## MC74LVX50

## Hex Buffer

The MC74LVX50 is an advanced high speed CMOS buffer fabricated with silicon gate CMOS technology.

The internal circuit is composed of three stages, including a buffered output which provides high noise immunity and stable output. The inputs tolerate voltages up to 7.0 V , allowing the interface of 5.0 V systems to 3.0 V systems.

## Features

- High Speed: $\mathrm{t}_{\mathrm{PD}}=4.1 \mathrm{~ns}(\mathrm{Typ})$ at $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}$
- Low Power Dissipation: $\mathrm{I}_{\mathrm{CC}}=2 \mu \mathrm{~A}(\mathrm{Max})$ at $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$
- High Noise Immunity: $\mathrm{V}_{\mathrm{NIH}}=\mathrm{V}_{\mathrm{NIL}}=28 \% \mathrm{~V}_{\mathrm{CC}}$
- Power Down Protection Provided on Inputs
- Balanced Propagation Delays
- Designed for 2.0 V to 3.6 V Operating Range
- Low Noise: $\mathrm{V}_{\mathrm{OLP}}=0.5 \mathrm{~V}$ (Max)
- These Devices are $\mathrm{Pb}-$ Free and are RoHS Compliant


Figure 1. Logic Diagram


Figure 2. Logic Symbol


ON Semiconductor ${ }^{\circledR}$
http://onsemi.com


SOIC-14 NB
TSSOP-14
DT SUFFIX CASE 948G

PIN ASSIGNMENT


MARKING DIAGRAMS


14 月HBH日B
LVX 50 0 ALYW=
1 HEFEFEF
TSSOP-14

$$
\begin{array}{ll}
\text { LVX50 } & =\text { Specific Device Code } \\
\text { A } & =\text { Assembly Location } \\
\text { WL, L } & =\text { Wafer Lot } \\
\text { Y } & =\text { Year } \\
\text { WW, W } & =\text { Work Week } \\
\text { G or } \quad & =\text { Pb-Free Package }
\end{array}
$$

(Note: Microdot may be in either location)
ORDERING INFORMATION
See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

## MC74LVX50

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
| :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {CC }}$ | DC Supply Voltage | -0.5 to +7.0 | V |
| $\mathrm{V}_{\text {IN }}$ | DC Input Voltage | -0.5 to +7.0 | V |
| $\mathrm{V}_{\text {OUT }}$ | DC Output Voltage | -0.5 to $\mathrm{V}_{\mathrm{CC}}+0.5$ | V |
| IIK | DC Input Diode Current $\quad \mathrm{V}_{1}<$ GND | -20 | mA |
| lok | DC Output Diode Current $\quad \mathrm{V}_{\mathrm{O}}<$ GND | $\pm 20$ | mA |
| Iout | DC Output Sink Current | $\pm 25$ | mA |
| ICC | DC Supply Current per Supply Pin | $\pm 50$ | mA |
| $\mathrm{T}_{\text {STG }}$ | Storage Temperature Range | -65 to +150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{L}}$ | Lead Temperature, 1 mm from Case for 10 Seconds | 260 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{J}$ | Junction Temperature under Bias | +150 | ${ }^{\circ} \mathrm{C}$ |
| $\theta_{\mathrm{JA}}$ | Thermal Resistance (Note 1) <br> SOIC  <br> TSSOP  | $\begin{aligned} & 125 \\ & 170 \end{aligned}$ | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| MSL | Moisture Sensitivity | Level 1 |  |
| $\mathrm{F}_{\mathrm{R}}$ | Flammability Rating Oxygen Index: 30\% - 35\% | UL 94-V0 @ 0.125 in |  |
| $\mathrm{V}_{\text {ESD }}$ | ESD Withstand VoltageHuman Body Model (Note 2) <br> Machine Model (Note 3) <br> Charged Device Model (Note 4) | $\begin{aligned} & >2000 \\ & >200 \\ & 2000 \end{aligned}$ | V |
| ILatchup | Latchup Performance Above $\mathrm{V}_{\mathrm{CC}}$ and Below GND at $85^{\circ} \mathrm{C}$ (Note 5) | $\pm 300$ | mA |

