

# Power Rectifier, Ultra-Fast Recovery, 1 A, 50-600 V

**MURS105, MURS110,  
MURS120, MURS140,  
MURS160, NRVUS110V,  
NRVUS120V, NRVUS160V**

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,  $T_J = 150^\circ\text{C}$ )
- 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:

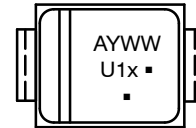
- Case: Epoxy, Molded
- Weight: 95 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Max. for 10 Seconds
- Polarity: Polarity Band Indicates Cathode Lead
- ESD Rating:
  - ♦ Human Body Model = 3B (> 8 kV)
  - ♦ Charged Device Model > 1000 V

## 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 3 of this data sheet.

## DEVICE MARKING INFORMATION

See general marking information in the device marking table on page 3 of this data sheet.

# MURS105, MURS110, MURS120, MURS140, MURS160, NRVUS110V, NRVUS120V, NRVUS160V

## MAXIMUM RATINGS

| Symbol                          | Rating                                                                                                    | MURS/SURS8/NRVUS                                                                       |       |       |       |                                                                                        |       | Unit               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------|-------|-------|----------------------------------------------------------------------------------------|-------|--------------------|
|                                 |                                                                                                           | 105T3                                                                                  | 110T3 | 115T3 | 120T3 | 140T3                                                                                  | 160T3 |                    |
| $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                    | 50                                                                                     | 100   | 150   | 200   | 400                                                                                    | 600   | V                  |
| $I_{F(DC)}$                     | Continuous Forward Current                                                                                | 1.0 @ $T_L = 159\text{ }^{\circ}\text{C}$<br>2.0 @ $T_L = 139\text{ }^{\circ}\text{C}$ |       |       |       | 1.0 @ $T_L = 159\text{ }^{\circ}\text{C}$<br>2.0 @ $T_L = 139\text{ }^{\circ}\text{C}$ |       | A                  |
| $I_{FSM}$                       | Non-Repetitive Peak Surge Current, (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | 35                                                                                     |       |       |       | 35                                                                                     |       | A                  |
| $T_J$                           | Operating Junction Temperature                                                                            | − 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

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

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , Unless otherwise noted)

|          |                                                                                                                                                                                                   |               |  |  |  |              |  |               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--|--|--|--------------|--|---------------|
| $V_F$    | Maximum Instantaneous Forward Voltage (Note 1)<br>( $i_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $i_F = 1.0\text{ A}$ , $T_J = 150^\circ\text{C}$ )                                     | 0.875<br>0.71 |  |  |  | 1.25<br>1.05 |  | V             |
| $i_R$    | Maximum Instantaneous Reverse Current (Note 1)<br>(Rated DC Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated DC Voltage, $T_J = 150^\circ\text{C}$ )                                                 | 2.0<br>50     |  |  |  | 5.0<br>150   |  | $\mu\text{A}$ |
| $t_{rr}$ | Maximum Reverse Recovery Time<br>( $i_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ )<br>( $i_F = 0.5\text{ A}$ , $i_R = 1.0\text{ A}$ , $I_R$ to $0.25\text{ A}$ ) | 35<br>25      |  |  |  | 75<br>50     |  | ns            |
| $t_{fr}$ | Maximum Forward Recovery Time<br>( $i_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , Rec. to $1.0\text{ V}$ )                                                                           | 25            |  |  |  | 50           |  | ns            |
| $I_{RM}$ | Typical Peak Reverse Recovery Current<br>( $i_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )                                                                                             | 0.75          |  |  |  | 1.60         |  | A             |

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  $\leq 2.0\%$ .



