

# 8-Bit Addressable Latch

## MC74AC259, MC74ACT259

The MC74AC259/74ACT259 is a high-speed 8-bit addressable latch designed for general purpose storage applications in digital systems. It is a multifunctional device capable of storing single line data in eight addressable latches, and also a 1-of-8 decoder and demultiplexer with active HIGH outputs. The device also incorporates an active LOW Common Clear for resetting all latches, as well as an active LOW Enable. It is functionally identical to the ALS259 8-bit addressable latch.

- Serial-to-Parallel Conversion
- Eight Bits of Storage with Output of Each Bit Available
- Random (Addressable) Data Entry
- Active High Demultiplexing or Decoding Capability
- Easily Expandable
- Common Clear
- These are Pb-Free Devices

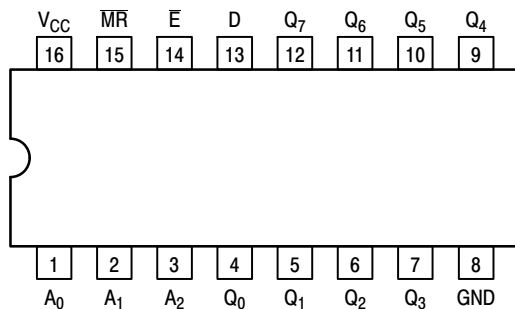


Figure 1. Pinout: 16-Lead Packages Conductors (Top View)

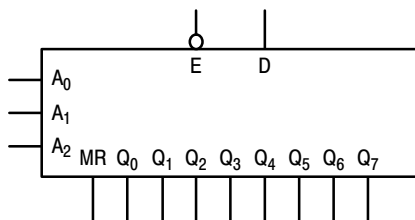


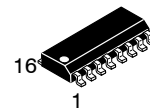
Figure 2. Logic Symbol

### MODE SELECT TABLE

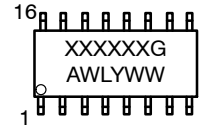
| E | MR | Mode                                |
|---|----|-------------------------------------|
| L | H  | Addressable Latch                   |
| H | H  | Memory                              |
| L | L  | Active HIGH 8-Channel Demultiplexer |
| H | L  | Clear                               |

H = HIGH Voltage Level  
L = LOW Voltage Level

### MARKING DIAGRAM



SOIC-16  
D SUFFIX  
CASE 751B



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

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet.

# MC74AC259, MC74ACT259

MODE SELECT-FUNCTION TABLE

| Operating Mode                                        | Inputs          |   |   |                |                |                | Outputs        |                |                |                |                |                |                |                |
|-------------------------------------------------------|-----------------|---|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                       | $\overline{MR}$ | E | D | A <sub>0</sub> | A <sub>1</sub> | A <sub>2</sub> | Q <sub>0</sub> | Q <sub>1</sub> | Q <sub>2</sub> | Q <sub>3</sub> | Q <sub>4</sub> | Q <sub>5</sub> | Q <sub>6</sub> | Q <sub>7</sub> |
| Master Reset                                          | L               | H | X | X              | X              | X              | L              | L              | L              | L              | L              | L              | L              | L              |
| Demultiplex<br>(Active HIGH<br>Decoder when<br>D = H) | L               | L | d | L              | L              | L              | Q = d          | L              | L              | L              | L              | L              | L              | L              |
|                                                       | L               | L | d | H              | L              | L              | L              | Q = d          | L              | L              | L              | L              | L              | L              |
|                                                       | L               | L | d | L              | H              | L              | L              | L              | Q = d          | L              | L              | L              | L              | L              |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | L               | L | d | H              | H              | H              | L              | L              | L              | L              | L              | L              | L              | Q = d          |
| Store<br>(Do Nothing)                                 | H               | H | X | X              | X              | X              | q <sub>0</sub> | q <sub>1</sub> | q <sub>2</sub> | q <sub>3</sub> | q <sub>4</sub> | q <sub>5</sub> | q <sub>6</sub> | q <sub>7</sub> |
| Addressable<br>Latch                                  | H               | L | d | L              | L              | L              | Q = d          | q <sub>1</sub> | q <sub>2</sub> | q <sub>3</sub> | q <sub>4</sub> | q <sub>5</sub> | q <sub>6</sub> | q <sub>7</sub> |
|                                                       | H               | L | d | H              | L              | L              | q <sub>0</sub> | Q = d          | q <sub>2</sub> | q <sub>3</sub> | q <sub>4</sub> | q <sub>5</sub> | q <sub>6</sub> | q <sub>7</sub> |
|                                                       | H               | L | d | L              | H              | L              | q <sub>0</sub> | q <sub>1</sub> | Q = d          | q <sub>3</sub> | q <sub>4</sub> | q <sub>5</sub> | q <sub>6</sub> | q <sub>7</sub> |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | •               | • | • | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              | •              |
|                                                       | H               | L | d | H              | H              | H              | q <sub>0</sub> | q <sub>1</sub> | q <sub>2</sub> | q <sub>3</sub> | q <sub>4</sub> | q <sub>5</sub> | q <sub>6</sub> | Q = d          |

