

Fig. 4 Functional diagram.

APPLICATIONS

- Process controllers
- Servo-motor control

FUNCTION TABLE

COMPARING INPUTS				CASCADING INPUTS			OUTPUTS		
A ₃ , B ₃	A ₂ , B ₂	A ₁ , B ₁	A ₀ , B ₀	I _A >B	I _A <B	I _A =B	Q _A >B	Q _A <B	Q _A =B
A ₃ >B ₃	X	X	X	X	X	X	H	L	L
A ₃ <B ₃	X	X	X	X	X	X	L	H	L
A ₃ =B ₃	A ₂ >B ₂	X	X	X	X	X	H	L	L
A ₃ =B ₃	A ₂ <B ₂	X	X	X	X	X	L	H	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ >B ₁	X	X	X	X	H	L	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ <B ₁	X	X	X	X	L	H	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ >B ₀	X	X	X	H	L	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ <B ₀	X	X	X	L	H	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	H	L	L	H	L	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	L	H	L	L	H	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	L	L	H	L	L	H
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	X	X	H	L	L	H
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	H	H	L	L	L	L
A ₃ =B ₃	A ₂ =B ₂	A ₁ =B ₁	A ₀ =B ₀	L	L	L	H	H	L

H = HIGH voltage level
L = LOW voltage level
X = don't care

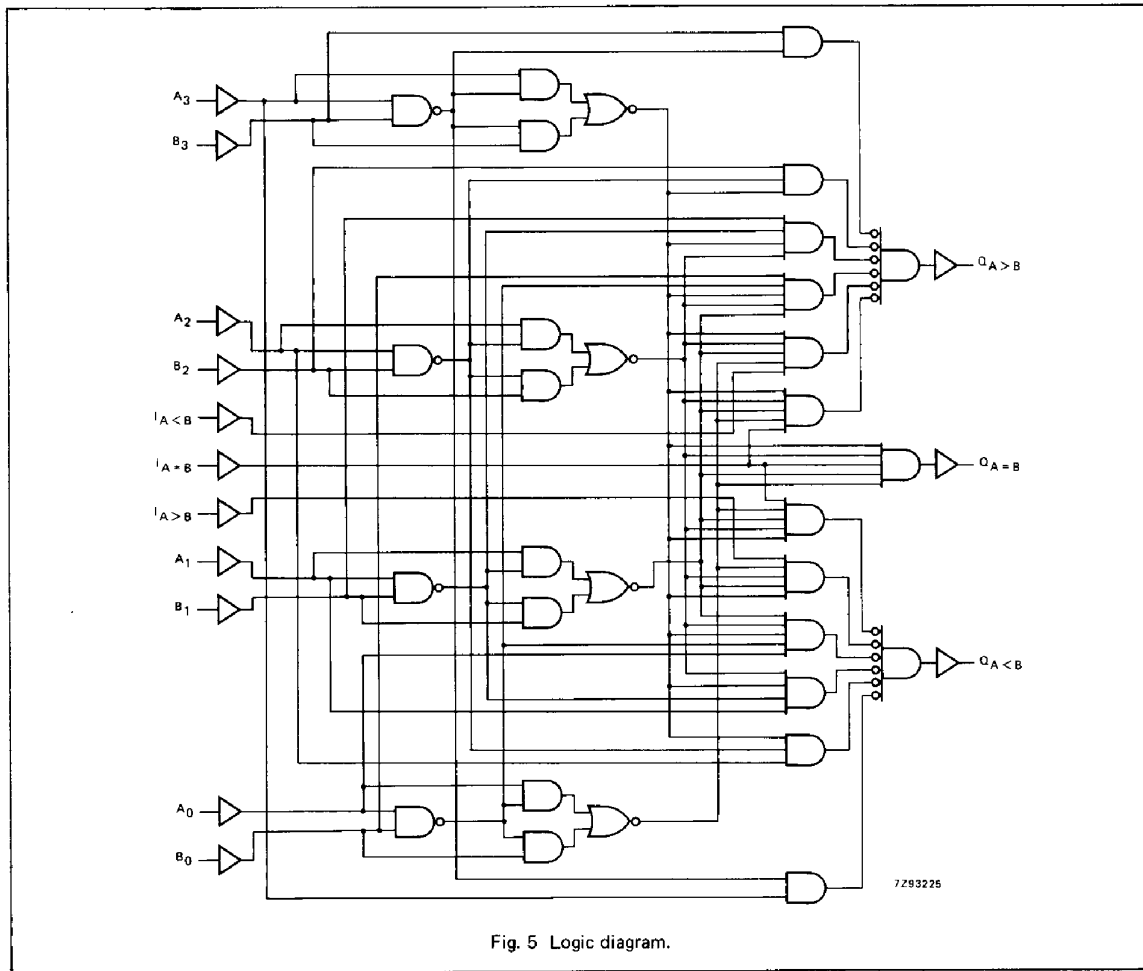


Fig. 5 Logic diagram.

