## MC74LCX125

## Low-Voltage CMOS Quad Buffer

## With 5 V-Tolerant Inputs and Outputs (3-State, Non-Inverting)

The MC74LCX125 is a high performance, non-inverting quad buffer operating from a 2.3 to 3.6 V supply. High impedance TTL compatible inputs significantly reduce current loading to input drivers while TTL compatible outputs offer improved switching noise performance. A $\mathrm{V}_{\mathrm{I}}$ specification of 5.5 V allows MC74LCX125 inputs to be safely driven from 5.0 V devices. The MC74LCX125 is suitable for memory address driving and all TTL level bus oriented transceiver applications.

Current drive capability is 24 mA at the outputs. The Output Enable ( $\overline{\mathrm{OE}} \mathrm{n}$ ) inputs, when HIGH, disable the outputs by placing them in a HIGH Z condition.

## Features

- Designed for 2.3 to $3.6 \mathrm{~V} \mathrm{~V}_{\mathrm{CC}}$ Operation
- 5.0 V Tolerant - Interface Capability With 5.0 V TTL Logic
- Supports Live Insertion and Withdrawal
- $\mathrm{I}_{\mathrm{OFF}}$ Specification Guarantees High Impedance When $\mathrm{V}_{\mathrm{CC}}=0 \mathrm{~V}$
- LVTTL Compatible
- LVCMOS Compatible
- 24 mA Balanced Output Sink and Source Capability
- Near Zero Static Supply Current in all Three Logic States (10 $\mu \mathrm{A}$ ) Substantially Reduces System Power Requirements
- Latchup Performance Exceeds 500 mA
- ESD Performance: Human Body Model >2000 V Machine Model >200 V
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are $\mathrm{Pb}-$ Free, Halogen Free/BFR Free and are RoHS Compliant

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http://onsemi.com
SOIC-14
DIAGRAMS

## ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

## MC74LCX125



Figure 1. Pinout: 14-Lead (Top View)

## PIN NAMES

| Pins | Function |
| :---: | :---: |
| OEn | Output Enable Inputs |
| Dn | Data Inputs |
| On | 3-State Outputs |



