



DECADE COUNTER; DIVIDE-BY-TWELVE COUNTER; 4-BIT BINARY COUNTER

The SN54/74LS90, SN54/74LS92 and SN54/74LS93 are high-speed 4-bit ripple type counters partitioned into two sections. Each counter has a divide-by-two section and either a divide-by-five (LS90), divide-by-six (LS92) or divide-by-eight (LS93) section which are triggered by a HIGH-to-LOW transition on the clock inputs. Each section can be used separately or tied together (Q to CP) to form BCD, bi-quinary, modulo-12, or modulo-16 counters. All of the counters have a 2-input gated Master Reset (Clear), and the LS90 also has a 2-input gated Master Set (Preset 9).

- Low Power Consumption . . . Typically 45 mW
- High Count Rates . . . Typically 42 MHz
- Choice of Counting Modes . . . BCD, Bi-Quinary, Divide-by-Twelve, Binary
- Input Clamp Diodes Limit High Speed Termination Effects

PIN NAMES

CP ₀	Clock (Active LOW going edge) Input to +2 Section
CP ₁	Clock (Active LOW going edge) Input to +5 Section (LS90), +6 Section (LS92)
CP ₁	Clock (Active LOW going edge) Input to +8 Section (LS93)
MR ₁ , MR ₂	Master Reset (Clear) Inputs
MS ₁ , MS ₂	Master Set (Preset-9, LS90) Inputs
Q ₀	Output from +2 Section (Notes b & c)
Q ₁ , Q ₂ , Q ₃	Outputs from +5 (LS90), +6 (LS92), +8 (LS93) Sections (Note b)

LOADING (Note a)

	HIGH	LOW
CP ₀	0.5 U.L.	1.5 U.L.
CP ₁	0.5 U.L.	2.0 U.L.
CP ₁	0.5 U.L.	1.0 U.L.
MR ₁ , MR ₂	0.5 U.L.	0.25 U.L.
MS ₁ , MS ₂	0.5 U.L.	0.25 U.L.
Q ₀	10 U.L.	5 (2.5) U.L.
Q ₁ , Q ₂ , Q ₃	10 U.L.	5 (2.5) U.L.

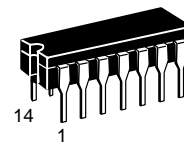
NOTES:

- 1 TTL Unit Load (U.L.) = 40 μA HIGH/1.6 mA LOW.
- The Output LOW drive factor is 2.5 U.L. for Military, (54) and 5 U.L. for commercial (74) Temperature Ranges.
- The Q₀ Outputs are guaranteed to drive the full fan-out plus the CP₁ input of the device.
- To insure proper operation the rise (t_r) and fall time (t_f) of the clock must be less than 100 ns.

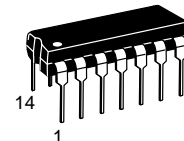
**SN54/74LS90
SN54/74LS92
SN54/74LS93**

**DECADE COUNTER;
DIVIDE-BY-TWELVE COUNTER;
4-BIT BINARY COUNTER**

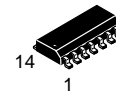
LOW POWER SCHOTTKY



**J SUFFIX
CERAMIC
CASE 632-08**



**N SUFFIX
PLASTIC
CASE 646-06**

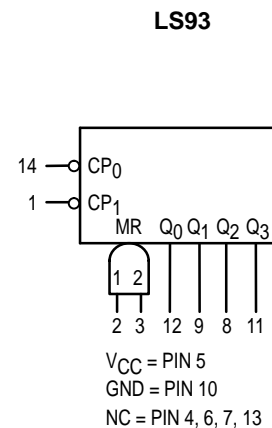
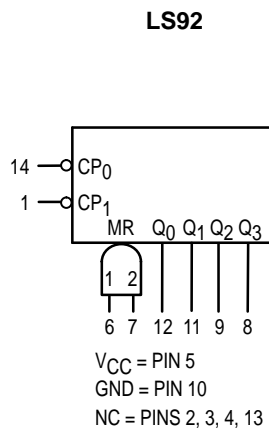
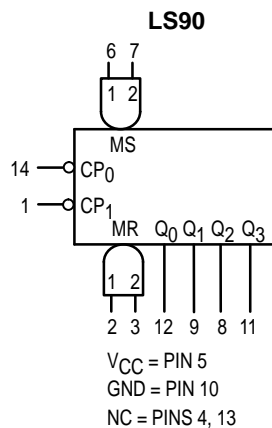


