



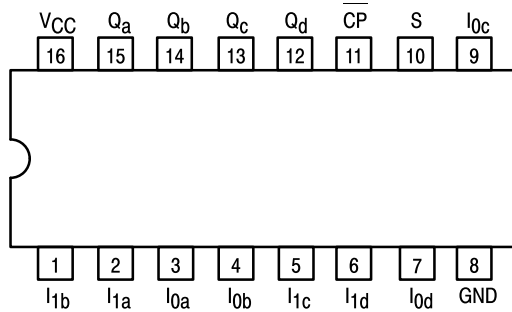
QUAD 2-INPUT MULTIPLEXER WITH STORAGE

The SN54/74LS298 is a Quad 2-Port Register. It is the logical equivalent of a quad 2-input multiplexer followed by a quad 4-bit edge-triggered register. A Common Select input selects between two 4-bit input ports (data sources.) The selected data is transferred to the output register synchronous with the HIGH to LOW transition of the Clock input.

The LS298 is fabricated with the Schottky barrier process for high speed and is completely compatible with all Motorola TTL families.

- Select From Two Data Sources
- Fully Edge-Triggered Operation
- Typical Power Dissipation of 65 mW
- Input Clamp Diodes Limit High Speed Termination Effects

CONNECTION DIAGRAM DIP (TOP VIEW)



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

PIN NAMES

| | |
|----------------------------------|-------------------------------------|
| <u>S</u> | Common Select Input |
| <u>CP</u> | Clock (Active LOW Going Edge) Input |
| I _{0a} -I _{0d} | Data Inputs From Source 0 |
| I _{1a} -I _{1d} | Data Inputs From Source 1 |
| Q _a -Q _d | Register Outputs (Note b) |

LOADING (Note a)

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

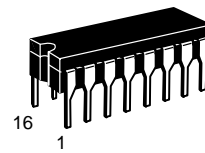
NOTES:

- a) 1 TTL Unit Load (U.L.) = 40 μ A HIGH/1.6 mA LOW.
b) The Output LOW drive factor is 2.5 U.L. for Military (54) and 5 U.L. for Commercial (74) Temperature Ranges.

