

# 8-Bit Addressable Latch 1-of-8 Decoder

## High-Performance Silicon-Gate CMOS

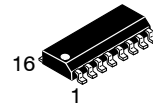
### MC74HC259A, MC74HCT259A

The MC74HC259A/MC74HCT259A is identical in pinout to the LS259. The device inputs are compatible with standard CMOS outputs; with pullup resistors, they are compatible with LSTTL outputs. The MC74HCT259A inputs are compatible with standard CMOS and LSTTL outputs.

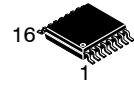
The device has four modes of operation as shown in the mode selection table. In the addressable latch mode, the data on Data In is written into the addressed latch. The addressed latch follows the data input with all non-addressed latches remaining in their previous states. In the memory mode, all latches remain in their previous state and are unaffected by the Data or Address inputs. In the one-of-eight decoding or demultiplexing mode, the addressed output follows the state of Data In with all other outputs in the LOW state. In the Reset mode all outputs are LOW and unaffected by the address and data inputs. When operating the device as an addressable latch, changing more than one bit of the address could impose a transient wrong address. Therefore, this should only be done while in the memory mode.

#### Features

- Output Drive Capability: 10 LSTTL Loads
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 2 to 6 V (HC), 4.5 to 5.5 V (HCT)
- Low Input Current: 1  $\mu$ A
- High Noise Immunity Characteristic of CMOS Devices
- -Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant



SOIC-16  
D SUFFIX  
CASE 751B

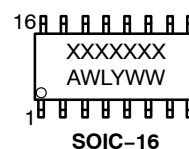


TSSOP-16  
DT SUFFIX  
CASE 948F

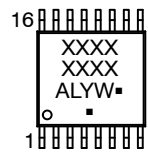


QFN16  
MN SUFFIX  
CASE 485AW

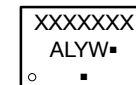
#### MARKING DIAGRAMS



SOIC-16



TSSOP-16



QFN16

XXXXXXX = Specific Device Code

A = Assembly Location

WL, L = Wafer Lot

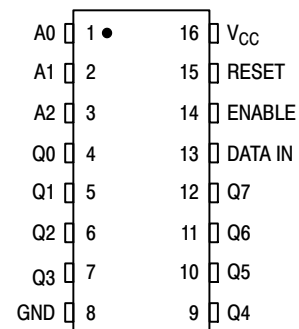
Y = Year

WW, W = Work Week

G or ■ = Pb-Free Package

(Note: Microdot may be in either location)

#### PIN ASSIGNMENT



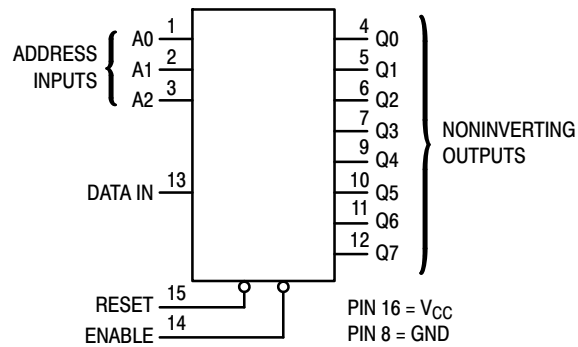
#### MODE SELECTION TABLE

| Enable | Reset | Mode                 |
|--------|-------|----------------------|
| L      | H     | Addressable Latch    |
| H      | H     | Memory               |
| L      | L     | 8-Line Demultiplexer |
| H      | L     | Reset                |

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

# MC74HC259A, MC74HCT259A



**LATCH SELECTION TABLE**

| Address Inputs |                |                | Latch Addressed |
|----------------|----------------|----------------|-----------------|
| A <sub>2</sub> | A <sub>1</sub> | A <sub>0</sub> |                 |
| L              | L              | L              | Q0              |
| L              | L              | H              | Q1              |
| L              | H              | L              | Q2              |
| L              | H              | H              | Q3              |
| H              | L              | L              | Q4              |
| H              | L              | H              | Q5              |
| H              | H              | L              | Q6              |
| H              | H              | H              | Q7              |

