

# MC74AC652, MC74ACT652

## Octal Transceiver/Register with 3-State Outputs (Non-Inverting)

The MC74AC/ACT652 consists of registered bus transceiver circuits, with outputs, D-type flip-flops and control circuitry providing multiplexed transmission of data directly from the input bus or from the internal storage registers. Data on the A or B bus will be loaded into the respective registers on the LOW-to-HIGH transition of the appropriate clock pin (CAB or CBA). The four fundamental data handling functions available are illustrated in Figures 1 to 4.

- Independent Registers for A and B Buses
- Multiplexed Real-Time and Stored Data Transfers
- Choice of True and Inverting Data Paths
- 3-State Outputs
- 300 mil Slim Dual-in-Line Package
- Outputs Source/Sink 24 mA
- 'ACT652 Has TTL Compatible Inputs
- **These devices are available in Pb-free package(s). Specifications herein apply to both standard and Pb-free devices. Please see our website at [www.onsemi.com](http://www.onsemi.com) for specific Pb-free orderable part numbers, or contact your local ON Semiconductor sales office or representative.**

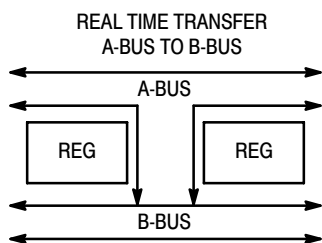


Figure 1.

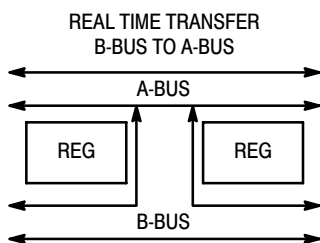


Figure 2.

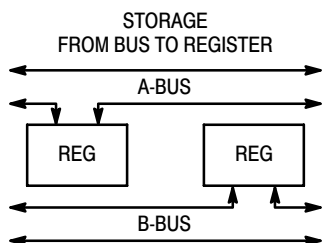


Figure 3.

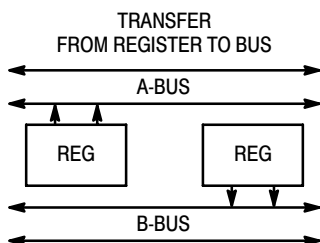
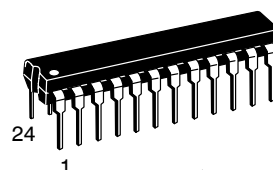


Figure 4.

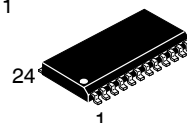


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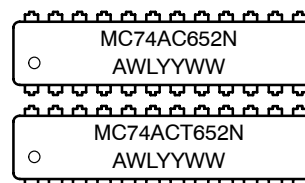
PDIP-24  
N SUFFIX  
CASE 724



