

To all our customers

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

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# HD74HC237

## 3-to-8-line Decoder/Demultiplexer with Address Latch



ADE-205-469 (Z)  
1st. Edition  
Sep. 2000

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### Description

The HD74HC237 decodes a three-bit Address to one-of-eight active-high outputs. The device has a transparent latch for storage of the Address. Two Chip Selects, one active-low and one active-high, are provided to facilitate the demultiplexing, cascading, and chip-selecting functions.

The demultiplexing function is accomplished by using the Address inputs to select the desired device output, and then by using one of the Chip Selects as a data input while holding the other one active.

The HD74HD237 is the noninverting version of the HD74HC137.

### Features

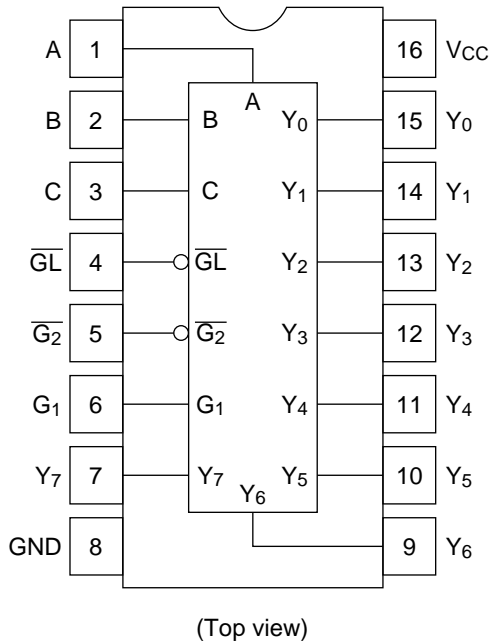
- High Speed Operation:  $t_{pd}$  (Data to Y) = 19 ns typ ( $C_L = 50$  pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a = 25^\circ\text{C}$ )

## Function Table

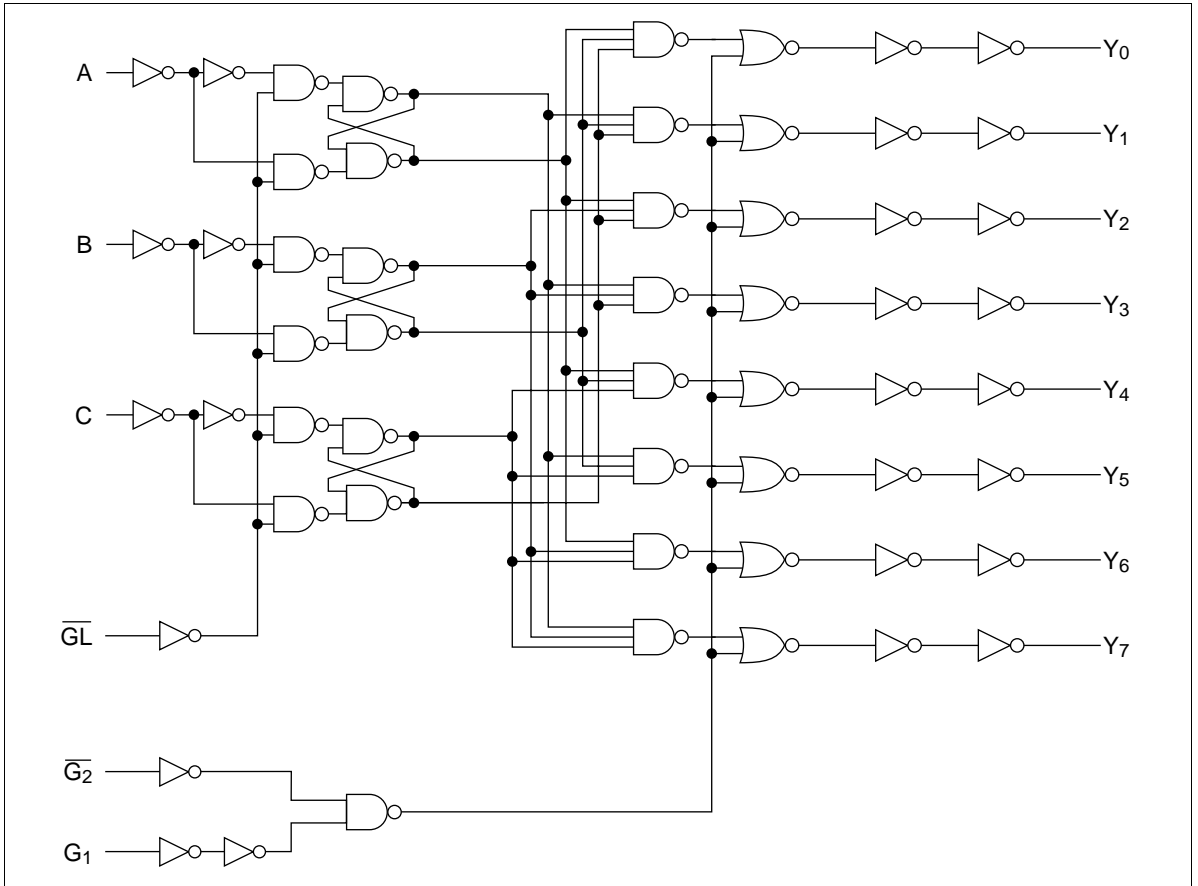
### Inputs

Enable			Select			Outputs							
$\overline{G_L}$	$G_1$	$\overline{G_2}$	C	B	A	$Y_0$	$Y_1$	$Y_2$	$Y_3$	$Y_4$	$Y_5$	$Y_6$	$Y_7$
X	X	H	X	X	X	L	L	L	L	L	L	L	L
X	L	X	X	X	X	L	L	L	L	L	L	L	L
L	H	L	L	L	L	H	L	L	L	L	L	L	L
L	H	L	L	L	H	L	H	L	L	L	L	L	L
L	H	L	L	H	L	L	L	H	L	L	L	L	L
L	H	L	L	H	H	L	L	L	H	L	L	L	L
L	H	L	H	L	L	L	L	L	L	H	L	L	L
L	H	L	H	L	H	L	L	L	L	L	H	L	L
L	H	L	H	H	L	L	L	L	L	L	L	H	L
L	H	L	H	H	H	L	L	L	L	L	L	L	H
H	H	L	X	X	X	Output corresponding to stored address H; all others L							