**Figure 1. Logic Diagram**

## MAXIMUM RATINGS

| Symbol               | Parameter   | Value                           | Unit |
|----------------------|---|---------------------------------|------|
| V <sub>CC</sub>      | DC Supply Voltage   | −0.5 to +6.5                    | V    |
| V <sub>IN</sub>      | DC Input Voltage  | −0.5 to V <sub>CC</sub> +0.5    | V    |
| V <sub>OUT</sub>     | DC Output Voltage   | −0.5 to V <sub>CC</sub> +0.5    | V    |
| I <sub>IN</sub>      | DC Input Diode Current, per Pin   | ±20                             | mA   |
| I <sub>OUT</sub>     | DC Input Diode Current, Per Pin   | ±25                             | mA   |
| I <sub>CC</sub>      | DC Supply Current, V <sub>CC</sub> and GND Pins                                     | ±50                             | mA   |
| I <sub>IK</sub>      | Input Clamp Current (V <sub>IN</sub> < 0 or V <sub>IN</sub> > V <sub>CC</sub> )     | ±20                             | mA   |
| I <sub>OK</sub>      | Output Clamp Current (V <sub>OUT</sub> < 0 or V <sub>OUT</sub> > V <sub>CC</sub> )  | ±20                             | mA   |
| T <sub>STG</sub>     | Storage Temperature Range   | −65 to +150                     | °C   |
| T <sub>L</sub>       | Lead Temperature, 1 mm from Case for 10 secs  | 260                             | °C   |
| T <sub>J</sub>       | Junction Temperature Under Bias   | +150                            | °C   |
| θ <sub>JA</sub>      | Thermal Resistance (Note 1)<br><div>SOIC-16<br/>QFN16<br/>TSSOP-16</div>            | <div>126<br/>118<br/>159</div>  | °C/W |
| P <sub>D</sub>       | Power Dissipation in Still Air at 25°C<br><div>SOIC-16<br/>QFN16<br/>TSSOP-16</div> | <div>995<br/>1062<br/>787</div> | mW   |
| MSL                  | Moisture Sensitivity  | Level 1                         | –    |
| F <sub>R</sub>       | Flammability Rating<br>Oxygen Index: 28 to 34                                       | UL 94 V-0 @ 0.125 in            | –    |
| V <sub>ESD</sub>     | ESD Withstand Voltage (Note 2)<br>Human Body Model<br>Charged Device Model          | <div>2000<br/>N/A</div>         | V    |
| I <sub>LATCHUP</sub> | Latchup Performance (Note 3)  | ±100                            | 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 76mm-by-114mm, 2-ounce copper trace no air flow per JESD51-7.
2. HBM tested to EIA / JESD22-A114-A. CDM tested to JESD22-C101-A. JEDEC recommends that ESD qualification to EIA/JESD22-A115A (Machine Model) be discontinued.
3. Tested to EIA/JESD78 Class II.

# MC74HC259A, MC74HCT259A

## RECOMMENDED OPERATING CONDITIONS

| Symbol                             | Parameter   | Min              | Max                       | Unit |
|------------------------------------|---|------------------|---------------------------|------|
| MC74HC                             |   |                  |                           |      |
| V <sub>CC</sub>                    | DC Supply Voltage   | 2.0              | 6.0                       | V    |
| V <sub>in</sub> , V <sub>out</sub> | DC Input, Output Voltage (Note 4)   | 0                | V <sub>CC</sub>           | V    |
| T <sub>A</sub>                     | Operating Free–Air Temperature  | –55              | +125                      | °C   |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise or Fall Time<br><br>V <sub>CC</sub> = 2.0 V<br>V <sub>CC</sub> = 3.0 V<br>V <sub>CC</sub> = 4.5 V<br>V <sub>CC</sub> = 6.0 V | 0<br>0<br>0<br>0 | 1000<br>600<br>500<br>400 | ns   |
| MC74HCT                            |   |                  |                           |      |
| V <sub>CC</sub>                    | DC Supply Voltage   | 4.5              | 5.5                       | V    |
| V <sub>in</sub> , V <sub>out</sub> | DC Input, Output Voltage (Note 4)   | 0                | V <sub>CC</sub>           | V    |
| T <sub>A</sub>                     | Operating Free–Air Temperature  | –55              | +125                      | °C   |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise or Fall Time   | 0                | 500                       | ns   |

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.

4. Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or  $V_{CC}$ ). Unused outputs must be left open.

## DC ELECTRICAL CHARACTERISTICS (MC74HC259A)

| Symbol   | Parameter                                      | Test Conditions   | $V_{CC}$<br>V            | Guaranteed Limit           |                            |                            | Unit |
|----------|--|---|--------------------------|----------------------------|----------------------------|----------------------------|------|
|          |  |   |                          | - 55 to<br>25°C            | ≤ 85°C                     | ≤ 125°C                    |      |
| $V_{IH}$ | Minimum High-Level Input Voltage               | $V_{out} = 0.1\text{ V}$ or $V_{CC} - 0.1\text{ V}$<br>$ I_{out}  \leq 20\text{ }\mu\text{A}$                                       | 2.0<br>3.0<br>4.5<br>6.0 | 1.5<br>2.1<br>3.15<br>4.2  | 1.5<br>2.1<br>3.15<br>4.2  | 1.5<br>2.1<br>3.15<br>4.2  | V    |
| $V_{IL}$ | Maximum Low-Level Input Voltage                | $V_{out} = 0.1\text{ V}$ or $V_{CC} - 0.1\text{ V}$<br>$ I_{out}  \leq 20\text{ }\mu\text{A}$                                       | 2.0<br>3.0<br>4.5<br>6.0 | 0.5<br>0.9<br>1.35<br>1.80 | 0.5<br>0.9<br>1.35<br>1.80 | 0.5<br>0.9<br>1.35<br>1.80 | V    |
| $V_{OH}$ | Minimum High-Level Output Voltage              | $V_{in} = V_{IH}$ or $V_{IL}$<br>$ I_{out}  \leq 20\text{ }\mu\text{A}$   | 2.0<br>4.5<br>6.0        | 1.9<br>4.4<br>5.9          | 1.9<br>4.4<br>5.9          | 1.9<br>4.4<br>5.9          | V    |
|          |  |   | 3.0<br>4.5<br>6.0        | 2.48<br>3.98<br>5.48       | 2.34<br>3.84<br>5.34       | 2.20<br>3.70<br>5.20       |      |
|          |  |   |                          |                            |                            |                            |      |
|          |  | $V_{in} = V_{IH}$ or $V_{IL}$<br>$ I_{out}  \leq 2.4\text{ mA}$<br>$ I_{out}  \leq 4.0\text{ mA}$<br>$ I_{out}  \leq 5.2\text{ mA}$ | 3.0<br>4.5<br>6.0        | 0.26<br>0.26<br>0.26       | 0.33<br>0.33<br>0.33       | 0.40<br>0.40<br>0.40       |      |
| $V_{OL}$ | Maximum Low-Level Output Voltage               | $V_{in} = V_{IH}$ or $V_{IL}$<br>$ I_{out}  \leq 20\text{ }\mu\text{A}$   | 2.0<br>4.5<br>6.0        | 0.1<br>0.1<br>0.1          | 0.1<br>0.1<br>0.1          | 0.1<br>0.1<br>0.1          | V    |
|          |  |   | 3.0<br>4.5<br>6.0        | 0.26<br>0.26<br>0.26       | 0.33<br>0.33<br>0.33       | 0.40<br>0.40<br>0.40       |      |
|          |  |   |                          |                            |                            |                            |      |
|          |  | $V_{in} = V_{IH}$ or $V_{IL}$<br>$ I_{out}  \leq 2.4\text{ mA}$<br>$ I_{out}  \leq 4.0\text{ mA}$<br>$ I_{out}  \leq 5.2\text{ mA}$ | 3.0<br>4.5<br>6.0        | 0.26<br>0.26<br>0.26       | 0.33<br>0.33<br>0.33       | 0.40<br>0.40<br>0.40       |      |
| $I_{in}$ | Maximum Input Leakage Current                  | $V_{in} = V_{CC}$ or GND  | 6.0                      | ± 0.1                      | ± 1.0                      | ± 1.0                      | μA   |
| $I_{CC}$ | Maximum Quiescent Supply Current (per Package) | $V_{in} = V_{CC}$ or GND<br>$I_{out} = 0\text{ }\mu\text{A}$  | 6.0                      | 4                          | 40                         | 160                        | μA   |