H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

d = HIGH or LOW Data one setup time prior to the LOW-to-HIGH Enable transition

q = Lower case letters indicate the state of the referenced output established during the last cycle in which it was addressed or cleared.

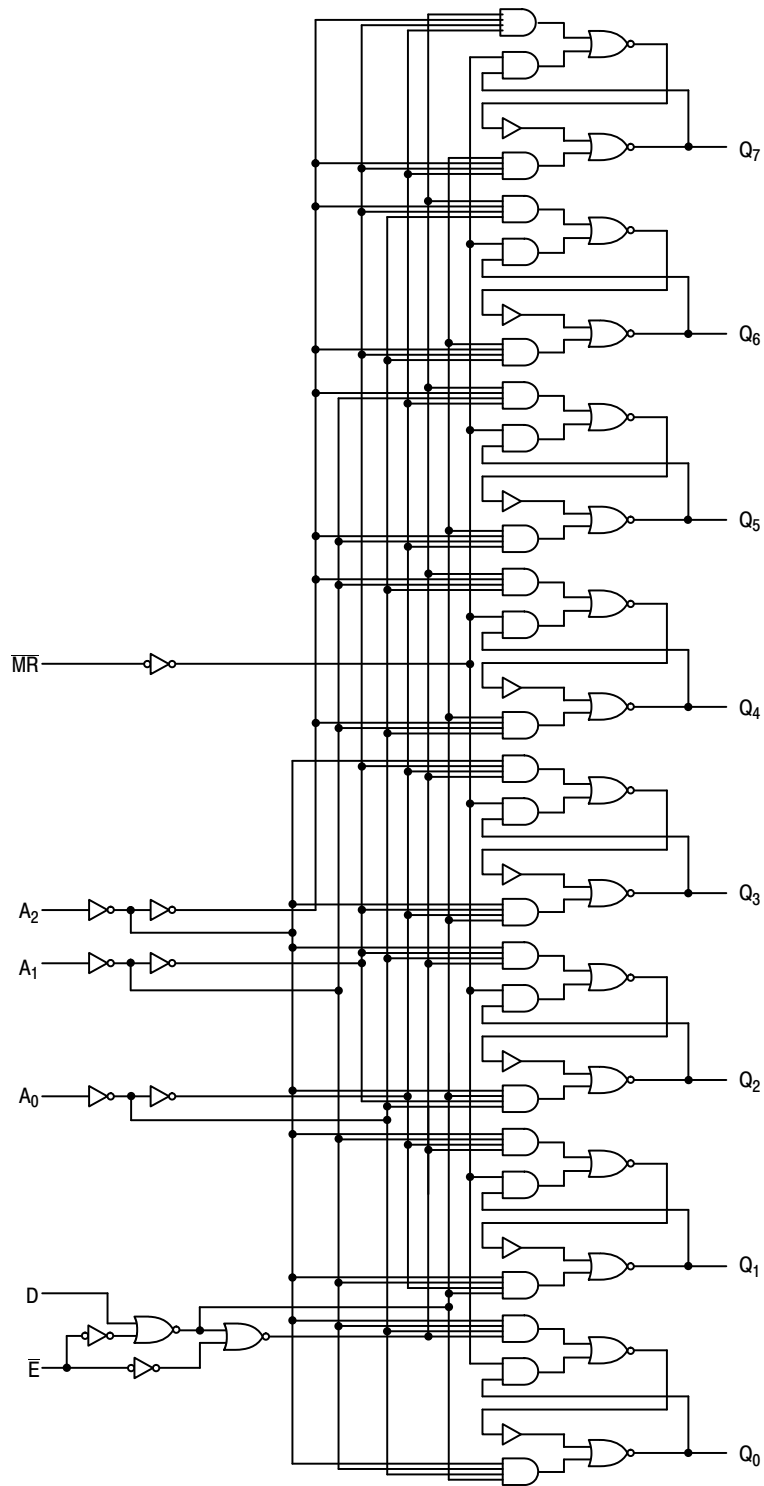
## FUNCTIONAL DESCRIPTION

The MC74AC259/74ACT259 has four modes of operation as shown in the Mode Selection Table. In the addressable latch mode, data on the Data line (D) is written into the addressed latch. The addressed latch will follow 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 will follow the state of the D input with all other outputs in the LOW state. In the clear mode all outputs are LOW and unaffected by the address and data inputs. When operating the MC74AC/ACT259 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. The Mode Select Function Table summarizes the operations of the MC74AC/ACT259.