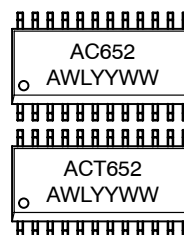
SO-24  
DW SUFFIX  
CASE 751E

### MARKING DIAGRAMS

#### PDIP-24



#### SO-24

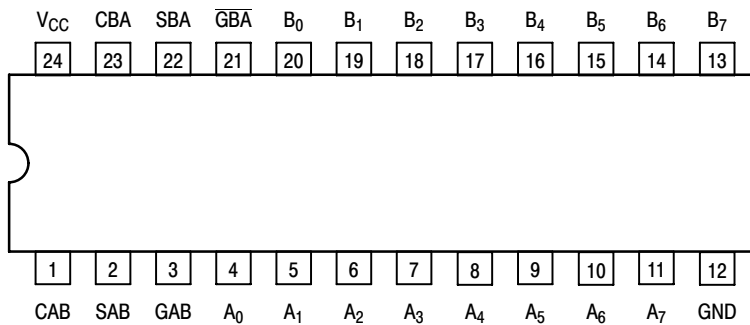


A = Assembly  
Location  
L, WL = Wafer Lot  
Y, YY = Year  
W, WW = Work Week

### ORDERING INFORMATION

| Device         | Package | Shipping         |
|----------------|---------|------------------|
| MC74AC652N     | PDIP-24 | 15 Units/Rail    |
| MC74ACT652N    | PDIP-24 | 15 Units/Rail    |
| MC74AC652DW    | SOIC-24 | 30 Units/Rail    |
| MC74AC652DWR   | SOIC-24 | 1000 Tape & Reel |
| MC74ACT652DW   | SOIC-24 | 30 Units/Rail    |
| MC74ACT652DWR2 | SOIC-24 | 1000 Tape & Reel |

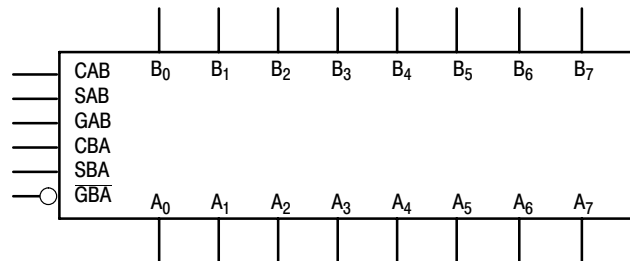
# MC74AC652, MC74ACT652



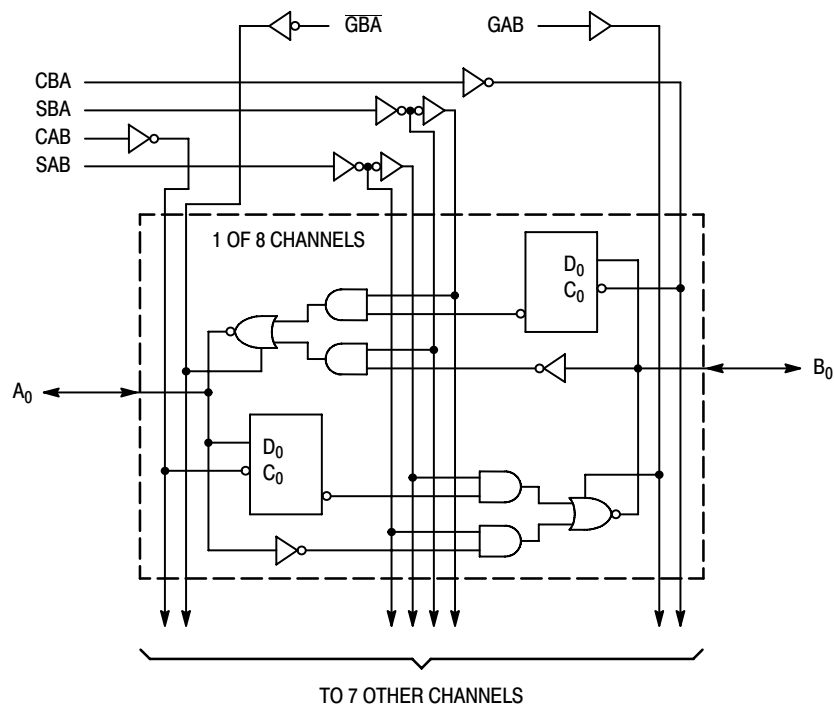
## PIN ASSIGNMENT

| PIN                            | FUNCTION                                          |
|--------------------------------|---------------------------------------------------|
| A <sub>0</sub> –A <sub>7</sub> | Data Register A Inputs<br>Data Register A Outputs |
| B <sub>0</sub> –B <sub>7</sub> | Data Register B Inputs<br>Data Register B Outputs |
| CAB, CBA                       | Clock Pulse Inputs                                |
| SAB, SBA                       | Transmit/Receive Inputs                           |
| GAB, GBA                       | Output Enable Inputs                              |

