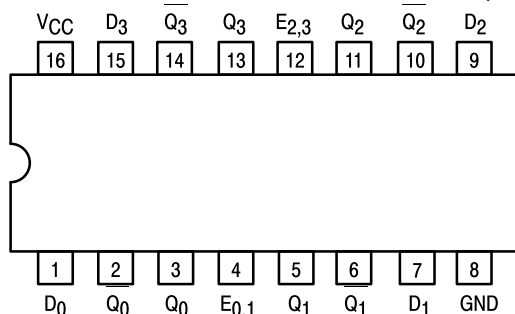




## 4-BIT D LATCH

The SN54/74LS375 is a 4-Bit D-Type Latch for use as temporary storage for binary information between processing limits and input/output or indicator units. When the Enable (E) is HIGH, information present at the D input will be transferred to the Q output and, if E is HIGH, the Q output will follow the input. When E goes LOW, the information present at the D input prior to its setup time will be retained at the Q outputs.

CONNECTION DIAGRAM DIP (TOP VIEW)



NOTE:  
The Flatpak version  
has the same pinouts  
(Connection Diagram) as  
the Dual In-Line Package.

TRUTH TABLE  
(Each latch)

| $t_n$ | $t_{n+1}$ |
|-------|-----------|
| D     | Q         |
| H     | H         |
| L     | L         |

NOTES:  
 $t_n$  = bit time before enable  
negative-going transition.  
 $t_{n+1}$  = bit time after enable  
negative-going transition.

### PIN NAMES

|           |                                      |
|-----------|--------------------------------------|
| $D_1-D_4$ | Data Inputs                          |
| $E_{0-1}$ | Enable Input Latches 0, 1            |
| $E_{2-3}$ | Enable Input Latches 2, 3            |
| $Q_1-Q_4$ | Latch Outputs (Note b)               |
| $Q_1-Q_4$ | Complimentary Latch Outputs (Note b) |

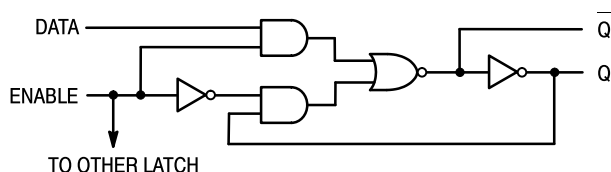
### LOADING (Note a)

| HIGH     | LOW          |
|----------|--------------|
| 0.5 U.L. | 0.25 U.L.    |
| 2.0 U.L. | 1.0 U.L.     |
| 2.0 U.L. | 1.0 U.L.     |
| 10 U.L.  | 5 (2.5) U.L. |
| 10 U.L.  | 5 (2.5) U.L. |

### NOTES:

- a) 1 TTL Unit Load (U.L.) = 40  $\mu$ A HIGH/1.6 mA LOW.  
b) The Output LOW drive factor is 25 U.L. for Military (54) and 5 U.L. for Commercial (74) Temperature Ranges.

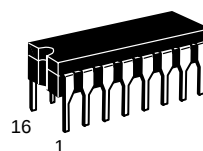
LOGIC DIAGRAM



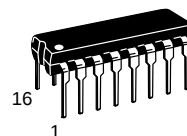
## SN54/74LS375

### 4-BIT D LATCH

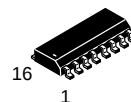
### LOW POWER SCHOTTKY



J SUFFIX  
CERAMIC  
CASE 620-09



N SUFFIX  
PLASTIC  
CASE 648-08

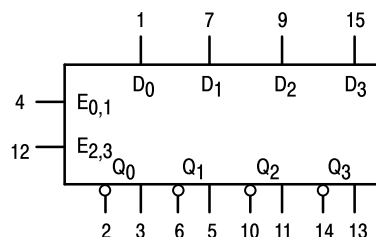


D SUFFIX  
SOIC  
CASE 751B-03

### ORDERING INFORMATION

|            |         |
|------------|---------|
| SN54LSXXXJ | Ceramic |
| SN74LSXXXN | Plastic |
| SN74LSXXXD | SOIC    |

