

HD74HC682/HD74HC684

8-bit Magnitude Comparator

HITACHI

ADE-205-528 (Z)
1st. Edition
Sep. 2000

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 pullup termination resistors on the Q inputs for analog or switch data.

Type	$\overline{P=Q}$	$\overline{P>Q}$	Output Enable	20 k Ω 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 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

Function Table

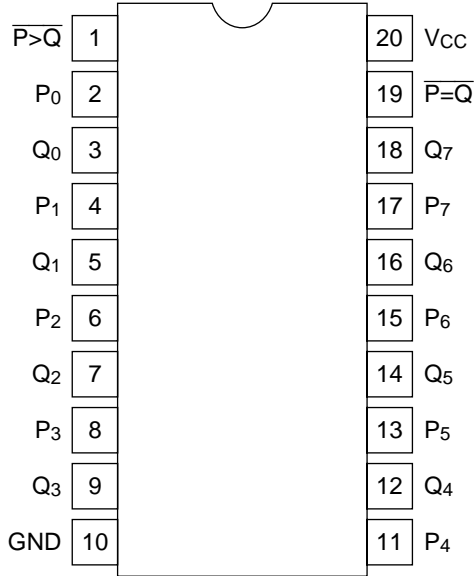
Input		Outputs	
Data		$\overline{P=Q}$	$\overline{P>Q}$
P, Q			
P=Q		L	H
P>Q		H	L
P<Q		H	H

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

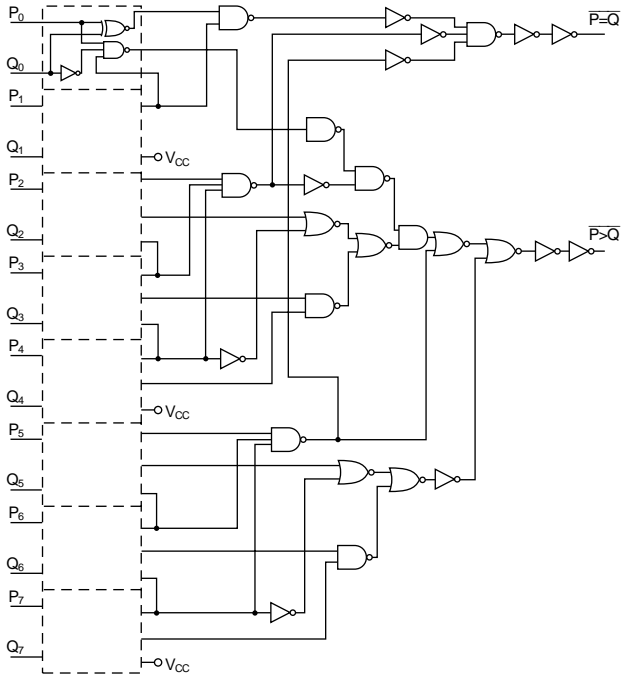
HD74HC682/HD74HC684



(Top view)

Logic Diagram

HD74HC682/HD74HC684



DC Characteristics

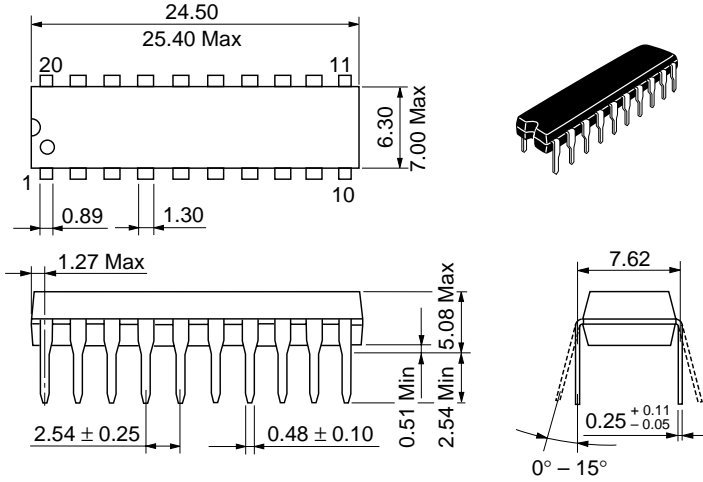
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0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

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 $\overline{P=Q}$
		4.5	—	—	35	—	44		
		6.0	—	—	30	—	37		
	t_{PHL}	2.0	—	—	200	—	250	ns	P or Q to $\overline{P>Q}$
		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	

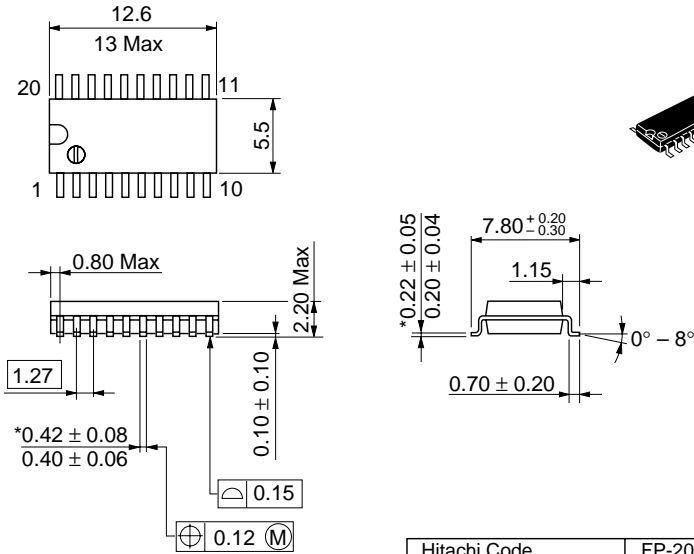
Package Dimensions

Unit: mm



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

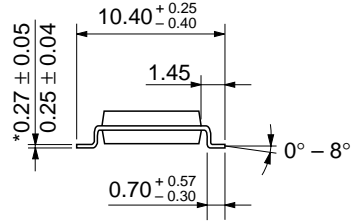
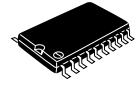
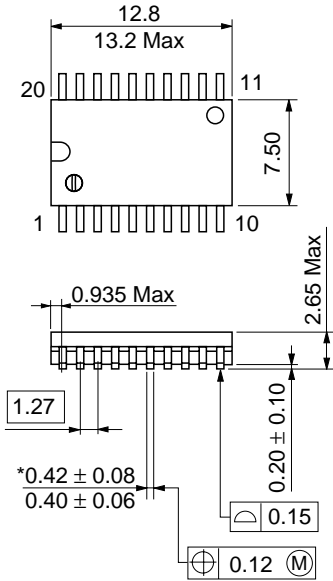
Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.31 g

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Mass (reference value)	0.52 g

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