## Pin Arrangement



Logic Diagram



## DC Characteristics

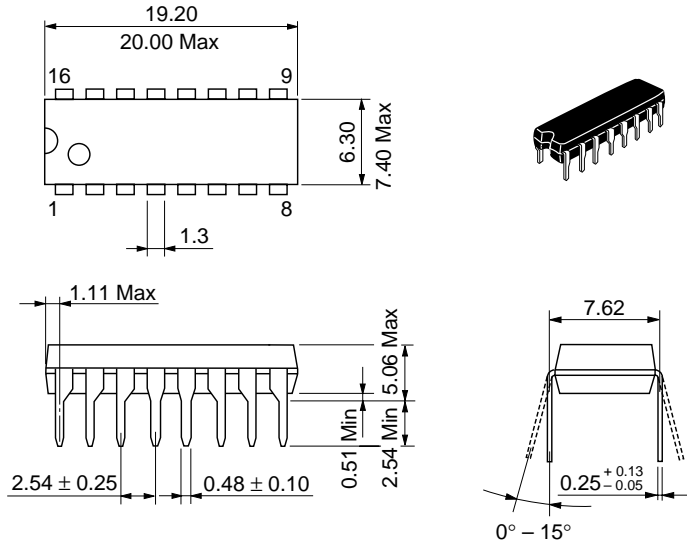
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions			
			Min	Typ	Max	Min			Max		
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V			
		4.5	3.15	—	—	3.15	—				
		6.0	4.2	—	—	4.2	—				
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5		V		
		4.5	—	—	1.35	—	1.35				
		6.0	—	—	1.8	—	1.8				
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	—	—	185	—	230	ns	Data to Y
		4.5	—	19	37	—	46		
		6.0	—	—	31	—	39		
		2.0	—	—	145	—	180	ns	$\overline{G}_2$ to Y
		4.5	—	14	29	—	36		
		6.0	—	—	25	—	31		
		2.0	—	—	145	—	180	ns	$G_1$ to Y
		4.5	—	14	29	—	36		
		6.0	—	—	25	—	31		
		2.0	—	—	190	—	240	ns	$\overline{GL}$ to Y
		4.5	—	21	38	—	48		
		6.0	—	—	32	—	41		
Pulse width	$t_w$	2.0	80	—	—	100	—	ns	
		4.5	16	8	—	20	—		
		6.0	14	—	—	17	—		
Hold time	$t_h$	2.0	5	—	—	5	—	ns	
		4.5	5	-4	—	5	—		
		6.0	5	—	—	5	—		
Setup time	$t_{SU}$	2.0	75	—	—	95	—	ns	
		4.5	15	4	—	19	—		
		6.0	13	—	—	16	—		
Output rise/fall time	$t_{TLH}$	2.0	—	—	75	—	95	ns	
		4.5	—	5	15	—	19		
		6.0	—	—	13	—	16		
	$t_{THL}$								
Input capacitance	$C_{in}$	—	—	5	10	—	10	pF	

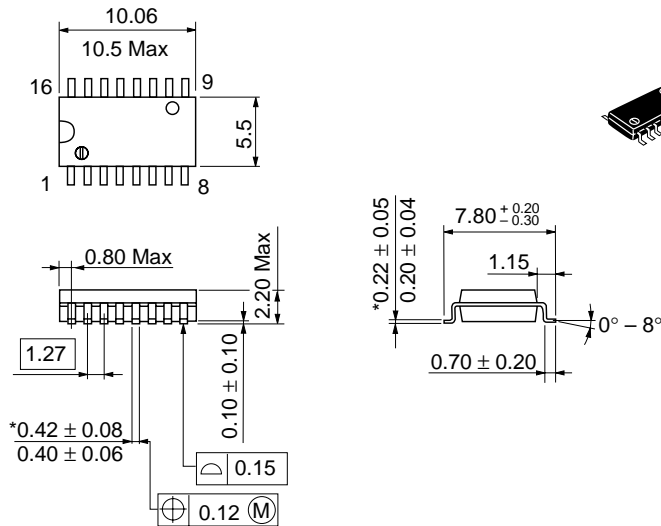
## Package Dimensions

Unit: mm



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

Unit: mm

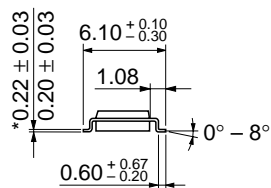
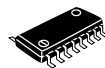
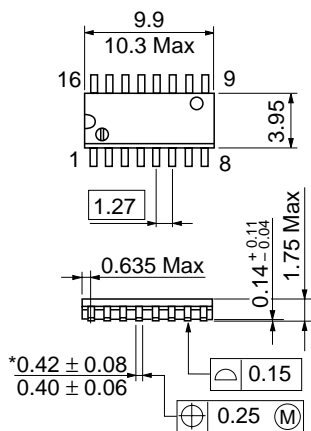


Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.24 g

\*Dimension including the plating thickness  
Base material dimension



Unit: mm



\*Dimension including the plating thickness  
 Base material dimension

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

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