

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

**MURS105, MURS110,  
MURS115, MURS120,  
MURS140, MURS160,  
SURS8105, SURS8110,  
SURS8120, SURS8140,  
SURS8160, 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<sub>J</sub> = 150°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:

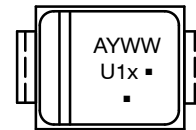
- Case: Epoxy, Molded
- Weight: 95 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Polarity Band Indicates Cathode Lead
- ESD Rating:
  - ◆ 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.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 3.

## DEVICE MARKING INFORMATION

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

**MURS105, MURS110, MURS115, MURS120, MURS140, MURS160, SURS8105, SURS8110, SURS8120, SURS8140, SURS8160, NRVUS110V, NRVUS120V, NRVUS160V**

**MAXIMUM RATINGS**

Symbol	Rating	MURS/SURS8/NRVUS						Unit
		105T3	110T3	115T3	120T3	140T3	160T3	
$V_{RRM}$ $V_{RWM}$ $V_R$	Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	50	100	150	200	400	600	V
$I_{F(DC)}$	Continuous Forward Current	1.0 @ $T_L = 159^{\circ}C$ 2.0 @ $T_L = 139^{\circ}C$				1.0 @ $T_L = 159^{\circ}C$ 2.0 @ $T_L = 139^{\circ}C$		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						$^{\circ}C$

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 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) ( $i_F = 1.0\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $i_F = 1.0\text{ A}$ , $T_J = 150^\circ\text{C}$ )	0.875 0.71				1.25 1.05		V
$i_R$	Maximum Instantaneous Reverse Current (Note 1) (Rated DC Voltage, $T_J = 25^\circ\text{C}$ ) (Rated DC Voltage, $T_J = 150^\circ\text{C}$ )	2.0 50				5.0 150		$\mu\text{A}$
$t_{rr}$	Maximum Reverse Recovery Time ( $i_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ ) ( $i_F = 0.5\text{ A}$ , $i_R = 1.0\text{ A}$ , $I_R$ to 0.25 A)	35 25				75 50		ns
$t_{fr}$	Maximum Forward Recovery Time ( $i_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , Rec. to 1.0 V)	25				50		ns
$I_{RM}$	Typical Peak Reverse Recovery Current ( $i_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )	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, MURS115, MURS120, MURS140, MURS160, SURS8105, SURS8110, SURS8120, SURS8140, SURS8160, NRVUS110V, NRVUS120V, NRVUS160V**

**DEVICE MARKING AND ORDERING INFORMATION**

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

**DISCONTINUED** (Note 2)

MURS115T3G, SURS8115T3G*	U1C	SMB (Pb-Free)	2,500 Units / Tape & Reel
SURS8105T3G*	U1A	SMB (Pb-Free)	2,500 Units / Tape & Reel
SURS8110T3G*	U1B	SMB (Pb-Free)	2,500 Units / Tape & Reel
SURS8120T3G*	U1D	SMB (Pb-Free)	2,500 Units / Tape & Reel
SURS8140T3G*	U1G	SMB (Pb-Free)	2,500 Units / Tape & Reel
SURS8160T3G*	U1J	SMB (Pb-Free)	2,500 Units / Tape & Reel

