

To all our customers

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

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# HD74HC131

## 3-to-8-line Decoder/Demultiplexer with Edge-Triggered Address Registers



ADE-205-440 (Z)  
1st. Edition  
Sep. 2000

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### Description

The HD74HC131 is 3-to-8 line decoder. It has Address select inputs (A,B,C) and D type register.

Address select data store to D type registers, during the positive going transition of the clock pulse.

Output control ( $G_1, \overline{G_2}$ ) are independent of select input and CLK input, and when  $G_1$  is low or  $\overline{G_2} = \text{High}$ , all outputs is high.









### Features

- High Speed Operation:  $t_{pd}$  (CLK to Y) = 20 ns typ ( $C_L = 50$  pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  V to 6 V
- Low Input Current: 1  $\mu\text{A}$  max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu\text{A}$  max ( $T_a = 25^\circ\text{C}$ )

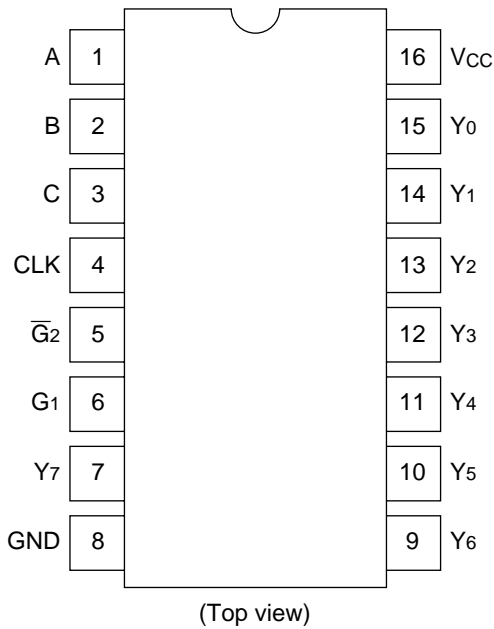
# HD74HC131

## Function Table

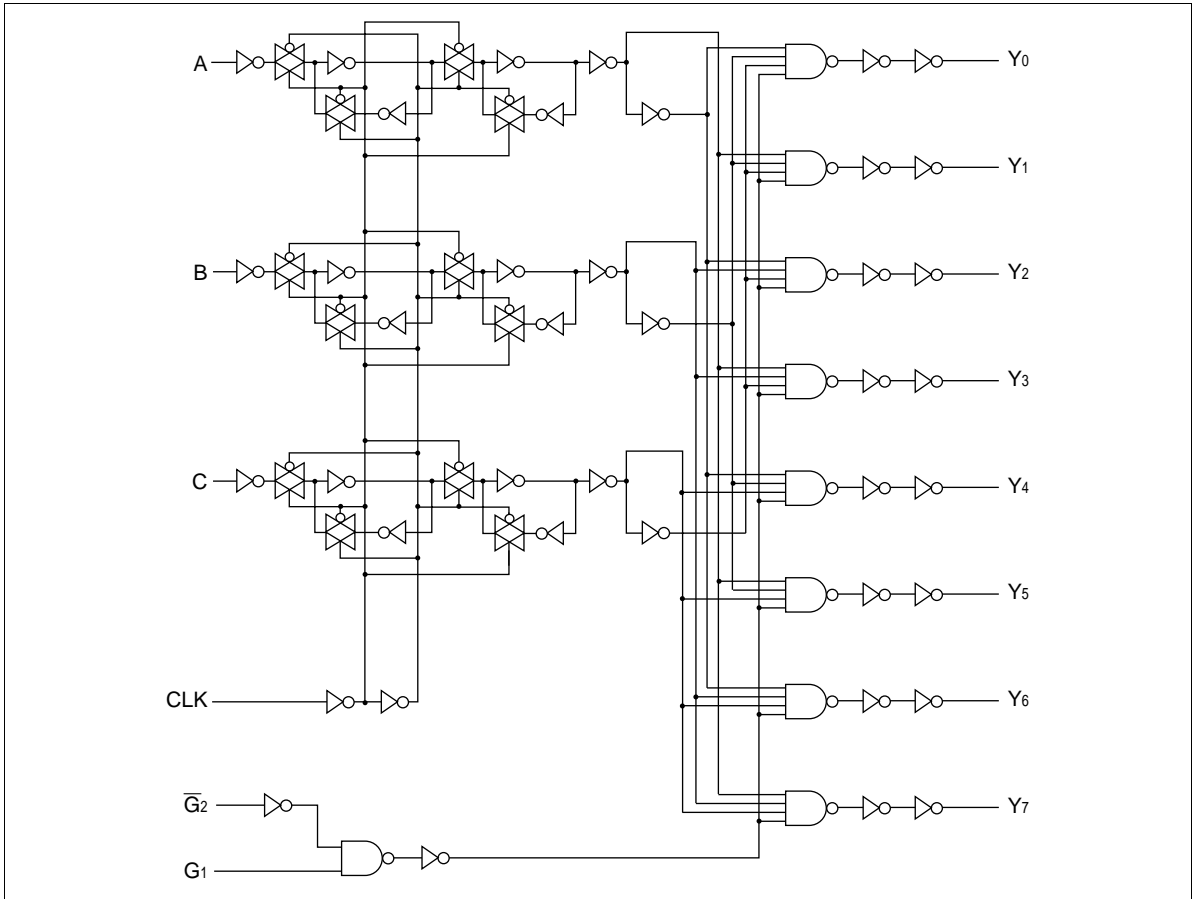
### Inputs

Enable			Select			Outputs							
CLK	G1	$\overline{G}_2$	C	B	A	Y <sub>0</sub>	Y <sub>1</sub>	Y <sub>2</sub>	Y <sub>3</sub>	Y <sub>4</sub>	Y <sub>5</sub>	Y <sub>6</sub>	Y <sub>7</sub>