### LOGIC SYMBOL



$V_{CC}$  = PIN 16  
GND = PIN 8

# SN54/74LS375

## DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

| Symbol   | Parameter                      |                    | Limits |       |              | Unit          | Test Conditions                                                                                         |
|----------|--------------------------------|--------------------|--------|-------|--------------|---------------|---------------------------------------------------------------------------------------------------------|
|          |                                |                    | Min    | Typ   | Max          |               |                                                                                                         |
| $V_{IH}$ | Input HIGH Voltage             |                    | 2.0    |       |              | V             | Guaranteed Input HIGH Voltage for All Inputs                                                            |
| $V_{IL}$ | Input LOW Voltage              | 54                 |        |       | 0.7          | V             | Guaranteed Input LOW Voltage for All Inputs                                                             |
|          |                                | 74                 |        |       | 0.8          |               |                                                                                                         |
| $V_{IK}$ | Input Clamp Diode Voltage      |                    |        | -0.65 | -1.5         | V             | $V_{CC} = \text{MIN}$ , $I_{IN} = -18 \text{ mA}$                                                       |
| $V_{OH}$ | Output HIGH Voltage            | 54                 | 2.5    | 3.5   |              | V             | $V_{CC} = \text{MIN}$ , $I_{OH} = \text{MAX}$ , $V_{IN} = V_{IH}$ or $V_{IL}$ per Truth Table           |
|          |                                | 74                 | 2.7    | 3.5   |              | V             |                                                                                                         |
| $V_{OL}$ | Output LOW Voltage             | 54, 74             |        | 0.25  | 0.4          | V             | $I_{OL} = 4.0 \text{ mA}$ $V_{CC} = V_{CC} \text{ MIN}$ , $V_{IN} = V_{IL}$ or $V_{IH}$ per Truth Table |
|          |                                | 74                 |        | 0.35  | 0.5          | V             | $I_{OL} = 8.0 \text{ mA}$                                                                               |
| $I_{IH}$ | Input HIGH Current             | D Input<br>E Input |        |       | 20<br>80     | $\mu\text{A}$ | $V_{CC} = \text{MAX}$ , $V_{IN} = 2.7 \text{ V}$                                                        |
|          |                                | D Input<br>E Input |        |       | 0.1<br>0.4   | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = 7.0 \text{ V}$                                                        |
| $I_{IL}$ | Input LOW Current              | D Input<br>E Input |        |       | -0.4<br>-1.6 | mA            | $V_{CC} = \text{MAX}$ , $V_{IN} = 0.4 \text{ V}$                                                        |
| $I_{OS}$ | Short Circuit Current (Note 1) |                    | -20    |       | -100         | mA            | $V_{CC} = \text{MAX}$                                                                                   |
| $I_{CC}$ | Power Supply Current           |                    |        |       | 12           | mA            | $V_{CC} = \text{MAX}$                                                                                   |

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

## AC CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ , $V_{CC} = 5.0 \text{ V}$ )

| Symbol                 | Parameter                                   |  | Limits |           |          | Unit | Test Conditions                                   |
|------------------------|---------------------------------------------|--|--------|-----------|----------|------|---------------------------------------------------|
|                        |                                             |  | Min    | Typ       | Max      |      |                                                   |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay, Data to Q                |  |        | 15<br>9.0 | 27<br>17 | ns   | $V_{CC} = 5.0 \text{ V}$<br>$C_L = 15 \text{ pF}$ |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay, Data to $\overline{Q}$   |  |        | 12<br>7.0 | 20<br>15 | ns   |                                                   |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay, Enable to Q              |  |        | 15<br>14  | 27<br>25 | ns   |                                                   |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay, Enable to $\overline{Q}$ |  |        | 16<br>7.0 | 30<br>15 | ns   |                                                   |

### LOGIC DIAGRAM



**AC SETUP REQUIREMENTS** ( $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 5.0\text{ V}$ )

## AC WAVEFORMS

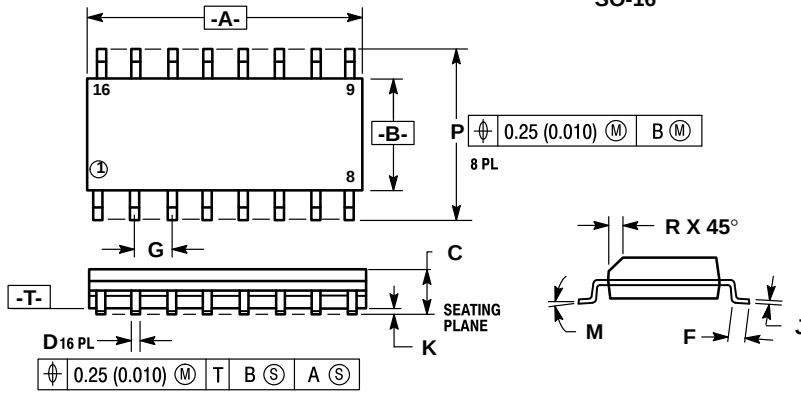


**SETUP TIME (ts)** — is defined as the minimum time required for the correct logic level to be present at the logic input prior to the clock transition from LOW-to-HIGH in order to be recognized and transferred to the outputs.

HOLD TIME ( $t_h$ ) — is defined as the minimum time following

the clock transition from LOW-to-HIGH that the logic level must be maintained at the input in order to ensure continued recognition. A negative HOLD TIME indicates that the correct logic level may be released prior to the clock transition from LOW-to-HIGH and still be recognized.