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.

# MC74HC259A, MC74HCT259A

## AC ELECTRICAL CHARACTERISTICS (MC74HC259A)

| Symbol                                 | Parameter   | V <sub>CC</sub><br>V | Guaranteed Limit |        |         | Unit |
|--|---|----------------------|------------------|--------|---------|------|
|  |   |                      | – 55 to 25°C     | ≤ 85°C | ≤ 125°C |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Data to Output<br>(Figures 2, 3)           | 2.0                  | 125              | 160    | 175     | ns   |
|  |   | 3.0                  | 45               | 60     | 70      |      |
|  |   | 4.5                  | 32               | 32     | 42      |      |
|  |   | 6.0                  | 25               | 28     | 33      |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Address Select to Output<br>(Figures 2, 4) | 2.0                  | 150              | 175    | 200     | ns   |
|  |   | 3.0                  | 60               | 70     | 80      |      |
|  |   | 4.5                  | 32               | 40     | 45      |      |
|  |   | 6.0                  | 28               | 30     | 35      |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Enable to Output<br>(Figures 2, 5)         | 2.0                  | 150              | 175    | 200     | ns   |
|  |   | 3.0                  | 60               | 70     | 80      |      |
|  |   | 4.5                  | 32               | 40     | 45      |      |
|  |   | 6.0                  | 28               | 30     | 35      |      |
| t <sub>PHL</sub>                       | Maximum Propagation Delay, Reset to Output<br>(Figures 2, 6)          | 2.0                  | 110              | 125    | 160     | ns   |
|  |   | 3.0                  | 36               | 45     | 60      |      |
|  |   | 4.5                  | 22               | 26     | 32      |      |
|  |   | 6.0                  | 19               | 23     | 28      |      |
| t <sub>TLH</sub> ,<br>t <sub>THL</sub> | Maximum Output Transition Time, Any Output<br>(Figures 2, 3)          | 2.0                  | 75               | 95     | 110     | ns   |
|  |   | 3.0                  | 27               | 32     | 36      |      |
|  |   | 4.5                  | 15               | 19     | 22      |      |
|  |   | 6.0                  | 13               | 16     | 19      |      |
| C <sub>in</sub>                        | Maximum Input Capacitance   | –                    | 10               | 10     | 10      | pF   |

|                 |   |   |  |  |    |
|-----------------|---|---|--|--|----|
| C <sub>PD</sub> | Power Dissipation Capacitance (Per Package) | Typical @ 25°C, V <sub>CC</sub> = 5.0 V |  |  | pF |
|                 |   | 30                                      |  |  |    |

