

# Low-Voltage CMOS Unbuffered Hex Inverter

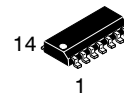
With 5 V-Tolerant Inputs

## MC74LCXU04

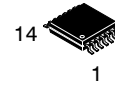
The MC74LCXU04 is a high performance unbuffered hex inverter operating from a 2.3 to 3.6 V supply. (High impedance TTL compatible inputs significantly reduce current loading to input drivers while TTL compatible outputs offer improved switching noise performance.) A  $V_I$  specification of 5.5 V allows MC74LCXU04 inputs to be safely driven from 5 V devices.

### Features

- Designed for 2.3 to 3.6 V  $V_{CC}$  Operation
- 5 V Tolerant Inputs – Interface Capability With 5 V TTL Logic
- LVTTL Compatible
- LVC MOS Compatible
- Near Zero Static Supply Current (10  $\mu$ A) Substantially Reduces System Power Requirements
- Latchup Performance Exceeds 500 mA
- ESD Performance:
  - Human Body Model >2000 V
  - Machine Model >200 V
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

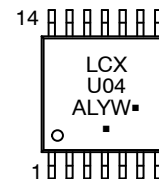
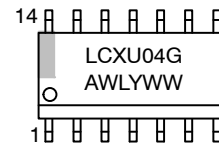


SOIC-14  
D SUFFIX  
CASE 751A



TSSOP-14  
DT SUFFIX  
CASE 948G

### MARKING DIAGRAMS



A = Assembly Location  
 L, WL = Wafer Lot  
 Y, YY = Year  
 W, WW = Work Week  
 G or ■ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 6.

# MC74LCXU04

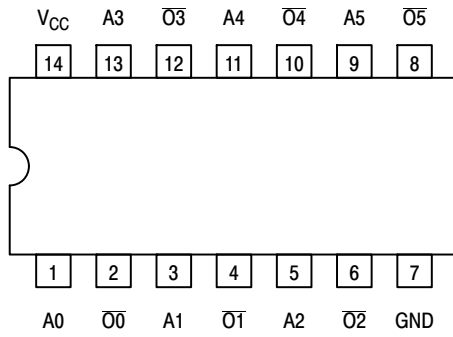


Figure 1. Pinout: 14-Lead (Top View)

## PIN NAMES

| Pins             | Function    |
|------------------|-------------|
| An               | Data Inputs |
| $\overline{O_n}$ | Outputs     |

## TRUTH TABLE

| An | $\overline{O_n}$ |
|----|------------------|
| L  | H                |
| H  | L                |

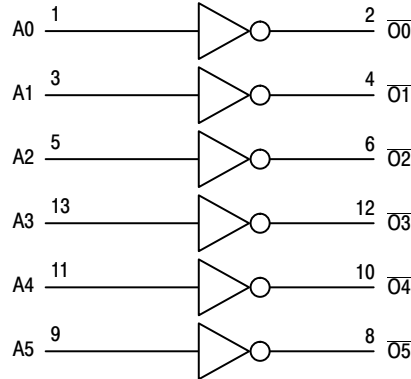


Figure 2. Logic Diagram

## MAXIMUM RATINGS

| Symbol    | Parameter                        | Value                             | Condition                             | Units |
|-----------|----------------------------------|-----------------------------------|---------------------------------------|-------|
| $V_{CC}$  | DC Supply Voltage                | -0.5 to +7.0                      |                                       | V     |
| $V_I$     | DC Input Voltage                 | $-0.5 \leq V_I \leq +7.0$         |                                       | V     |
| $V_O$     | DC Output Voltage                | $-0.5 \leq V_O \leq V_{CC} + 0.5$ | Output in HIGH or LOW State. (Note 1) | V     |
| $I_{IK}$  | DC Input Diode Current           | -50                               | $V_I < GND$                           | mA    |
| $I_{OK}$  | DC Output Diode Current          | -50                               | $V_O < GND$                           | mA    |
|           |                                  | +50                               | $V_O > V_{CC}$                        | mA    |
| $I_O$     | DC Output Source/Sink Current    | $\pm 50$                          |                                       | mA    |
| $I_{CC}$  | DC Supply Current Per Supply Pin | $\pm 100$                         |                                       | mA    |
| $I_{GND}$ | DC Ground Current Per Ground Pin | $\pm 100$                         |                                       | mA    |
| $T_{STG}$ | Storage Temperature Range        | -65 to +150                       |                                       | °C    |
| MSL       | Moisture Sensitivity             |                                   | Level 1                               |       |

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.  $I_O$  absolute maximum rating must be observed.

