

54LS/74LS504

12-BIT SUCCESSIVE APPROXIMATION REGISTER (With Expansion Control)

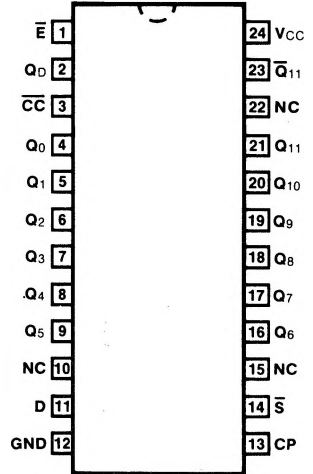
DESCRIPTION — The 'LS504 performs serial-to-parallel conversion and provides a Conversion Complete (\overline{CC}) signal. The 'LS504 is a 12-bit version of the 8-bit 'LS502 and has an active LOW Enable (\overline{E}) input for expansion, similar to the 'LS503. For detailed discussion of the various operations, please see the 'LS502 and 'LS503 data sheets.

- PERFORMS SERIAL-TO-PARALLEL CONVERSION
- EXPANSION CONTROL FOR LONGER WORDS
- STORAGE AND CONTROL FOR SUCCESSIVE APPROXIMATION A TO D CONVERSION
- LOW POWER SCHOTTKY VERSION OF 2504

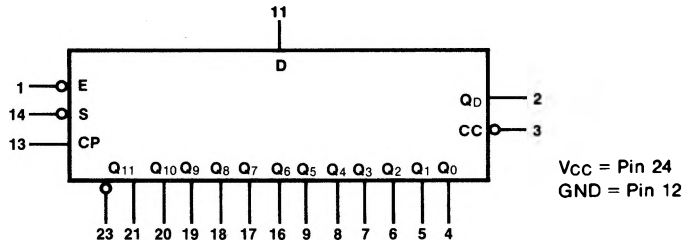
ORDERING CODE: See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		$V_{CC} = +5.0\text{ V} \pm 5\%$, $T_A = 0^\circ\text{C to } +70^\circ\text{C}$	$V_{CC} = +5.0\text{ V} \pm 10\%$, $T_A = -55^\circ\text{C to } +125^\circ\text{C}$	
Plastic DIP (P)	A	74LS504PC		9N
Ceramic DIP (D)	A	74LS504DC	54LS504DM	6N
Flatpak (F)	A	74LS504FC	54LS504FM	4M

CONNECTION DIAGRAM PINOUT A



LOGIC SYMBOL



INPUT LOADING/FAN-OUT: See Section 3 for U.L. definitions

PIN NAMES	DESCRIPTION	54/74LS (U.L.) HIGH/LOW
D	Serial Data Input	0.5/0.25
\bar{S}	Start Input (Active LOW)	0.5/0.25
CP	Clock Pulse Input (Active Rising Edge)	0.5/0.25
\bar{E}	Conversion Enable Input (Active LOW)	0.5/0.25
Q _D	Synchronized Serial Data Output	10/5.0 (2.5)
\overline{CC}	Conversion Complete Output (Active LOW)	10/5.0 (2.5)
Q ₀ — Q ₁₁	Parallel Register Outputs	10/5.0 (2.5)
\overline{Q}_{11}	Complement of Q ₁₁ Output	10/5.0 (2.5)

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	54/74LS		UNITS	CONDITIONS
		Min	Max		
I _{CC}	Power Supply Current	90		mA	V _{CC} = Max

AC CHARACTERISTICS: V_{CC} = +5.0 V, T_A = +25°C (See Section 3 for waveforms and load configurations)

SYMBOL	PARAMETER	54/74LS		UNITS	CONDITIONS
		C _L = 15 pF			
		Min	Max		
f _{max}	Maximum Clock Frequency	15		MHz	Figs. 3-1, 3-8
t _{PLH} t _{PHL}	Propagation Delay CP to Q _n or \overline{CC}	38 28		ns	
t _{PLH} t _{PHL}	Propagation Delay \bar{E} to Q ₇	19 24		ns	

AC OPERATING REQUIREMENTS: V_{CC} = +5.0 V, T_A = +25°C

SYMBOL	PARAMETER	54/74LS		UNITS	CONDITIONS
		Min	Max		
t _s (H) t _s (L)	Setup Time HIGH or LOW \bar{S} to CP	16 16		ns	Fig. 3-6
t _h (H) t _h (L)	Hold Time HIGH or LOW \bar{S} to CP	0 0		ns	
t _s (H) t _s (L)	Setup Time HIGH or LOW D to CP	8.0 8.0		ns	
t _h (H) t _h (L)	Hold Time HIGH or LOW D to CP	10 10		ns	
t _w (H) t _w (L)	CP Pulse Width HIGH or LOW	20 46		ns	Fig. 3-8