

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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# HD74HC149

## 8-to-8-line Priority Encoder



ADE-205-448 (Z)  
1st. Edition  
Sep. 2000

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### Description

The HD74HC149 is priority encoder which has 8 input lines (0 - 7) and 8 output lines ( $Y_0 - Y_7$ ).

It is the logical combination of a HD74HC148 8-3 line priority encoder driving a HD74HC138 3-8 line decoder.

Only one request output can be low at a time. The output that is low is dependent on the highest priority request that is low. The order of priority is 7 highest and 0 lowest.

When  $\bar{E}$  input is high, all outputs are high.

When a output ( $Y_0 - Y_7$ ) is low,  $\bar{P}$  output is low and this indicates active condition.

### Features

- High Speed Operation:  $t_{pd}$  (0 - 7 to Y) = 16 ns typ ( $C_L = 50$  pF)
- 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

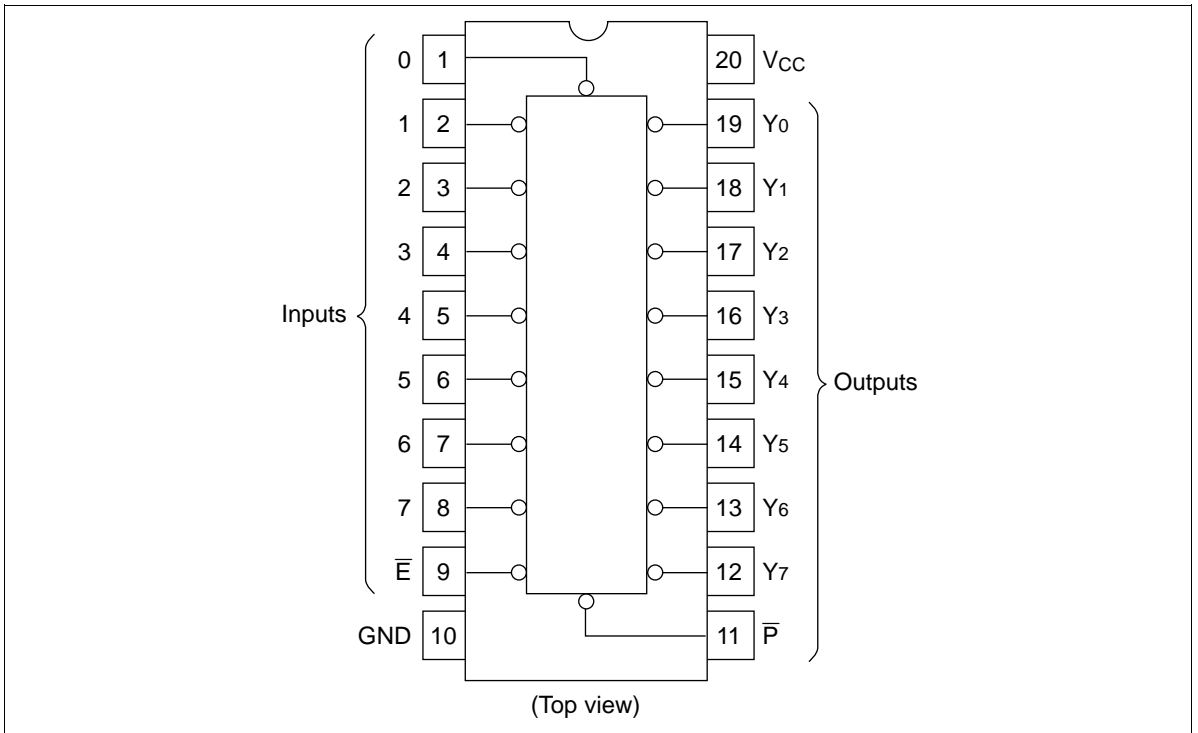
Inputs									Outputs									
0	1	2	3	4	5	6	7	$\bar{E}$	$Y_0$	$Y_1$	$Y_2$	$Y_3$	$Y_4$	$Y_5$	$Y_6$	$Y_7$	$\bar{P}$	
X	X	X	X	X	X	X	X	H	H	H	H	H	H	H	H	H	H	
H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	
X	X	X	X	X	X	X	L	L	H	H	H	H	H	H	H	L	L	
X	X	X	X	X	X	L	H	L	H	H	H	H	H	H	L	H	L	
X	X	X	X	X	L	H	H	L	H	H	H	H	L	H	H	H	L	
X	X	X	L	H	H	H	H	L	H	H	L	H	H	H	H	H	L	
X	X	L	H	H	H	H	H	L	H	H	L	H	H	H	H	H	L	
X	L	H	H	H	H	H	H	L	H	L	H	H	H	H	H	H	L	
L	H	H	H	H	H	H	H	L	L	H	H	H	H	H	H	H	L	