# MC74AC259, MC74ACT259



NOTE: This diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

**Figure 3. Logic Diagram**

# MC74AC259, MC74ACT259

## MAXIMUM RATINGS

| Symbol                | Parameter                                       | Value                                                      | Unit             |    |
|-----------------------|-------------------------------------------------|------------------------------------------------------------|------------------|----|
| V <sub>CC</sub>       | DC Supply Voltage                               | −0.5 to +6.5                                               | V                |    |
| V <sub>I</sub>        | DC Input Voltage                                | −0.5 ≤ V <sub>CC</sub> +0.5                                | V                |    |
| V <sub>O</sub>        | DC Output Voltage (Note 1)                      | −0.5 ≤ V <sub>CC</sub> +0.5                                | V                |    |
| I <sub>IK</sub>       | DC Input Diode Current                          | ±20                                                        | mA               |    |
| I <sub>OK</sub>       | DC Output Diode Current                         | ±50                                                        | mA               |    |
| I <sub>O</sub>        | DC Output Sink/Source Current                   | ±50                                                        | mA               |    |
| I <sub>CC</sub>       | DC Supply Current per Output Pin                | ±50                                                        | mA               |    |
| I <sub>GND</sub>      | DC Ground Current per Output Pin                | ±50                                                        | mA               |    |
| T <sub>STG</sub>      | Storage Temperature Range                       | −65 to +150                                                | °C               |    |
| T <sub>L</sub>        | Lead temperature, 1 mm from Case for 10 Seconds | 260                                                        | °C               |    |
| T <sub>J</sub>        | Junction temperature under Bias                 | +150                                                       | °C               |    |
| θ <sub>JA</sub>       | Thermal Resistance (Note 2)                     | 126                                                        | °C/W             |    |
| P <sub>D</sub>        | Power Dissipation in Still Air at 25°C (Note 3) | 995                                                        | mW               |    |
| MSL                   | Moisture Sensitivity                            | Level 1                                                    |                  |    |
| F <sub>R</sub>        | Flammability Rating                             | Oxygen Index: 30% – 35%<br>UL 94 V–0 @ 0.125 in            |                  |    |
| V <sub>ESD</sub>      | ESD Withstand Voltage                           | Human Body Model (Note 4)<br>Charged Device Model (Note 5) | > 2000<br>> 1000 | V  |
| I <sub>Latch–Up</sub> | Latch–Up Performance                            | Above V <sub>CC</sub> and Below GND at 85°C (Note 6)       | ±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. I<sub>O</sub> absolute maximum rating must be observed.
2. The package thermal impedance is calculated in accordance with JESD51–7.
3. 500 mW at 65°C; derate to 300 mW by 10 mW/°C from 65°C to 85°C.
4. Tested to EIA/JESD22–A114–A.
5. Tested to JESD22–C101–A.
6. Tested to EIA/JESD78.

## RECOMMENDED OPERATING CONDITIONS

| Symbol                             | Parameter                                                               | Min                     | Typ | Max             | Unit |
|------------------------------------|-------------------------------------------------------------------------|-------------------------|-----|-----------------|------|
| V <sub>CC</sub>                    | Supply Voltage                                                          | 'AC                     | 2.0 | 5.0             | V    |
|                                    |                                                                         | 'ACT                    | 4.5 | 5.0             |      |
| V <sub>IN</sub> , V <sub>OUT</sub> | DC Input Voltage, Output Voltage (Ref. to GND)                          | 0                       | –   | V <sub>CC</sub> | V    |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note 1)<br>'AC Devices except Schmitt Inputs  | V <sub>CC</sub> @ 3.0 V | –   | 150             | ns/V |
|                                    |                                                                         | V <sub>CC</sub> @ 4.5 V | –   | 40              |      |
|                                    |                                                                         | V <sub>CC</sub> @ 5.5 V | –   | 25              |      |
| t <sub>r</sub> , t <sub>f</sub>    | Input Rise and Fall Time (Note 2)<br>'ACT Devices except Schmitt Inputs | V <sub>CC</sub> @ 4.5 V | –   | 10              | ns/V |
|                                    |                                                                         | V <sub>CC</sub> @ 5.5 V | –   | 8.0             |      |
| T <sub>A</sub>                     | Operating Ambient Temperature Range                                     | –40                     | 25  | 85              | °C   |
| I <sub>OH</sub>                    | Output Current – High                                                   | –                       | –   | –24             | mA   |
| I <sub>OL</sub>                    | Output Current – Low                                                    | –                       | –   | 24              | mA   |

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.