**Figure 5. Pinout: 24-Lead Plastic Package (Top View)**



**Figure 6. Logic Symbol**



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

**Figure 7. Logic Diagram**

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## FUNCTION TABLE

| Inputs |        |             |             |          |          | Data I/O*                       |                                 | Operation or Function                                |
|--------|--------|-------------|-------------|----------|----------|---------------------------------|---------------------------------|------------------------------------------------------|
| GAB    | GBA    | CAB         | CBA         | SAB      | SBA      | A <sub>0</sub> – A <sub>7</sub> | B <sub>0</sub> – B <sub>7</sub> |                                                      |
| L<br>L | H<br>H | H or L<br>↑ | H or L<br>↑ | X<br>X   | X<br>X   | Input                           | Input                           | Isolation<br>Store A and B Data                      |
| X<br>H | H<br>H | ↑<br>↑      | H or L<br>↑ | X<br>X** | X<br>X   | Input<br>Input                  | Unspecified*<br>Output          | Store A, Hold B<br>Store A in Both Registers         |
| L<br>L | X<br>L | H or L<br>↑ | ↑<br>↑      | X<br>X   | X<br>X** | Unspecified*<br>Output          | Input<br>Input                  | Hold A, Store B<br>Store B in Both Registers         |
| L<br>L | L<br>L | X<br>X      | X<br>H or L | X<br>X   | L<br>H   | Output                          | Input                           | Real-Time B Data to A Bus<br>Stored B Data to A Bus  |
| H<br>H | H<br>H | X<br>H or L | X<br>X      | L<br>H   | X<br>X   | Input                           | Output                          | Real-Time A Data to B Bus<br>Stored A Data to B Bus  |
| H      | L      | H or L      | H or L      | H        | H        | Output                          | Output                          | Stored A Data to B Bus and<br>Stored B Data to A Bus |

\*The data output functions may be enabled or disabled by various signals at the GBA and GAB inputs. Data input functions are always enabled; i.e., data at the bus pins will be stored on every LOW-to-HIGH transition of the appropriate clock inputs.

\*\*Select control = L: clocks can occur simultaneously.

H = HIGH Voltage Level; L = LOW Voltage Level; X = Immaterial; ↑ = LOW-to-HIGH Transition

## MAXIMUM RATINGS\*

| Symbol           | Parameter                                        | Value                         | Unit |
|------------------|--------------------------------------------------|-------------------------------|------|
| V <sub>CC</sub>  | DC Supply Voltage (Referenced to GND)            | –0.5 to +7.0                  | V    |
| V <sub>in</sub>  | DC Input Voltage (Referenced to GND)             | –0.5 to V <sub>CC</sub> + 0.5 | V    |
| V <sub>out</sub> | DC Output Voltage (Referenced to GND)            | –0.5 to V <sub>CC</sub> + 0.5 | V    |
| I <sub>in</sub>  | DC Input Current, per Pin                        | ±20                           | mA   |
| I <sub>out</sub> | DC Output Sink/Source Current, per Pin           | ±50                           | mA   |
| I <sub>CC</sub>  | DC V <sub>CC</sub> or GND Current per Output Pin | ±50                           | mA   |
| T <sub>stg</sub> | Storage Temperature                              | –65 to +150                   | °C   |

\*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

| Symbol                             | Parameter                                                               |                         | Min | Typ | Max             | Unit |
|------------------------------------|-------------------------------------------------------------------------|-------------------------|-----|-----|-----------------|------|
| V <sub>CC</sub>                    | Supply Voltage                                                          | 'AC                     | 2.0 | 5.0 | 6.0             | V    |
|                                    |                                                                         | 'ACT                    | 4.5 | 5.0 | 5.5             |      |
| 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>J</sub>                     | Junction Temperature (PDIP)                                             |                         | –   | –   | 140             | °C   |
| 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   |

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.

