

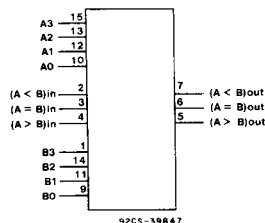
CD54HC85/3A

CD54HCT85/3A

4-Bit Magnitude Comparator

The RCA-CD54HC85 and CD54HCT85 are high-speed magnitude comparators that use silicon-gate CMOS technology to achieve operating speeds similar to LSTTL with the low power consumption of standard CMOS integrated circuits.

These four-bit devices compare two binary, BCD, or other monotonic codes and present the three possible magnitude results at the outputs ($A > B$, $A < B$, and $A = B$). The four-bit input words are weighted (A_0 to A_3 and B_0 to B_3), where A_3 and B_3 are the most significant bits.



FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 11

Static Electrical Characteristics (Limits with black dots (•) are tested 100%)

CHARACTERISTICS	TEST CONDITIONS	TEST CONDITIONS				LIMITS		UNITS		
		HC/HCT				V_{IH}				
		V_{DD}	V_O	I_O	V_{CC} OR GND	HC V_{IL} OR V_{IH}	HCT V_{IL} OR V_{IH}		MIN.	MAX.
Quiescent Device Current I_{CC}	25°C	6	—	—	6, 0	—	—	—	8•	μA
	-55°C	6	—	—	6, 0	—	—	—	160•	
	+125°C	6	—	—	6, 0	—	—	—	160•	

HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
A_0 - A_3 , B_0 - B_3 and $(A=B)$ in	1.5
$(A>B)$ in, $(A<B)$ in	1

The complete static electrical test specification consists of the above by-type static tests combined with the standard static tests in the beginning of this section.

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 360 μA max. @ 25°C.

Switching Speed (Limits with black dots (•) are tested 100%)

SWITCHING CHARACTERISTICS ($C_L = 50$ pF, Input t_r , $t_f = 6$ ns)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS								UNITS
			25°C				-55°C to +125°C				
			HC		HCT		54HC		54HCT		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Propagation Delay A_n , B_n to $(A>B)$ out, $(A<B)$ out		2	—	195	—	—	—	295	—	—	ns
		4.5	—	39•	—	37•	—	59•	—	56•	
		6	—	33	—	—	—	50	—	—	
A_n , B_n to $(A=B)$ out	t_{PLH}	2	—	175	—	—	—	265	—	—	
		4.5	—	35•	—	40•	—	53•	—	60•	
		6	—	30	—	—	—	45	—	—	
$(A>B)$ in, $(A<B)$ in, $(A=B)$ in to $(A>B)$ out, $(A<B)$ out	t_{PHL}	2	—	140	—	—	—	210	—	—	
		4.5	—	28•	—	30•	—	42•	—	45•	
		6	—	24	—	—	—	36	—	—	
$(A=B)$ in to $(A=B)$ out		2	—	120	—	—	—	180	—	—	
		4.5	—	24•	—	31•	—	36•	—	47•	
		6	—	20	—	—	—	31	—	—	
Output Transition Time	t_{TLH} t_{THL}	2	—	75	—	—	—	110	—	—	
		4.5	—	15	—	15	—	22	—	22	
		6	—	13	—	—	—	19	—	—	
Input Capacitance	C_i	—	—	10	—	10	—	10	—	10	pF

CD54HC85/3A CD54HCT85/3A

Burn-In Test-Circuit Connections (Use Static II for /3A burn-in and Dynamic for Life Test.)

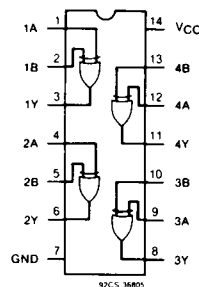
Static	STATIC BURN-IN I			STATIC BURN-IN II		
	OPEN	GROUND	V _{cc} (6V)	OPEN	GROUND	V _{cc} (6V)
CD54HC/HCT85	5-7	1-4,8-15	16	5-7	8	1-4,9-16
Dynamic	OPEN	GROUND	1/2 V _{cc} (3V)	V _{cc} (6V)	OSCILLATOR	
					50 kHz	25 kHz
CD54HC/HCT85	—	1,8,10,11,13	5-7	2-4,16	12,15	9,14

NOTE: Each pin except V_{cc} and Gnd will have a resistor of 2k-47k ohms.

CD54HC86/3A CD54HCT86/3A

Quad 2-Input EXCLUSIVE-OR Gate

The RCA-CD54HC86 and CD54HCT86 contain four independent EXCLUSIVE-OR gates in one package. They provide the system designer with a means for implementation of the EXCLUSIVE-OR function.



FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 10

Static Electrical Characteristics (Limits with black dots (•) are tested 100%)

CHARACTERISTICS		TEST CONDITIONS								UNITS
		HC/HCT				V _{IN}		LIMITS		
		V _{DD}	V _O	I _O	V _{CC} OR GND	HC V _{IL} or V _{IH}	HCT V _{IL} or V _{IH}	MIN.	MAX.	
Quiescent Device Current I _{CC}	25°C	6	—	—	6, 0	—	—	—	2•	μA
	-55°C	6	—	—	6, 0	—	—	—	40•	
	+125°C	6	—	—	6, 0	—	—	—	40•	

The complete static electrical test specification consists of the above by-type static tests combined with the standard static tests in the beginning of this section.

HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
All Inputs	1

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 360 μA max. @ 25°C.