DC CHARACTERISTICS FOR 74HC

For the DC characteristics see chapter "HCMOS family characteristics", section "Family specifications".

Output capability: standard

I_{CC} category: MSI

AC CHARACTERISTICS FOR 74HC

GND = 0 V; t_r = t_f = 6 ns; C_L = 50 pF

SYMBOL	PARAMETER	T _{amb} (°C)						UNIT	TEST CONDITIONS		
		74HC							V _{CC} V	WAVEFORMS	
		+25			-40 to +85		-40 to +125				
		min.	typ.	max.	min.	max.	min.				max.
t _{PHL} / t _{PLH}	propagation delay A _n , B _n to Q _A >B or Q _A <B		63 23 18	195 39 33		245 49 42		295 59 50	ns	2.0 4.5 6.0	Fig. 6
t _{PHL} / t _{PLH}	propagation delay A _n , B _n to Q _A =B		58 21 17	175 35 30		220 44 37		265 53 45	ns	2.0 4.5 6.0	Fig. 6
t _{PHL} / t _{PLH}	propagation delay I _A <B, I _A =B, I _A >B to Q _A <B, Q _A >B		50 18 14	140 28 24		175 35 30		210 42 36	ns	2.0 4.5 6.0	Fig. 6
t _{PHL} / t _{PLH}	propagation delay I _A =B to Q _A =B		39 14 11	120 24 20		150 30 26		180 36 31	ns	2.0 4.5 6.0	Fig. 6
t _{THL} / t _{TLH}	output transition time		19 7 6	75 15 13		95 19 16		110 22 19	ns	2.0 4.5 6.0	Fig. 6

DC CHARACTERISTICS FOR 74HCT

For the DC characteristics see chapter "HCMOS family characteristics", section "Family specifications".

Output capability: standard

I_{CC} category: MSI

Note to HCT types

The value of additional quiescent supply current (ΔI_{CC}) for a unit load of 1 is given in the family specifications. To determine ΔI_{CC} per input, multiply this value by the unit load coefficient shown in the table below.

INPUT	UNIT LOAD COEFFICIENT
$I_{A<B}$	1.00
$I_{A>B}$	1.00
$I_{A=B}$	1.50
A_n, B_n	1.50

AC CHARACTERISTICS FOR 74HCT

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF

SYMBOL	PARAMETER	T_{amb} (°C)						UNIT	TEST CONDITIONS		
		74HCT							V_{CC} V	WAVEFORMS	
		+25			-40 to +85		-40 to +125				
		min.	typ.	max.	min.	max.	min.				max.
t_{PHL}/t_{PLH}	propagation delay A_n, B_n to $Q_{A>B}$ or $Q_{A<B}$		26	44		55		66	ns	4.5	Fig. 6
t_{PHL}/t_{PLH}	propagation delay A_n, B_n to $Q_{A=B}$		24	40		50		60	ns	4.5	Fig. 6
t_{PHL}/t_{PLH}	propagation delay $I_{A<B}, I_{A=B}, I_{A>B}$ to $Q_{A<B}, Q_{A>B}$		18	31		39		47	ns	4.5	Fig. 6
t_{PHL}/t_{PLH}	propagation delay $I_{A=B}$ to $Q_{A=B}$		18	31		39		47	ns	4.5	Fig. 6
t_{THL}/t_{TLH}	output transition time		7	15		19		22	ns	4.5	Fig. 6

AC WAVEFORMS

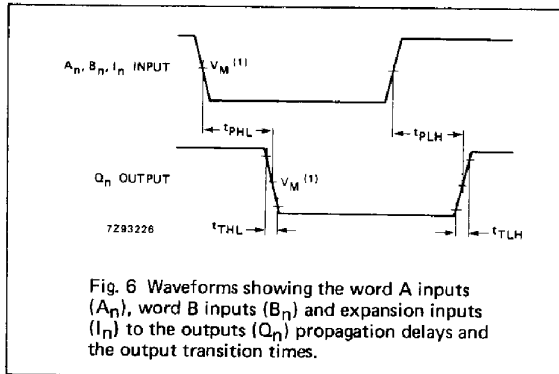


Fig. 6 Waveforms showing the word A inputs (A_n), word B inputs (B_n) and expansion inputs (I_n) to the outputs (Q_n) propagation delays and the output transition times.

