

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | 7V |
| Operating Free Air Temperature Range | |
| DM54LS | −55°C to +125°C |
| DM74LS | 0°C to +70°C |
| Storage Temperature Range | −65°C to +150°C |

Note: 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" table 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 | DM54LS154 | | | DM74LS154 | | | Units |
|-----------------|--------------------------------|-----------|-----|------|-----------|-----|------|-------|
| | | Min | Nom | Max | Min | Nom | Max | |
| V _{CC} | Supply Voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} | High Level Input Voltage | 2 | | | 2 | | | V |
| V _{IL} | Low Level Input Voltage | | | 0.7 | | | 0.8 | V |
| I _{OH} | High Level Output Current | | | −0.4 | | | −0.4 | mA |
| I _{OL} | Low Level Output Current | | | 4 | | | 8 | mA |
| T _A | Free Air Operating Temperature | −55 | | 125 | 0 | | 70 | °C |

Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ (Note 1) | Max | Units |
|-----------------|-----------------------------------|--|-------------|--------------|------|-------|
| V _I | Input Clamp Voltage | V _{CC} = Min, I _I = −18 mA | | | −1.5 | V |
| V _{OH} | High Level Output Voltage | V _{CC} = Min, I _{OH} = Max V _{IL} = Max, V _{IH} = Min | DM54 2.5 | 3.4 | | V |
| V _{OL} | Low Level Output Voltage | V _{CC} = Min, I _{OL} = Max V _{IL} = Max, V _{IH} = Min | DM54 | 0.25 | 0.4 | V |
| | | | DM74 | 0.35 | 0.5 | |
| | | I _{OL} = 4 mA, V _{CC} = Min | DM74 | 0.25 | 0.4 | |
| I _I | Input Current @ Max Input Voltage | V _{CC} = Max, V _I = 7V | | | 0.1 | mA |
| I _{IH} | High Level Input Current | V _{CC} = Max, V _I = 2.7V | | | 20 | μA |
| I _{IL} | Low Level Input Current | V _{CC} = Max, V _I = 0.4V | | | −0.4 | mA |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 2) | DM54 −20 | | −100 | mA |
| | | | DM74 −20 | | −100 | |
| I _{CC} | Supply Current | V _{CC} = Max (Note 3) | | 9 | 14 | mA |

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Note 3: I_{CC} is measured with all outputs open and all inputs grounded.

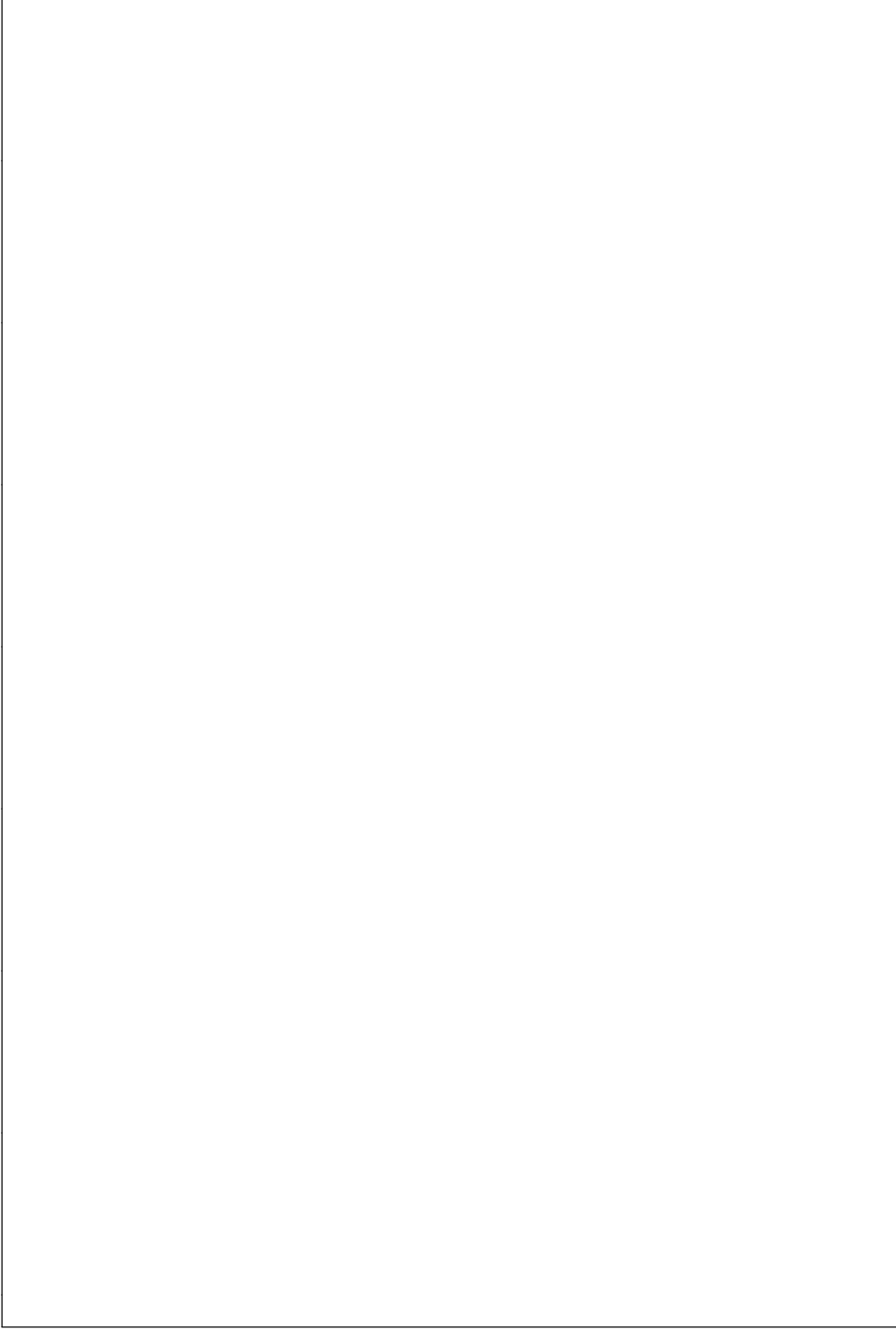
Switching Characteristics at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