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.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm -by-1 inch, 2-ounce copper trace with no air flow.
2. Tested to EIA/JESD22-A114-A.
3. Tested to EIA/JESD22-A115-A.
4. Tested to JESD22-C101-A.
5. Tested to EIA/JESD78.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
| :---: | :--- | :---: | :---: | :---: |
| $\mathrm{V}_{\mathrm{CC}}$ | Supply Voltage | (Note 6) | 0 | 5.5 |
| $\mathrm{~V}_{\mathrm{I}}$ | Input Voltage | (HIGH or LOW State) | 0 | V |
| $\mathrm{~V}_{\mathrm{O}}$ | Output Voltage |  | $\mathrm{V}_{\mathrm{CC}}$ | V |
| $\mathrm{T}_{\mathrm{A}}$ | Operating Free-Air Temperature | -40 | +85 | ${ }^{\circ} \mathrm{C}$ |
| $\Delta \mathrm{t} / \Delta \mathrm{V}$ | Input Transition Rise or Fall Rate | $\mathrm{V}_{\mathrm{CC}}=3.0 \mathrm{~V} \pm 0.3 \mathrm{~V}$ | 0 | 100 |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.
6. Unused inputs may not be left open. All inputs must be tied to a high- or low-logic input voltage level.

NOTE: The $\theta_{\mathrm{JA}}$ of the package is equal to $1 /$ Derating. Higher junction temperatures may affect the expected lifetime of the device per the table and figure below.

DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test Conditions | $\begin{aligned} & V_{\mathrm{cc}} \\ & \text { (V) } \end{aligned}$ | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $\mathrm{T}_{\mathrm{A}} \leq 85^{\circ} \mathrm{C}$ |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max |  |
| $\mathrm{V}_{\mathrm{IH}}$ | High-Level Input Voltage |  | $\begin{aligned} & 2.0 \\ & 3.0 \\ & 3.6 \end{aligned}$ | $\begin{aligned} & 1.5 \\ & 2.0 \\ & 2.4 \end{aligned}$ |  |  | $\begin{aligned} & \hline 1.5 \\ & 2.0 \\ & 2.4 \end{aligned}$ |  | V |
| $\mathrm{V}_{\text {IL }}$ | Low-Level Input Voltage |  | $\begin{aligned} & \hline 2.0 \\ & 3.0 \\ & 3.6 \end{aligned}$ |  |  | $\begin{aligned} & 0.5 \\ & 0.8 \\ & 0.8 \end{aligned}$ |  | $\begin{aligned} & \hline 0.5 \\ & 0.8 \\ & 0.8 \end{aligned}$ | V |
| $\mathrm{V}_{\mathrm{OH}}$ | High-Level Output Voltage $\left(\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}}\right.$ or $\left.\mathrm{V}_{\mathrm{IL}}\right)$ | $\begin{aligned} & \mathrm{I}_{\mathrm{OH}}=-50 \mu \mathrm{~A} \\ & \mathrm{I}_{\mathrm{OH}}=-50 \mu \mathrm{~A} \\ & \mathrm{I}_{\mathrm{OH}}=-4 \mathrm{~mA} \end{aligned}$ | $\begin{aligned} & 2.0 \\ & 3.0 \\ & 3.0 \end{aligned}$ | $\begin{gathered} 1.9 \\ 2.9 \\ 2.58 \end{gathered}$ | $\begin{aligned} & 2.0 \\ & 3.0 \end{aligned}$ |  | $\begin{gathered} 1.9 \\ 2.9 \\ 2.48 \end{gathered}$ |  | V |
| $\mathrm{V}_{\text {OL }}$ | Low-Level Output Voltage $\left(\mathrm{V}_{\mathrm{IN}}=\mathrm{V}_{\mathrm{IH}}\right.$ or $\left.\mathrm{V}_{\mathrm{IL}}\right)$ | $\begin{aligned} & \mathrm{IOL}=50 \mu \mathrm{~A} \\ & \mathrm{IOL}=50 \mu \mathrm{~A} \\ & \mathrm{IOL}=4 \mathrm{~mA} \end{aligned}$ | $\begin{aligned} & \hline 2.0 \\ & 3.0 \\ & 3.0 \end{aligned}$ |  | $\begin{aligned} & \hline 0.0 \\ & 0.0 \end{aligned}$ | $\begin{gathered} \hline 0.1 \\ 0.1 \\ 0.36 \end{gathered}$ |  | $\begin{gathered} \hline 0.1 \\ 0.1 \\ 0.44 \end{gathered}$ | V |
| $\mathrm{I}_{\mathrm{N}}$ | Input Leakage Current | $\mathrm{V}_{\mathrm{IN}}=5.5 \mathrm{~V}$ or GND | $\begin{aligned} & \hline 0 \text { to } \\ & 3.6 \end{aligned}$ |  |  | $\pm 0.1$ |  | $\pm 1.0$ | $\mu \mathrm{A}$ |
| Icc | Quiescent Supply Current | $\mathrm{V}_{\text {IN }}=\mathrm{V}_{\text {CC }}$ or GND | 3.6 |  |  | 2.0 |  | 20.0 | $\mu \mathrm{A}$ |

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.

