

DM74LS75 Quad Latch

General Description

These latches are ideally suited for use as temporary storage for binary information between processing units and input/output or indicator units. Information present at a data (D) input is transferred to the Q output when the enable is HIGH, and the Q output will follow the data input as long as the enable remains HIGH. When the enable goes LOW, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable is permitted to go HIGH.

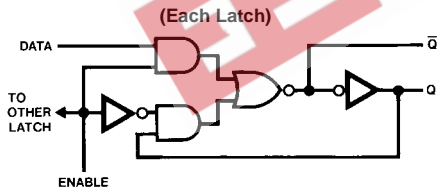
These latches feature complementary Q and \bar{Q} outputs from a 4-bit latch, and are available in 16-pin packages.

Ordering Code:

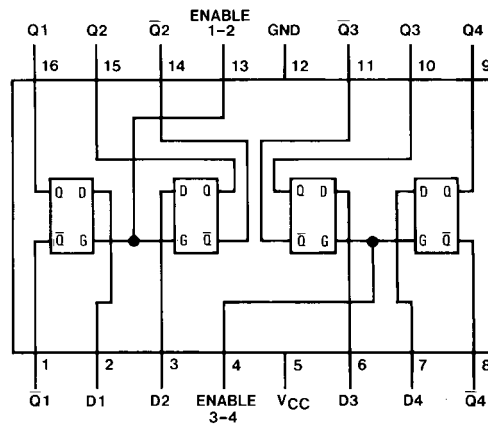
| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| DM74LS75M | M16A | 16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow |
| DM74LS75N | N16E | 16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

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

Logic Diagram



Connection Diagram



Function Table (Each Latch)

| Inputs | | Outputs | |
|--------|--------|---------|-------------|
| D | Enable | Q | \bar{Q} |
| L | H | L | H |
| H | H | H | L |
| X | L | Q_0 | \bar{Q}_0 |

H = HIGH Level
L = LOW Level
X = Don't Care
 Q_0 = The Level of Q Before the HIGH-to-LOW Transition of ENABLE

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 |

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 | 4.75 | 5 | 5.25 | V |
| V _{IH} | HIGH Level Input Voltage | 2 | | | V |
| V _{IL} | LOW Level Input Voltage | | | 0.8 | V |
| I _{OH} | HIGH Level Output Current | | | -0.4 | mA |
| I _{OL} | LOW Level Output Current | | | 8 | mA |
| t _W | Enable Pulse Width (Note 5) | 20 | | | ns |
| t _{SU} | Setup Time (Note 5) | 20 | | | ns |
| t _H | Hold Time (Note 5) | 0 | | | ns |
| T _A | Free Air Operating Temperature | 0 | | 70 | °C |

Electrical Characteristics

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

| Symbol | Parameter | Conditions | Min | Typ (Note 2) | 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 | 2.7 | 3.5 | | V |
| V _{OL} | LOW Level Output Voltage | V _{CC} = Min, I _{OL} = Max V _{IL} = Max, V _{IH} = Min I _{OL} = 4 mA, V _{CC} = Min | | 0.35 | 0.5 | V |
| I _I | Input Current @ Max Input Voltage | V _{CC} = Max, V _I = 7V | D | | 0.1 | mA |
| | | | Enable | | 0.4 | |
| I _{IH} | HIGH Level Input Current | V _{CC} = Max, V _I = 2.7V | D | | 20 | μA |
| | | | Enable | | 80 | |
| I _{IL} | LOW Level Input Current | V _{CC} = Max, V _I = 0.4V | D | | -0.4 | mA |
| | | | Enable | | -1.6 | |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 2) | | | -20 | mA |
| I _{CC} | Supply Current | V _{CC} = Max (Note 3) | | 6.3 | 12 | mA |