# MC74LCXU04

## RECOMMENDED OPERATING CONDITIONS

| Symbol              | Parameter                                                                                                                                               | Min        | Typ                  | Max              | Units |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------|------------------|-------|
| $V_{CC}$            | Supply Voltage<br>Operating<br>Data Retention Only                                                                                                      | 2.0<br>1.5 | 2.5, 3.3<br>2.5, 3.3 | 3.6<br>3.6       | V     |
| $V_I$               | Input Voltage                                                                                                                                           | 0          |                      | 5.5              | V     |
| $V_O$               | Output Voltage (HIGH or LOW State)                                                                                                                      | 0          |                      | $V_{CC}$         | V     |
| $I_{OH}$            | HIGH Level Output Current<br>$V_{CC} = 3.0\text{ V} - 3.6\text{ V}$<br>$V_{CC} = 2.7\text{ V} - 3.0\text{ V}$<br>$V_{CC} = 2.3\text{ V} - 2.7\text{ V}$ |            |                      | -18<br>-12<br>-8 | mA    |
| $I_{OL}$            | LOW Level Output Current<br>$V_{CC} = 3.0\text{ V} - 3.6\text{ V}$<br>$V_{CC} = 2.7\text{ V} - 3.0\text{ V}$<br>$V_{CC} = 2.3\text{ V} - 2.7\text{ V}$  |            |                      | +16<br>+12<br>+8 | mA    |
| $T_A$               | Operating Free-Air Temperature                                                                                                                          | -40        |                      | +85              | °C    |
| $\Delta t/\Delta V$ | Input Transition Rise or Fall Rate, $V_{IN}$ from 0.8 V to 2.0 V, $V_{CC} = 3.0\text{ V}$                                                               | 0          |                      | 10               | ns/V  |

## DC ELECTRICAL CHARACTERISTICS

| Symbol          | Characteristic                    | Condition                                                                     | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |         | Units         |
|-----------------|-----------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------|---------|---------------|
|                 |                                   |                                                                               | Min                                             | Max     |               |
| $V_{IH}$        | HIGH Level Input Voltage (Note 2) | $V_{CC} = 2.3\text{ V}$                                                       | 1.7                                             |         | V             |
|                 |                                   | $V_{CC} = 2.7\text{ V}$                                                       | 2.1                                             |         |               |
|                 |                                   | $V_{CC} = 3.0\text{ V}$                                                       | 2.2                                             |         |               |
|                 |                                   | $V_{CC} = 3.6\text{ V}$                                                       | 2.7                                             |         |               |
| $V_{IL}$        | LOW Level Input Voltage (Note 2)  | $V_{CC} = 2.3\text{ V}$                                                       |                                                 | 0.55    | V             |
|                 |                                   | $V_{CC} = 2.7\text{ V}$                                                       |                                                 | 0.55    |               |
|                 |                                   | $V_{CC} = 3.0\text{ V}$                                                       |                                                 | 0.55    |               |
|                 |                                   | $V_{CC} = 3.6\text{ V}$                                                       |                                                 | 0.55    |               |
| $V_{OH}$        | HIGH Level Output Voltage         | $2.3\text{ V} \leq V_{CC} \leq 3.6\text{ V}; I_{OL} = 100\text{ }\mu\text{A}$ | $V_{CC} - 0.2$                                  |         | V             |
|                 |                                   | $V_{CC} = 2.3\text{ V}; I_{OH} = -8\text{ mA}$                                | 1.8                                             |         |               |
|                 |                                   | $V_{CC} = 2.7\text{ V}; I_{OH} = -12\text{ mA}$                               | 2.2                                             |         |               |
|                 |                                   | $V_{CC} = 3.0\text{ V}; I_{OH} = -18\text{ mA}$                               | 2.4                                             |         |               |
| $V_{OL}$        | LOW Level Output Voltage          | $2.3\text{ V} \leq V_{CC} \leq 3.6\text{ V}; I_{OL} = 100\text{ }\mu\text{A}$ |                                                 | 0.2     | V             |
|                 |                                   | $V_{CC} = 2.3\text{ V}; I_{OL} = 8\text{ mA}$                                 |                                                 | 0.6     |               |
|                 |                                   | $V_{CC} = 2.7\text{ V}; I_{OL} = 12\text{ mA}$                                |                                                 | 0.4     |               |
|                 |                                   | $V_{CC} = 3.0\text{ V}; I_{OL} = 16\text{ mA}$                                |                                                 | 0.5     |               |
| $I_{OFF}$       | Power Off Leakage Current         | $V_{CC} = 0, V_{IN} = 5.5\text{ V or } V_{OUT} = 5.5\text{ V}$                |                                                 | 10      | $\mu\text{A}$ |
| $I_{IN}$        | Input Leakage Current             | $V_{CC} = 3.6\text{ V}, V_{IN} = 5.5\text{ V or GND}$                         |                                                 | $\pm 5$ | $\mu\text{A}$ |
| $I_{CC}$        | Quiescent Supply Current          | $V_{CC} = 3.6\text{ V}, V_{IN} = 5.5\text{ V or GND}$                         |                                                 | 10      | $\mu\text{A}$ |
| $\Delta I_{CC}$ | Increase in $I_{CC}$ per Input    | $2.3 \leq V_{CC} \leq 3.6\text{ V}; V_{IH} = V_{CC} - 0.6\text{ V}$           |                                                 | 500     | $\mu\text{A}$ |