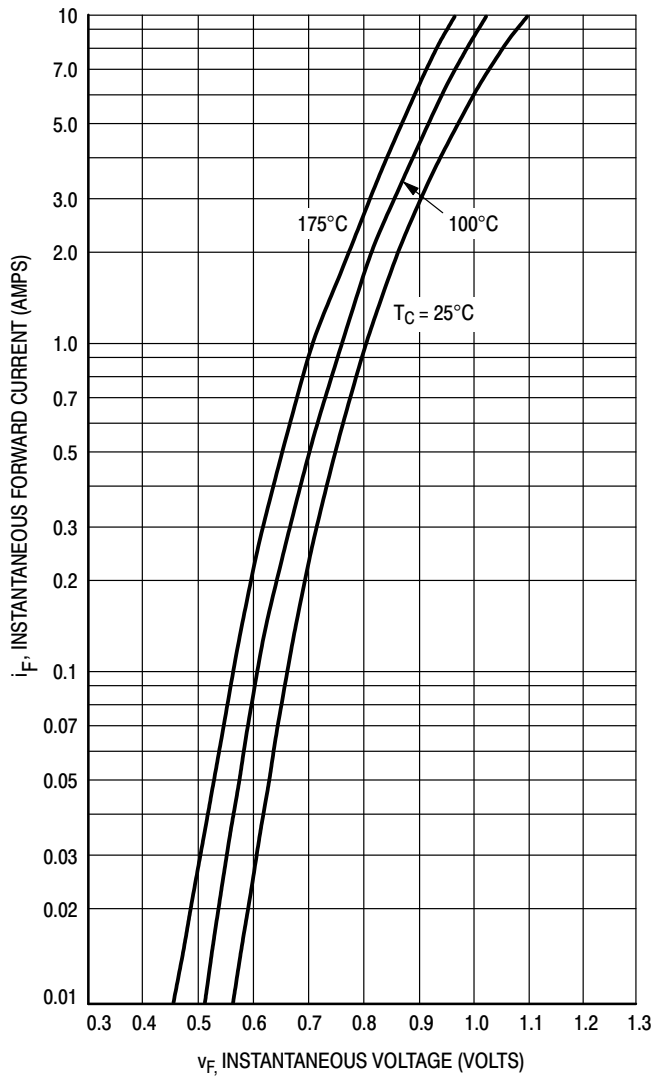
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*NRVUS and SURS8 Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

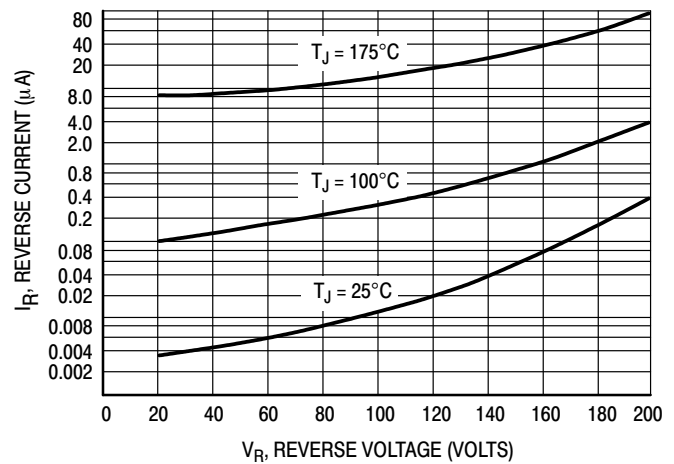
2. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

**MURS105, MURS110, MURS115, MURS120, MURS140, MURS160, SURS8105, SURS8110, SURS8120, SURS8140, SURS8160, NRVUS110V, NRVUS120V, NRVUS160V**

**MURS105T3G, MURS110T3G, MURS115T3G, MURS120T3G, SURS8105T3G, SURS8110T3G, SURS8115T3G, SURS8120T3G, NRVUS110VT3G, NRVUS120VT3G, NRVUS110VT3G-GA01, NRVUS120VT3G-GA01**