# MURS105, MURS110, MURS120, MURS140, MURS160, NRVUS110V, NRVUS120V, NRVUS160V

## DEVICE MARKING AND ORDERING INFORMATION

| Device                                           | Marking | Package          | Shipping <sup>†</sup>     |
|--------------------------------------------------|---------|------------------|---------------------------|
| MURS105T3G                                       | U1A     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS110T3G, NRVUS110VT3G*,<br>NRVUS110VT3G-GA01* | U1B     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS120T3G, NRVUS120VT3G*,<br>NRVUS120VT3G-GA01* | U1D     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS140T3G                                       | U1G     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |
| MURS160T3G, NRVUS160VT3G*,<br>NRVUS160VT3G-GA01* | U1J     | SMB<br>(Pb-Free) | 2,500 Units / Tape & Reel |

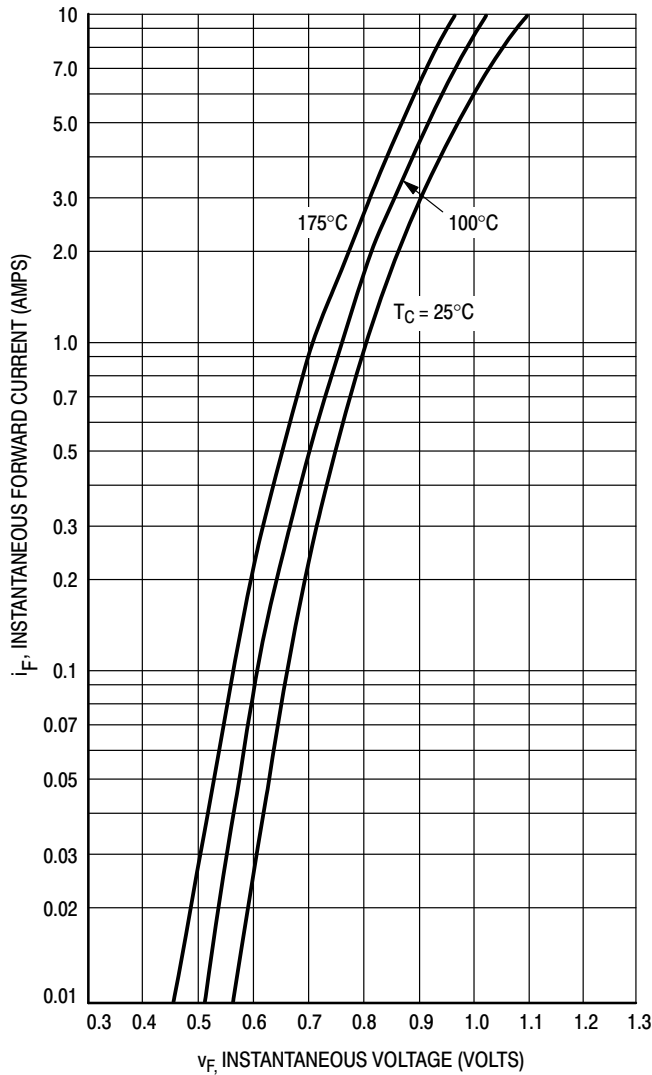
<sup>†</sup> For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