X	X	H	X	X	X	H	H	H	H	H	H	H	H
X	L	X	X	X	X	H	H	H	H	H	H	H	H
	H	L	L	L	L	L	H	H	H	H	H	H	H
	H	L	L	L	H	H	L	H	H	H	H	H	H
	H	L	L	H	L	H	H	L	H	H	H	H	H
	H	L	L	H	H	H	H	H	L	H	H	H	H
	H	L	H	L	L	H	H	H	H	L	H	H	H
	H	L	H	L	H	H	H	H	H	H	L	H	H
	H	L	H	H	L	H	H	H	H	H	H	L	H
	H	L	H	H	H	H	H	H	H	H	H	H	L
L	H	L	X	X	X	Outputs corresponding to stored address, L; all others H							

## Pin Arrangement



Logic Diagram



## DC Characteristics

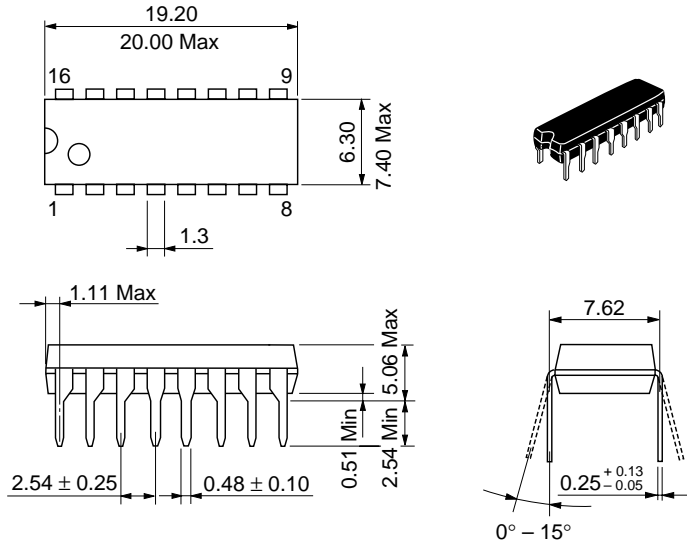
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
			Min	Typ	Max	Min			Max	
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output 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	—	—	210	—	265	ns	CLK to Y	
	$t_{PHL}$	4.5	—	20	42	—	53			
		6.0	—	—	36	—	45			
		$t_{PLH}$	2.0	—	—	140	—	175	ns	$G_1$ or $\overline{G_2}$ to Y
		$t_{PHL}$	4.5	—	15	28	—	35		
			6.0	—	—	24	—	30		
Pulse width	$t_w$	2.0	80	—	—	100	—	ns		
		4.5	16	5	—	20	—			
		6.0	14	—	—	17	—			
Setup time	$t_{su}$	2.0	50	—	—	65	—	ns		
		4.5	10	2	—	13	—			
		6.0	9	—	—	11	—			
Hold time	$t_h$	2.0	5	—	—	5	—	ns		
		4.5	5	-1	—	5	—			
		6.0	5	—	—	5	—			
Output rise/fall time	$t_{TLH}$	2.0	—	—	75	—	95	ns		
	$t_{THL}$	4.5	—	5	15	—	19			
		6.0	—	—	13	—	16			
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF		