# MC74AC652, MC74ACT652

## DC CHARACTERISTICS

| Symbol           | Parameter                            | V <sub>CC</sub><br>(V) | 74AC                   |                   | 74AC                                  | Unit | Conditions                                                                                                                                  |
|------------------|--------------------------------------|------------------------|------------------------|-------------------|---------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                                      |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to<br>+85°C |      |                                                                                                                                             |
|                  |                                      |                        | Typ                    | Guaranteed Limits |                                       |      |                                                                                                                                             |
| V <sub>IH</sub>  | Minimum High Level<br>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<br>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<br>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>  | Minimum Low Level<br>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<br>Leakage Current     | 5.5                    | –                      | ±0.1              | ±1.0                                  | μA   | V <sub>I</sub> = V <sub>CC</sub> , GND                                                                                                      |
| I <sub>OZT</sub> | Maximum<br>3-State<br>Current        | 5.5                    | –                      | ±0.6              | ±6.0                                  | μA   | V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>I</sub> = V <sub>CC</sub> , GND<br>V <sub>O</sub> = V <sub>CC</sub> , GND |
| I <sub>OLD</sub> | †Minimum Dynamic<br>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<br>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 input 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.

# MC74AC652, MC74ACT652

## 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                                              | Max          | Min                                                          | Max          |      |
| t <sub>PLH</sub> | Propagation Delay<br>CPBA or CPAB to A <sub>n</sub> or B <sub>n</sub> | 3.0<br>5.0               | 4.0<br>2.5                                       | 17.0<br>12.0 | 3.0<br>2.0                                                   | 19.0<br>14.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>CPBA or CPAB to A <sub>n</sub> or B <sub>n</sub> | 3.0<br>5.0               | 3.0<br>2.0                                       | 14.5<br>10.5 | 2.5<br>1.5                                                   | 16.5<br>12.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>A or B to B <sub>n</sub> or A <sub>n</sub>       | 3.0<br>5.0               | 3.0<br>2.0                                       | 14.0<br>9.5  | 2.5<br>1.5                                                   | 16.0<br>11.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>A or B to B <sub>n</sub> or A <sub>n</sub>       | 3.0<br>5.0               | 2.5<br>1.5                                       | 13.0<br>9.0  | 2.0<br>1.0                                                   | 15.0<br>10.5 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>SBA or SAB to A <sub>n</sub> or B <sub>n</sub>   | 3.0<br>5.0               | 3.0<br>2.5                                       | 14.0<br>10.0 | 2.5<br>2.0                                                   | 16.0<br>11.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>SBA or SAB to A <sub>n</sub> or B <sub>n</sub>   | 3.0<br>5.0               | 2.5<br>2.0                                       | 13.5<br>10.0 | 2.0<br>1.5                                                   | 15.5<br>11.5 | ns   |
| t <sub>PZH</sub> | Output Enable Time<br>OEBA to A <sub>n</sub>                          | 3.0<br>5.0               | 2.5<br>1.5                                       | 12.0<br>9.0  | 2.0<br>1.0                                                   | 13.5<br>10.0 | ns   |
| t <sub>PZL</sub> | Output Enable Time<br>OEBA to A <sub>n</sub>                          | 3.0<br>5.0               | 2.5<br>1.5                                       | 12.0<br>9.0  | 2.0<br>1.0                                                   | 14.0<br>10.5 | ns   |
| t <sub>PHZ</sub> | Output Disable Time<br>OEBA to A <sub>n</sub>                         | 3.0<br>5.0               | 3.0<br>2.0                                       | 13.0<br>11.0 | 2.5<br>1.5                                                   | 14.0<br>12.0 | ns   |
| t <sub>PLZ</sub> | Output Disable Time<br>OEBA to A <sub>n</sub>                         | 3.0<br>5.0               | 2.5<br>2.0                                       | 12.5<br>10.5 | 2.0<br>1.5                                                   | 14.0<br>12.0 | 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.