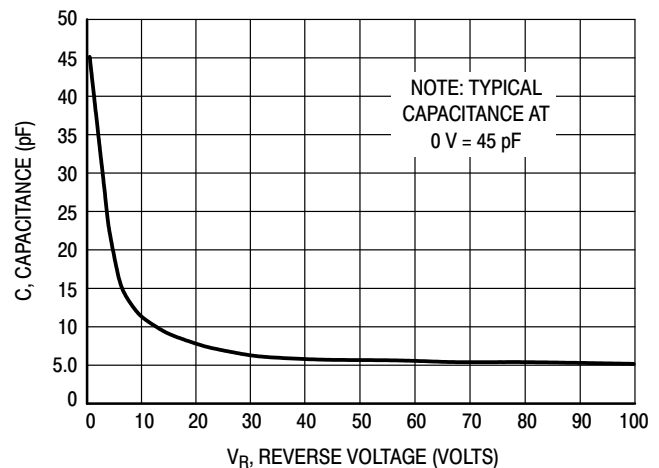


**Figure 1. Typical Forward Voltage**

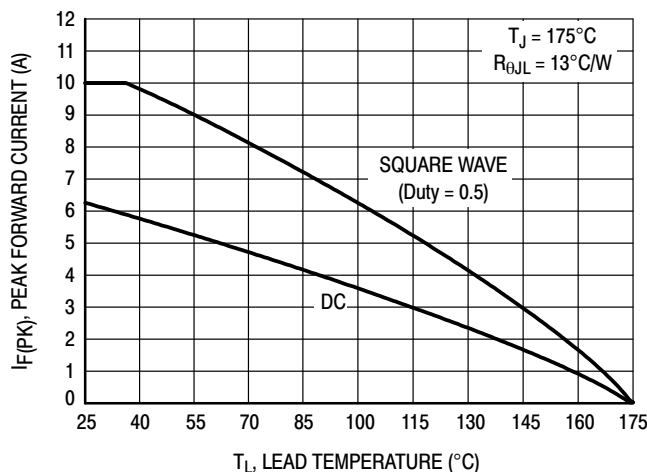


**Figure 2. Typical Reverse Current\***

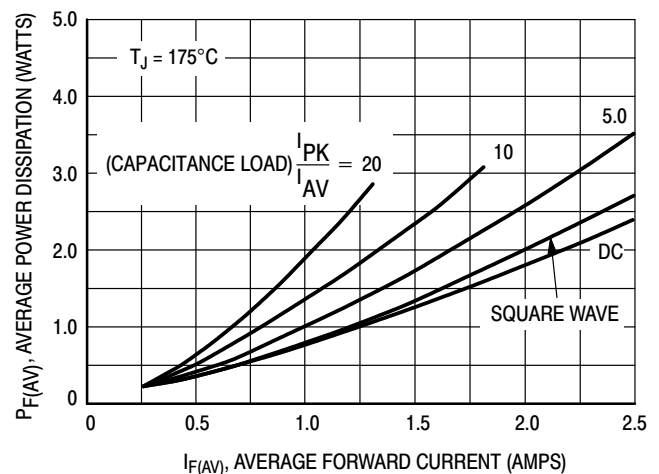
\*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if applied  $V_R$  is sufficiently below rated  $V_R$ .