1. V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2. V<sub>IN</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.



# MC74AC259, MC74ACT259

## DC CHARACTERISTICS

| Symbol           | Parameter                         | V <sub>CC</sub><br>(V) | 74AC                   |                   | 74AC                            | Unit | Conditions                                                                                          |
|------------------|-----------------------------------|------------------------|------------------------|-------------------|---------------------------------|------|-----------------------------------------------------------------------------------------------------|
|                  |                                   |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> = -40°C to +85°C |      |                                                                                                     |
|                  |                                   |                        | Typ                    | Guaranteed Limits |                                 |      |                                                                                                     |
| V <sub>IH</sub>  | Minimum High Level Input Voltage  | 3.0                    | 1.5                    | 2.1               | 2.1                             | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> - 0.1 V                                              |
|                  |                                   | 4.5                    | 2.25                   | 3.15              | 3.15                            |      |                                                                                                     |
|                  |                                   | 5.5                    | 2.75                   | 3.85              | 3.85                            |      |                                                                                                     |
| V <sub>IL</sub>  | Maximum Low Level Input Voltage   | 3.0                    | 1.5                    | 0.9               | 0.9                             | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> - 0.1 V                                              |
|                  |                                   | 4.5                    | 2.25                   | 1.35              | 1.35                            |      |                                                                                                     |
|                  |                                   | 5.5                    | 2.75                   | 1.65              | 1.65                            |      |                                                                                                     |
| V <sub>OH</sub>  | Minimum High Level Output Voltage | 3.0                    | 2.99                   | 2.9               | 2.9                             | V    | I <sub>OUT</sub> = -50 μA                                                                           |
|                  |                                   | 4.5                    | 4.49                   | 4.4               | 4.4                             |      |                                                                                                     |
|                  |                                   | 5.5                    | 5.49                   | 5.4               | 5.4                             |      |                                                                                                     |
|                  |                                   | 3.0                    | -                      | 2.56              | 2.46                            | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>-12 mA<br>I <sub>OH</sub> -24 mA<br>-24 mA |
|                  |                                   | 4.5                    | -                      | 3.86              | 3.76                            |      |                                                                                                     |
|                  |                                   | 5.5                    | -                      | 4.86              | 4.76                            |      |                                                                                                     |
| V <sub>OL</sub>  | Maximum Low Level Output Voltage  | 3.0                    | 0.002                  | 0.1               | 0.1                             | V    | I <sub>OUT</sub> = 50 μA                                                                            |
|                  |                                   | 4.5                    | 0.001                  | 0.1               | 0.1                             |      |                                                                                                     |
|                  |                                   | 5.5                    | 0.001                  | 0.1               | 0.1                             |      |                                                                                                     |
|                  |                                   | 3.0                    | -                      | 0.36              | 0.44                            | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>12 mA<br>I <sub>OL</sub> 24 mA<br>24 mA    |
|                  |                                   | 4.5                    | -                      | 0.36              | 0.44                            |      |                                                                                                     |
|                  |                                   | 5.5                    | -                      | 0.36              | 0.44                            |      |                                                                                                     |
| I <sub>IN</sub>  | Maximum Input Leakage Current     | 5.5                    | -                      | ±0.1              | ±1.0                            | μA   | V <sub>I</sub> = V <sub>CC</sub> , GND                                                              |
| I <sub>OLD</sub> | †Minimum Dynamic Output Current   | 5.5                    | -                      | -                 | 75                              | mA   | V <sub>OLD</sub> = 1.65 V Max                                                                       |
| I <sub>OHD</sub> |                                   | 5.5                    | -                      | -                 | -75                             | mA   | V <sub>OHD</sub> = 3.85 V Min                                                                       |
| I <sub>CC</sub>  | Maximum Quiescent Supply Current  | 5.5                    | -                      | 8.0               | 80                              | μA   | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                            |

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: I<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.