AC ELECTRICAL CHARACTERISTICS $\operatorname{Input} t_{r}=t_{f}=3.0 \mathrm{~ns}$

| Symbol | Parameter | Test Conditions |  | $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}$ |  |  | $\mathrm{T}_{\mathrm{A}} \leq 85^{\circ} \mathrm{C}$ |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Min | Typ | Max | Min | Max |  |
| $\begin{aligned} & \mathrm{t}_{\mathrm{PLL}}, \\ & \mathrm{t}_{\text {PHL }} \end{aligned}$ | Propagation Delay, Input A to Y | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V}$ | $\begin{aligned} & \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  | $\begin{aligned} & 5.4 \\ & 7.9 \end{aligned}$ | $\begin{aligned} & 10.1 \\ & 13.6 \end{aligned}$ | $\begin{aligned} & 1.0 \\ & 1.0 \end{aligned}$ | $\begin{aligned} & 12.5 \\ & 16.0 \end{aligned}$ | ns |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$ | $\begin{aligned} & \mathrm{C}_{\mathrm{L}}=15 \mathrm{pF} \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \end{aligned}$ |  | $\begin{aligned} & 4.1 \\ & 6.6 \end{aligned}$ | $\begin{aligned} & 6.2 \\ & 9.7 \end{aligned}$ | $\begin{aligned} & 1.0 \\ & 1.0 \end{aligned}$ | $\begin{gathered} \hline 7.5 \\ 11.5 \end{gathered}$ |  |
| toshl tosth | Output-to-Output Skew (Note 7) | $\mathrm{V}_{\mathrm{CC}}=2.7 \mathrm{~V}$ | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  |  | 1.5 |  | 1.5 | ns |
|  |  | $\mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V} \pm 0.3 \mathrm{~V}$ | $\mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ |  |  | 1.5 |  | 1.5 |  |
| $\mathrm{ClN}_{\text {IN }}$ | Input Capacitance |  |  |  | 4 | 10 |  | 10 | pF |
| $\mathrm{C}_{\text {PD }}$ | Power Dissipation Capacitance (Note 8) |  |  | Typical @ $25^{\circ} \mathrm{C}, \mathrm{V}_{\mathrm{cc}}=3.3 \mathrm{~V}$ |  |  |  |  | pF |
|  |  |  |  |  |  | 15 |  |  |  |

7. 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.
8. $\mathrm{C}_{\text {PD }}$ is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $\mathrm{I}_{\mathrm{CC}(\mathrm{OPR})}=\mathrm{C}_{\mathrm{PD}} \bullet \mathrm{V}_{\mathrm{CC}} \bullet \mathrm{f}_{\mathrm{in}}+\mathrm{I}_{\mathrm{CC}}$. $\mathrm{C}_{\mathrm{PD}}$ is used to determine the no-load dynamic power consumption; $\mathrm{P}_{\mathrm{D}}=\mathrm{C}_{\mathrm{PD}} \bullet \mathrm{V}_{\mathrm{CC}}{ }^{2} \bullet \mathrm{f}_{\text {in }}+\mathrm{I}_{\mathrm{CC}} \bullet \mathrm{V}_{\mathrm{CC}}$.

NOISE CHARACTERISTICS Input $t_{r}=t_{f}=3.0 \mathrm{~ns}, C_{L}=50 \mathrm{pF}, \mathrm{V}_{\mathrm{CC}}=3.3 \mathrm{~V}$

|  |  | $\mathbf{T}_{\mathbf{A}}=\mathbf{2 5} \mathbf{C}$ |  |  |
| :---: | :--- | :---: | :---: | :---: |
| Symbol | Characteristic | $\mathbf{T y p}$ | Max | Unit |
| $\mathrm{V}_{\text {OLP }}$ | Quiet Output Maximum Dynamic $\mathrm{V}_{\mathrm{OL}}$ | 0.3 | 0.5 | V |
| $\mathrm{~V}_{\text {OLV }}$ | Quiet Output Minimum Dynamic $\mathrm{V}_{\mathrm{OL}}$ | -0.3 | -0.5 | V |
| $\mathrm{~V}_{\text {IHD }}$ | Minimum High Level Dynamic Input Voltage |  | 2.0 | V |
| $\mathrm{~V}_{\text {ILD }}$ | Maximum Low Level Dynamic Input Voltage |  | 0.8 | V |