| Symbol | Parameter | From (Input) To (Output) | R _L = 2 kΩ | | | | Units |
|------------------|--|-----------------------------|------------------------|-----|------------------------|-----|-------|
| | | | C _L = 15 pF | | C _L = 50 pF | | |
| | | | Min | Max | Min | Max | |
| t _{PLH} | Propagation Delay Time Low to High Level Output | Data to Output | | 30 | | 35 | ns |
| t _{PHL} | Propagation Delay Time High to Low Level Output | Data to Output | | 30 | | 35 | ns |
| t _{PLH} | Propagation Delay Time Low to High Level Output | Strobe to Output | | 20 | | 25 | ns |
| t _{PHL} | Propagation Delay Time High to Low Level Output | Strobe to Output | | 25 | | 35 | ns |

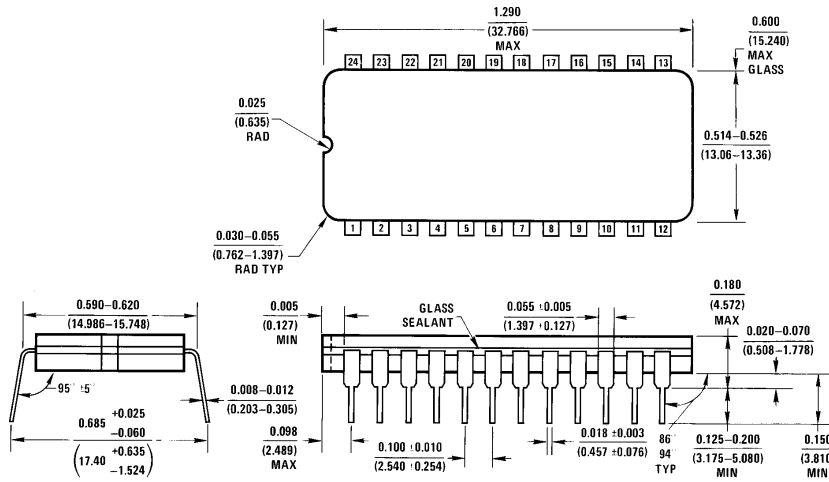
Function Table

| | | Inputs | | | | Outputs | | | | | | | | | | | | | | | | |
|----|----|--------|---|---|---|---------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|---|
| G1 | G2 | D | C | B | A | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| L | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| L | L | L | L | L | H | H | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| L | L | L | L | H | H | H | H | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| L | L | L | H | L | L | H | H | H | H | L | H | H | H | H | H | H | H | H | H | H | H | H |
| L | L | L | H | L | H | H | H | H | H | H | L | H | H | H | H | H | H | H | H | H | H | H |
| L | L | L | H | H | L | H | H | H | H | H | H | L | H | H | H | H | H | H | H | H | H | H |