Note to AC waveforms

(1) HC : $V_M = 50\%$; $V_I = \text{GND to } V_{CC}$.
HCT: $V_M = 1.3 \text{ V}$; $V_I = \text{GND to } 3 \text{ V}$.

APPLICATION INFORMATION

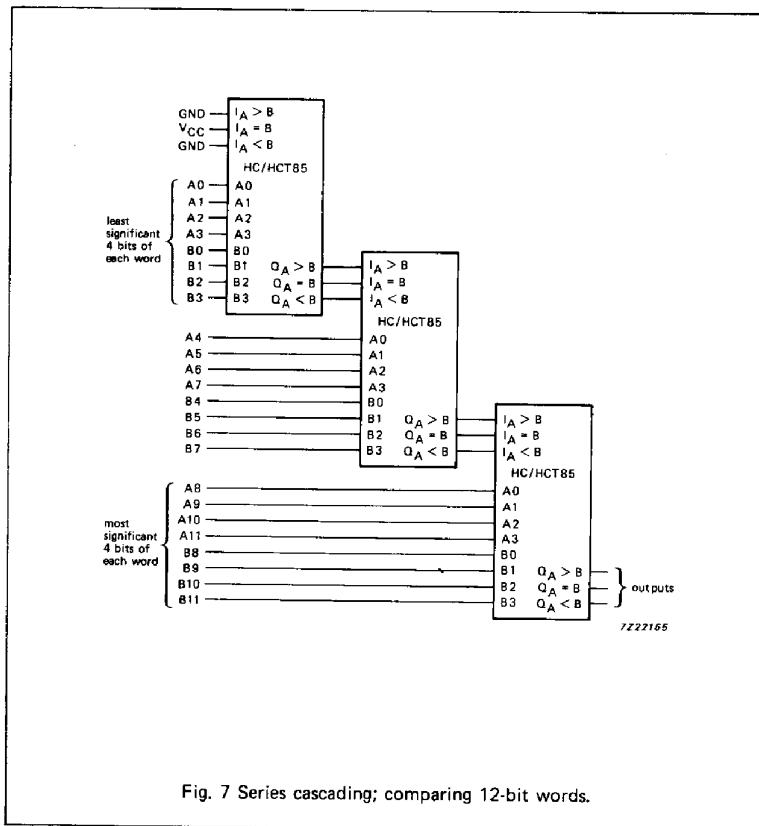


Fig. 7 Series cascading; comparing 12-bit words.

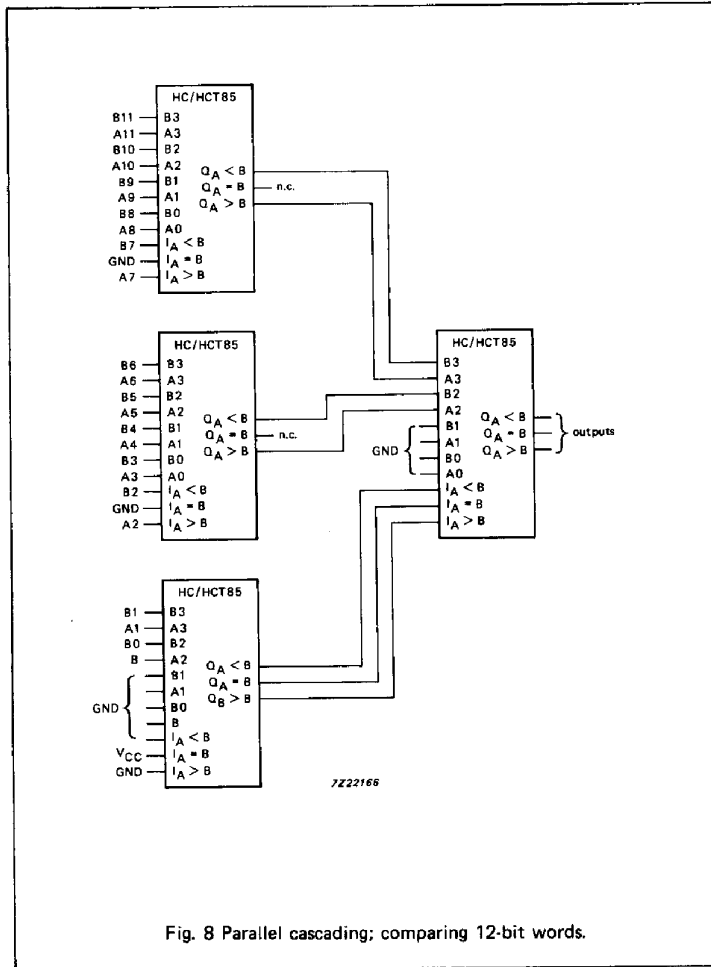


Fig. 8 Parallel cascading; comparing 12-bit words.