

DM74ALS153

Dual 1-of-4 Line Data Selector/Multiplexer

General Description

This Data Selector/Multiplexer contains full on-chip decoding to select one-of-four data sources as a result of a unique two-bit binary code at the Select inputs. Each of the two Data Selector/Multiplexer circuits have their own separate Data and Strobe inputs and a non-inverting output buffer. The Select inputs A and B are common to both sections. The Strobe inputs, when at the HIGH level, disable their associated data inputs and force the corresponding output to the LOW state. The Select input buffers incorporate internal overlap features to ensure that select input changes do not cause invalid output transients.

Features

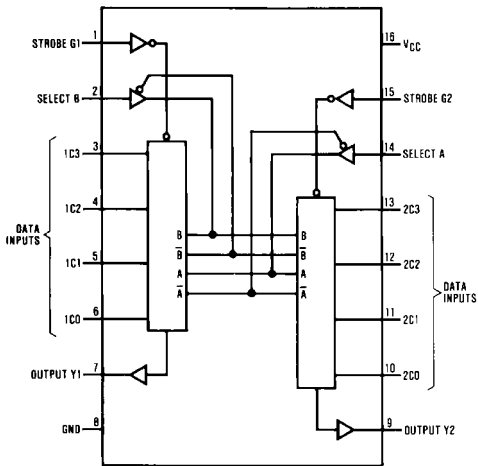
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Switching performance is guaranteed over full temperature and V_{CC} supply range
- Pin and functional compatible with LS family counterpart
- Improved output transient handling capability

Ordering Code:

| Order Number | Package Number | Package Description |
|--------------|----------------|-----------------------------------------------------------------------------|
| DM74ALS153M | M16A | 16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow |
| DM74ALS153SJ | M16D | 16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide |
| DM74ALS153N | N16E | 16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

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 |

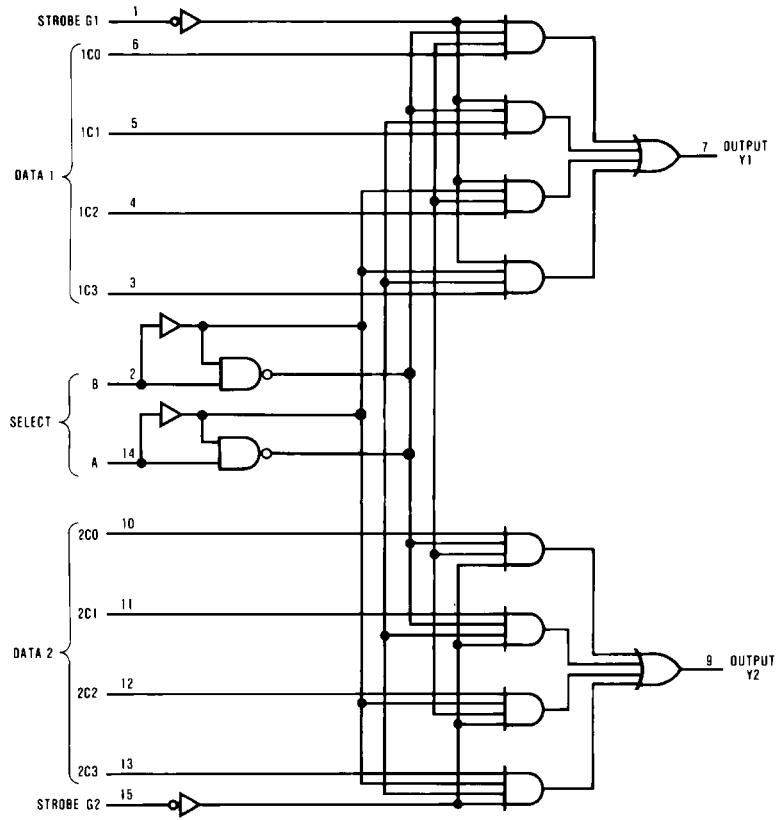
Select inputs A and B are common to both sections.