| L | L | H | L | L | L | H | H | H | H | H | H | H | H | L | H | H | H | H | H | H | H | H |
| L | L | H | L | L | H | H | H | H | H | H | H | H | H | H | L | H | H | H | H | H | H | H |
| L | L | H | L | H | L | H | H | H | H | H | H | H | H | H | H | L | H | H | H | H | H | H |
| L | L | H | H | L | L | H | H | H | H | H | H | H | H | H | H | H | L | H | H | H | H | H |
| L | L | H | H | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L | H | H | H |
| L | L | H | H | H | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L | H | H |
| L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | L |
| L | H | X | X | X | X | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| H | L | X | X | X | X | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| H | H | X | X | X | X | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |

H = High Level, L = Low Level, X = Don't Care

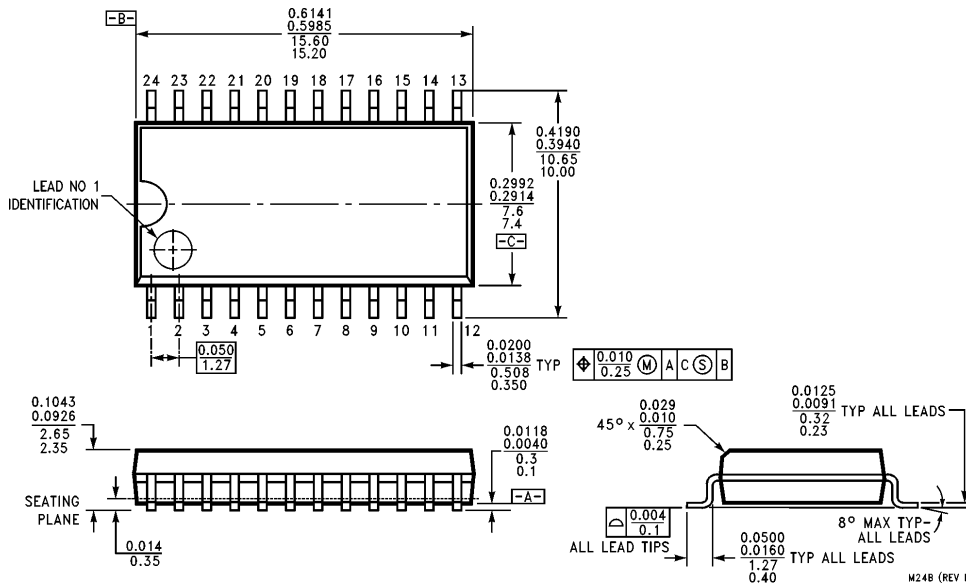


Physical Dimensions inches (millimeters)



24-Lead Ceramic Dual-In-Line Package (J)
Order Number DM54LS154J
NS Package Number J24A

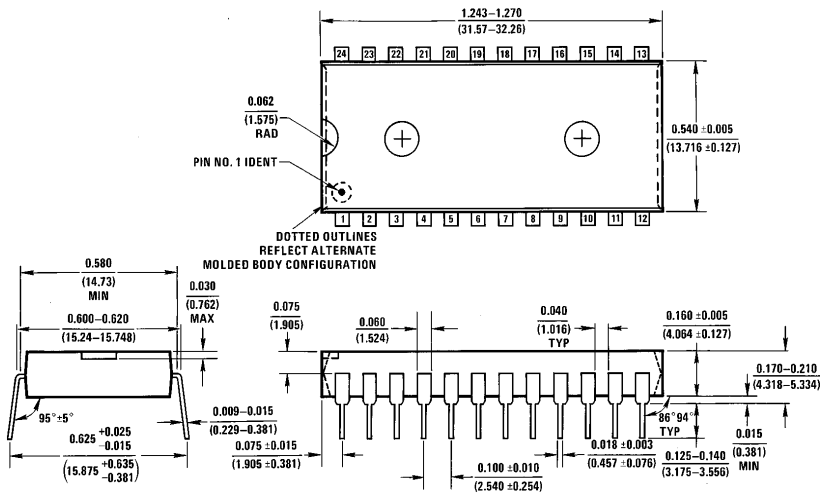
J24A (REV H)



24-Lead Wide Small Outline Molded Package (M)
Order Number DM74LS154WM
NS Package Number M24B

M24B (REV F)

Physical Dimensions inches (millimeters) (Continued)



24-Lead Molded Dual-In-Line Package (N)
Order Number DM74LS154N
NS Package Number N24A

N24A (REV 6)

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