H : High level

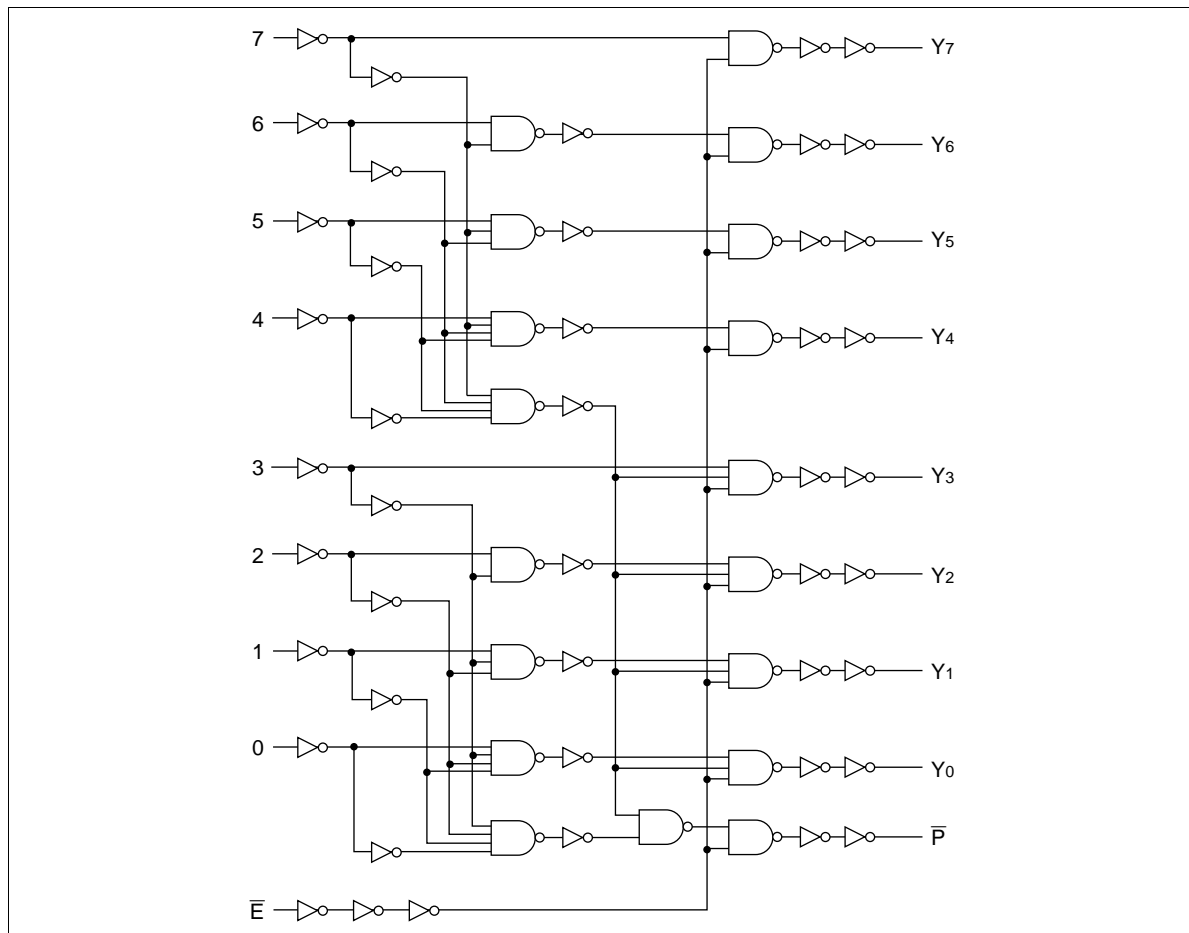
L : Low level

X : Irrelevant

## Pin Arrangement



Logic Diagram



## DC Characteristics

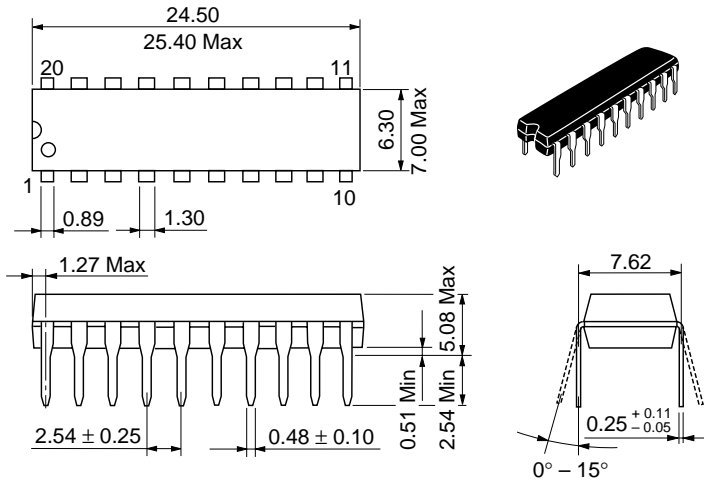
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
			Min	Typ	Max	Min			Max	
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output 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	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA	Vin = V <sub>CC</sub> or GND	
Quiescent supply current	I <sub>CC</sub>	6.0	—	—	4.0	—	40	μA	Vin = V <sub>CC</sub> or GND, I <sub>out</sub> = 0 μA	

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

Item	Symbol	$V_{CC}$ (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Propagation delay time	$t_{PLH}$	2.0	—	—	140	—	175	ns	0 - 7 to Y, $\bar{P}$