# MC74AC652, MC74ACT652

## DC CHARACTERISTICS

| Symbol            | Parameter                              | V <sub>CC</sub><br>(V) | 74ACT                  |                   | 74ACT                                 |    | Unit                                                                                                                                        | Conditions |
|-------------------|----------------------------------------|------------------------|------------------------|-------------------|---------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                   |                                        |                        | T <sub>A</sub> = +25°C |                   | T <sub>A</sub> =<br>–40°C to<br>+85°C |    |                                                                                                                                             |            |
|                   |                                        |                        | Typ                    | Guaranteed Limits |                                       |    |                                                                                                                                             |            |
| V <sub>IH</sub>   | Minimum High Level<br>Input Voltage    | 4.5<br>5.5             | 1.5<br>1.5             | 2.0<br>2.0        | 2.0<br>2.0                            | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                                                                      |            |
| V <sub>IL</sub>   | Maximum Low Level<br>Input Voltage     | 4.5<br>5.5             | 1.5<br>1.5             | 0.8<br>0.8        | 0.8<br>0.8                            | V  | V <sub>OUT</sub> = 0.1 V<br>or V <sub>CC</sub> – 0.1 V                                                                                      |            |
| V <sub>OH</sub>   | Minimum High Level<br>Output Voltage   | 4.5<br>5.5             | 4.49<br>5.49           | 4.4<br>5.4        | 4.4<br>5.4                            | V  | I <sub>OUT</sub> = – 50 µA                                                                                                                  |            |
|                   |                                        | 4.5<br>5.5             | –<br>–                 | 3.86<br>4.86      | 3.76<br>4.76                          | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>– 24 mA<br>I <sub>OH</sub> – 24 mA                                                 |            |
| V <sub>OL</sub>   | Minimum Low Level<br>Output Voltage    | 4.5<br>5.5             | 0.001<br>0.001         | 0.1<br>0.1        | 0.1<br>0.1                            | V  | I <sub>OUT</sub> = – 50 µA                                                                                                                  |            |
|                   |                                        | 4.5<br>5.5             | –<br>–                 | 0.36<br>0.36      | 0.44<br>0.44                          | V  | *V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub><br>– 24 mA<br>I <sub>OH</sub> – 24 mA                                                 |            |
| I <sub>IN</sub>   | Maximum Input<br>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>OZT</sub>  | Maximum<br>3-State<br>Current          | 5.5                    | –                      | ±0.6              | ±6.0                                  | µA | V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub><br>V <sub>I</sub> = V <sub>CC</sub> , GND<br>V <sub>O</sub> = V <sub>CC</sub> , GND |            |
| I <sub>OLD</sub>  | †Minimum Dynamic<br>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<br>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 input loaded at a time.