Figure 2. Logic Diagram

TRUTH TABLE

| INPUTS |  | OUTPUTS |
| :---: | :---: | :---: |
| OEn | Dn | On |
| L | L | L |
| L | H | H |
| H | X | Z |

[^0]MAXIMUM RATINGS

| Symbol | Parameter | Value | Condition | Units |
| :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | DC Supply Voltage | -0.5 to +7.0 |  | V |
| $\mathrm{V}_{1}$ | DC Input Voltage | $-0.5 \leq \mathrm{V}_{1} \leq+7.0$ |  | V |
| $\mathrm{V}_{\mathrm{O}}$ | DC Output Voltage | $-0.5 \leq \mathrm{V}_{\mathrm{O}} \leq+7.0$ | Output in 3-State | V |
|  |  | $-0.5 \leq \mathrm{V}_{\mathrm{O}} \leq \mathrm{V}_{\mathrm{CC}}+0.5$ | Output in HIGH or LOW State. (Note 1) | V |
| IIK | DC Input Diode Current | -50 | $V_{1}<$ GND | mA |
| lok | DC Output Diode Current | -50 | $\mathrm{V}_{\mathrm{O}}<$ GND | mA |
|  |  | +50 | $\mathrm{V}_{\mathrm{O}}>\mathrm{V}_{\mathrm{CC}}$ | mA |
| $\mathrm{I}_{0}$ | DC Output Source/Sink Current | $\pm 50$ |  | mA |
| $\mathrm{I}_{\mathrm{Cc}}$ | DC Supply Current Per Supply Pin | $\pm 100$ |  | mA |
| $\mathrm{I}_{\text {GND }}$ | DC Ground Current Per Ground Pin | $\pm 100$ |  | mA |
| $\mathrm{T}_{\text {STG }}$ | Storage Temperature Range | -65 to +150 |  | ${ }^{\circ} \mathrm{C}$ |
| MSL | Moisture Sensitivity |  | Level 1 |  |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. $\mathrm{I}_{\mathrm{O}}$ absolute maximum rating must be observed.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Typ | Max | Units |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Supply Voltage Operating Data Retention Only | $\begin{aligned} & 2.0 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 2.5,3.3 \\ & 2.5,3.3 \end{aligned}$ | $\begin{aligned} & 3.6 \\ & 3.6 \end{aligned}$ | V |
| $V_{1}$ | Input Voltage | 0 |  | 5.5 | V |
| $\mathrm{V}_{\mathrm{O}}$ | Output Voltage HIGH or LOW State 3-State | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ |  | $\begin{gathered} V_{C C} \\ 5.5 \end{gathered}$ | V |
| $\mathrm{IOH}^{\prime}$ | HIGH Level Output Current $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}-3.6 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.7 \mathrm{~V}-3.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V}-2.7 \mathrm{~V} \end{aligned}$ |  |  | $\begin{gathered} -24 \\ -12 \\ -8 \end{gathered}$ | mA |
| ${ }^{\text {IOL }}$ | LOW Level Output Current $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}-3.6 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.7 \mathrm{~V}-3.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.3 \mathrm{~V}-2.7 \mathrm{~V} \end{aligned}$ |  |  | $\begin{gathered} +24 \\ +12 \\ +8 \end{gathered}$ | mA |
| $\mathrm{T}_{\mathrm{A}}$ | Operating Free-Air Temperature | -40 |  | +85 | ${ }^{\circ} \mathrm{C}$ |
| $\Delta t / \Delta \mathrm{V}$ | Input Transition Rise or Fall Rate, $\mathrm{V}_{\mathrm{IN}}$ from 0.8 V to 2.0 V , $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$ | 0 |  | 10 | ns/V |

## DC ELECTRICAL CHARACTERISTICS

| Symbol | Characteristic | Condition | $\mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Min | Max |  |
| $\mathrm{V}_{\mathrm{IH}}$ | HIGH Level Input Voltage (Note 2) | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 2.7 \mathrm{~V}$ | 1.7 |  | V |
|  |  | $2.7 \mathrm{~V} \leq \mathrm{V}_{C C} \leq 3.6 \mathrm{~V}$ | 2.0 |  |  |
| $\mathrm{V}_{\text {IL }}$ | LOW Level Input Voltage (Note 2) | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 2.7 \mathrm{~V}$ |  | 0.7 | V |
|  |  | $2.7 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$ |  | 0.8 |  |
| $\mathrm{V}_{\mathrm{OH}}$ | HIGH Level Output Voltage | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$; $\mathrm{I}_{\mathrm{OL}}=100 \mu \mathrm{~A}$ | $\mathrm{V}_{C C}-0.2$ |  | V |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.3 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-8 \mathrm{~mA}$ | 1.8 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-12 \mathrm{~mA}$ | 2.2 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-18 \mathrm{~mA}$ | 2.4 |  |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V} ; \mathrm{I}_{\mathrm{OH}}=-24 \mathrm{~mA}$ | 2.2 |  |  |
| VoL | LOW Level Output Voltage | $2.3 \mathrm{~V} \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V}$; $\mathrm{I}_{\mathrm{OL}}=100 \mu \mathrm{~A}$ |  | 0.2 | V |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.3 \mathrm{~V}$; $\mathrm{l}_{\mathrm{OL}}=8 \mathrm{~mA}$ |  | 0.6 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V}$; $\mathrm{IOL}=12 \mathrm{~mA}$ |  | 0.4 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$; $\mathrm{IOL}=16 \mathrm{~mA}$ |  | 0.4 |  |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V}$; $\mathrm{IOL}=24 \mathrm{~mA}$ |  | 0.55 |  |
| $\mathrm{I}_{\text {Oz }}$ | 3-State Output Current | $\begin{gathered} \mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}} \text { or } \mathrm{V}_{\mathrm{IL}}, \\ \mathrm{~V}_{\mathrm{OUT}}=0 \text { to } 5.5 \mathrm{~V} \end{gathered}$ |  | $\pm 5$ | $\mu \mathrm{A}$ |
| IOFF | Power Off Leakage Current | $\mathrm{V}_{\mathrm{CC}}=0, \mathrm{~V}_{\text {IN }}=5.5 \mathrm{~V}$ or $\mathrm{V}_{\text {OUT }}=5.5 \mathrm{~V}$ |  | 10 | $\mu \mathrm{A}$ |
| 1 N | Input Leakage Current | $\mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\text {IN }}=5.5 \mathrm{~V}$ or GND |  | $\pm 5$ | $\mu \mathrm{A}$ |
| $\mathrm{I}_{\mathrm{cc}}$ | Quiescent Supply Current | $\mathrm{V}_{\mathrm{CC}}=3.6 \mathrm{~V}, \mathrm{~V}_{\text {IN }}=5.5 \mathrm{~V}$ or GND |  | 10 | $\mu \mathrm{A}$ |
| $\Delta \mathrm{l}_{\mathrm{CC}}$ | Increase in $\mathrm{I}_{\text {CC }}$ per Input | $2.3 \leq \mathrm{V}_{\mathrm{CC}} \leq 3.6 \mathrm{~V} ; \mathrm{V}_{\mathrm{IH}}=\mathrm{V}_{\mathrm{CC}}-0.6 \mathrm{~V}$ |  | 500 | $\mu \mathrm{A}$ |