## MC74LVX50



Figure 3. Switching Waveforms

*Includes all probe and jig capacitance


Figure 4. Test Circuit

Figure 5. Input Equivalent Circuit

EMBOSSED CARRIER DIMENSIONS (See Notes 9 and 10)

| Tape Size | $B_{1}$ <br> Max | D | $\mathrm{D}_{1}$ | E | F | K | P | $\mathrm{P}_{0}$ | $\mathrm{P}_{2}$ | R | T | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 8 mm | $\begin{aligned} & 4.35 \mathrm{~mm} \\ & \left(0.179^{\prime \prime}\right) \end{aligned}$ | $\begin{gathered} 1.5 \mathrm{~mm} \\ +0.1 \\ -0.0 \\ (0.059 \\ +0.004 \\ -0.0) \end{gathered}$ |  | $\begin{gathered} \hline 1.75 \mathrm{~mm} \\ \pm 0.1 \\ (0.069 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 3.5 \mathrm{~mm} \\ \pm 0.5 \\ (1.38 \\ \left. \pm 0.002^{\prime \prime}\right) \end{gathered}$ |  | $\begin{gathered} 4.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.157 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 4.0 \mathrm{~mm} \\ \pm 0.1 \\ (0.157 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 2.0 \mathrm{~mm} \\ \pm 0.1 \\ (0.079 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 25 \mathrm{~mm} \\ \left(0.98^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 0.6 \mathrm{~mm} \\ (0.024) \end{gathered}$ | $\begin{aligned} & 8.3 \mathrm{~mm} \\ & (0.327) \end{aligned}$ |
| 12 mm | 8.2 mm (0.323") |  | $\begin{aligned} & 1.5 \mathrm{~mm} \\ & \mathrm{Min} \\ & (0.060) \end{aligned}$ |  | $\begin{gathered} 5.5 \mathrm{~mm} \\ \pm 0.5 \\ (0.217 \\ \left. \pm 0.002^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 6.4 \mathrm{~mm} \\ \text { Max } \\ \left(0.252^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} \hline 4.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.157 \\ \left. \pm 0.004^{\prime \prime}\right) \\ 8.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.315 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ |  |  | $\begin{aligned} & 30 \mathrm{~mm} \\ & \left(1.18^{\prime \prime}\right) \end{aligned}$ |  | $\begin{gathered} 12.0 \mathrm{~mm} \\ \pm 0.3 \\ (0.470 \\ \left. \pm 0.012^{\prime \prime}\right) \end{gathered}$ |
| 16 mm | 12.1 mm <br> (0.476") |  |  |  | $\begin{gathered} 7.5 \mathrm{~mm} \\ \pm 0.10 \\ (0.295 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ |  | $\begin{gathered} 4.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.157 \\ \left. \pm 0.004^{\prime \prime}\right) \\ 8.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.315 \\ \left. \pm 0.004^{\prime \prime}\right) \\ 12.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.472 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ |  |  |  |  | 16.3 mm <br> (0.642) |
| 24 mm | $\begin{gathered} 20.1 \mathrm{~mm} \\ \left(0.791^{\prime \prime}\right) \end{gathered}$ |  |  |  | $\begin{gathered} 11.5 \mathrm{~mm} \\ \pm 0.10 \\ (0.453 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ | 11.9 mm Max (0.468") | $\begin{gathered} 16.0 \mathrm{~mm} \\ \pm 0.10 \\ (0.63 \\ \left. \pm 0.004^{\prime \prime}\right) \end{gathered}$ |  |  |  |  | $\begin{gathered} 24.3 \mathrm{~mm} \\ (0.957) \end{gathered}$ |

[^0]
11. $\mathrm{A}_{0}, \mathrm{~B}_{0}$, and $\mathrm{K}_{0}$ are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min to 0.50 mm max. The component cannot rotate more than $10^{\circ}$ within the determined cavity