## TIMING REQUIREMENTS (MC74HC259A)

| Symbol                          | Parameter   | V <sub>CC</sub><br>V | Guaranteed Limit |        |         | Unit |
|---------------------------------|---|----------------------|------------------|--------|---------|------|
|                                 |   |                      | - 55 to 25°C     | ≤ 85°C | ≤ 125°C |      |
| t <sub>su</sub>                 | Minimum Setup Time, Address or Data to Enable<br>(Figure 7) | 2.0                  | 75               | 95     | 110     | ns   |
|                                 |   | 3.0                  | 30               | 40     | 55      |      |
|                                 |   | 4.5                  | 15               | 19     | 22      |      |
|                                 |   | 6.0                  | 13               | 16     | 19      |      |
| t <sub>h</sub>                  | Minimum Hold Time, Enable to Address or Data<br>(Figure 7)  | 2.0                  | 1                | 1      | 1       | ns   |
|                                 |   | 3.0                  | 1                | 1      | 1       |      |
|                                 |   | 4.5                  | 1                | 1      | 1       |      |
|                                 |   | 6.0                  | 1                | 1      | 1       |      |
| t <sub>w</sub>                  | Minimum Pulse Width, Reset or Enable<br>(Figure 5, 6)       | 2.0                  | 70               | 90     | 100     | ns   |
|                                 |   | 3.0                  | 27               | 32     | 36      |      |
|                                 |   | 4.5                  | 15               | 19     | 22      |      |
|                                 |   | 6.0                  | 13               | 16     | 19      |      |
| t <sub>r</sub> , t <sub>f</sub> | Maximum Input Rise and Fall Times<br>(Figure 3)             | 2.0                  | 1000             | 1000   | 1000    | ns   |
|                                 |   | 3.0                  | 600              | 600    | 600     |      |
|                                 |   | 4.5                  | 500              | 500    | 500     |      |
|                                 |   | 6.0                  | 400              | 400    | 400     |      |

# MC74HC259A, MC74HCT259A

## DC ELECTRICAL CHARACTERISTICS (MC74HCT259A)

| Symbol           | Parameter                                      | Test Conditions   | V <sub>CC</sub><br>V | Guaranteed Limit |             |            | Unit |
|------------------|--|---|----------------------|------------------|-------------|------------|------|
|                  |  |   |                      | – 55 to 25°C     | ≤ 85°C      | ≤ 125°C    |      |
| V <sub>IH</sub>  | Minimum High-Level Input Voltage               | V <sub>out</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V<br> I <sub>out</sub>   ≤ 20 μA  | 4.5<br>5.5           | 2.0<br>2.0       | 2.0<br>2.0  | 2.0<br>2.0 | V    |
| V <sub>IL</sub>  | Maximum Low-Level Input Voltage                | V <sub>out</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V<br> I <sub>out</sub>   ≤ 20 μA  | 4.5<br>5.5           | 0.8<br>0.8       | 0.8<br>0.8  | 0.8<br>0.8 | V    |
| V <sub>OH</sub>  | Minimum High-Level Output Voltage              | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br> I <sub>out</sub>   ≤ 20 μA                                       | 4.5<br>5.5           | 4.4<br>5.4       | 4.4<br>5.4  | 4.4<br>5.4 | V    |
|                  |  | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub>  I <sub>out</sub>   ≤ 5.2 mA   | 4.5                  | 3.98             | 3.84        | 3.70       |      |
| V <sub>OL</sub>  | Maximum Low-Level Output Voltage               | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub><br> I <sub>out</sub>   ≤ 20 μA                                       | 4.5<br>5.5           | 0.1<br>0.1       | 0.1<br>0.1  | 0.1<br>0.1 | V    |
|                  |  | V <sub>in</sub> = V <sub>IH</sub> or V <sub>IL</sub>  I <sub>out</sub>   ≤ 5.2 mA   | 4.5                  | 0.26             | 0.33        | 0.40       |      |
| I <sub>in</sub>  | Maximum Input Leakage Current                  | V <sub>in</sub> = V <sub>CC</sub> or GND  | 5.5                  | ± 0.1            | ± 1.0       | ± 1.0      | μA   |
| I <sub>CC</sub>  | Maximum Quiescent Supply Current (per Package) | V <sub>in</sub> = V <sub>CC</sub> or GND<br>I <sub>out</sub> = 0 μA   | 5.5                  | 4                | 40          | 160        | μA   |
| ΔI <sub>CC</sub> | Additional Quiescent Supply Current            | V <sub>in</sub> = 2.4V, Any One Input<br>V <sub>in</sub> = V <sub>CC</sub> or GND, Other Inputs<br>I <sub>out</sub> = 0μA | 5.5                  | ≥ –55°C          | 25 to 125°C |            | mA   |
|                  |  |   |                      | 2.9              | 2.4         |            |      |

## AC ELECTRICAL CHARACTERISTICS (MC74HCT259A)

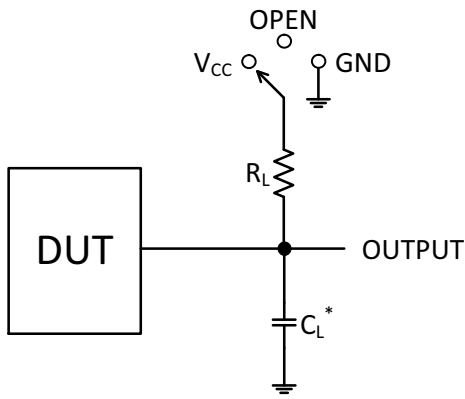
| Symbol                                 | Parameter   | Guaranteed Limit |        |         | Unit |
|--|---|------------------|--------|---------|------|
|  |   | -55 to 25°C      | ≤ 85°C | ≤ 125°C |      |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Data to Output<br>(Figures 2, 3)           | 32               | 32     | 42      | ns   |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Address Select to Output<br>(Figures 2, 4) | 32               | 40     | 45      | ns   |
| t <sub>PLH</sub> ,<br>t <sub>PHL</sub> | Maximum Propagation Delay, Enable to Output<br>(Figures 2, 5)         | 32               | 40     | 45      | ns   |
| t <sub>PHL</sub>                       | Maximum Propagation Delay, Reset to Output<br>(Figures 2, 6)          | 22               | 26     | 32      | ns   |
| t <sub>TLH</sub> ,<br>t <sub>THL</sub> | Maximum Output Transition Time, Any Output<br>(Figures 2, 3)          | 15               | 19     | 22      | ns   |
| C <sub>in</sub>                        | Maximum Input Capacitance   | 10               | 10     | 10      | pF   |

|                 |   |   |    |
|-----------------|---|---|----|
| C <sub>PD</sub> | Power Dissipation Capacitance (Per Package) | Typical @ 25°C, V <sub>CC</sub> = 5.0 V | pF |
|                 |   | 30                                      |    |