[^1]
## MC74LCX125

AC CHARACTERISTICS ( $\mathrm{t}_{\mathrm{R}}=\mathrm{t}_{\mathrm{F}}=2.5 \mathrm{~ns} ; \mathrm{R}_{\mathrm{L}}=500 \Omega$ )

| Symbol | Parameter | Waveform | Limits |  |  |  |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\mathrm{T}_{\mathrm{A}}=-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |  |  |  |  |  |  |
|  |  |  | $\mathrm{V}_{\mathrm{Cc}}=3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$ |  | $\mathrm{V}_{\mathrm{cc}}=2.7 \mathrm{~V}$ |  | $\mathrm{V}_{\mathrm{CC}}=2.5 \mathrm{~V} \pm 0.2 \mathrm{~V}$ |  |  |
|  |  |  | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  | $\mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}$ |  |  |
|  |  |  | Min | Max | Min | Max | Min | Max |  |
| $\begin{aligned} & \mathrm{tPLH} \\ & \mathrm{t}_{\mathrm{PHL}} \end{aligned}$ | Propagation Delay Time Input to Output | 1 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 6.0 \\ & 6.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 6.5 \\ & 6.5 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.2 \\ & 7.2 \end{aligned}$ | ns |
| $\begin{aligned} & \mathrm{t}_{\mathrm{tpzH}} \\ & \mathrm{t}_{\mathrm{pzL}} \end{aligned}$ | Output Enable Time to High and Low Level | 2 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.0 \\ & 7.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 8.0 \\ & 8.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 9.1 \\ & 9.1 \end{aligned}$ | ns |
| $\begin{aligned} & \text { tpHz } \\ & \mathrm{t}_{\mathrm{PLLZ}} \end{aligned}$ | Output Disable Time From High and Low Level | 2 | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & \hline 6.0 \\ & 6.0 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.0 \\ & 7.0 \end{aligned}$ | $\begin{aligned} & \hline 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 7.2 \\ & 7.2 \end{aligned}$ | ns |
| toshl tosLh | Output-to-Output Skew (Note 3) |  |  | $\begin{aligned} & 1.0 \\ & 1.0 \end{aligned}$ |  |  |  |  | ns |

3. Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (toshl) or LOW-to-HIGH (tosLh); parameter guaranteed by design.