**Figure 3. Typical Capacitance**

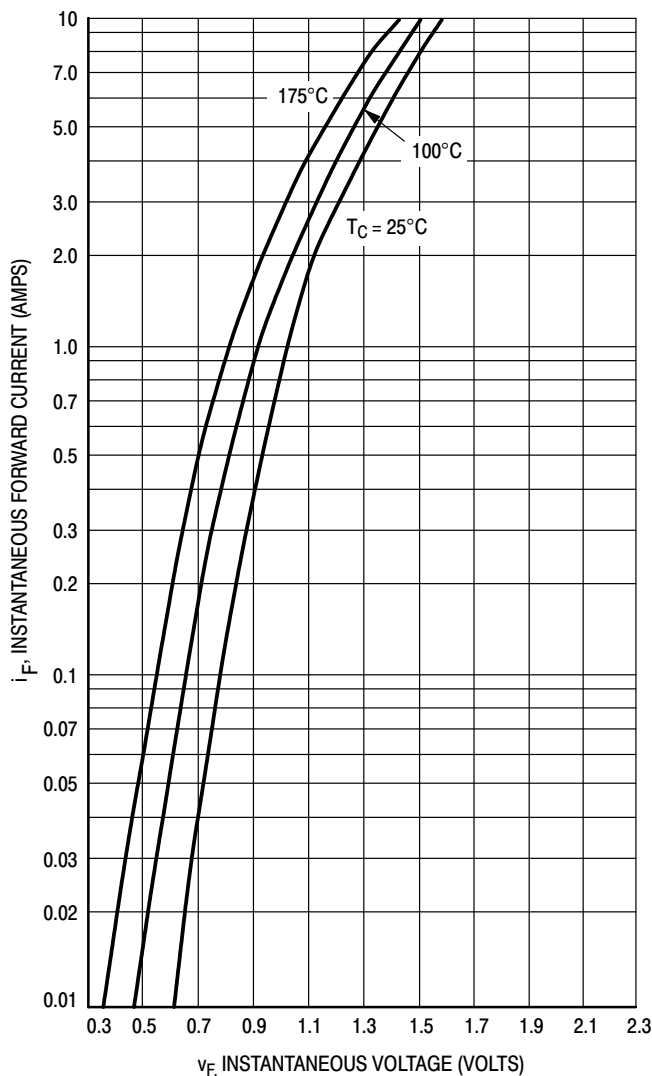


**Figure 4. Forward Current Derating of Lead Temperature**

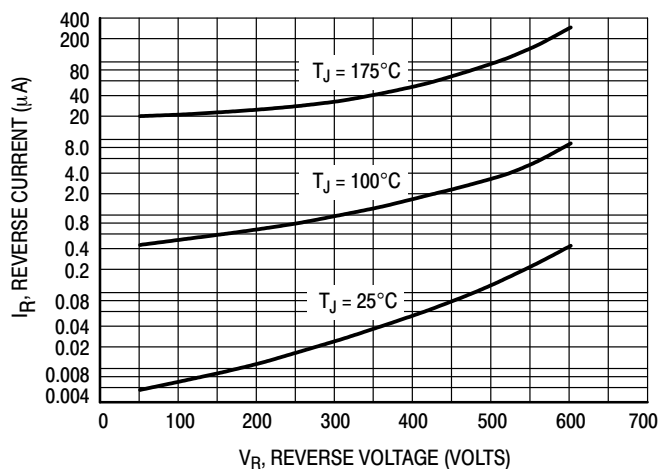


**Figure 5. Power Dissipation**

**MURS105, MURS110, MURS115, MURS120, MURS140, MURS160, SURS8105, SURS8110, SURS8120, SURS8140, SURS8160, NRVUS110V, NRVUS120V, NRVUS160V MURS140T3G, MURS160T3G, SURS8140T3G, SURS8160T3G, NRVUS160VT3G, NRVUS160VT3G-GA01**

