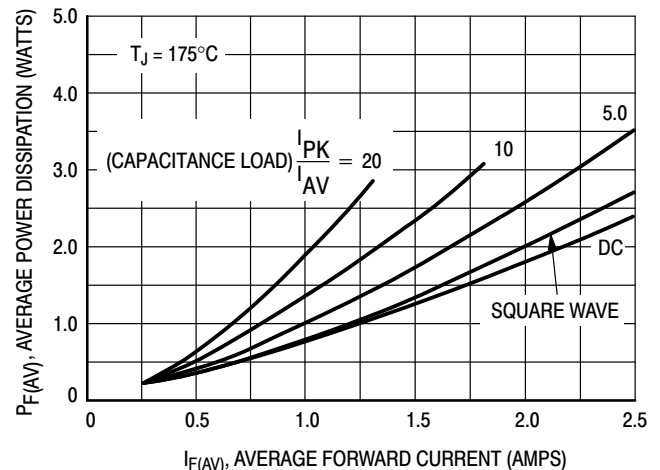


Figure 5. Power Dissipation

# MURS120T3G Series, SURS8120T3G Series

## MURS140T3G, MURS160T3G, SURS8140T3G, SURS8160T3G

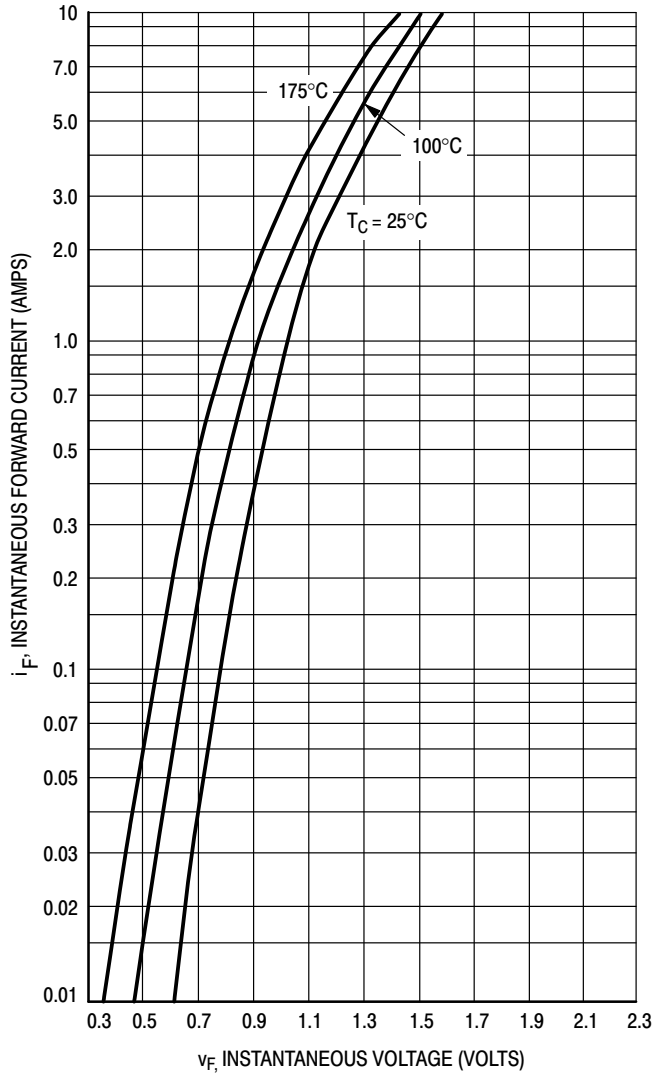


Figure 6. Typical Forward Voltage

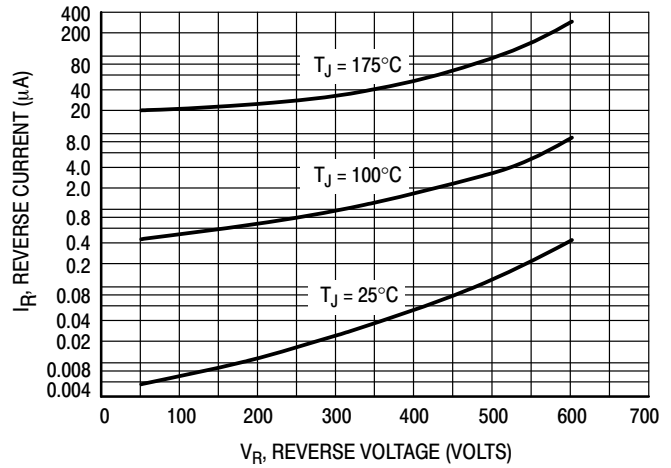


Figure 7. Typical Reverse Current\*

\*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  $V_R$ .