**D SUFFIX
SOIC
CASE 751A-02**

ORDERING INFORMATION

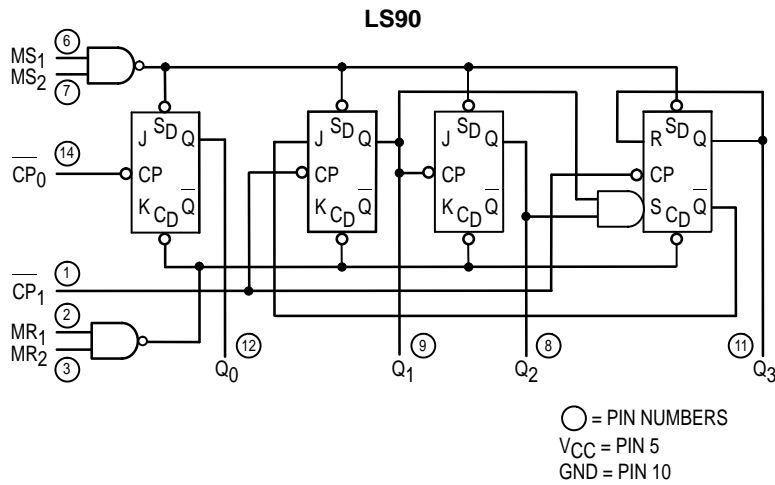
SN54LSXXJ	Ceramic
SN74LSXXN	Plastic
SN74LSXXD	SOIC

LOGIC SYMBOL

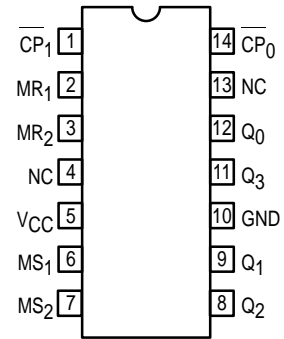


SN54/74LS90 • SN54/74LS92 • SN54/74LS93

LOGIC DIAGRAM



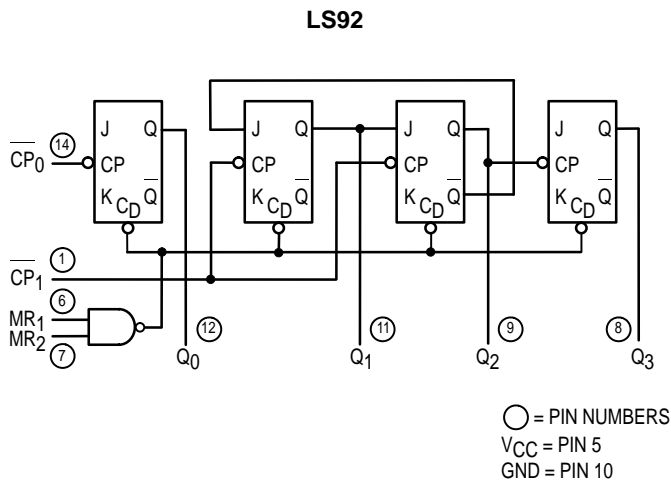
CONNECTION DIAGRAM DIP (TOP VIEW)



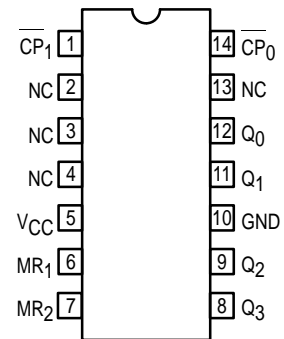
NC = NO INTERNAL CONNECTION

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

LOGIC DIAGRAM



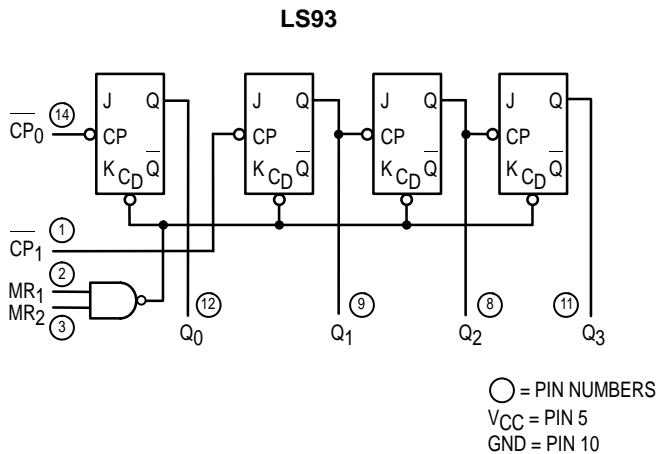
CONNECTION DIAGRAM DIP (TOP VIEW)



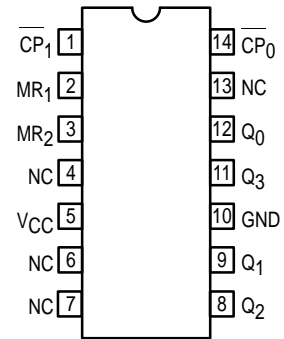
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LOGIC DIAGRAM



CONNECTION DIAGRAM DIP (TOP VIEW)



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