HD74HC682, HD74HC684 ● 8-bit Magnitude Comparator

These magnitude comparators perform comparisons of two eight-bit binary or BCD words. All types provide $\overline{P=Q}$ outputs and provide $\overline{P>Q}$ outputs. The HD74HC682 features 20kΩ pullup termination resistors on the Q inputs for analog or switch data.

Type	P=Q	P>Q	Output Enable	20kΩ Pullup
HD74HC682	Yes	Yes	No	Yes
HD74HC684	Yes	Yes	No	No

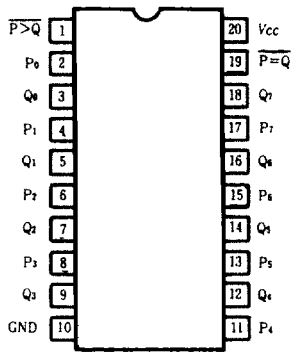
■ FEATURES

- High Speed Operation
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage: V_{CC}=2~6V
- Low Input Current: 1μA max.
- Low Quiescent Supply Current: I_{CC} (static)=4μA max. (Ta=25°C)

■ PIN ARRANGEMENT

● HD74HC682

● HD74HC684



(Top View)

■ FUNCTION TABLE

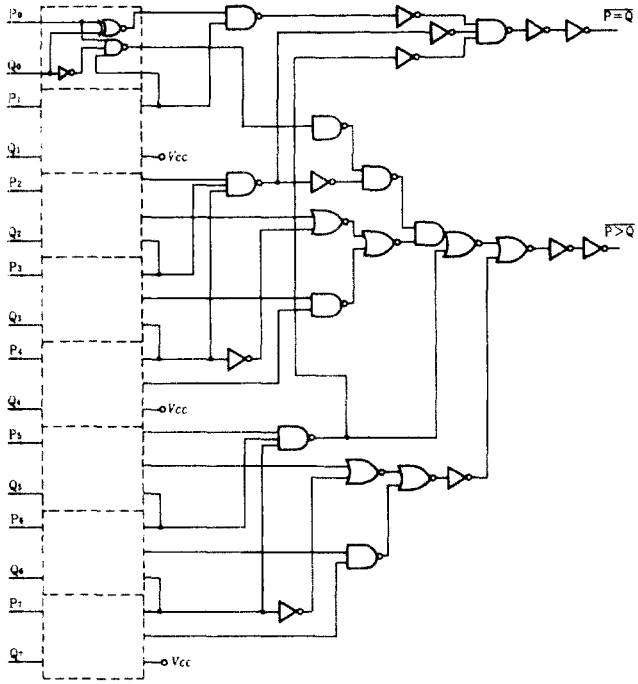
Input Data P, Q	Outputs $\overline{P=Q}$	Outputs $\overline{P>Q}$
P = Q	L	H
P > Q	H	L
P < Q	H	H

Note: 1. The $\overline{P<Q}$ function can be generated by applying the $\overline{P=Q}$ and $\overline{P>Q}$ Outputs to a 2-input NAND gate.

■ LOGIC DIAGRAM

● HD74HC682

● HD74HC684



■ DC CHARACTERISTICS

Item	Symbol	V_{CC}(V)	Test Conditions		Ta=25°C min.	typ.	max.	Ta=−40~+85°C min.	max.	Unit
Input Voltabe	V_{IH}	2.0			1.5	–	–	1.5	–	V
		4.5			3.15	–	–	3.15	–	
		6.0			4.2	–	–	4.2	–	
	V_{IL}	2.0			–	–	–	0.5	–	V
		4.5			–	–	1.35	–	1.35	
		6.0			–	–	1.8	–	1.8	
Output Voltage	V_{OH}	2.0	V_{in}= V_{IH} or V_{IL}	I_{OH} = −20 μA	1.9	2.0	–	1.9	–	V
		4.5			4.4	4.5	–	4.4	–	
		6.0			5.9	6.0	–	5.9	–	
		4.5		I_{OH} = −4 mA	4.18	–	–	4.13	–	
		6.0		I_{OH} = −5.2 mA	5.68	–	–	5.63	–	
	V_{OL}	2.0	V_{in}= V_{IH} or V_{IL}	I_{OL} = 20 μA	–	0.0	0.1	–	0.1	V
		4.5			–	0.0	0.1	–	0.1	
		6.0			–	0.0	0.1	–	0.1	
		4.5		I_{OL} = 4 mA	–	–	0.26	–	0.33	
		6.0		I_{OL} = 5.2 mA	–	–	0.26	–	0.33	
Input Current (HC684)	I_{in}	6.0	V_{in}= V_{IH} or GND		–	–	±0.1	–	±1.0	μA
Quiescent Supply Current (HC684)	I_{CC}	6.0	V_{in}= V_{IH} or GND, I_{out}=0 μA		–	–	4.0	–	40	μA
Input Curent (HC682)	I_{in}	6.0	V_{in}= V_{CC}		–	–	±0.1	–	±1.0	μA
			I_{in}= GND		–	–	−0.6	–	−0.7	mA
Quescent Supply Current (HC682)	I_{CC}	6.0	Qn=GND, other inputs=Vcc or GND Iout=0 μA		–	–	4.8	–	5.6	mA
			Qn=Vcc, other inputs=Vcc or GND Iout=0 μA		–	–	4.0	–	40	μA

■ AC CHARACTERISTICS (C_L=50pF, Input t_r=t_f=6ns)

Item	Symbol	V_{CC}(V)	Test Conditions	Ta=25°C min.	typ.	max.	Ta=−40~−85°C min.	max.	Unit
Propagation Delay Time	t_{PLH} t_{PHL}	2.0	P or Q to $\overline{P=Q}$	–	–	175	–	220	ns
		4.5		–	–	35	–	44	
		6.0		–	–	30	–	37	
	t_{PLH} t_{PHL}	2.0	P or Q to $\overline{P>Q}$	–	–	200	–	250	ns
		4.5		–	–	40	–	50	
		6.0		–	–	34	–	43	
Output Rise/Fall Time	t_{TLH} t_{THL}	2.0		–	–	60	–	75	ns
		4.5		–	–	12	–	15	
		6.0		–	–	10	–	13	
Input Capacitance	C_{in}	–		–	5	10	–	10	pF