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

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

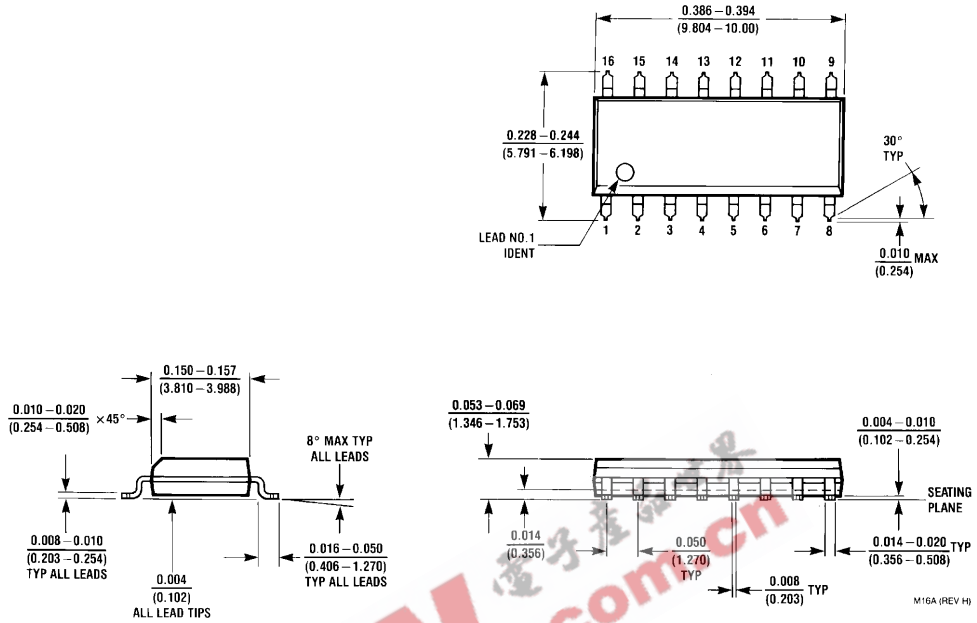
Note 4: I_{CC} is measured with all outputs open and all inputs grounded.

Note 5: T_A = 25°C and V_{CC} = 5V.

| Switching Characteristics | | | | | | | |
|---|--|-----------------------------|--------------------------|-----|----------------------|-----|-------|
| at $V_{CC} = 5V$ and $T_A = 25^\circ C$ | | | | | | | |
| Symbol | Parameter | From (Input) To (Output) | $R_L = 2\text{ k}\Omega$ | | | | Units |
| | | | $C_L = 15\text{ pF}$ | | $C_L = 50\text{ pF}$ | | |
| | | | Min | Max | Min | Max | |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | D to Q | | 27 | | 30 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | D to Q | | 17 | | 25 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | D to \bar{Q} | | 20 | | 25 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | D to \bar{Q} | | 15 | | 20 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | Enable to Q | | 27 | | 30 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | Enable to Q | | 25 | | 30 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | Enable to \bar{Q} | | 30 | | 30 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | Enable to \bar{Q} | | 15 | | 20 | ns |

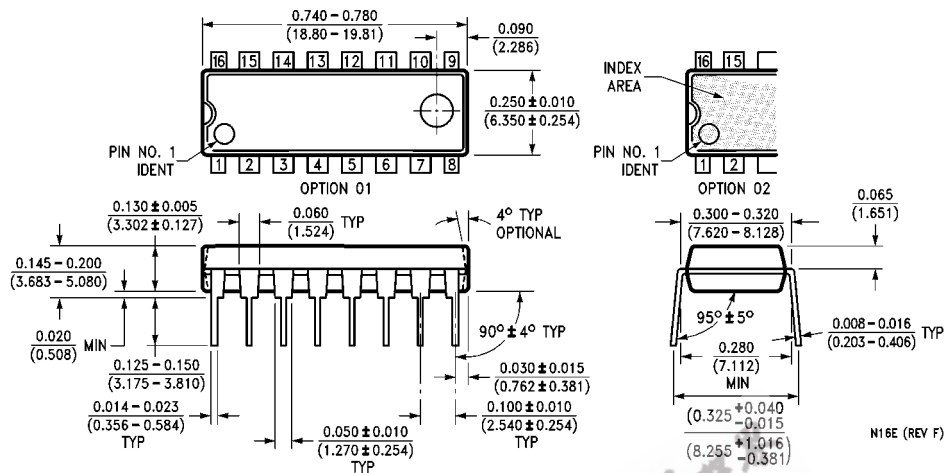
DM74LS75

Physical Dimensions inches (millimeters) unless otherwise noted

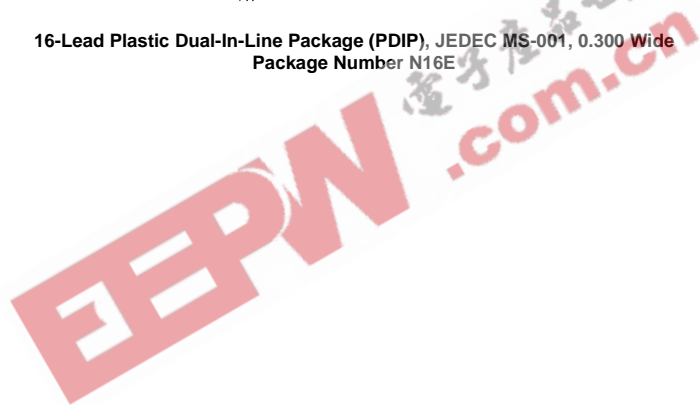


**16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
Package Number M16A**

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



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



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