H = HIGH Level

L = LOW Level

X = Don't Care

Logic Diagram



Absolute Maximum Ratings(Note 1)

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | 7V |
| Operating Free Air Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -65°C to +150°C |
| Typical θ_{JA} | |
| N Package | 78.0°C/W |
| M Package | 107.0°C/W |

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_{CC} | Supply Voltage | 4.5 | 5 | 5.5 | V |
| V_{IH} | HIGH Level Input Voltage | 2 | | | V |
| V_{IL} | LOW Level Input Voltage | | | 0.8 | V |
| I_{OH} | HIGH Level Output Current | | | -2.6 | mA |
| I_{OL} | LOW Level Output Current | | | 24 | mA |
| T_A | Free Air Operating Temperature | 0 | | 70 | °C |

Electrical Characteristics

over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

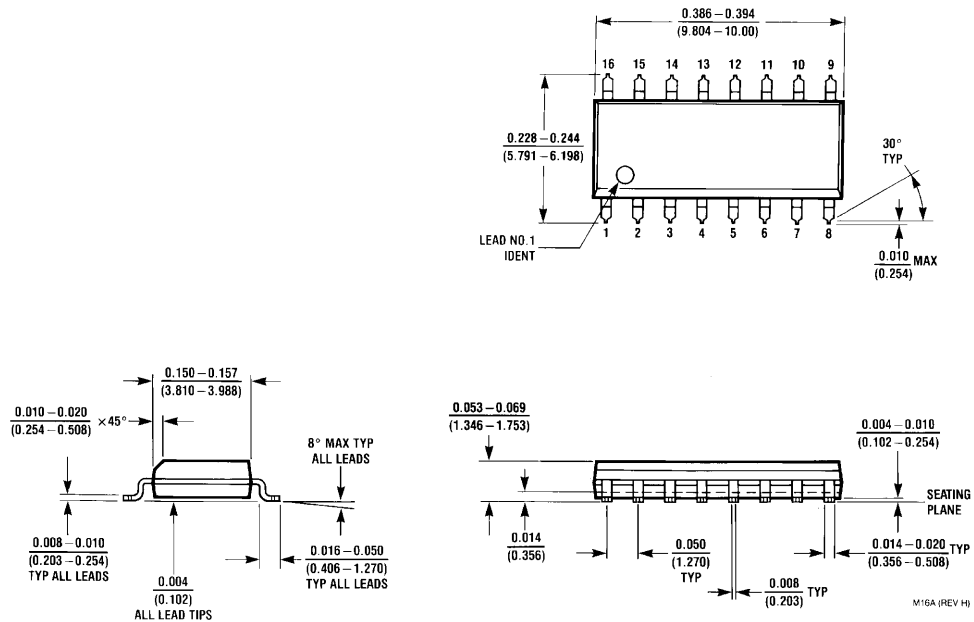
| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|----------|------------------------------------|---------------------------------------------------------|--------------|------|------|---------|
| V_{IK} | Input Clamp Voltage | $V_{CC} = 4.5V$, $I_{IN} = -18\text{ mA}$ | | | -1.5 | V |
| V_{OH} | HIGH Level Output Voltage | $V_{CC} = 4.5V$, $I_{OH} = \text{Max}$ | 2.4 | 3.2 | | V |
| | | $I_{OH} = -400\ \mu A$, $V_{CC} = 4.5V\text{ to }5.5V$ | $V_{CC} - 2$ | | | V |
| V_{OL} | LOW Level Output Voltage | $V_{CC} = 4.5V$ | | 0.35 | 0.5 | V |
| | | $I_{OL} = 24\text{ mA}$ | | | | |
| I_I | Input Current at Max Input Voltage | $V_{CC} = 5.5V$, $V_{IN} = 7V$ | | | 0.1 | mA |
| I_{IH} | High Level Input Current | $V_{CC} = 5.5V$, $V_{IN} = 2.7V$ | | | 20 | μA |
| I_{IL} | Low Level Input Current | $V_{CC} = 5.5V$, $V_{IN} = 0.4V$ | | | -0.1 | mA |
| I_O | Output Drive Current | $V_{CC} = 5.5V$, $V_{OUT} = 2.25V$ | -30 | | -112 | mA |
| I_{CC} | Supply Current | $V_{CC} = 5.5V$ | | 7.5 | 14 | mA |
| | | All Inputs = 4.5V | | | | |

Switching Characteristics

over recommended operating free air temperature range.