# MC74AC259, MC74ACT259

## AC CHARACTERISTICS

| Symbol           | Parameter                                             | V <sub>CC</sub> *<br>(V) | 74AC                                             |             |              | 74AC                                                         |              | Unit |
|------------------|-------------------------------------------------------|--------------------------|--------------------------------------------------|-------------|--------------|--------------------------------------------------------------|--------------|------|
|                  |                                                       |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |             |              | T <sub>A</sub> = -40°C<br>to +85°C<br>C <sub>L</sub> = 50 pF |              |      |
|                  |                                                       |                          | Min                                              | Typ         | Max          | Min                                                          | Max          |      |
| t <sub>PLH</sub> | Propagation Delay<br>D <sub>n</sub> to Q <sub>n</sub> | 3.3<br>5.0               | 2.0<br>2.0                                       | 9.0<br>6.5  | 14.5<br>10.0 | 1.5<br>1.5                                                   | 17.0<br>11.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>D <sub>n</sub> to Q <sub>n</sub> | 3.3<br>5.0               | 2.0<br>2.0                                       | 9.0<br>6.0  | 13.5<br>9.5  | 1.5<br>1.5                                                   | 16.0<br>11.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>E to Q <sub>n</sub>              | 3.3<br>5.0               | 2.0<br>2.0                                       | 10.5<br>7.0 | 15.0<br>10.5 | 1.5<br>1.5                                                   | 17.5<br>12.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>E to Q <sub>n</sub>              | 3.3<br>5.0               | 2.0<br>2.0                                       | 8.0<br>7.5  | 12.5<br>9.0  | 1.5<br>1.5                                                   | 15.0<br>11.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>Address to Q <sub>n</sub>        | 3.3<br>5.0               | 2.0<br>2.0                                       | 12.0<br>8.0 | 19.0<br>13.0 | 1.5<br>1.5                                                   | 22.5<br>15.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Address to Q <sub>n</sub>        | 3.3<br>5.0               | 2.0<br>2.0                                       | 10.0<br>7.0 | 16.0<br>11.0 | 1.5<br>1.5                                                   | 19.0<br>13.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>MR to Q                          | 3.3<br>5.0               | 2.0<br>2.0                                       | 8.0<br>6.0  | 12.0<br>9.0  | 1.5<br>1.5                                                   | 13.5<br>10.0 | ns   |

\*Voltage Range 3.3 V is 3.3 V ±0.3 V.

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

## AC OPERATING REQUIREMENTS

| Symbol         | Parameter                                                   | V <sub>CC</sub> *<br>(V) | 74AC                                             |                    | 74AC                                                      | Unit |
|----------------|-------------------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------|------|
|                |                                                             |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |                    | T <sub>A</sub> = -40°C to +85°C<br>C <sub>L</sub> = 50 pF |      |
|                |                                                             |                          | Typ                                              | Guaranteed Minimum |                                                           |      |
| t <sub>s</sub> | Setup Time, HIGH or LOW<br>D <sub>n</sub> to $\overline{E}$ | 3.3                      | –                                                | 3.5                | 4.5                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 2.5                | 3.5                                                       |      |
| t <sub>h</sub> | Hold Time, HIGH or LOW<br>D <sub>n</sub> to $\overline{E}$  | 3.3                      | –                                                | 2.5                | 2.5                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 2.0                | 2.0                                                       |      |
| t <sub>s</sub> | Setup Time<br>Address to $\overline{E}$                     | 3.3                      | –                                                | 7.0                | 9.0                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 4.0                | 6.0                                                       |      |
| t <sub>h</sub> | Hold Time<br>Address to $\overline{E}$                      | 3.3                      | –                                                | 2.0                | 2.0                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 2.0                | 2.0                                                       |      |
| t <sub>w</sub> | Minimum Pulse<br>Width $\overline{MR}$                      | 3.3                      | –                                                | 6.0                | 6.5                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 5.5                | 6.0                                                       |      |
| t <sub>w</sub> | Minimum Pulse<br>Width $\overline{E}$                       | 3.3                      | –                                                | 6.5                | 7.0                                                       | ns   |
|                |                                                             | 5.0                      | –                                                | 5.5                | 6.0                                                       |      |

\*Voltage Range 3.3 V is 3.3 V ±0.3 V.