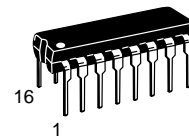
SN54/74LS298

QUAD 2-INPUT MULTIPLEXER WITH STORAGE

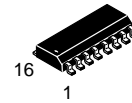
LOW POWER SCHOTTKY



J SUFFIX
CERAMIC
CASE 620-09



N SUFFIX
PLASTIC
CASE 648-08

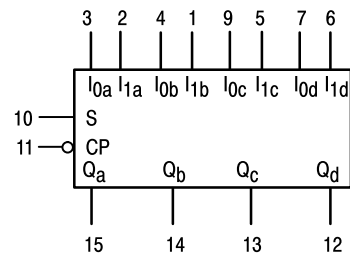


D SUFFIX
SOIC
CASE 751B-03

ORDERING INFORMATION

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

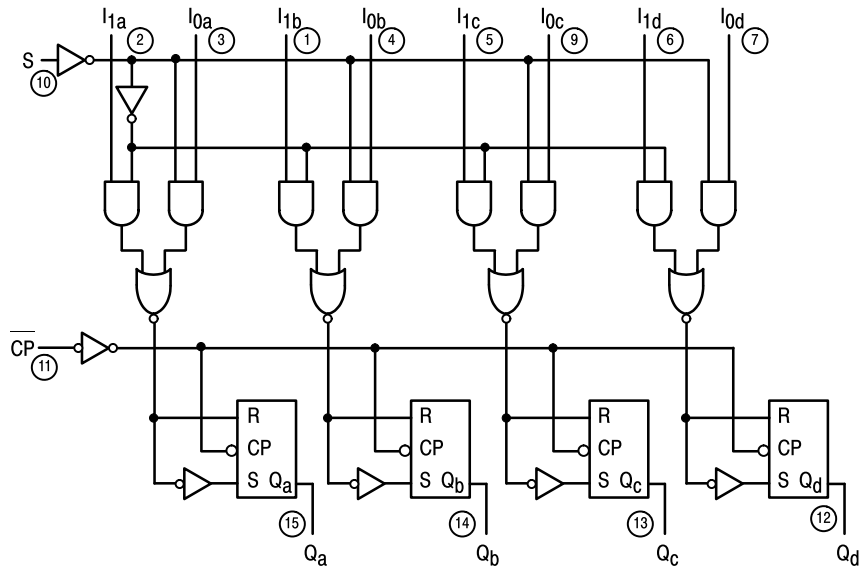
LOGIC SYMBOL



V_{CC} = PIN 16
GND = PIN 8

SN54/74LS298

LOGIC OR BLOCK DIAGRAM



V_{CC} = PIN 16
 GND = PIN 8
 ○ = PIN NUMBERS

FUNCTIONAL DESCRIPTION

The LS298 is a high speed Quad 2-Port Register. It selects four bits of data from two sources (ports) under the control of a Common Select Input (S). The selected data is transferred to the 4-bit output register synchronous with the HIGH to LOW

transition of the Clock input (CP). The 4-bit output register is fully edge-triggered. The Data inputs (I) and Select input (S) must be stable only one setup time prior to the HIGH to LOW transition of the clock for predictable operation.

TRUTH TABLE

| INPUTS | | | OUTPUT |
|--------|----------------|----------------|--------|
| S | I ₀ | I ₁ | Q |
| l | l | X | L |
| l | h | X | H |
| h | X | l | L |
| h | X | h | H |

L = LOW Voltage Level
 H = HIGH Voltage Level
 X = Don't Care
 l = LOW Voltage Level one setup time prior to the HIGH to LOW clock transition.
 h = HIGH Voltage Level one setup time prior to the HIGH to LOW clock transition.

GUARANTEED OPERATING RANGES

| Symbol | Parameter | | Min | Typ | Max | Unit |
|-----------------|-------------------------------------|----------|-------------|------------|-------------|------|
| V _{CC} | Supply Voltage | 54 74 | 4.5 4.75 | 5.0 5.0 | 5.5 5.25 | V |
| T _A | Operating Ambient Temperature Range | 54 74 | -55 0 | 25 25 | 125 70 | °C |
| I _{OH} | Output Current — High | 54, 74 | | | -0.4 | mA |
| I _{OL} | Output Current — Low | 54 74 | | | 4.0 8.0 | mA |

SN54/74LS298

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} = MIN, I _{IN} = -18 mA |
| V _{OH} | Output HIGH Voltage | 54 | 2.5 | 3.5 | | V | V _{CC} = MIN, I _{OH} = 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 mA V _{CC} = V _{CC} MIN, V _{IN} = V _{IL} or V _{IH} per Truth Table |
| | | 74 | | 0.35 | 0.5 | V | |
| I _{IH} | Input HIGH Current | | | | 20 | μA | V _{CC} = MAX, V _{IN} = 2.7 V |
| | | | | | 0.1 | mA | V _{CC} = MAX, V _{IN} = 7.0 V |
| I _{IL} | Input LOW Current | | | | -0.4 | mA | V _{CC} = MAX, V _{IN} = 0.4 V |
| I _{OS} | Short Circuit Current (Note 1) | | -20 | | -100 | mA | V _{CC} = MAX |
| I _{CC} | Power Supply Current | | | | 21 | mA | V _{CC} = 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°C, V_{CC} = 5.0 V)

| Symbol | Parameter | | Limits | | | Unit | Test Conditions |
|--------------------------------------|---------------------------------------|--|--------|-----|-----|------|--|
| | | | Min | Typ | Max | | |
| t _{PLH} t _{PHL} | Propagation Delay, Clock to Output | | | 18 | 27 | ns | V _{CC} = 5.0 V, C _L = 15 pF |
| | | | | 21 | 32 | ns | |

AC SET-UP REQUIREMENTS (T_A = 25°C, V_{CC} = 5.0 V)

| Symbol | Parameter | | Limits | | | Unit | Test Conditions |
|----------------|-------------------|--|--------|-----|-----|------|-------------------------|
| | | | Min | Typ | Max | | |
| t _W | Clock Pulse Width | | 20 | | | ns | V _{CC} = 5.0 V |
| t _S | Data Setup Time | | 15 | | | ns | |
| t _S | Select Setup Time | | 25 | | | ns | |
| t _H | Data Hold Time | | 5.0 | | | ns | |
| t _H | Select Hold Time | | 0 | | | | |

DEFINITIONS OF TERMS

SETUP TIME (t_S) — 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.