2. These values of  $V_I$  are used to test DC electrical characteristics only.

# MC74LCXU04

## AC CHARACTERISTICS ( $t_R = t_F = 2.5$ ns; $R_L = 500 \Omega$ ) (Note 3)

| Symbol                                 | Parameter                            | Waveform | Limits                          |            |                         |            |                                 |            | Units |
|----------------------------------------|--------------------------------------|----------|---------------------------------|------------|-------------------------|------------|---------------------------------|------------|-------|
|                                        |                                      |          | T <sub>A</sub> = −40°C to +85°C |            |                         |            |                                 |            |       |
|                                        |                                      |          | V <sub>CC</sub> = 3.3 V ± 0.3 V |            | V <sub>CC</sub> = 2.7 V |            | V <sub>CC</sub> = 2.5 V ± 0.2 V |            |       |
|                                        |                                      |          | C <sub>L</sub> = 50 pF          |            | C <sub>L</sub> = 50 pF  |            | C <sub>L</sub> = 30 pF          |            |       |
|                                        |                                      |          | Min                             | Max        | Min                     | Max        | Min                             | Max        |       |
| t <sub>PLH</sub><br>t <sub>PHL</sub>   | Propagation Delay<br>Input to Output | 1        | 1.0<br>1.0                      | 3.6<br>3.6 | 1.0<br>1.0              | 4.5<br>4.5 | 1.0<br>1.0                      | 4.3<br>4.3 | ns    |
| t <sub>OSHL</sub><br>t <sub>OSLH</sub> | Output-to-Output Skew<br>(Note 4)    |          |                                 | 1.0<br>1.0 |                         |            |                                 |            | ns    |

3. These AC parameters are preliminary and may be modified.

4. 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 ( $t_{OSHL}$ ) or LOW-to-HIGH ( $t_{OSLH}$ ); parameter guaranteed by design.