## TIMING REQUIREMENTS (MC74HCT259A)

| Symbol          | Parameter  | Guaranteed Limit |        |         | Unit |
|-----------------|--|------------------|--------|---------|------|
|                 |  | -55 to 25°C      | ≤ 85°C | ≤ 125°C |      |
| t <sub>su</sub> | Minimum Setup Time, Address or Data to Enable (Figure 7) | 15               | 19     | 22      | ns   |
| t <sub>h</sub>  | Minimum Hold Time, Enable to Address or Data (Figure 7)  | 1                | 1      | 1       | ns   |
| t <sub>w</sub>  | Minimum Pulse Width, Reset or Enable (Figure 5 or 6)     | 15               | 19     | 22      | ns   |

# MC74HC259A, MC74HCT259A



\*C<sub>L</sub> Includes probe and jig capacitance

| Test                                | Switch Position | C <sub>L</sub> | R <sub>L</sub> |
|-------------------------------------|-----------------|----------------|----------------|
| t <sub>PLH</sub> / t <sub>PHL</sub> | Open            | 50 pF          | 1 kΩ           |
| t <sub>PLZ</sub> / t <sub>PZL</sub> | V <sub>CC</sub> |                |                |
| t <sub>PHZ</sub> / t <sub>PZH</sub> | GND             |                |                |

Figure 2. Test Circuit

## SWITCHING WAVEFORMS

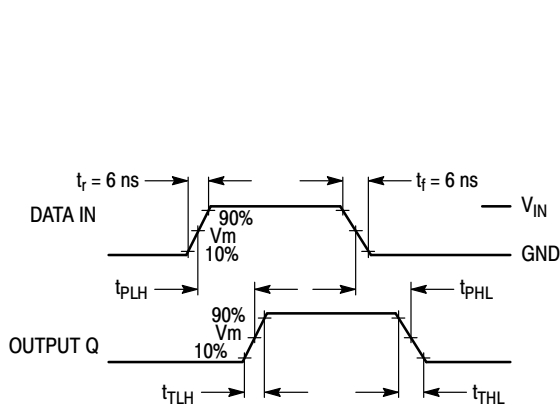


Figure 3.

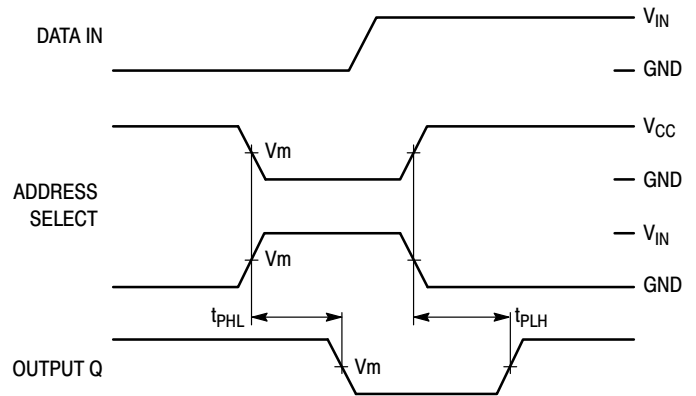


Figure 4.

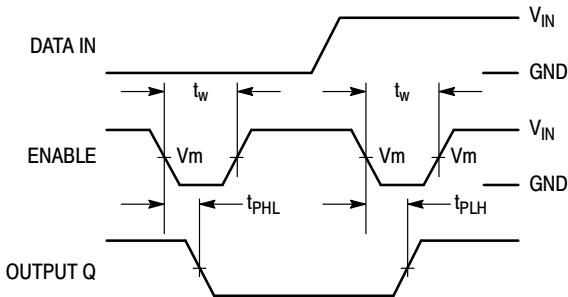


Figure 5.

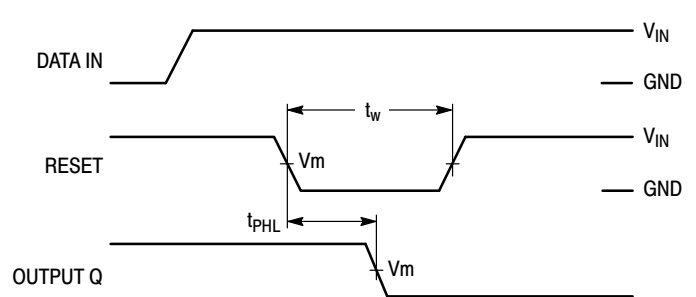


Figure 6.

