

# HD74HC682/HD74HC684

## 8-bit Magnitude Comparator

# HITACHI

### Description

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 20 k $\Omega$  pullup termination resistors on the Q inputs for analog or switch data.

Type	P=Q	P>Q	Output Enable	20 k $\Omega$ 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:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a = 25^\circ\text{C}$ )

### Function Table

Input		Outputs	
Data		$\overline{P=Q}$	$\overline{P>Q}$
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.

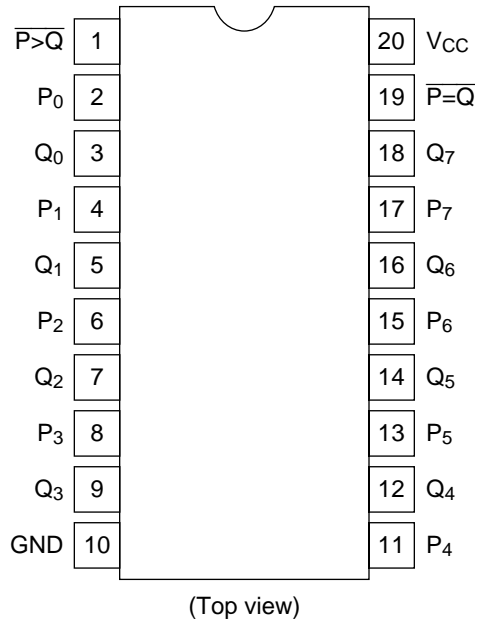
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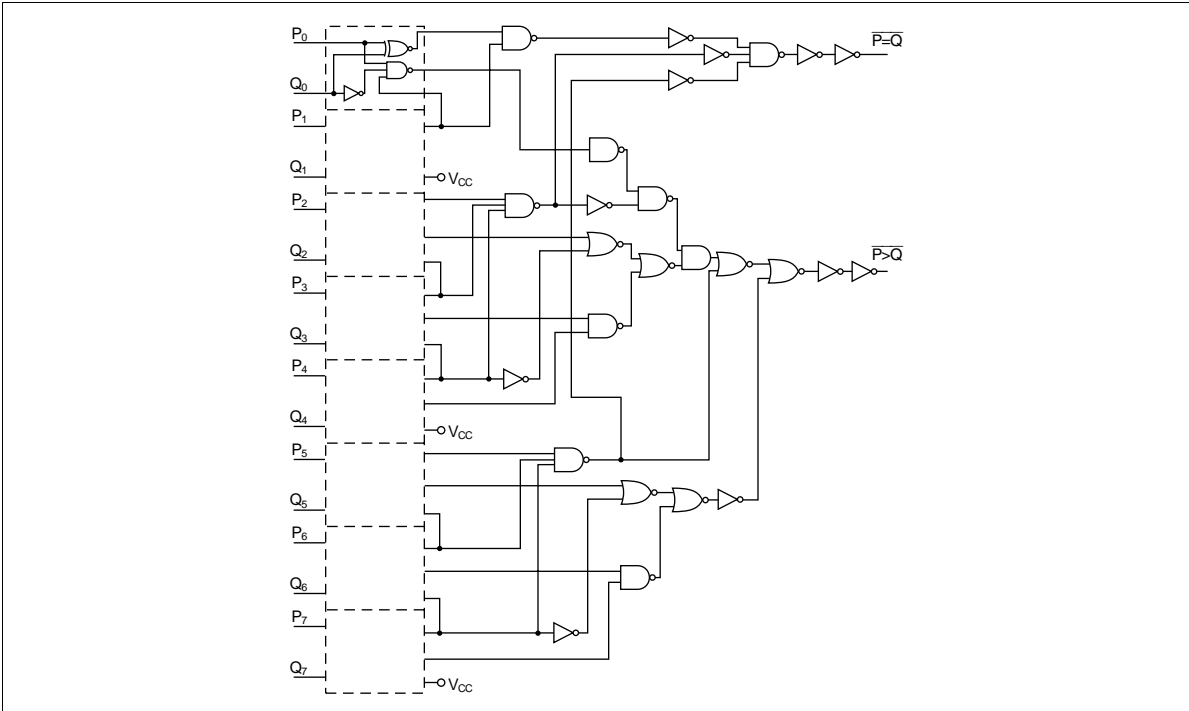
## Pin Arrangement

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Logic Diagram

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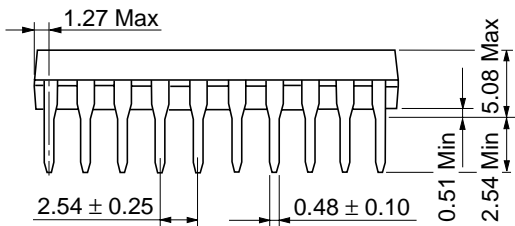
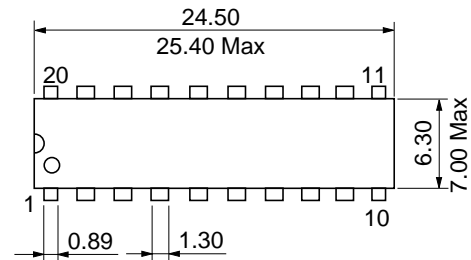


## DC Characteristics

Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
			Min	Typ	Max	Min			Max	
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	—	0.5	—		V	
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V <sub>OH</sub>	2.0	1.9	2.0	—	1.9	—	V		Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -20 μA
		4.5	4.4	4.5	—	4.4	—			
		6.0	5.9	6.0	—	5.9	—			
		4.5	4.18	—	—	4.13	—		I <sub>OH</sub> = -4 mA	
		6.0	5.68	—	—	5.63	—		I <sub>OH</sub> = -5.2 mA	
	V <sub>OL</sub>	2.0	—	0.0	0.1	—	0.1	V	Vin = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 20 μA	
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			I <sub>OL</sub> = 4 mA
		6.0	—	—	0.26	—	0.33			I <sub>OL</sub> = 5.2 mA
Input current (HC684)	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA	Vin = V <sub>CC</sub> or GND	
Quiescent supply current (HC684)	I <sub>CC</sub>	6.0	—	—	4.0	—	40	μA	Vin = V <sub>CC</sub> or GND, I <sub>out</sub> = 0 μA	
Input current (HD682)	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA	Vin = V <sub>CC</sub>	
							-0.6			-0.7
Quiescent supply current (HC682)	I <sub>CC</sub>	6.0	—	—	4.8	—	5.6	mA	Qn = GND, other inputs = V <sub>CC</sub> or GND I <sub>out</sub> = 0 μA	
							—			40

AC Characteristics ( $C_L = 50$  pF, Input  $t_r = t_f = 6$  ns)

Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$		$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Propagation delay time	$t_{PLH}$	2.0	—	—	175	—	220	ns	P or Q to $\overline{P=Q}$
	$t_{PHL}$	4.5	—	—	35	—	44		
		6.0	—	—	30	—	37		
	$t_{PLH}$	2.0	—	—	200	—	250	ns	P or Q to $\overline{P>Q}$
	$t_{PHL}$	4.5	—	—	40	—	50		
		6.0	—	—	34	—	43		
Output rise/fall time	$t_{TLH}$	2.0	—	—	60	—	75	ns	
	$t_{THL}$	4.5	—	—	12	—	15		
		6.0	—	—	10	—	13		
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF	



Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g

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