Figure 6. Carrier Tape Specifications

## MC74LVX50



Figure 7. Reel Dimensions

REEL DIMENSIONS

| Tape Size | T\&R Suffix | A Max | G | t Max |
| :---: | :---: | :---: | :---: | :---: |
| 8 mm | T1, T2 | $\begin{gathered} 178 \mathrm{~mm} \\ \left(7^{\prime \prime}\right) \end{gathered}$ | $\begin{aligned} & 8.4 \mathrm{~mm},+1.5 \mathrm{~mm},-0.0 \\ & \left(0.33 "+0.059^{\prime \prime},-0.00\right) \end{aligned}$ | $\begin{gathered} 14.4 \mathrm{~mm} \\ (0.56 ") \end{gathered}$ |
| 8 mm | T3, T4 | $\begin{gathered} 330 \mathrm{~mm} \\ \left(13^{\prime \prime}\right) \end{gathered}$ | $\begin{aligned} & 8.4 \mathrm{~mm},+1.5 \mathrm{~mm},-0.0 \\ & \left(0.33^{\prime \prime}+0.059 ",-0.00\right) \end{aligned}$ | $\begin{gathered} 14.4 \mathrm{~mm} \\ \left(0.56^{\prime \prime}\right) \end{gathered}$ |
| 12 mm | R2 | $\begin{gathered} 330 \mathrm{~mm} \\ \left(13^{\prime \prime}\right) \end{gathered}$ | $12.4 \mathrm{~mm},+2.0 \mathrm{~mm},-0.0$ ( 0.49 " +0.079 ", -0.00 ) | $\begin{gathered} 18.4 \mathrm{~mm} \\ \left(0.72^{\prime \prime}\right) \end{gathered}$ |
| 16 mm | R2 | $\begin{gathered} 360 \mathrm{~mm} \\ \left(14.173^{\prime \prime}\right) \end{gathered}$ | $\begin{aligned} & 16.4 \mathrm{~mm},+2.0 \mathrm{~mm},-0.0 \\ & \left(0.646^{\prime \prime}+0.078 ",-0.00\right) \end{aligned}$ | $\begin{gathered} 22.4 \mathrm{~mm} \\ (0.882 ") \end{gathered}$ |
| 24 mm | R2 | $\begin{gathered} 360 \mathrm{~mm} \\ \left(14.173^{\prime \prime}\right) \end{gathered}$ | $\begin{gathered} 24.4 \mathrm{~mm},+2.0 \mathrm{~mm},-0.0 \\ (0.961 "+0.078 \prime,-0.00) \end{gathered}$ | $\begin{gathered} 30.4 \mathrm{~mm} \\ (1.197 \prime \text { " } \end{gathered}$ |



Figure 8. Reel Winding Direction


Figure 9. Tape Ends for Finished Goods


Figure 10. TSSOP and SOIC R2 Reel Configuration/Orientation

TAPE UTILIZATION BY PACKAGE

| Tape Size | SOIC | TSSOP | QFN | SC88A / SOT-353 <br> SC88/SOT-363 |
| :---: | :---: | :---: | :---: | :---: |
| 8 mm |  |  |  | $5-, 6-$ Lead |
| 12 mm | 8 -Lead | $8-, 14-, 16$-Lead | $8-, 14-, 16-$ Lead |  |
| 16 mm | $14-$ - 16 -Lead | $20-, 24-$ Lead | $20-, 24-$ Lead |  |
| 24 mm | $18-, 20-, 24-, 28-$ Lead | $48-, 56-$ Lead | $48-, 56-$ Lead |  |

ORDERING INFORMATION

| Device | Package | Shipping ${ }^{\dagger}$ |
| :--- | :---: | :---: |
| MC74LVX50DG | SOIC-14 NB <br> (Pb-Free) | 55 Units / Rail |
| MC74LVX50DR2G | SOIC-14 NB <br> (Pb-Free) | 2500 Tape \& Reel |
| MC74LVX50DTG | TSSOP-14 <br> (Pb-Free) | 96 Units / Rail |
| MC74LVX50DTR2G | 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.


SOIC-14 NB
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 SIDE.

| DIM | MILLIMETERS |  | INCHES |  |
| :---: | :---: | :---: | :---: | :---: |
|  | MIN | MAX | MIN | MAX |
|  | 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 | $0^{\circ}$ | $7^{\circ}$ | $0^{\circ}$ | $7^{\circ}$ |

## SOLDERING FOOTPRINT*



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 |

[^1] rights of others.

STYLE 1:
PIN 1. COMMON CATHODE
2. ANODE/CATHODE
3. 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
12. ANODE/CATHODE
13. NO CONNECTION
4. COMMON ANODE
STYLE $5:$

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

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

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| DESCRIPTION: | SOIC-14 NB |  |

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NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS MOLD FLASH OR GATE BURRS SHALL NOT MOLD FLASH OR GATE BURRS
4. DIMENSION B DOES 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*



| 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. Pb-Free indicator, "G" or microdot " $\bullet$ ", may or may not be present.

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

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[^0]:    9. Metric Dimensions Govern-English are in parentheses for reference only.
    10. $A_{0}, B_{0}$, and $K_{0}$ are determined by component size. The clearance between the components and the cavity must be within 0.05 mm min to 0.50 mm max. The component cannot rotate more than $10^{\circ}$ within the determined cavity
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