

92D 10594 DT 45-17

HD74HC682, HD74HC684, HD74HC686 ● 8-bit Magnitude Comparator

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

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

FUNCTION TABLE

Inputs			Outputs	
Data	Enable		$\overline{P=Q}$	$P>Q$
P, Q	$\overline{G_1}$, $\overline{G_2}$	$\overline{G_2}$		
P=Q	L	L	L	H
P>Q	L	L	H	L
P<Q	L	L	H	H
$\times$	H	H	H	H

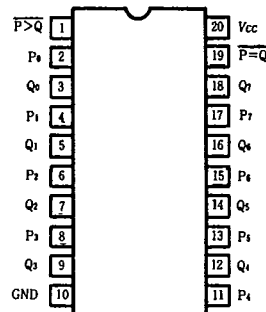
Notes: 1. The last line of function table applies only to those devices having enable inputs.

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

PIN ARRANGEMENT

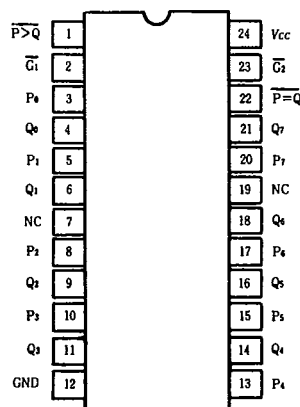
● HD74HC682

● HD74HC684



(Top View)

● HD74HC686



(Top View)



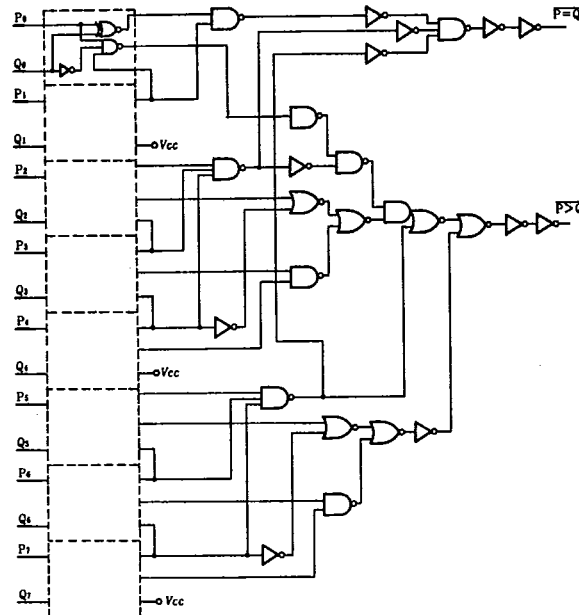
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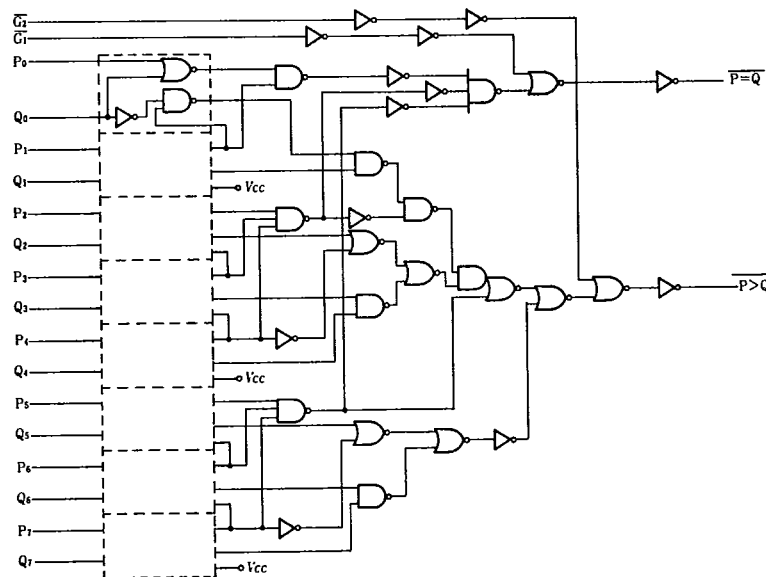
■ LOGIC DIAGRAM

● HD74HC682

● HD74HC684



● HD74HC686



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■ DC CHARACTERISTICS

Item	Symbol	$V_{CC}(V)$	Test Conditions	$T_a = 25^\circ C$			$T_a = -40 \sim +85^\circ C$		Unit
				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	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OH} = -20\mu A$		1.9	2.0	—	V
		4.5				4.4	4.5	—	
		6.0				5.9	6.0	—	
		4.5		$I_{OH} = -4mA$		4.18	—	—	
		6.0		$I_{OH} = -5.2mA$		5.68	—	—	
		6.0				5.63	—	—	
	V_{OL}	2.0	$V_{in} = V_{IH} \text{ or } V_{IL}$	$I_{OL} = 20\mu A$		—	0.0	0.1	V
		4.5				—	0.0	0.1	
		6.0				—	0.0	0.1	
		4.5		$I_{OL} = 4mA$		—	—	0.26	
		6.0		$I_{OL} = 5.2mA$		—	—	0.26	
		6.0				—	—	0.33	
Input Current	I_{in}	6.0	$V_{in} = V_{CC} \text{ or } GND$	—	—	± 0.1	—	± 1.0	μA
Quiescent Supply Current	I_{CC}	6.0	$V_{in} = V_{CC} \text{ or } GND, I_{in} = 0\mu A$	—	—	4.0	—	40	μA

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

Item	Symbol	$V_{CC}(V)$	Test Conditions	$T_a = 25^\circ C$			$T_a = -40 \sim +85^\circ C$		Unit
				min.	typ.	max.	min.	max.	
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



PACKAGE INFORMATION

T-90-20

In the HD74HC series of HS-CMOS logic, either of plastic DIP and small outline packages can be selected.
For your ordering, please refer to the following package code.