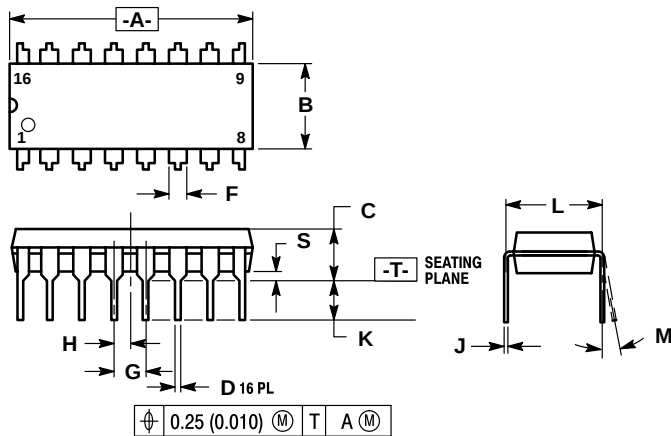
**Case 751B-03 D Suffix**  
**16-Pin Plastic**  
**SO-16**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
  5. 751B-01 IS OBSOLETE, NEW STANDARD 751B-03.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 9.80        | 10.00 | 0.386     | 0.393 |
| B   | 3.80        | 4.00  | 0.150     | 0.157 |
| C   | 1.35        | 1.75  | 0.054     | 0.068 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.40        | 1.25  | 0.016     | 0.049 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.19        | 0.25  | 0.008     | 0.009 |
| K   | 0.10        | 0.25  | 0.004     | 0.009 |
| M   | 0°          | 7°    | 0°        | 7°    |
| P   | 5.80        | 6.20  | 0.229     | 0.244 |
| R   | 0.25        | 0.50  | 0.010     | 0.019 |

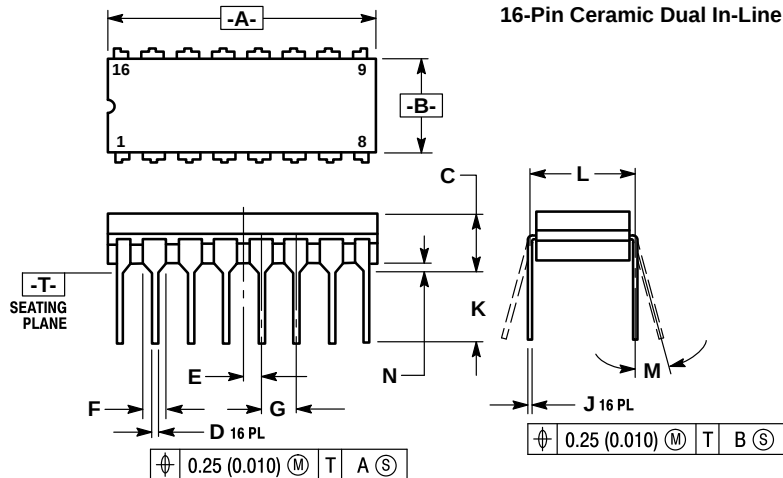
**Case 648-08 N Suffix**  
**16-Pin Plastic**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION "L" TO CENTER OF LEADS WHEN FORMED PARALLEL.
  4. DIMENSION "B" DOES NOT INCLUDE MOLD FLASH.
  5. ROUNDED CORNERS OPTIONAL.
  6. 648-01 THRU -07 OBSOLETE, NEW STANDARD 648-08.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 18.80       | 19.55 | 0.740     | 0.770 |
| B   | 6.35        | 6.85  | 0.250     | 0.270 |
| C   | 3.69        | 4.44  | 0.145     | 0.175 |
| D   | 0.39        | 0.53  | 0.015     | 0.021 |
| F   | 1.02        | 1.77  | 0.040     | 0.070 |
| G   | 2.54 BSC    |       | 0.100 BSC |       |
| H   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.21        | 0.38  | 0.008     | 0.015 |
| K   | 2.80        | 3.30  | 0.110     | 0.130 |
| L   | 7.50        | 7.74  | 0.295     | 0.305 |
| M   | 0°          | 10°   | 0°        | 10°   |
| S   | 0.51        | 1.01  | 0.020     | 0.040 |

**Case 620-09 J Suffix**  
**16-Pin Ceramic Dual In-Line**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
  4. DIM F MAY NARROW TO 0.76 (0.030) WHERE THE LEAD ENTERS THE CERAMIC BODY.
  5. 620-01 THRU -08 OBSOLETE, NEW STANDARD 620-09.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 19.05       | 19.55 | 0.750     | 0.770 |
| B   | 6.10        | 7.36  | 0.240     | 0.290 |
| C   | —           | 4.19  | —         | 0.165 |
| D   | 0.39        | 0.53  | 0.015     | 0.021 |
| E   | 1.27 BSC    |       | 0.050 BSC |       |
| F   | 1.40        | 1.77  | 0.055     | 0.070 |
| G   | 2.54 BSC    |       | 0.100 BSC |       |
| J   | 0.23        | 0.27  | 0.009     | 0.011 |
| K   | —           | 5.08  | —         | 0.200 |
| L   | 7.62 BSC    |       | 0.300 BSC |       |
| M   | 0°          | 15°   | 0°        | 15°   |
| N   | 0.39        | 0.88  | 0.015     | 0.035 |

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