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

# MC74AC259, MC74ACT259

## DC CHARACTERISTICS

| Symbol            | Parameter                              | V <sub>CC</sub><br>(V) | 74ACT                  |                   | 74ACT                           |  | Unit | Conditions                                                                                |
|-------------------|----------------------------------------|------------------------|------------------------|-------------------|---------------------------------|--|------|-------------------------------------------------------------------------------------------|
|                   |                                        |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> = -40°C to +85°C |  |      |                                                                                           |
|                   |                                        |                        | Typ                    | Guaranteed Limits |                                 |  |      |                                                                                           |
| V <sub>IH</sub>   | Minimum High Level Input Voltage       | 4.5                    | 1.5                    | 2.0               | 2.0                             |  | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> - 0.1 V                                    |
|                   |                                        | 5.5                    | 1.5                    | 2.0               | 2.0                             |  |      |                                                                                           |
| V <sub>IL</sub>   | Maximum Low Level Input Voltage        | 4.5                    | 1.5                    | 0.8               | 0.8                             |  | V    | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> - 0.1 V                                    |
|                   |                                        | 5.5                    | 1.5                    | 0.8               | 0.8                             |  |      |                                                                                           |
| V <sub>OH</sub>   | Minimum High Level Output Voltage      | 4.5                    | 4.49                   | 4.4               | 4.4                             |  | V    | I <sub>OUT</sub> = -50 μA                                                                 |
|                   |                                        | 5.5                    | 5.49                   | 5.4               | 5.4                             |  |      |                                                                                           |
|                   |                                        | 4.5                    | -                      | 3.86              | 3.76                            |  | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>-24 mA<br>I <sub>OH</sub> -24 mA |
|                   |                                        | 5.5                    | -                      | 4.86              | 4.76                            |  |      |                                                                                           |
| V <sub>OL</sub>   | Maximum Low Level Output Voltage       | 4.5                    | 0.001                  | 0.1               | 0.1                             |  | V    | I <sub>OUT</sub> = 50 μA                                                                  |
|                   |                                        | 5.5                    | 0.001                  | 0.1               | 0.1                             |  |      |                                                                                           |
|                   |                                        | 4.5                    | -                      | 0.36              | 0.44                            |  | V    | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>24 mA<br>I <sub>OL</sub> 24 mA   |
|                   |                                        | 5.5                    | -                      | 0.36              | 0.44                            |  |      |                                                                                           |
| I <sub>IN</sub>   | Maximum Input Leakage Current          | 5.5                    | -                      | ±0.1              | ±1.0                            |  | μA   | V <sub>I</sub> = V <sub>CC</sub> , GND                                                    |
| ΔI <sub>CCT</sub> | Additional Max. I <sub>CC</sub> /Input | 5.5                    | 0.6                    | -                 | 1.5                             |  | mA   | V <sub>I</sub> = V <sub>CC</sub> - 2.1 V                                                  |
| I <sub>OLD</sub>  | †Minimum Dynamic Output Current        | 5.5                    | -                      | -                 | 75                              |  | mA   | V <sub>OLD</sub> = 1.65 V Max                                                             |
| I <sub>OHD</sub>  |                                        | 5.5                    | -                      | -                 | -75                             |  | mA   | V <sub>OHD</sub> = 3.85 V Min                                                             |
| I <sub>CC</sub>   | Maximum Quiescent Supply Current       | 5.5                    | -                      | 8.0               | 80                              |  | μA   | V <sub>IN</sub> = V <sub>CC</sub> or GND                                                  |

\*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

## AC CHARACTERISTICS

| Symbol           | Parameter                                             | V <sub>CC</sub> *<br>(V) | 74ACT                                            |      |      | 74ACT                                                     |      | Unit |
|------------------|-------------------------------------------------------|--------------------------|--------------------------------------------------|------|------|-----------------------------------------------------------|------|------|
|                  |                                                       |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |      |      | T <sub>A</sub> = -40°C to +85°C<br>C <sub>L</sub> = 50 pF |      |      |
|                  |                                                       |                          | Min                                              | Typ  | Max  | Min                                                       | Max  |      |
| t <sub>PLH</sub> | Propagation Delay<br>D <sub>n</sub> to Q <sub>n</sub> | 5.0                      | 2.0                                              | 6.5  | 11.0 | 1.5                                                       | 12.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>D <sub>n</sub> or Q <sub>n</sub> | 5.0                      | 2.0                                              | 7.0  | 10.5 | 1.5                                                       | 12.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>E to Q <sub>n</sub>              | 5.0                      | 2.0                                              | 10.5 | 14.0 | 1.5                                                       | 16.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>E or Q <sub>n</sub>              | 5.0                      | 2.0                                              | 9.0  | 12.0 | 1.5                                                       | 14.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>Address to Q <sub>n</sub>        | 5.0                      | 2.0                                              | 8.0  | 11.5 | 1.5                                                       | 13.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>Address to Q <sub>n</sub>        | 5.0                      | 2.0                                              | 6.0  | 10.0 | 1.5                                                       | 12.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>MR to Q                          | 5.0                      | 2.0                                              |      | 10.0 | 1.5                                                       | 11.0 | ns   |

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.