SN54/74LS298

AC WAVEFORMS

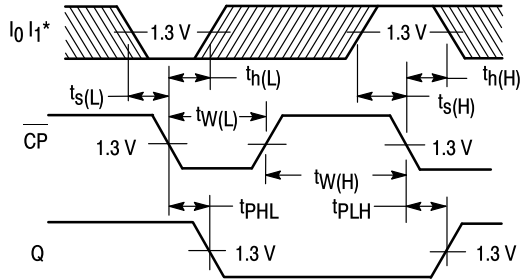


Figure 1

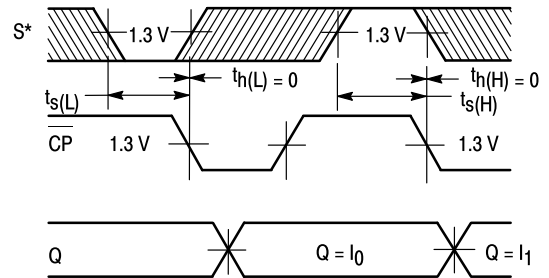
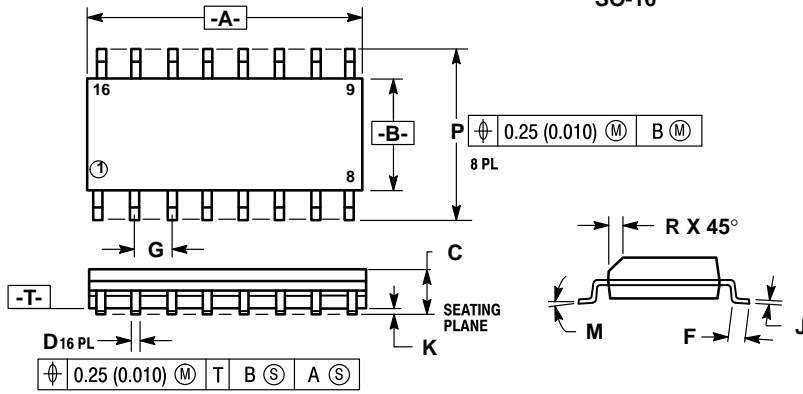


Figure 2

*The shaded areas indicate when the input is permitted to change for predictable output performance.

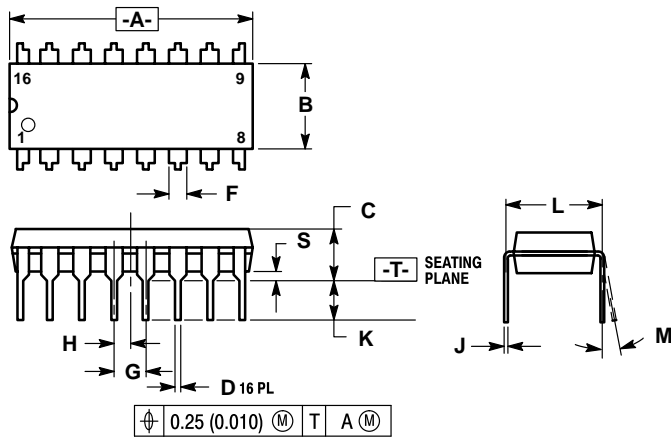
**Case 751B-03 D Suffix
16-Pin Plastic
SO-16**



- 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 |

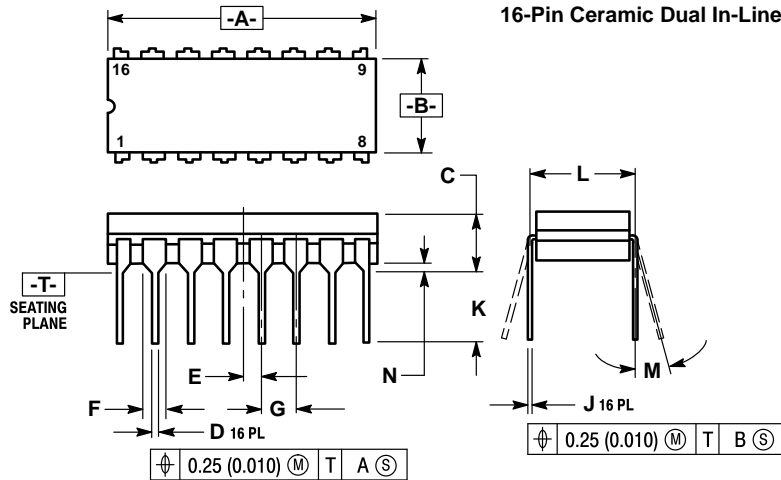
**Case 648-08 N Suffix
16-Pin Plastic**



- 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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