# MC74AC652, MC74ACT652

## 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<br>to +85°C<br>C <sub>L</sub> = 50 pF |      |      |
|                  |                                                                             |                          | Min                                              | Max  | Min                                                          | Max  |      |
| t <sub>PLH</sub> | Propagation Delay<br>CPBA or CPAB to A <sub>n</sub> or B <sub>n</sub>       | 5.0                      | 4.0                                              | 14.5 | 3.5                                                          | 16.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>CPBA or CPAB to A <sub>n</sub> or B <sub>n</sub>       | 5.0                      | 3.5                                              | 14.5 | 3.0                                                          | 16.5 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>A or B to B <sub>n</sub> or A <sub>n</sub>             | 5.0                      | 2.5                                              | 11.5 | 2.0                                                          | 13.0 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>A or B to B <sub>n</sub> or A <sub>n</sub>             | 5.0                      | 2.5                                              | 11.5 | 2.0                                                          | 13.0 | ns   |
| t <sub>PLH</sub> | Propagation Delay<br>SBA or SAB to A <sub>n</sub> or B <sub>n</sub>         | 5.0                      | 2.5                                              | 12.0 | 2.0                                                          | 13.5 | ns   |
| t <sub>PHL</sub> | Propagation Delay<br>SBA or SAB to A <sub>n</sub> or B <sub>n</sub>         | 5.0                      | 3.0                                              | 12.0 | 2.5                                                          | 13.5 | ns   |
| t <sub>PZH</sub> | Output Enable Time<br>OEBA to A <sub>n</sub>                                | 5.0                      | 2.0                                              | 11.5 | 1.5                                                          | 13.0 | ns   |
| t <sub>PZL</sub> | Output Enable Time<br>OEBA to A <sub>n</sub>                                | 5.0                      | 2.5                                              | 11.5 | 2.0                                                          | 13.0 | ns   |
| t <sub>PHZ</sub> | Output Disable Time<br>OEBA to A <sub>n</sub>                               | 5.0                      | 3.0                                              | 13.0 | 2.5                                                          | 14.0 | ns   |
| t <sub>PLZ</sub> | Output Disable Time<br>OEBA to A <sub>n</sub>                               | 5.0                      | 2.5                                              | 12.5 | 2.0                                                          | 14.0 | ns   |
| t <sub>PZH</sub> | Output Enable time<br>OEAB to B <sub>n</sub>                                | 5.0                      | 2.5                                              | 12.0 | 2.0                                                          | 13.5 | ns   |
| t <sub>PZL</sub> | Output Enable Time<br>OEAB to B <sub>n</sub>                                | 5.0                      | 2.5                                              | 12.0 | 2.0                                                          | 13.5 | ns   |
| t <sub>PHZ</sub> | Output Enable Time<br>OEAB to B <sub>n</sub>                                | 5.0                      | 3.5                                              | 13.5 | 3.0                                                          | 14.5 | ns   |
| t <sub>PLZ</sub> | Output Enable Time<br>OEAB to B <sub>n</sub>                                | 5.0                      | 3.0                                              | 13.5 | 2.5                                                          | 15.0 | ns   |
| t <sub>s</sub>   | Setup Time, HIGH or LOW<br>A <sub>n</sub> or B <sub>n</sub> to CPBA or CPAB | 5.0                      | 7.0                                              | –    | 8.0                                                          | –    | ns   |
| t <sub>h</sub>   | Hold Time, HIGH or LOW<br>A <sub>n</sub> or B <sub>n</sub> to CPBA or CPAB  | 5.0                      | 2.5                                              | –    | 2.5                                                          | –    | ns   |
| t <sub>w</sub>   | CPAB, CPBA Pulse Width<br>HIGH or LOW                                       | 5.0                      | 6.0                                              | –    | 7.0                                                          | –    | 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.

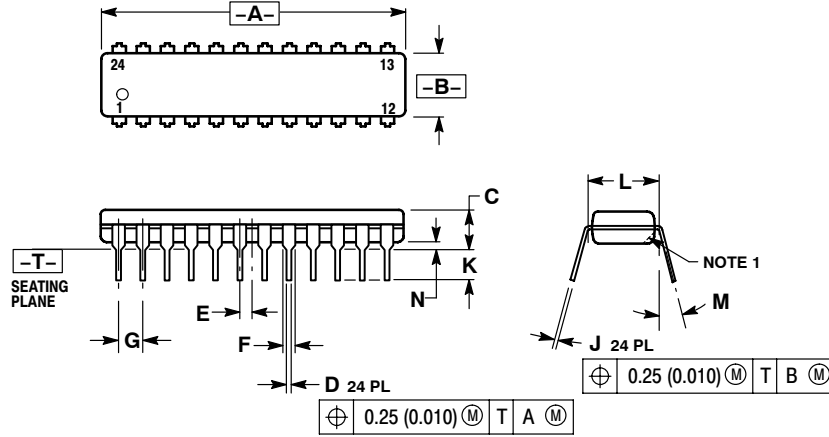
## CAPACITANCE

| Symbol           | Parameter                     | 74ACT<br>Typ | Unit | Test Conditions         |
|------------------|-------------------------------|--------------|------|-------------------------|
| C <sub>IN</sub>  | Input Capacitance             | 4.5          | pF   | V <sub>CC</sub> = 5.0 V |
| C <sub>I/O</sub> | Input/Output Capacitance      | 15           | pF   | V <sub>CC</sub> = 5.0 V |
| C <sub>PD</sub>  | Power Dissipation Capacitance | 60.0         | pF   | V <sub>CC</sub> = 5.0 V |