# MC74AC259, MC74ACT259

## AC OPERATING REQUIREMENTS

| Symbol         | Parameter                                              | V <sub>CC</sub> *<br>(V) | 74ACT                                            |                    | 74ACT                                                     |    | Unit |
|----------------|--------------------------------------------------------|--------------------------|--------------------------------------------------|--------------------|-----------------------------------------------------------|----|------|
|                |                                                        |                          | T <sub>A</sub> = +25°C<br>C <sub>L</sub> = 50 pF |                    | T <sub>A</sub> = -40°C to +85°C<br>C <sub>L</sub> = 50 pF |    |      |
|                |                                                        |                          | Typ                                              | Guaranteed Minimum |                                                           |    |      |
| t <sub>s</sub> | Setup Time, HIGH or LOW<br>D <sub>n</sub> to $\bar{E}$ | 5.0                      | –                                                | 3.0                | 4.0                                                       | ns |      |
| t <sub>h</sub> | Hold Time, HIGH or LOW<br>D <sub>n</sub> to $\bar{E}$  | 5.0                      | –                                                | 2.5                | 2.5                                                       | ns |      |
| t <sub>s</sub> | Setup Time<br>Address to $\bar{E}$                     | 5.0                      | –                                                | 4.5                | 6.5                                                       | ns |      |
| t <sub>h</sub> | Hold Time<br>Address to $\bar{E}$                      | 5.0                      | –                                                | 2.5                | 2.5                                                       | ns |      |
| t <sub>w</sub> | Minimum Pulse<br>Width $\overline{MR}$                 | 5.0                      | –                                                | 7.0                | 7.5                                                       | ns |      |
| t <sub>w</sub> | Minimum Pulse<br>Width $\bar{E}$                       | 5.0                      | –                                                | 7.0                | 7.5                                                       | ns |      |

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

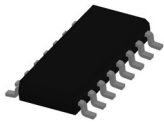
## CAPACITANCE

| Symbol          | Parameter                     | Value<br>Typ | Unit | Test Conditions         |
|-----------------|-------------------------------|--------------|------|-------------------------|
| C <sub>IN</sub> | Input Capacitance             | 4.5          | pF   | V <sub>CC</sub> = 5.0 V |
| C <sub>PD</sub> | Power Dissipation Capacitance | 50.0         | pF   | V <sub>CC</sub> = 5.0 V |

## ORDERING INFORMATION

| Part Number    | Marking | Package              | Shipping†          |
|----------------|---------|----------------------|--------------------|
| MC74AC259DG    | AC259   | SOIC-16<br>(Pb-Free) | 48 Units / Rail    |
| MC74AC259DR2G  | AC259   | SOIC-16<br>(Pb-Free) | 2500 / Tape & Reel |
| MC74ACT259DR2G | ACT259  | SOIC-16<br>(Pb-Free) | 2500 / 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.