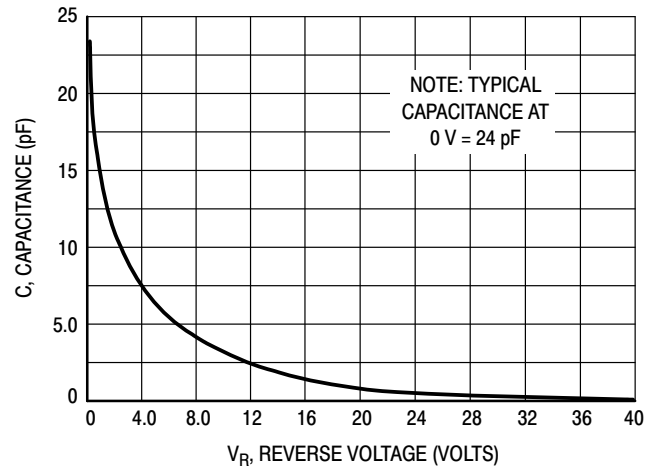


Figure 8. Typical Capacitance

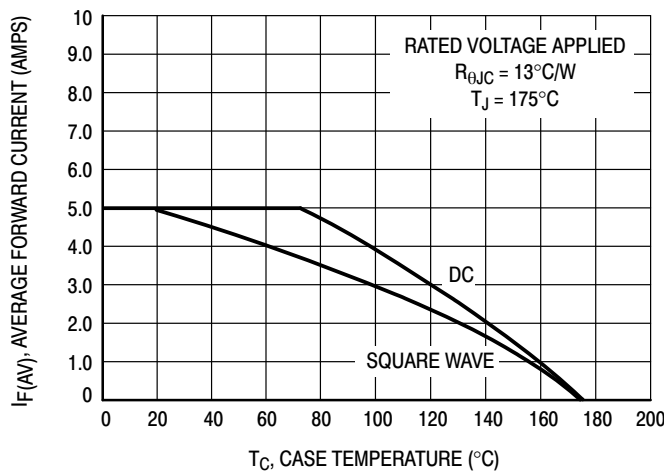


Figure 9. Current Derating, Case

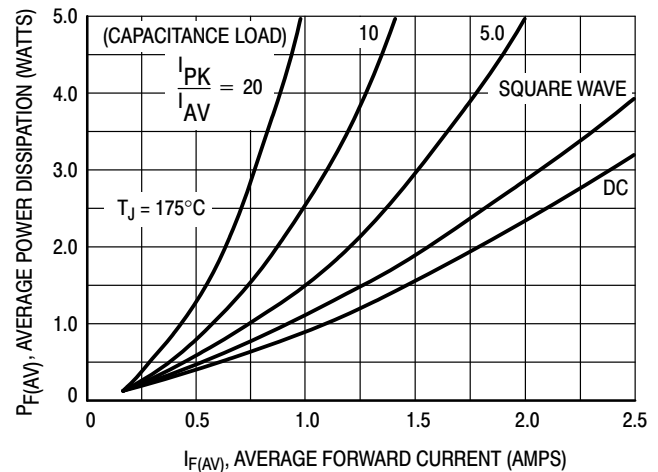
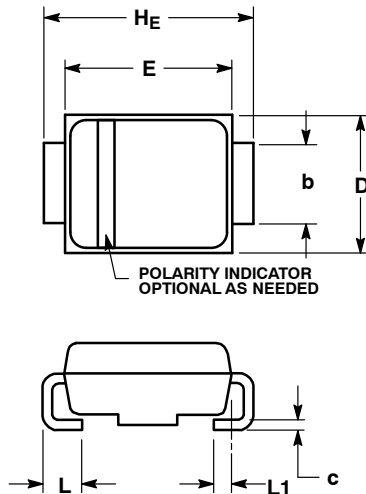


Figure 10. Power Dissipation

# MURS120T3G Series, SURS8120T3G Series

## PACKAGE DIMENSIONS

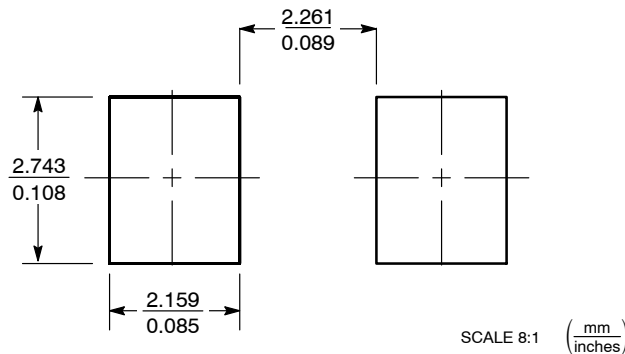
### SMB CASE 403A-03 ISSUE H



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

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.90        | 2.20 | 2.28 | 0.075     | 0.087 | 0.090 |
| A1  | 0.05        | 0.10 | 0.19 | 0.002     | 0.004 | 0.007 |
| 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 |       |       |

### 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.

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