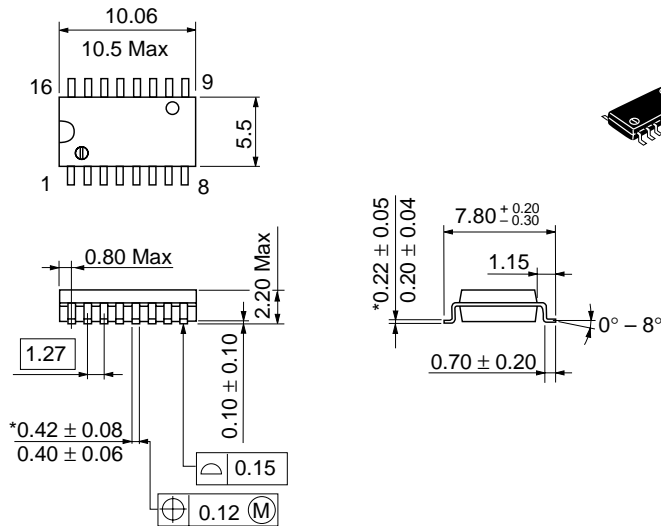
## Package Dimensions

Unit: mm



Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	1.07 g

Unit: mm

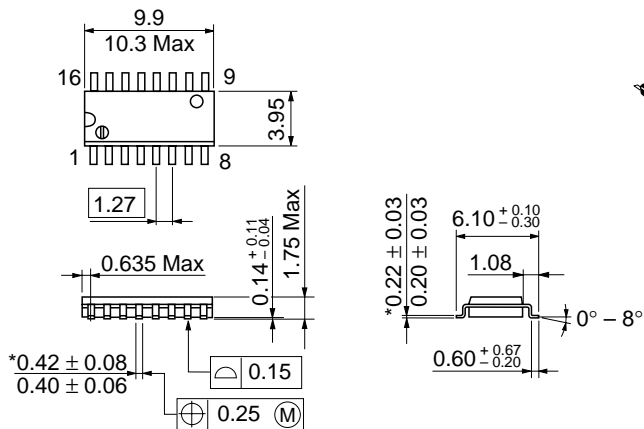


\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.24 g



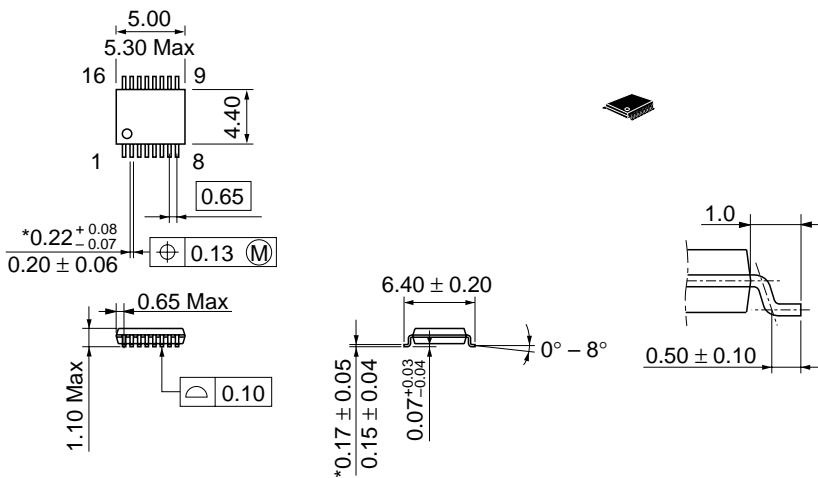
Unit: mm



Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.15 g

\*Dimension including the plating thickness  
Base material dimension

Unit: mm



Hitachi Code	TTP-16DA
JEDEC	—
EIAJ	—
Mass (reference value)	0.05 g

\*Dimension including the plating thickness  
Base material dimension

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