## DYNAMIC SWITCHING CHARACTERISTICS

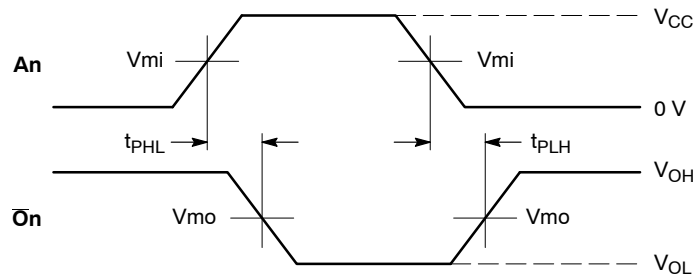
| Symbol    | Characteristic                         | Condition                                                                                                                                                                                  | $T_A = +25^\circ\text{C}$ |              |     | Units |
|-----------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------|-----|-------|
|           |                                        |                                                                                                                                                                                            | Min                       | Typ          | Max |       |
| $V_{OLP}$ | Dynamic LOW Peak Voltage<br>(Note 5)   | $V_{CC} = 3.3 \text{ V}, C_L = 50 \text{ pF}, V_{IH} = 3.3 \text{ V}, V_{IL} = 0 \text{ V}$<br>$V_{CC} = 2.5 \text{ V}, C_L = 30 \text{ pF}, V_{IH} = 2.5 \text{ V}, V_{IL} = 0 \text{ V}$ |                           | 0.8<br>0.6   |     | V     |
| $V_{OLV}$ | Dynamic LOW Valley Voltage<br>(Note 5) | $V_{CC} = 3.3 \text{ V}, C_L = 50 \text{ pF}, V_{IH} = 3.3 \text{ V}, V_{IL} = 0 \text{ V}$<br>$V_{CC} = 2.5 \text{ V}, C_L = 30 \text{ pF}, V_{IH} = 2.5 \text{ V}, V_{IL} = 0 \text{ V}$ |                           | -0.8<br>-0.6 |     | V     |

5. 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 |
|-----------|-------------------------------|----------------------------------------------------------------|---------|-------|
| $C_{IN}$  | Input Capacitance             | $V_{CC} = 3.3 \text{ V}, V_I = 0 \text{ V or } V_{CC}$         | 7       | pF    |
| $C_{OUT}$ | Output Capacitance            | $V_{CC} = 3.3 \text{ V}, V_I = 0 \text{ V or } V_{CC}$         | 8       | pF    |
| $C_{PD}$  | Power Dissipation Capacitance | 10 MHz, $V_{CC} = 3.3 \text{ V}, V_I = 0 \text{ V or } V_{CC}$ | 25      | pF    |

## MC74LCXU04

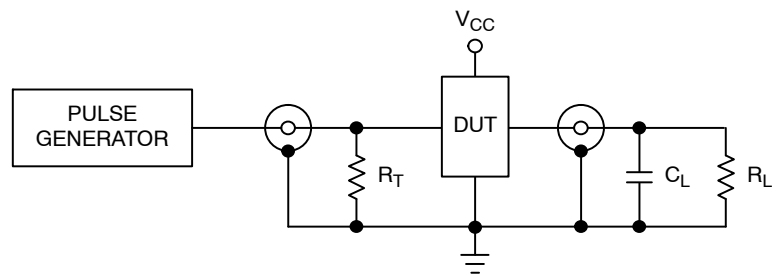


### PROPAGATION DELAYS

$t_R = t_F = 2.5\text{ ns}$ , 10% to 90%;  $f = 1\text{ MHz}$ ;  $t_W = 500\text{ ns}$

| Symbol   | $V_{CC}$                        |                |                                 |
|----------|---------------------------------|----------------|---------------------------------|
|          | $3.3\text{ V} \pm 0.3\text{ V}$ | $2.7\text{ V}$ | $2.5\text{ V} \pm 0.2\text{ V}$ |
| $V_{mi}$ | $1.5\text{ V}$                  | $1.5\text{ V}$ | $V_{CC}/2$                      |
| $V_{mo}$ | $1.5\text{ V}$                  | $1.5\text{ V}$ | $V_{CC}/2$                      |

Figure 3. AC Waveforms



$C_L = 50\text{ pF}$  at  $V_{CC} = 3.3 \pm 0.3\text{ V}$  or equivalent (includes jig and probe capacitance)  
 $C_L = 30\text{ pF}$  at  $V_{CC} = 2.5 \pm 0.2\text{ V}$  or equivalent (includes jig and probe capacitance)  
 $R_L = R_1 = 500\ \Omega$  or equivalent  
 $R_T = Z_{OUT}$  of pulse generator (typically  $50\ \Omega$ )

Figure 4. Test Circuit

## MC74LCXU04

| Device          | Package               | Shipping <sup>†</sup> |
|-----------------|-----------------------|-----------------------|
| MC74LCXU04DG    | SOIC-14<br>(Pb-Free)  | 55 Units / Rail       |
| MC74LCXU04DR2G  | SOIC-14<br>(Pb-Free)  | 2500 Tape & Reel      |
| MC74LCXU04DTR2G | TSSOP-14<br>(Pb-Free) | 2500 Tape & Reel      |

