HD74HC682, HD74HC684, HD74HC686 ● 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
HD74HC686	Yes	Yes	Yes	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)

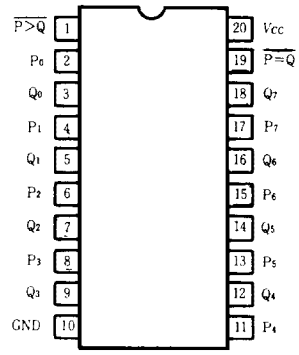
■ FUNCTION TABLE

Inputs			Outputs	
Data	Enable		$\overline{P=Q}$	P>Q
P, Q	$\overline{G}$, $\overline{G1}$	$\overline{G2}$		
P=Q	L	L	L	H
P>Q	L	L	H	L
P<Q	L	L	H	H
×	H	H	H	H

Notes: 1. The last line of function table applies only to those devices having enable inputs.
2. The $\overline{P<Q}$ function can be generated by applying the P Q and P>Q Outputs to a 2-input NAND gate.

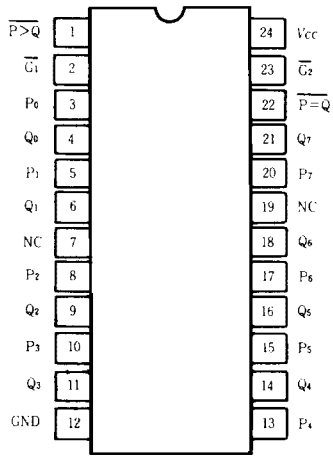
■ PIN ARRANGEMENT

●HD74HC682
●HD74HC684



(Top View)

●HD74HC686

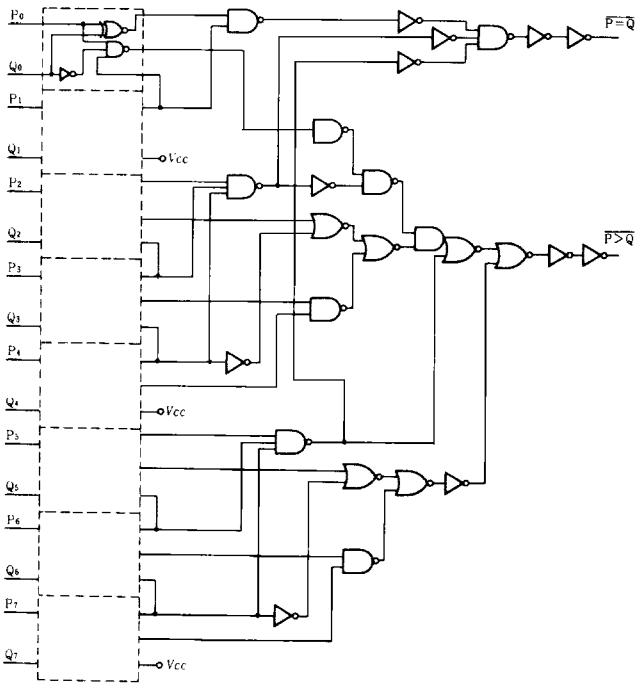


(Top View)

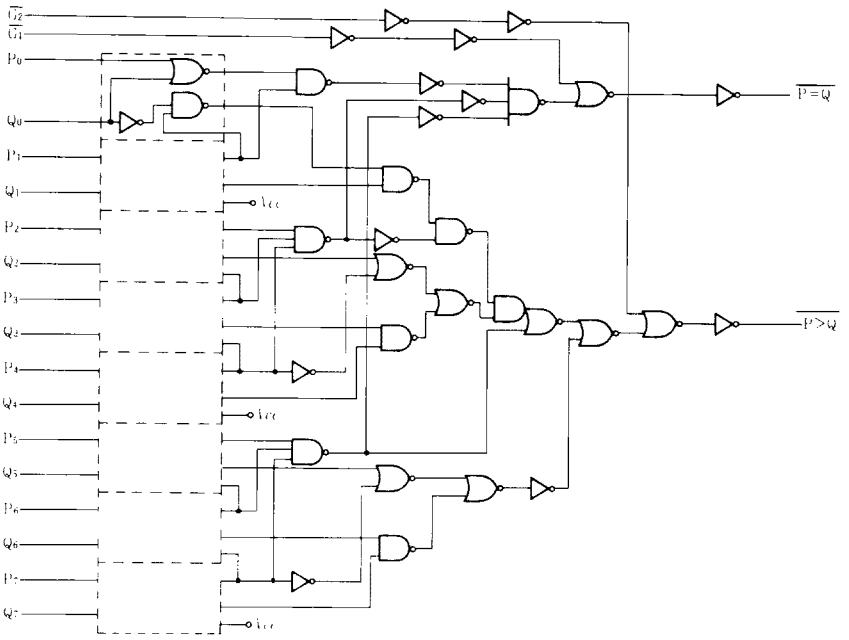
■ LOGIC DIAGRAM

● HD74HC682

● HD74HC684



● HD74HC686



■ DC CHARACTERISTICS

Item	Symbol	V_{CC}(V)	Test Conditions		Ta=25℃ min.	Ta=25℃ typ.	Ta=25℃ max.	Ta=−40~+85℃ min.	Ta=−40~+85℃ 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_{OH}=−4 mA	−	−	0.26	−	0.33	
		6.0		I_{OH}=−5.2 mA	−	−	0.26	−	0.33	
Input Current (HC684, 686)	I_{in}	6.0	V_{in}= V_{IH} or GND		−	−	±0.1	−	±1.0	μA
Quiescent Supply Current (HC684, 686)	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=V_{CC} or GND Iout=0 μA		−	−	4.8	−	5.6	mA
			Qn=V_{CC}, other inputs=V_{CC} or GND Iout=0 μA		−	−	4.0	−	4.0	μA

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

Item	Symbol	V_{CC} V	Test Conditions	Ta=25°C min.	Ta=25°C typ.	Ta=25°C max.	Ta=−40~+85°C min.	Ta=−40~+85°C max.	Unit
Propagation Delay Time	t_{PLH} t_{PHL}	2.0	P or Q to $\overline{P}$=$\overline{Q}$	−	−	175	−	220	ns
		4.5		−	−	35	−	44	
		6.0		−	−	30	−	37	
	t_{PLH} t_{PHL}	2.0	P or Q to $\overline{P}$>$\overline{Q}$	−	−	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