● Package code of HS-CMOS Logic

HD74HC XXXXP

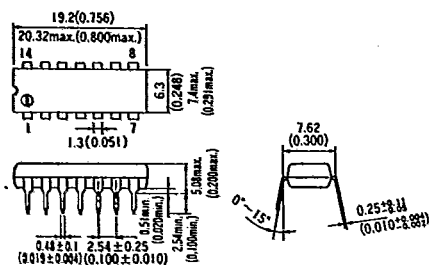
Package code (P : Plastic DIP, FP : Small outline package)
Individual device code
Series code of HS-CMOS logic
Initial code of Hitachi digital IC

■ PLASTIC DIP PACKAGE [Unit: mm (inch), scale: 1/1]

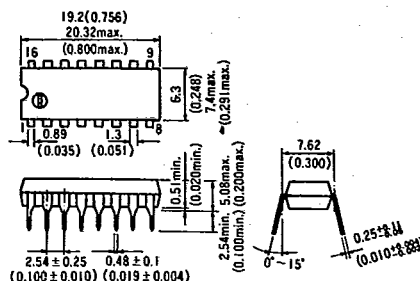
● 14-pin type

● 16-pin type

DP-14



DP-16

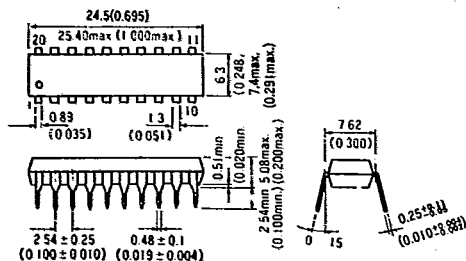


Note) For the present, both packages of 0.89 and 1.3 can be used. Please refer to the Technical Marketing Dept. for further details.

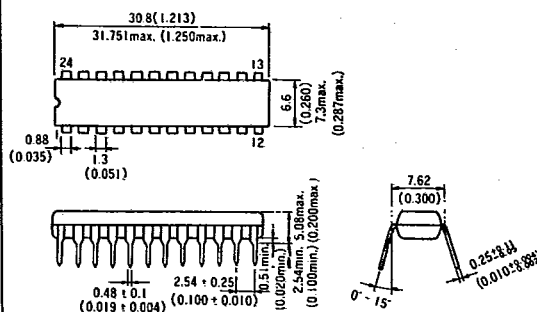
● 20-pin type

● 24-pin type

DP-20N



DP-24N



Note) Because this is under development, the dimensions may be changed partly.

0571

F-06



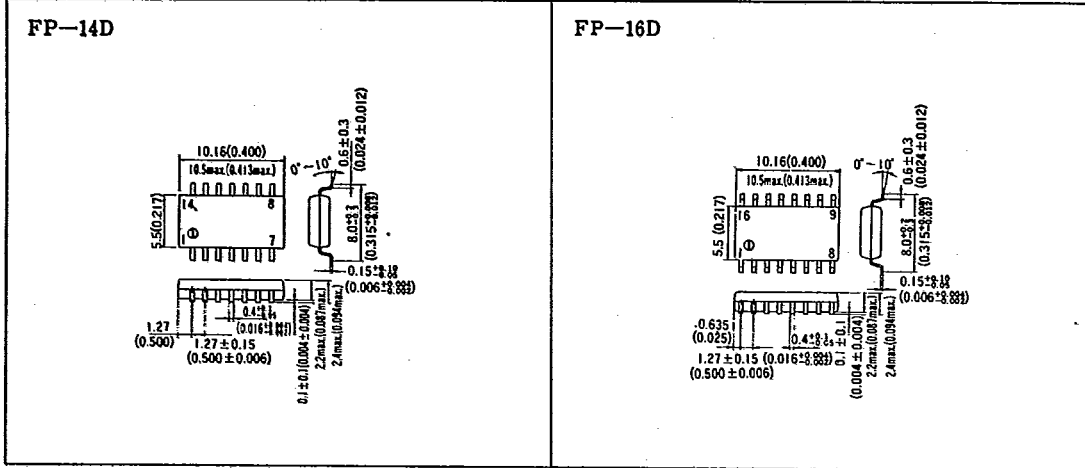
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■ SMALL OUTLINE PACKAGE [Unit: mm (inch), scale: 1½]

● 14—pin type

● 16—pin type



● 20—pin type