### DISCONTINUED (Note 6)

|               |                       |                 |
|---------------|-----------------------|-----------------|
| MC74LCXU04DTG | TSSOP-14<br>(Pb-Free) | 96 Units / Rail |
|---------------|-----------------------|-----------------|

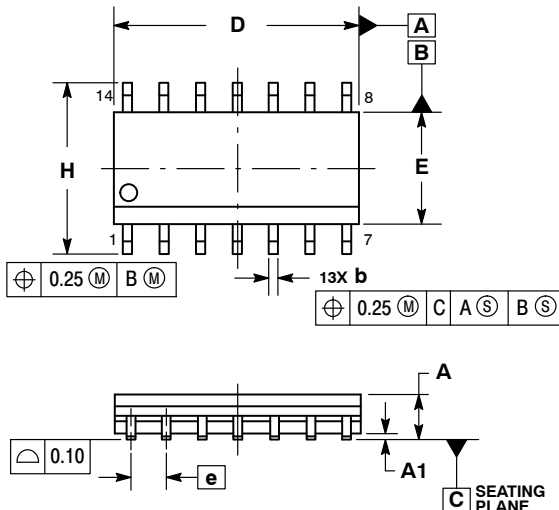
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

6. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).



SOIC-14 NB  
CASE 751A-03  
ISSUE L

DATE 03 FEB 2016

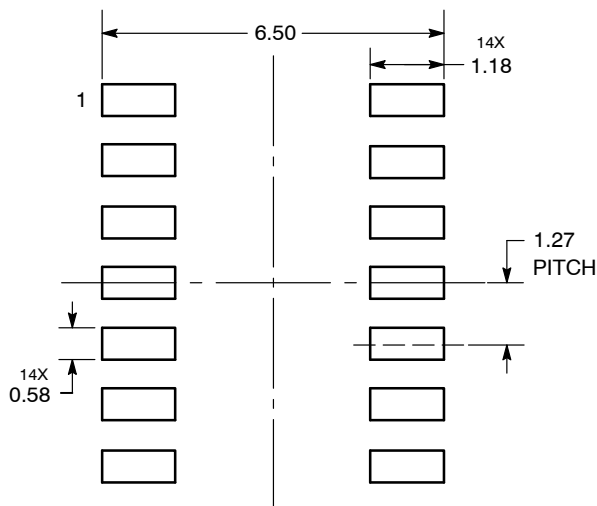


NOTES:

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   |
| 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°          | 7°   | 0°        | 7°    |

SOLDERING FOOTPRINT\*



DIMENSIONS: MILLIMETERS

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

GENERIC  
MARKING DIAGRAM\*



XXXXXX = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week  
G = Pb-Free Package

\*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.

STYLES ON PAGE 2

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOCUMENT NUMBER: | 98ASB42565B | Electronic versions are uncontrolled except when accessed directly from the Document Repository.<br>Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| DESCRIPTION:     | SOIC-14 NB  | PAGE 1 OF 2                                                                                                                                                                         |

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

SOIC-14  
CASE 751A-03  
ISSUE L

DATE 03 FEB 2016

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

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

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

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOCUMENT NUMBER: | 98ASB42565B | Electronic versions are uncontrolled except when accessed directly from the Document Repository.<br>Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| DESCRIPTION:     | SOIC-14 NB  | PAGE 2 OF 2                                                                                                                                                                         |

**onsemi** and **onsemi** are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.


**TSSOP-14 WB**  
**CASE 948G**  
**ISSUE C**

DATE 17 FEB 2016

SCALE 2:1


**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 EXCEED 0.15 (0.006) PER SIDE.
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°          | 8°   | 0°        | 8°    |

**RECOMMENDED  
SOLDERING FOOTPRINT\***


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

**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 "▪", may or may not be present. Some products may not follow the Generic Marking.

**DOCUMENT NUMBER:** 98ASH70246A

Electronic versions are uncontrolled except when accessed directly from the Document Repository.  
Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.

**DESCRIPTION:** TSSOP-14 WB

**PAGE 1 OF 1**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at  
[www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)