DYNAMIC SWITCHING CHARACTERISTICS

| Symbol | Characteristic | Condition | $\mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C}$ |  |  | Units |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Min | Typ | Max |  |
| $\mathrm{V}_{\text {OLP }}$ | Dynamic LOW Peak Voltage (Note 4) | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.5 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=2.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & 0.8 \\ & 0.6 \end{aligned}$ |  | V |
| $\mathrm{V}_{\text {OLV }}$ | Dynamic LOW Valley Voltage (Note 4) | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=2.5 \mathrm{~V}, \mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}, \mathrm{~V}_{\mathrm{IH}}=2.5 \mathrm{~V}, \mathrm{~V}_{\mathrm{IL}}=0 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & \hline-0.8 \\ & -0.6 \end{aligned}$ |  | V |

4. Number of outputs defined as " $n$ ". Measured with " $n-1$ " outputs switching from HIGH-to-LOW or LOW-to-HIGH. The remaining output is measured in the LOW state.

## CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Condition | Typical | Units |
| :---: | :--- | :--- | :---: | :---: |
| $\mathrm{C}_{\mathrm{IN}}$ | Input Capacitance | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 7 | pF |
| $\mathrm{C}_{\mathrm{OUT}}$ | Output Capacitance | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 8 | pF |
| $\mathrm{C}_{\mathrm{PD}}$ | Power Dissipation Capacitance | $10 \mathrm{MHz}, \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}, \mathrm{~V}_{\mathrm{I}}=0 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{CC}}$ | 25 | pF |

ORDERING INFORMATION

| Device | Package | Shipping $^{\dagger}$ |
| :--- | :---: | :---: |
| MC74LCX125DG | SOIC-14 <br> (Pb-Free) | 55 Units / Rail |
| MC74LCX125DR2G | SOIC-14 <br> (Pb-Free) | 2500 Tape \& Reel |
| MC74LCX125DTG | TSSOP-14 <br> (Pb-Free) | 96 Units / Rail |
| MC74LCX125DTR2G | TSSOP-14 <br> (Pb-Free) | 2500 Tape \& Reel |
| NLVLCX125DTR2G | TSSOP-14* <br> (Pb-Free) | 2500 Tape \& Reel |

$\dagger$ 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.
*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified.


WAVEFORM 1 - PROPAGATION DELAYS
$\mathrm{t}_{\mathrm{R}}=\mathrm{t}_{\mathrm{F}}=2.5 \mathrm{~ns}, 10 \%$ to $90 \% ; \mathrm{f}=1 \mathrm{MHz} ; \mathrm{t}_{\mathrm{w}}=500 \mathrm{~ns}$


WAVEFORM 2 - OUTPUT ENABLE AND DISABLE TIMES
$\mathrm{t}_{\mathrm{R}}=\mathrm{t}_{\mathrm{F}}=2.5 \mathrm{~ns}, 10 \%$ to $90 \% ; \mathrm{f}=1 \mathrm{MHz} ; \mathrm{t}_{\mathrm{w}}=500 \mathrm{~ns}$

|  | $\mathrm{V}_{\mathrm{CC}}$ |  |  |
| :---: | :---: | :---: | :---: |
| Symbol | $3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$ | 2.7 V | $2.5 \mathrm{~V} \pm 0.2 \mathrm{~V}$ |
| Vmi | 1.5 V | 1.5 V | $\mathrm{~V}_{\mathrm{CC}} / 2$ |
| Vmo | 1.5 V | 1.5 V | $\mathrm{~V}_{\mathrm{CC}} / 2$ |

Figure 3. AC Waveforms

$\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ at $\mathrm{V}_{\mathrm{CC}}=3.3 \pm 0.3 \mathrm{~V}$ or equivalent (includes jig and probe capacitance)
$\mathrm{C}_{\mathrm{L}}=30 \mathrm{pF}$ at $\mathrm{V}_{\mathrm{CC}}=2.5 \pm 0.2 \mathrm{~V}$ or equivalent (includes jig and probe capacitance)
$R_{L}=R_{1}=500 \Omega$ or equivalent
$\mathrm{R}_{\mathrm{T}}=\mathrm{Z}_{\text {OUT }}$ of pulse generator (typically $50 \Omega$ )
Figure 4. Test Circuit