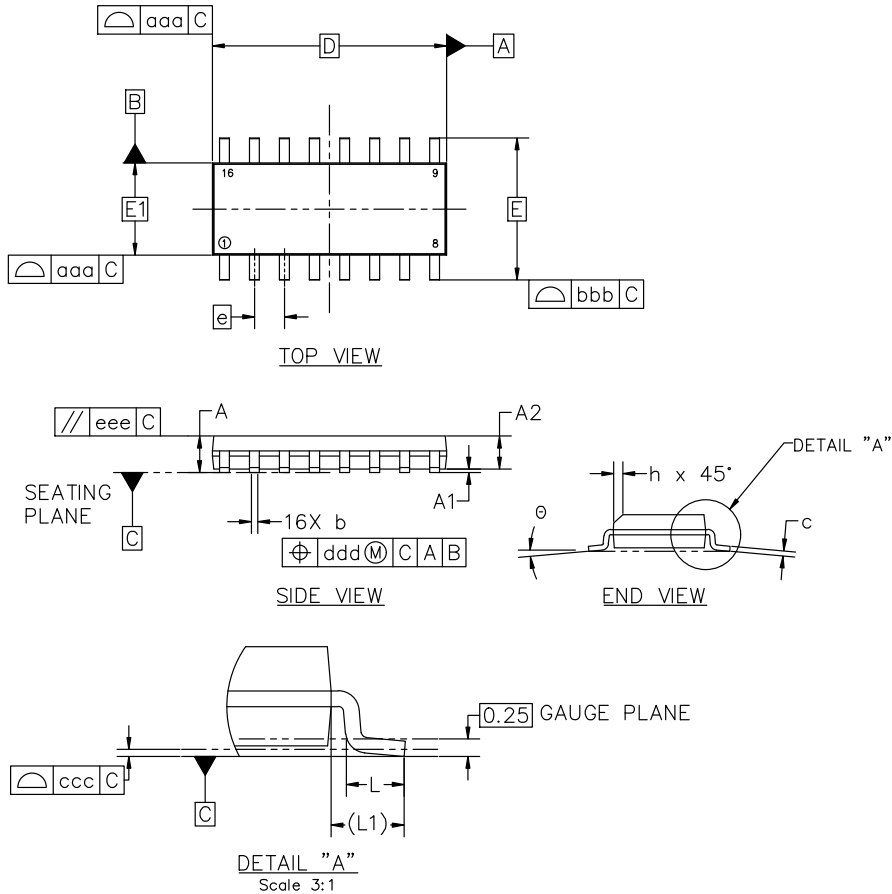


SOIC-16 9.90x3.90x1.37 1.27P  
CASE 751B  
ISSUE M

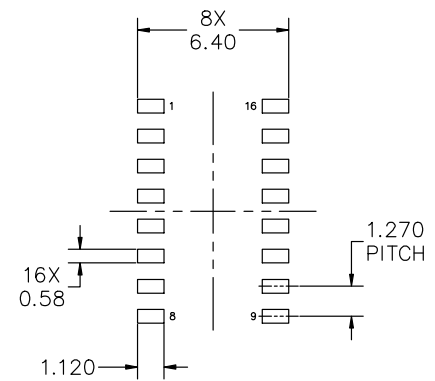
DATE 18 OCT 2024

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. DIMENSION IN MILLIMETERS. ANGLE IN DEGREES.
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15mm PER SIDE.
5. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127mm TOTAL IN EXCESS OF THE b DIMENSION AT MAXIMUM MATERIAL CONDITION.



| MILLIMETERS                    |          |      |      |
|--------------------------------|----------|------|------|
| DIM                            | MIN      | NOM  | MAX  |
| A                              | 1.35     | 1.55 | 1.75 |
| A1                             | 0.10     | 0.18 | 0.25 |
| A2                             | 1.25     | 1.37 | 1.50 |
| b                              | 0.35     | 0.42 | 0.49 |
| c                              | 0.19     | 0.22 | 0.25 |
| D                              | 9.90 BSC |      |      |
| E                              | 6.00 BSC |      |      |
| E1                             | 3.90 BSC |      |      |
| e                              | 1.27 BSC |      |      |
| h                              | 0.25     | ---  | 0.50 |
| L                              | 0.40     | 0.83 | 1.25 |
| L1                             | 1.05 REF |      |      |
| θ                              | 0°       | ---  | 7°   |
| TOLERANCE OF FORM AND POSITION |          |      |      |
| aaa                            | 0.10     |      |      |
| bbb                            | 0.20     |      |      |
| ccc                            | 0.10     |      |      |
| ddd                            | 0.25     |      |      |
| eee                            | 0.10     |      |      |



\*FOR ADDITIONAL INFORMATION ON OUR  
PB-FREE STRATEGY AND SOLDERING DETAILS,  
PLEASE DOWNLOAD THE onsemi SOLDERING  
AND MOUNTING TECHNIQUES REFERENCE  
MANUAL, SOLDERM/D

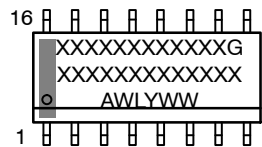
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SOIC-16 9.90x3.90x1.37 1.27P  
CASE 751B  
ISSUE M

DATE 18 OCT 2024

GENERIC  
MARKING DIAGRAM\*



XXXXX = 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.

|                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STYLE 1:</b><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                           | <b>STYLE 2:</b><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 | <b>STYLE 3:</b><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                                                                                         | <b>STYLE 4:</b><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 |
| <b>STYLE 5:</b><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 | <b>STYLE 6:</b><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                                 | <b>STYLE 7:</b><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 |                                                                                                                                                                                                                                                                                                                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                                                                     |
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