		4.5	—	16	28	—	35		
		6.0	—	—	24	—	30		
Propagation delay time	$t_{PHL}$	2.0	—	—	155	—	195	ns	$\bar{E}$ to Y, $\bar{P}$
		4.5	—	13	31	—	39		
		6.0	—	—	26	—	33		
Output rise/fall time	$t_{TLH}$	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF	

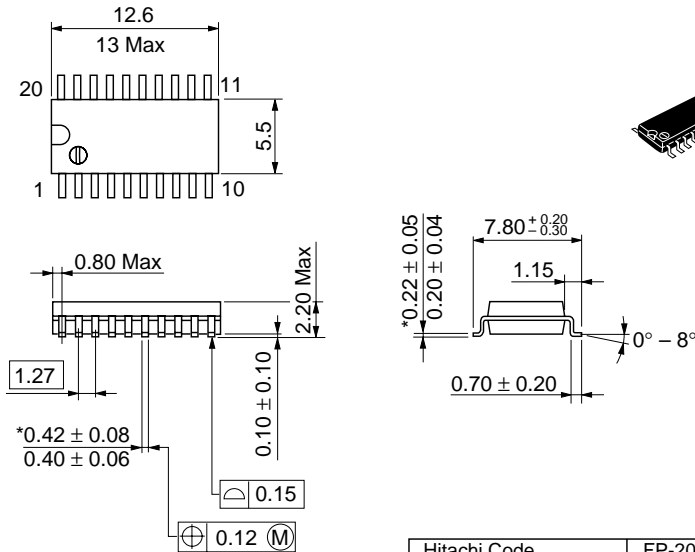
## Package Dimensions

Unit: mm



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

Unit: mm

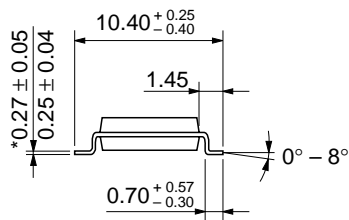
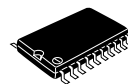
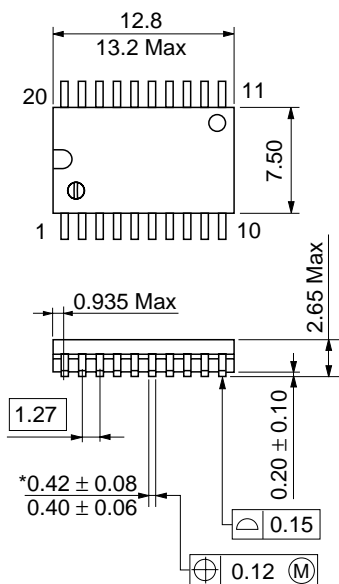


\*Dimension including the plating thickness  
Base material dimension

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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