\* NRVUS and MURS8 Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

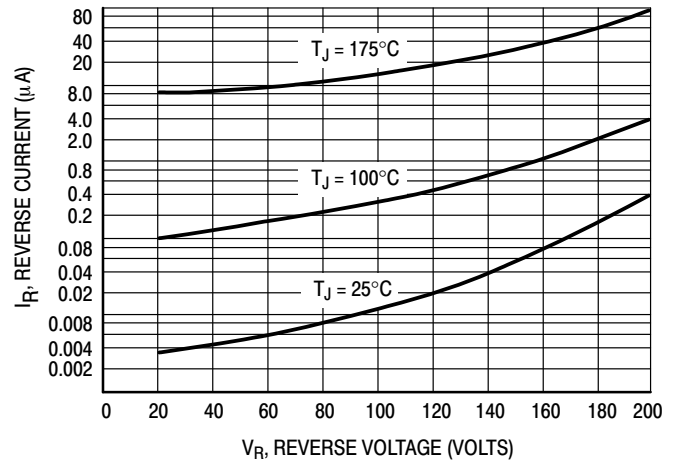


**MURS105, MURS110, MURS120, MURS140, MURS160, NRVUS110V, NRVUS120V, NRVUS160V**

**MURS105T3G, MURS110T3G, MURS120T3G,  
NRVUS110VT3G, NRVUS120VT3G, NRVUS110VT3G-GA01, NRVUS120VT3G-GA01**

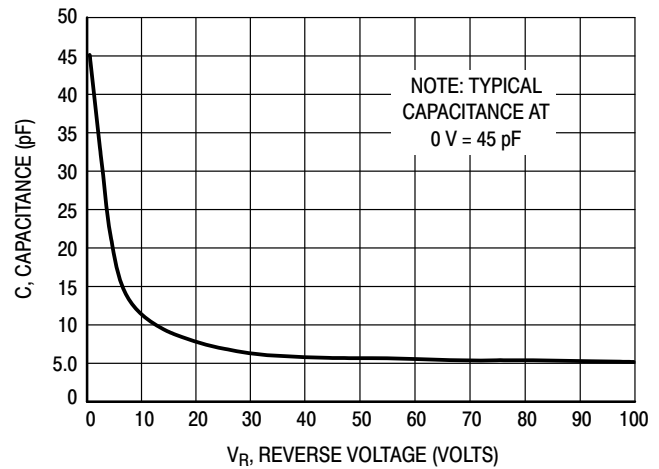


**Figure 1. Typical Forward Voltage**

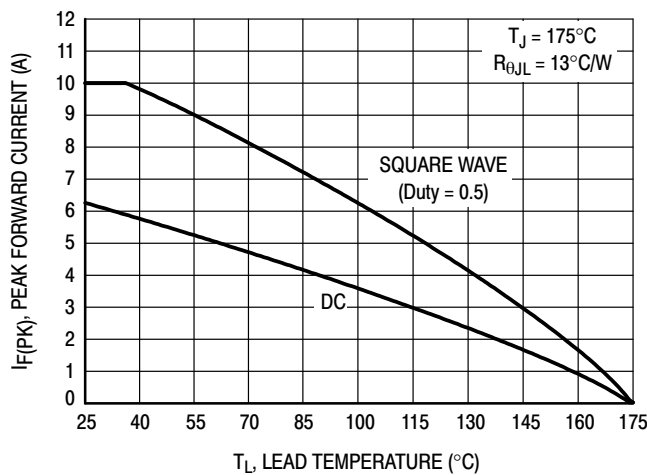


**Figure 2. Typical Reverse Current\***

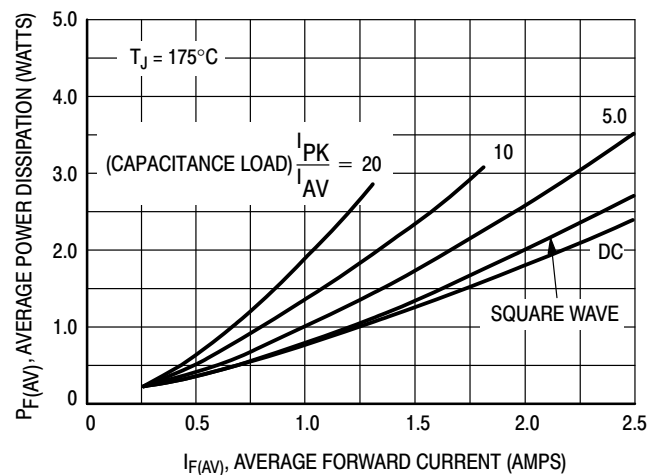
\*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if applied  $V_R$  is sufficiently below rated  $V_R$ .