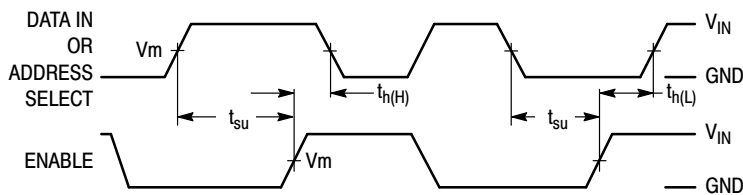


Figure 7.

| Device      | V <sub>IN</sub> , V | V <sub>m</sub> , V    |
|-------------|---------------------|-----------------------|
| MC74HC259A  | V <sub>CC</sub>     | 50% x V <sub>CC</sub> |
| MC74HCT259A | 3 V                 | 1.3 V                 |

## MC74HC259A, MC74HCT259A

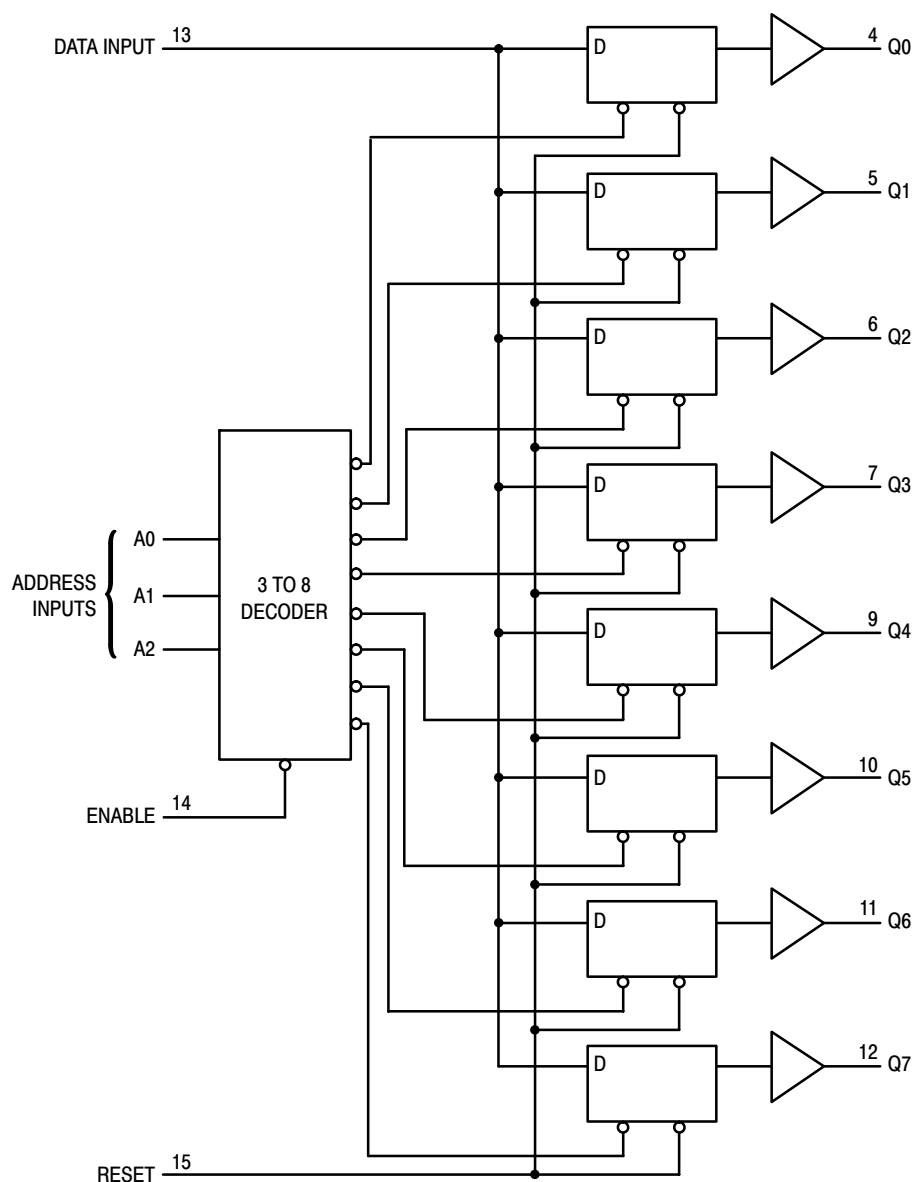


Figure 8. Expanded Logic Diagram

### ORDERING INFORMATION

| Device             | Marking    | Package  | Shipping†                |
|--------------------|------------|----------|--------------------------|
| MC74HC259ADR2G     | HC259AG    | SOIC-16  | 2500 Units / Tape & Reel |
| MC74HC259ADR2G-Q*  | HC259AG    | SOIC-16  | 2500 Units / Tape & Reel |
| MC74HC259ADTR2G    | HC<br>259A | TSSOP-16 | 2500 Units / Tape & Reel |
| MC74HC259ADTR2G-Q* | HC<br>259A | TSSOP-16 | 2500 Units / Tape & Reel |
| MC74HCT259ADR2G    | HCT259AG   | SOIC-16  | 2500 Units / Tape & Reel |