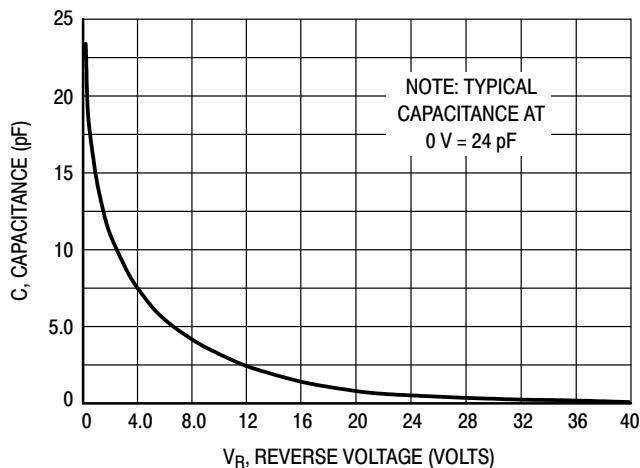


**Figure 6. Typical Forward Voltage**

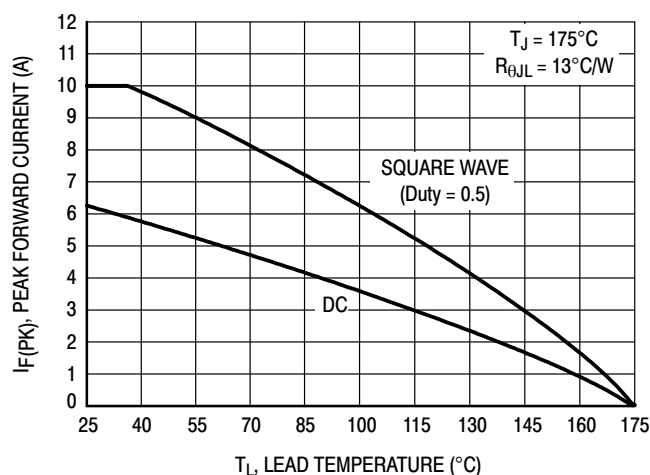


**Figure 7. Typical Reverse Current\***

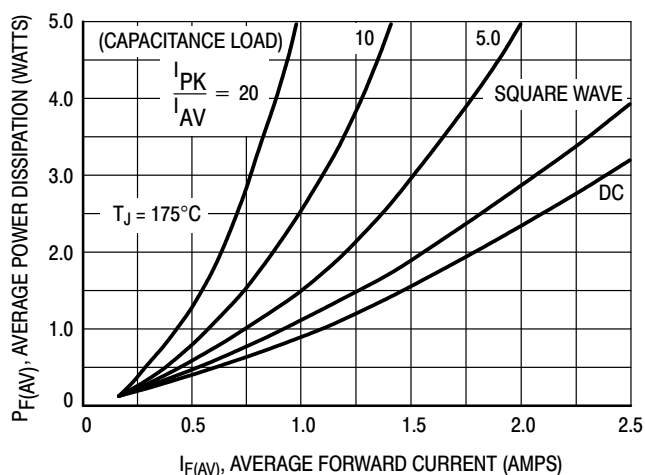
\*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if applied  $V_R$  is sufficiently below rated  $V_R$ .



**Figure 8. Typical Capacitance**



**Figure 9. Forward Current Derating of Lead Temperature**



**Figure 10. Power Dissipation**



SCALE 1:1

Polarity Band

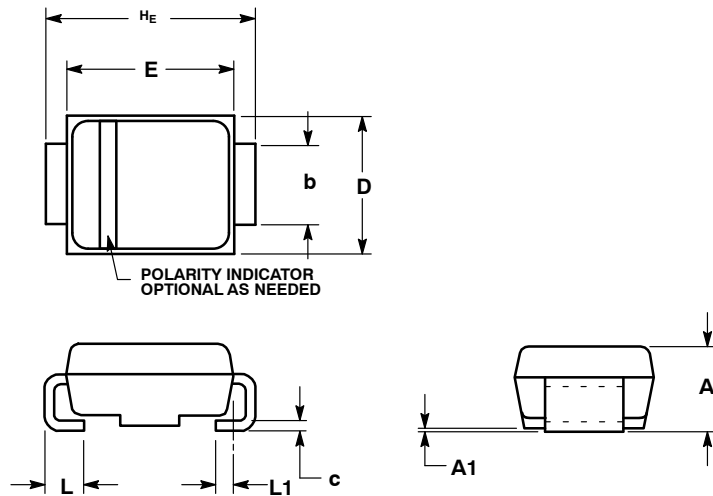
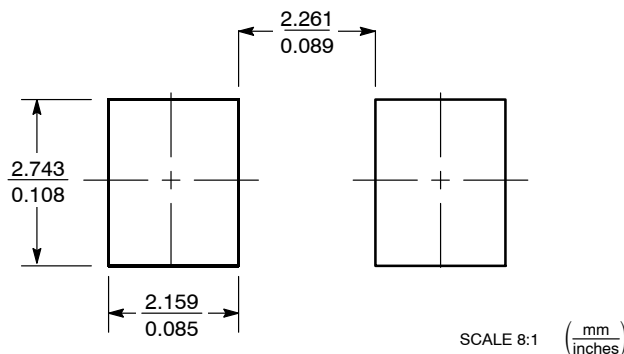


SCALE 1:1

Non-Polarity Band

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

DATE 19 JUL 2012

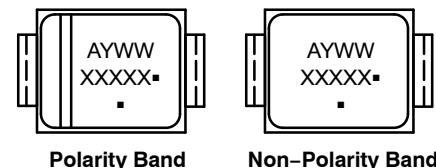

**SOLDERING FOOTPRINT\***


\*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
<b>A</b>	1.95	2.30	2.47	0.077	0.091	0.097
<b>A1</b>	0.05	0.10	0.20	0.002	0.004	0.008
<b>b</b>	1.96	2.03	2.20	0.077	0.080	0.087
<b>c</b>	0.15	0.23	0.31	0.006	0.009	0.012
<b>D</b>	3.30	3.56	3.95	0.130	0.140	0.156
<b>E</b>	4.06	4.32	4.60	0.160	0.170	0.181
<b>H<sub>E</sub></b>	5.21	5.44	5.60	0.205	0.214	0.220
<b>L</b>	0.76	1.02	1.60	0.030	0.040	0.063
<b>L1</b>	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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