CASE 751A-03
ISSUE L
SCALE 1:1


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF AT MAXIMUM MATERIAL CONDITION.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSIONS.
5. MAXIMUM MOLD PROTRUSION 0.15 PER 5. MAXIM
SIDE.

|  | MILLIMETERS |  | INCHES |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| DIM | MIN | MAX | MIN | MAX |  |  |
| A | 1.35 | 1.75 | 0.054 | 0.068 |  |  |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |  |  |
| A3 | 0.19 | 0.25 | 0.008 | 0.010 |  |  |
| b | 0.35 | 0.49 | 0.014 | 0.019 |  |  |
| D | 8.55 | 8.75 | 0.337 | 0.344 |  |  |
| E | 3.80 | 4.00 | 0.150 | 0.157 |  |  |
| e | 1.27 |  | BSC | 0.050 |  | BSC |
| H | 5.80 | 6.20 | 0.228 | 0.244 |  |  |
| h | 0.25 | 0.50 | 0.010 | 0.019 |  |  |
| L | 0.40 | 1.25 | 0.016 | 0.049 |  |  |
| M | $0^{\circ}$ | $7^{\circ}$ | $0^{\circ}$ | $7^{\circ}$ |  |  |

GENERIC
MARKING DIAGRAM*
*This information is generic. Please refer to device data sheet for actual part marking. $\mathrm{Pb}-$ Free indicator, " G " or microdot " $\mathrm{\bullet}$ ", may or may not be present.

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

## STYLES ON PAGE 2

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| DESCRIPTION: | SOIC-14 NB | PAGE 1 OF 2 |

[^2]STYLE 1:
PIN 1. COMMON CATHODE 2. ANODE/CATHODE ANODE/CATHODE
. ANODE/CATHODE
4. NO CONNECTION
5. ANODE/CATHODE
6. NO CONNECTION
7. ANODE/CATHODE
8. ANODE/CATHODE
9. ANODE/CATHODE
10. NO CONNECTION
11. ANODE/CATHODE
2. ANODE/CATHODE
3. NO CONNECTION
4. COMMON ANODE

STYLE $5:$
PIN 1. COMMON CATHODE
2. ANODE/CATHODE
3. ANODE/CATHOD
4. ANODE/CATHODE
4. ANODE/CATHODE
6. ANODE/CATHODE
7. NO CONNECTION
7. COMMON ANODE
8. COMMON CATHOD
9. ANODE/CATHODE
0. ANODE/CATHODE
11. ANODE/CATHODE
2. ANODE/CATHODE
13. NO CONNECTION
14. COMMON ANODE

STYLE 2:
CANCELLED

STYLE 3:
PIN 1. NO CONNECTION 2. ANODE 3. ANODE
4. NO CONNECTION 5. ANODE
6. NO CONNECTION
7. ANODE
8. ANODE
9. ANODE
10. NO CONNECTION
11. ANODE
12. ANODE
13. NO CONNECTION
14. COMMON CATHODE

STYLE 6:
PIN 1. CATHODE
2. CATHODE
3. CATHODE
4. CATHODE
4. CATHODE
5. CATHODE
6. CATHODE
7. CATHOD

ANODE
9. ANODE
10. ANODE
11. ANODE
12. ANODE
13. ANODE
14. ANODE

STYLE 7:
PIN 1. ANODE/CATHODE
. COMMON ANODE
. COMMON CATHODE
4. ANODE/CATHODE
5. ANODE/CATHODE
6. ANODE/CATHODE
7. ANODE/CATHODE
7. ANODE/CATHODE
8. ANODE/CATHODE
10. ANODE/CATHODE
11. COMMON CATHODE
12. COMMON ANODE
13. ANODE/CATHODE
14. ANODE/CATHODE