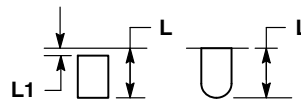
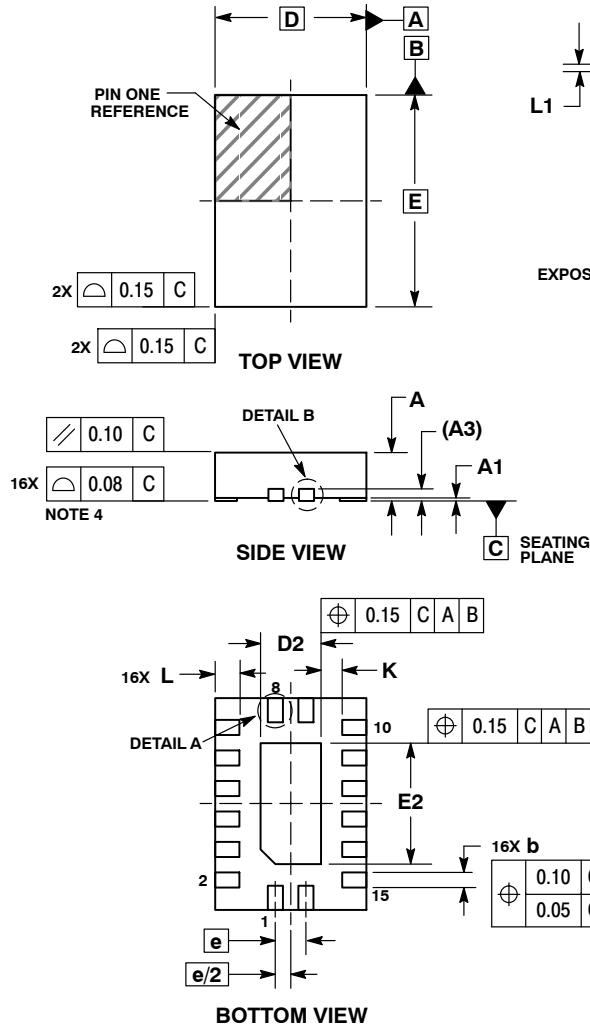
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*-Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

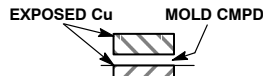
# MC74HC259A, MC74HCT259A

## PACKAGE DIMENSIONS

QFN16, 2.5x3.5, 0.5P  
CASE 485AW  
ISSUE O



**DETAIL A**  
ALTERNATE TERMINAL  
CONSTRUCTIONS



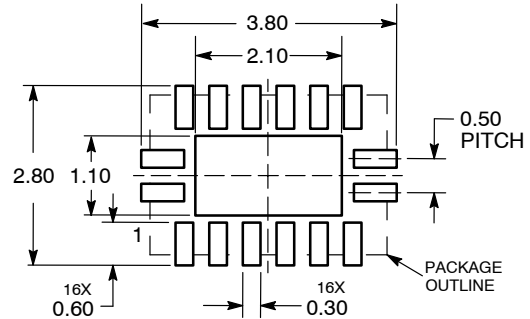
**DETAIL B**  
ALTERNATE  
CONSTRUCTIONS

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 0.80        | 1.00 |
| A1  | 0.00        | 0.05 |
| A3  | 0.20        | REF  |
| b   | 0.20        | 0.30 |
| D   | 2.50        | BSC  |
| D2  | 0.85        | 1.15 |
| E   | 3.50        | BSC  |
| E2  | 1.85        | 2.15 |
| e   | 0.50        | BSC  |
| K   | 0.20        | ---  |
| L   | 0.35        | 0.45 |
| L1  | ---         | 0.15 |