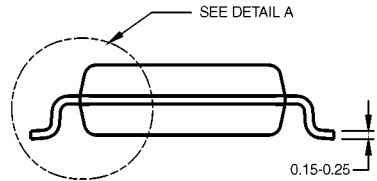
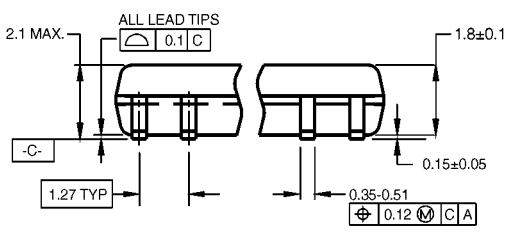
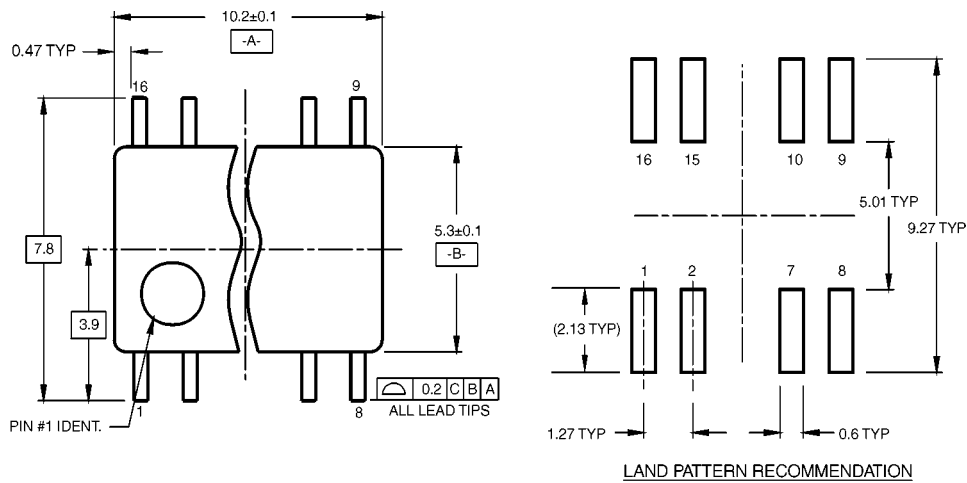
| Symbol | Parameter | Conditions | From | To | Min | Max | Units |
|-----------|----------------------------------------------------|-------------------------------------------------------------------------------|--------|----|-----|-----|-------|
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | $V_{CC} = 4.5V\text{ to }5.5V$ $C_L = 50\text{ pF}$ $R_L = 500\ \Omega$ | Select | Y | 5 | 21 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | | Select | Y | 5 | 21 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | | Data | Y | 3 | 10 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | | Data | Y | 4 | 15 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | | Strobe | Y | 5 | 18 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | | Strobe | Y | 5 | 18 | ns |

Physical Dimensions inches (millimeters) unless otherwise noted



**16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
Package Number M16A**

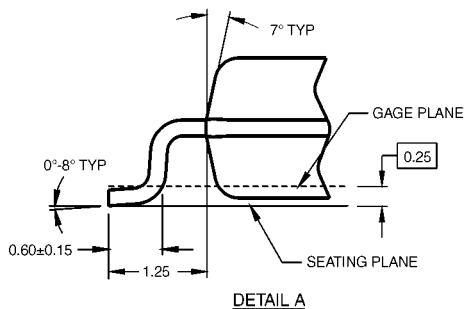
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



DIMENSIONS ARE IN MILLIMETERS

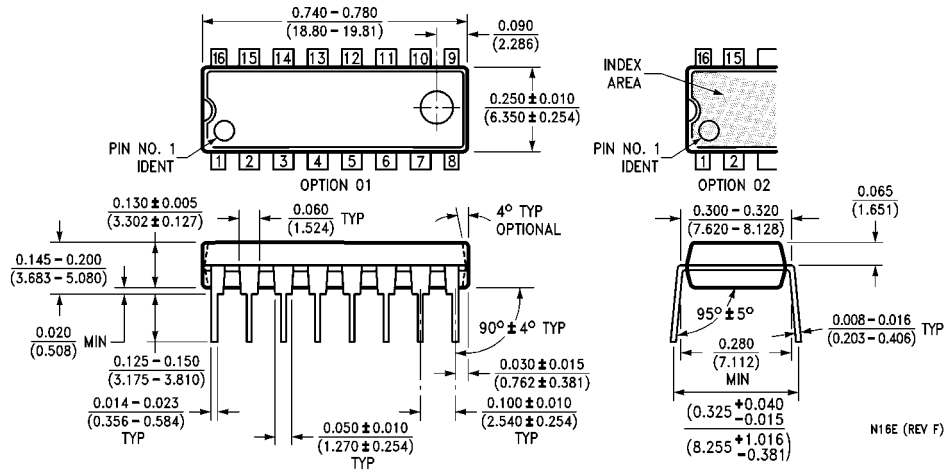
- NOTES:
 A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
 B. DIMENSIONS ARE IN MILLIMETERS.
 C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M16DRevB1



**16-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
 Package Number M16D**

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



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

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