

# DM74S153

## Dual 1-of-4 Line Data Selector/Multiplexer

### General Description

Each of these data selectors/multiplexers contains inverters and drivers to supply fully complementary, on-chip, binary decoding data selection to the AND-OR-invert gates. Separate strobe inputs are provided for each of the two four-line sections.

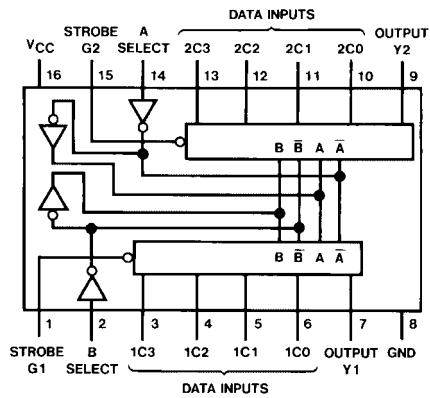
### Features

- Permits multiplexing from N lines to 1 line
- Performs parallel-to-serial conversion
- Strobe (enable) line provided for cascading (N lines to n lines)
- High fan-out, low-impedance, totem-pole outputs
- Typical average propagation delay times
  - From data 6 ns
  - From strobe 9.5 ns
  - From select 12 ns
- Typical power dissipation 225 mW

### Ordering Code:

| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| DM74S153N    | N16E           | 16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

### Connection Diagram

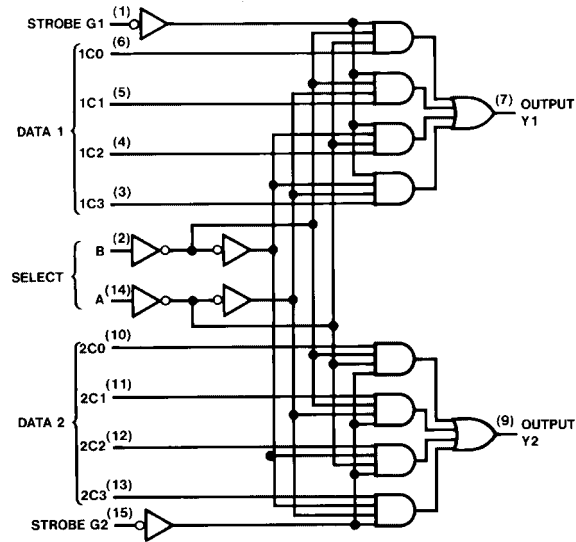


### Function Table

| Select Inputs |   | Data Inputs |    |    |    | Strobe | Output |
|---------------|---|-------------|----|----|----|--------|--------|
| B             | A | C0          | C1 | C2 | C3 | G      | Y      |
| X             | X | X           | X  | X  | X  | H      | L      |
| L             | L | L           | X  | X  | X  | L      | L      |
| L             | L | H           | X  | X  | X  | L      | H      |
| L             | H | X           | L  | X  | X  | L      | L      |
| L             | H | X           | H  | X  | X  | L      | H      |
| H             | L | X           | X  | L  | X  | L      | L      |
| H             | L | X           | X  | H  | X  | L      | H      |
| H             | H | X           | X  | X  | L  | L      | L      |
| H             | H | X           | X  | X  | H  | L      | H      |

Select inputs A and B are common to both sections.  
H = HIGH Level  
L = LOW Level  
X = Don't Care

### Logic Diagram



**Absolute Maximum Ratings**(Note 1)

|                                      |                 |
|--------------------------------------|-----------------|
| Supply Voltage                       | 7V              |
| Input Voltage                        | 5.5V            |
| Operating Free Air Temperature Range | 0°C to +70°C    |
| Storage Temperature Range            | -65°C to +150°C |

**Note 1:** The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

**Recommended Operating Conditions**

| Symbol          | Parameter                      | Min  | Nom | Max  | Units |
|-----------------|--------------------------------|------|-----|------|-------|
| V <sub>CC</sub> | Supply Voltage                 | 4.75 | 5   | 5.25 | V     |
| V <sub>IH</sub> | HIGH Level Input Voltage       | 2    |     |      | V     |
| V <sub>IL</sub> | LOW Level Input Voltage        |      |     | 0.8  | V     |
| I <sub>OH</sub> | HIGH Level Output Current      |      |     | -1   | mA    |
| I <sub>OL</sub> | LOW Level Output Current       |      |     | 20   | mA    |
| T <sub>A</sub>  | Free Air Operating Temperature | 0    |     | 70   | °C    |