### RECOMMENDED SOLDERING FOOTPRINT\*



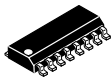
DIMENSIONS: MILLIMETERS

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



# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS



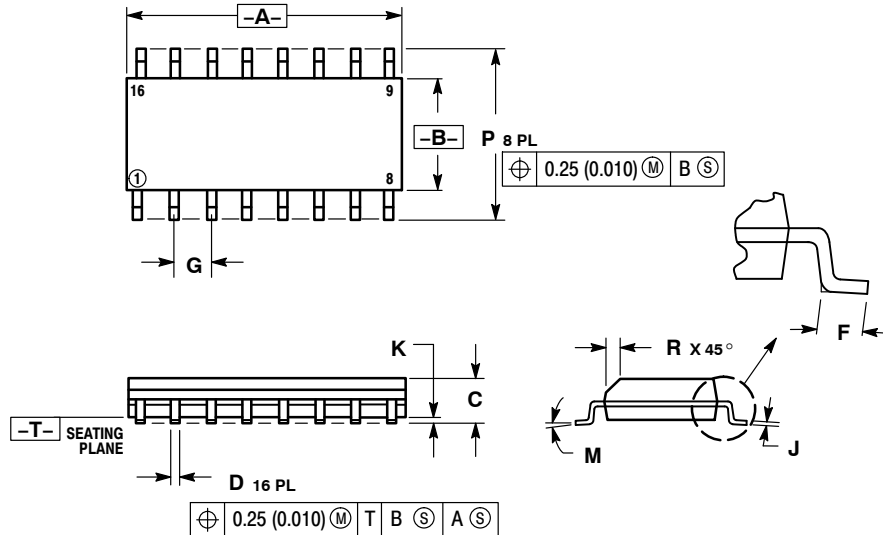
SCALE 1:1

### SOIC-16

#### CASE 751B-05

#### ISSUE K

DATE 29 DEC 2006



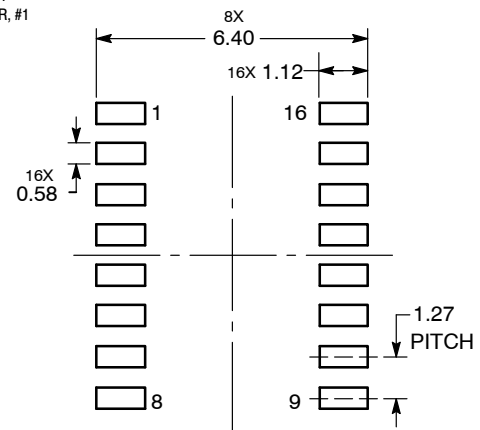
#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 9.80        | 10.00 | 0.386     | 0.393 |
| B   | 3.80        | 4.00  | 0.150     | 0.157 |
| C   | 1.35        | 1.75  | 0.054     | 0.068 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.40        | 1.25  | 0.016     | 0.049 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.19        | 0.25  | 0.008     | 0.009 |
| K   | 0.10        | 0.25  | 0.004     | 0.009 |
| M   | 0°          | 7°    | 0°        | 7°    |
| P   | 5.80        | 6.20  | 0.229     | 0.244 |
| R   | 0.25        | 0.50  | 0.010     | 0.019 |

|   |   |   |   |
|---|---|---|---|
| STYLE 1:<br>PIN 1. COLLECTOR<br>2. BASE<br>3. EMITTER<br>4. NO CONNECTION<br>5. EMITTER<br>6. BASE<br>7. COLLECTOR<br>8. COLLECTOR<br>9. BASE<br>10. EMITTER<br>11. NO CONNECTION<br>12. EMITTER<br>13. BASE<br>14. COLLECTOR<br>15. EMITTER<br>16. COLLECTOR                           | STYLE 2:<br>PIN 1. CATHODE<br>2. ANODE<br>3. NO CONNECTION<br>4. CATHODE<br>5. CATHODE<br>6. NO CONNECTION<br>7. ANODE<br>8. CATHODE<br>9. CATHODE<br>10. ANODE<br>11. NO CONNECTION<br>12. CATHODE<br>13. CATHODE<br>14. NO CONNECTION<br>15. ANODE<br>16. CATHODE | STYLE 3:<br>PIN 1. COLLECTOR, DYE #1<br>2. BASE, #1<br>3. EMITTER, #1<br>4. COLLECTOR, #1<br>5. COLLECTOR, #2<br>6. BASE, #2<br>7. EMITTER, #2<br>8. COLLECTOR, #2<br>9. COLLECTOR, #3<br>10. BASE, #3<br>11. EMITTER, #3<br>12. COLLECTOR, #3<br>13. COLLECTOR, #4<br>14. BASE, #4<br>15. EMITTER, #4<br>16. COLLECTOR, #4   | STYLE 4:<br>PIN 1. COLLECTOR, DYE #1<br>2. COLLECTOR, #1<br>3. COLLECTOR, #2<br>4. COLLECTOR, #2<br>5. COLLECTOR, #3<br>6. COLLECTOR, #3<br>7. COLLECTOR, #4<br>8. COLLECTOR, #4<br>9. BASE, #4<br>10. EMITTER, #4<br>11. BASE, #3<br>12. EMITTER, #3<br>13. BASE, #2<br>14. EMITTER, #2<br>15. BASE, #1<br>16. EMITTER, #1 |
| STYLE 5:<br>PIN 1. DRAIN, DYE #1<br>2. DRAIN, #1<br>3. DRAIN, #2<br>4. DRAIN, #2<br>5. DRAIN, #3<br>6. DRAIN, #3<br>7. DRAIN, #4<br>8. DRAIN, #4<br>9. GATE, #4<br>10. SOURCE, #4<br>11. GATE, #3<br>12. SOURCE, #3<br>13. GATE, #2<br>14. SOURCE, #2<br>15. GATE, #1<br>16. SOURCE, #1 | STYLE 6:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE<br>4. CATHODE<br>5. CATHODE<br>6. CATHODE<br>7. CATHODE<br>8. CATHODE<br>9. ANODE<br>10. ANODE<br>11. ANODE<br>12. ANODE<br>13. ANODE<br>14. ANODE<br>15. ANODE<br>16. ANODE                                 | STYLE 7:<br>PIN 1. SOURCE N-CH<br>2. COMMON DRAIN (OUTPUT)<br>3. COMMON DRAIN (OUTPUT)<br>4. GATE P-CH<br>5. COMMON DRAIN (OUTPUT)<br>6. COMMON DRAIN (OUTPUT)<br>7. COMMON DRAIN (OUTPUT)<br>8. SOURCE P-CH<br>9. SOURCE P-CH<br>10. COMMON DRAIN (OUTPUT)<br>11. COMMON DRAIN (OUTPUT)<br>12. COMMON DRAIN (OUTPUT)<br>13. GATE N-CH<br>14. COMMON DRAIN (OUTPUT)<br>15. COMMON DRAIN (OUTPUT)<br>16. SOURCE N-CH |   |

#### RECOMMENDED SOLDERING FOOTPRINT\*



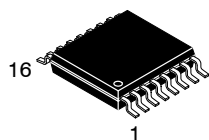
DIMENSIONS: MILLIMETERS

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

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# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



**TSSOP-16 WB**  
**CASE 948F**  
**ISSUE B**

DATE 19 OCT 2006



## NOTES:

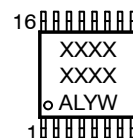
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD 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   | 0.18        | 0.28 | 0.007     | 0.011 |
| 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\*



## GENERIC MARKING DIAGRAM\*



XXXX = Specific Device Code  
A = Assembly Location  
L = Wafer Lot  
Y = Year  
W = Work Week  
G or ■ = 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.

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

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