**Figure 3. Typical Capacitance**



**Figure 4. Forward Current Derating of Lead Temperature**



**Figure 5. Power Dissipation**

# MURS105, MURS110, MURS120, MURS140, MURS160, NRVUS110V, NRVUS120V, NRVUS160V

MURS140T3G, MURS160T3G, SURS8140T3G, NRVUS160VT3G, NRVUS160VT3G-GA01

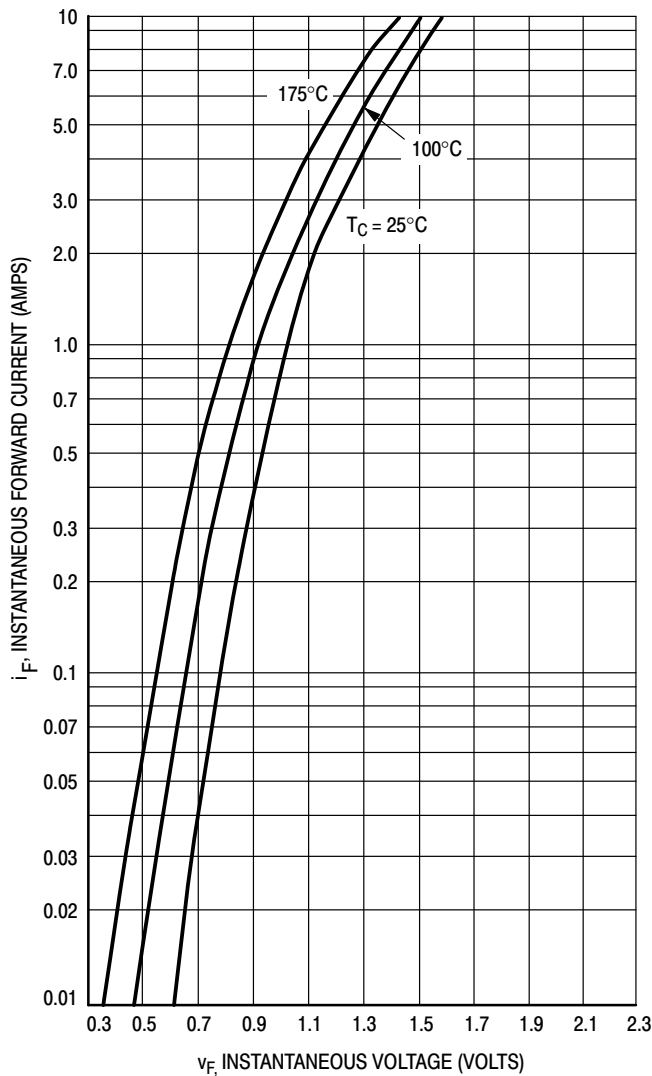


Figure 6. Typical Forward Voltage

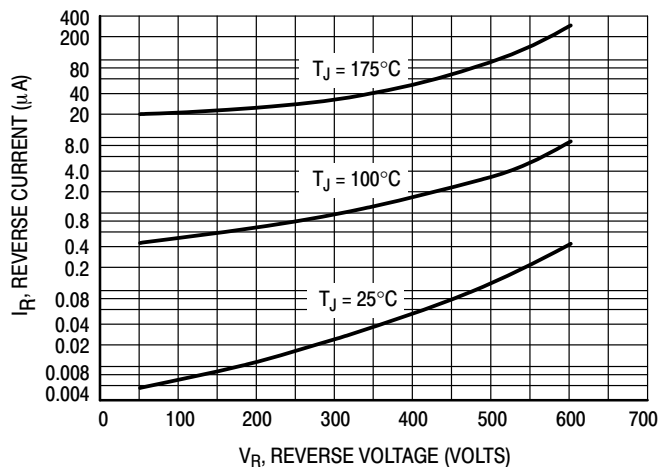


Figure 7. Typical Reverse Current\*

\*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  $V_R$ .