STYLE 4:
PIN 1. NO CONNECTION 2. CATHODE 3. CATHODE
4. NO CONNECTION 5. CATHODE
6. NO CONNECTION
7. CATHODE
8. CATHODE
9. CATHODE
10. NO CONNECTION
11. CATHODE
12. CATHODE
13. NO CONNECTION
14. COMMON ANODE

STYLE 8:
PIN 1. COMMON CATHODE
2. ANODE/CATHODE
3. ANODE/CATHODE
4. NO CONNECTION
4. NO CONNECTION
5. ANODE/CATHODE
6. ANODE/CATHODE
7. COMMON ANODE
8. COMMON ANODE
9. ANODE/CATHODE
10. ANODE/CATHODE
11. NO CONNECTION
11. NO CONNECTION
12. ANODE/CATHODE
13. ANODE/CATHODE
14. COMMON CATHODE

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DIMENSIONS：MILLIMETERS

## NOTES：

．DIMENSIONING AND TOLERANCING PER ANSI Y14．5M， 1982
2．CONTROLLING DIMENSION：MILLIMETER．
3．DIMENSION A DOES NOT INCLUDE MOLD FLASH，PROTRUSIONS OR GATE BURRS． FLASH，PROTRUSIONS OR GATE BURRS． MOLD FLASH OR GATE BURRS
4．DIMENSION BDOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION． INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 （ 0.010 ）PER SIDE．
5．DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION．ALLOWABLE DAMBAR
PROTRUSION SHALL BE 0.08 （0．003）TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION．
6．TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY
7．DIMENSION A AND B ARE TO BE
DETERMINED AT DATUM PLANE－W－．

| DIM | MILLIMETERS |  | INCHES |  |
| :---: | :---: | :---: | :---: | :---: |
|  | MIN | MAX | MIN | MAX |
| A | 4.90 | 5.10 | 0.193 | 0.200 |
| B | 4.30 | 4.50 | 0.169 | 0.177 |
| C | －－－ | 1.20 | －－－ | 0.047 |
| D | 0.05 | 0.15 | 0.002 | 0.006 |
| F | 0.50 | 0.75 | 0.020 | 0.030 |
| G | 0.65 BSC |  | 0.026 BSC |  |
| H | 0.50 | 0.60 | 0.020 | 0.024 |
| J | 0.09 | 0.20 | 0.004 | 0.008 |
| J1 | 0.09 | 0.16 | 0.004 | 0.006 |
| K | 0.19 | 0.30 | 0.007 | 0.012 |
| K1 | 0.19 | 0.25 | 0.007 | 0.010 |
| L | 6.40 BSC |  | 0.252 BSC |  |
| M | $0^{\circ}$ | $8^{\circ}$ | $0^{\circ}$ | $8^{\circ}$ |

GENERIC MARKING DIAGRAM＊

| 14 月HBHE日为 |
| :---: |
| XXXX |
| XXXX |
| ALYW• |
| $\bigcirc$－ |
| 渣昰 |


| A | $=$ Assembly Location |
| :--- | :--- |
| L | $=$ Wafer Lot |
| Y | $=$ Year |
| W | $=$ 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． $\mathrm{Pb}-F r e e ~ i n d i c a t o r, ~ " ~ G " ~ o r ~ m i c r o d o t ~ " ~ " ", ~$ may or may not be present．

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| ---: | :--- | :--- | :--- |
| DESCRIPTION： | TSSOP－14 WB | PAGE 1 OF 1 |

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[^0]:    $\mathrm{H}=$ High Voltage Level
    L = Low Voltage Level
    $Z=$ High Impedance State
    $\mathrm{X}=$ High or Low Voltage Level and Transitions Are Acceptable; for $\mathrm{I}_{\mathrm{CC}}$ reasons, DO NOT FLOAT Inputs

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