# MC74AC652, MC74ACT652

## PACKAGE DIMENSIONS

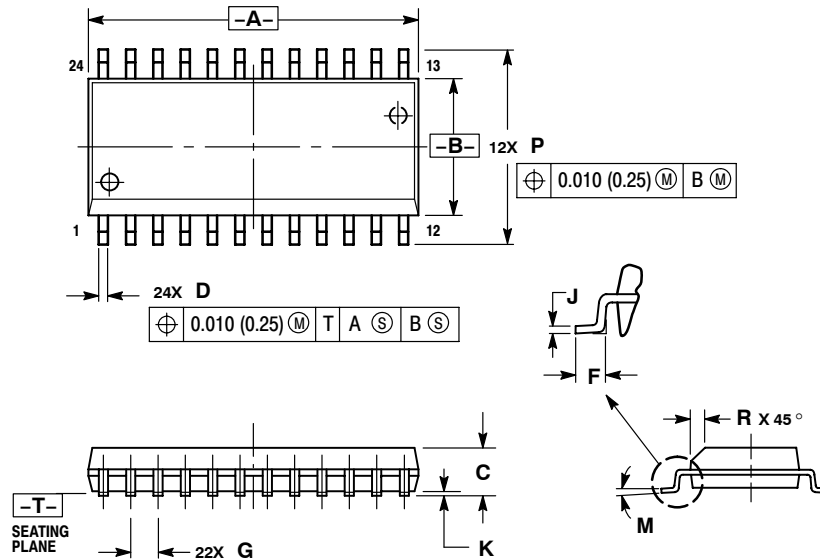
### PDIP-24 N SUFFIX 24 PIN PLASTIC DIP PACKAGE CASE 724-03 ISSUE D



- NOTES:
1. CHAMFERED CONTOUR OPTIONAL.
  2. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
  3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  4. CONTROLLING DIMENSION: INCH.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 1.230     | 1.265 | 31.25       | 32.13 |
| B   | 0.250     | 0.270 | 6.35        | 6.85  |
| C   | 0.145     | 0.175 | 3.69        | 4.44  |
| D   | 0.015     | 0.020 | 0.38        | 0.51  |
| E   | 0.050 BSC |       | 1.27 BSC    |       |
| F   | 0.040     | 0.060 | 1.02        | 1.52  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| J   | 0.007     | 0.012 | 0.18        | 0.30  |
| K   | 0.110     | 0.140 | 2.80        | 3.55  |
| L   | 0.300 BSC |       | 7.62 BSC    |       |
| M   | 0°        | 15°   | 0°          | 15°   |
| N   | 0.020     | 0.040 | 0.51        | 1.01  |

### SO-24 DW SUFFIX 24 PIN PLASTIC SOIC PACKAGE CASE 751E-04 ISSUE E



- 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 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 15.25       | 15.54 | 0.601     | 0.612 |
| B   | 7.40        | 7.60  | 0.292     | 0.299 |
| C   | 2.35        | 2.65  | 0.093     | 0.104 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.41        | 0.90  | 0.016     | 0.035 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.23        | 0.32  | 0.009     | 0.013 |
| K   | 0.13        | 0.29  | 0.005     | 0.011 |
| M   | 0°          | 8°    | 0°        | 8°    |
| P   | 10.05       | 10.55 | 0.395     | 0.415 |
| R   | 0.25        | 0.75  | 0.010     | 0.029 |

## **Notes**

## **Notes**

## Notes

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