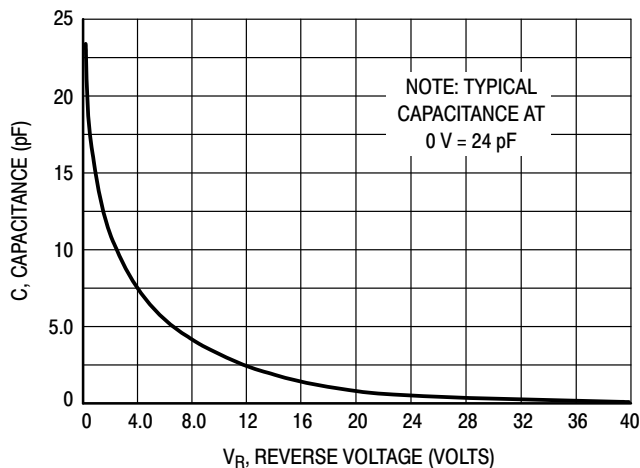


Figure 8. Typical Capacitance

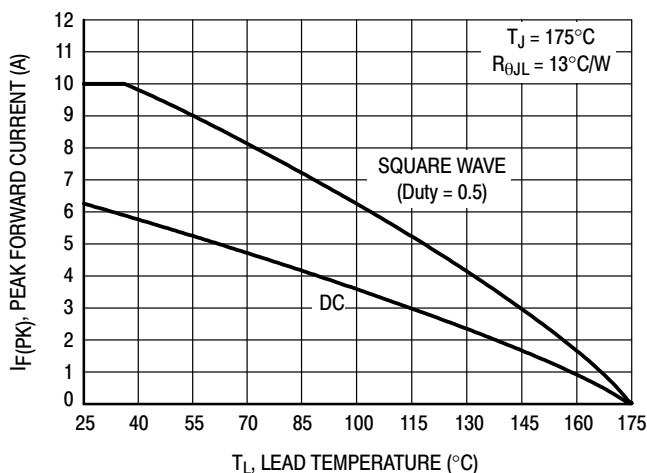


Figure 9. Forward Current Derating of Lead Temperature

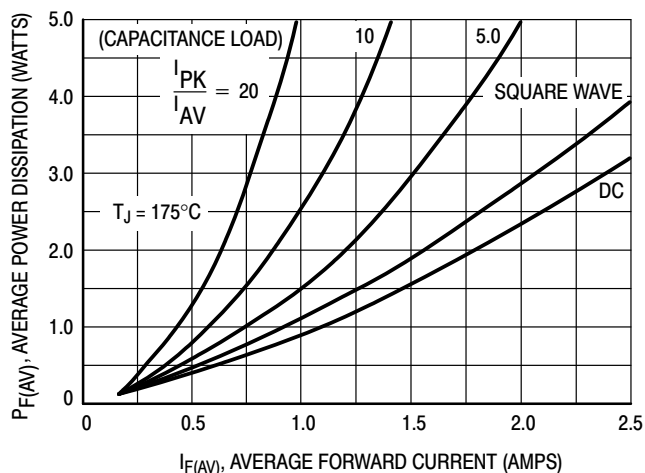


Figure 10. Power Dissipation

# MURS105, MURS110, MURS120, MURS140, MURS160, NRVUS110V, NRVUS120V, NRVUS160V

## REVISION HISTORY

| Revision | Description of Changes                                                                                                                                            | Date     |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 21       | Removal of MURS115, SURS8105, SURS8110, SURS8120, SURS8140 and SURS8160 devices from the front page title and Device Marking and Ordering Information table (p.3) | 9/8/2025 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.





SCALE 1:1

Polarity Band



SCALE 1:1

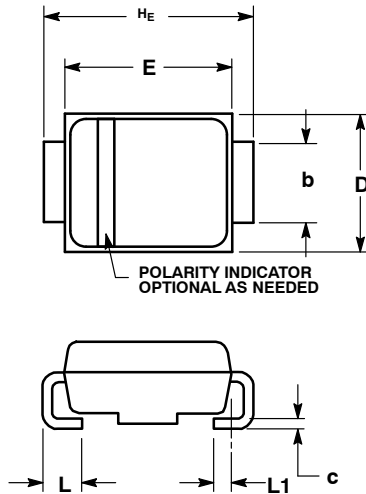
Non-Polarity Band

### SMB

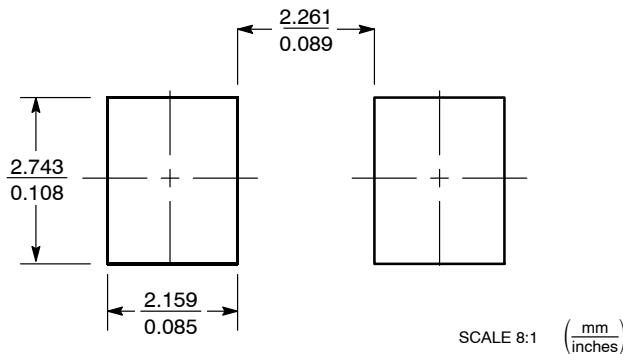
#### CASE 403A-03

#### ISSUE J

DATE 19 JUL 2012



SOLDERING FOOTPRINT\*



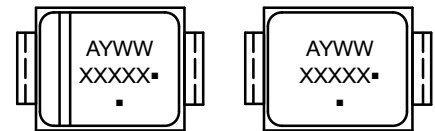
\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

#### 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\*



Polarity Band

Non-Polarity Band

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. Some products may not follow the Generic Marking.

|                  |             |                                                                                                                                                                                  |
|------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SMB         | PAGE 1 OF 1                                                                                                                                                                      |

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