**Electrical Characteristics**

over recommended operating free air temperature (unless otherwise noted)

| Symbol          | Parameter                         | Conditions   | Min | Typ (Note 2) | Max  | Units |
|-----------------|-----------------------------------|--|-----|--------------|------|-------|
| V <sub>I</sub>  | Input Clamp Voltage               | V <sub>CC</sub> = Min, I <sub>I</sub> = -18 mA   |     |              | -1.2 | V     |
| V <sub>OH</sub> | HIGH Level Output Voltage         | V <sub>CC</sub> = Min, I <sub>OH</sub> = Max, V <sub>IL</sub> = Max, V <sub>IH</sub> = Min | 2.7 | 3.4          |      | V     |
| V <sub>OL</sub> | LOW Level Output Voltage          | V <sub>CC</sub> = Min, I <sub>OL</sub> = Max, V <sub>IH</sub> = Min, V <sub>IL</sub> = Max |     |              | 0.5  | V     |
| I <sub>I</sub>  | Input Current @ Max Input Voltage | V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V   |     |              | 1    | mA    |
| I <sub>IH</sub> | HIGH Level Input Current          | V <sub>CC</sub> = Max, V <sub>I</sub> = 2.7V   |     |              | 50   | μA    |
| I <sub>IL</sub> | LOW Level Input Current           | V <sub>CC</sub> = Max, V <sub>I</sub> = 0.5V   |     |              | -2   | mA    |
| I <sub>OS</sub> | Short Circuit Output Current      | V <sub>CC</sub> = Max (Note 3)   | -40 |              | -100 | mA    |
| I <sub>CC</sub> | Supply Current                    | V <sub>CC</sub> = Max (Note 4)   |     | 45           | 70   | mA    |

**Note 2:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C.

**Note 3:** Not more than one output should be shorted at a time, and the duration should not exceed one second.

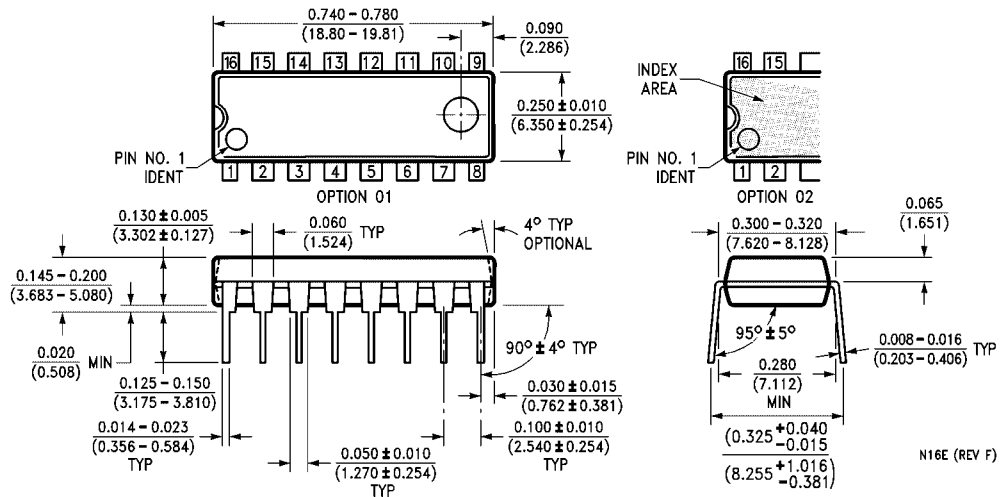
**Note 4:** I<sub>CC</sub> is measured with all outputs OPEN and all inputs grounded.

**Switching Characteristics**

at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C

| Symbol           | Parameter  | From (Input)<br>To (Output) | R <sub>L</sub> = 280Ω  |      |                        |     | Units |
|------------------|--|-----------------------------|------------------------|------|------------------------|-----|-------|
|                  |  |                             | C <sub>L</sub> = 15 pF |      | C <sub>L</sub> = 50 pF |     |       |
|                  |  |                             | Min                    | Max  | Min                    | Max |       |
| t <sub>PLH</sub> | Propagation Delay Time<br>LOW-to-HIGH Level Output | Data to Y                   |                        | 9    |                        | 12  | ns    |
| t <sub>PHL</sub> | Propagation Delay Time<br>HIGH-to-LOW Level Output | Data to Y                   |                        | 9    |                        | 12  | ns    |
| t <sub>PLH</sub> | Propagation Delay Time<br>LOW-to-HIGH Level Output | Select to Y                 |                        | 18   |                        | 20  | ns    |
| t <sub>PHL</sub> | Propagation Delay Time<br>HIGH-to-LOW Level Output | Select to Y                 |                        | 18   |                        | 21  | ns    |
| t <sub>PLH</sub> | Propagation Delay Time<br>LOW-to-HIGH Level Output | Strobe to Y                 |                        | 15   |                        | 18  | ns    |
| t <sub>PHL</sub> | Propagation Delay Time<br>HIGH-to-LOW Level Output | Strobe to Y                 |                        | 13.5 |                        | 17  | ns    |

**Physical Dimensions** inches (millimeters) unless otherwise noted



**16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide Package Number N16E**

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