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

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Keep safety first in your circuit designs!

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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HD74HC240

Octal Buffers/Line Drivers/Line Receivers
(with inverted 3-state outputs)



ADE-205-471 (Z)
1st. Edition
Sep. 2000

Description

The HD74HC240 is an inverting buffer and has two active low enables ($1\overline{G}$ and $2\overline{G}$). Each enable independently controls 4 buffers. This device does not have schmitt trigger inputs.

Features

- High Speed Operation: $t_{pd} = 10$ ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 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

Inputs		Output
$\overline{G}$	A	Y
H	X	Z
L	H	L
L	L	H

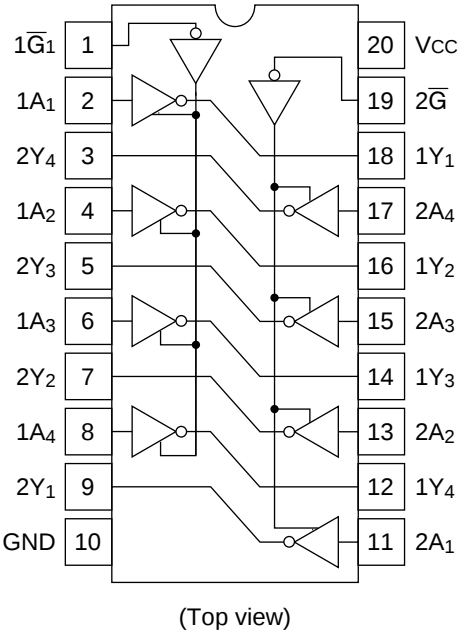
H : high level

L : low level

X : irrelevant

Z : off (high-impedance) state of a 3-state output

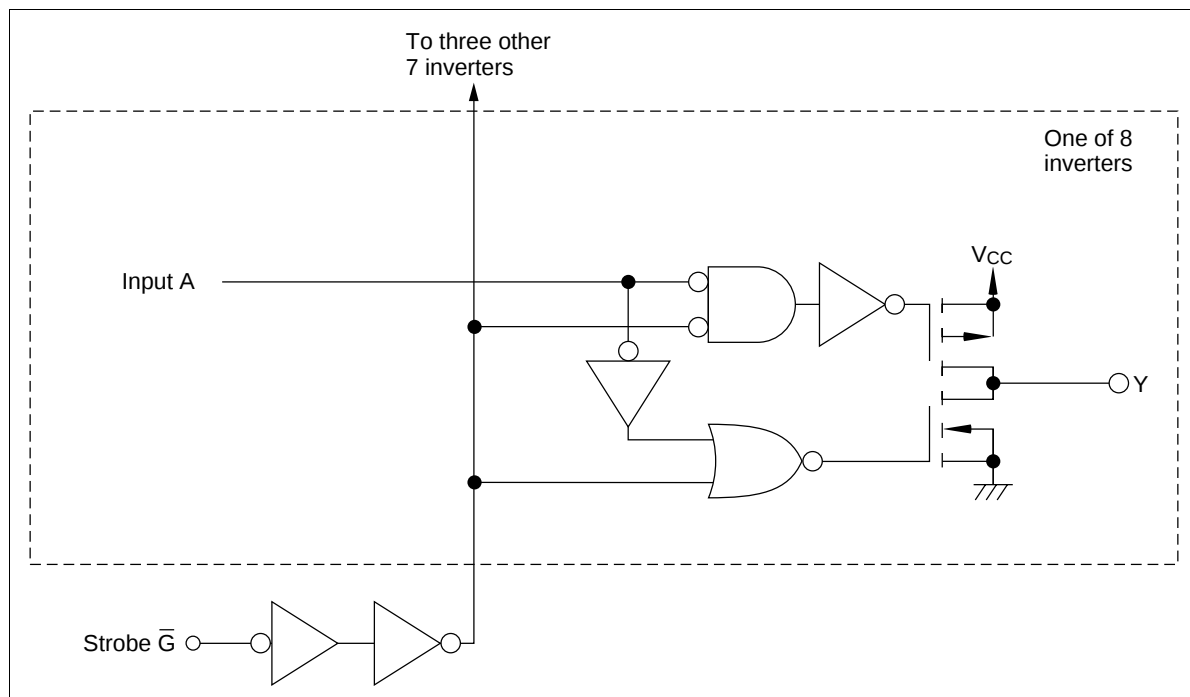
Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
DC current drain per pin	I_{OUT}	± 35	mA
DC current drain per V_{CC} , GND	I_{CC}, I_{GND}	± 75	mA
DC input diode current	I_{IK}	± 20	mA
DC output diode current	I_{OK}	± 20	mA
Power dissipation per package	P_T	500	mW
Storage temperature	Tstg	-65 to +150	°C

Logic Diagram



DC Characteristics

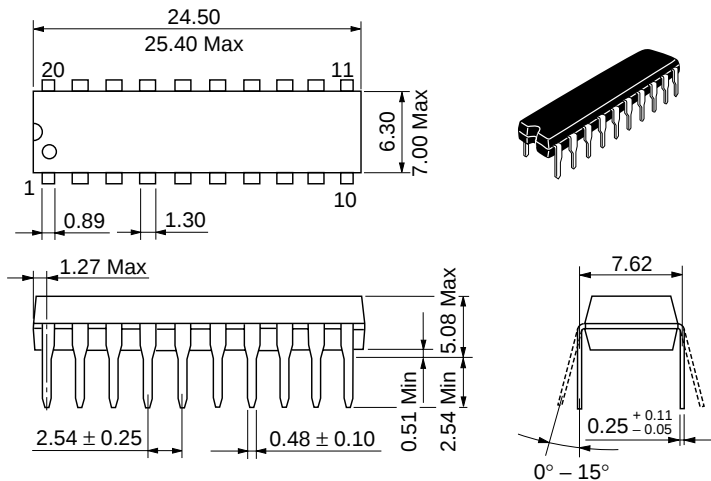
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0	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} = -6 mA
		6.0	5.68	—	—	5.63	—			I _{OH} = -7.8 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} = 6 mA
		6.0	—	—	0.26	—	0.33			I _{OL} = 7.8 mA
Off-state output current	I _{OZ}	6.0	—	—	±0.5	—	±5.0	μA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND	
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, Iout = 0 μA	

AC Characteristics ($C_L = 50 \text{ pF}$, Input $t_r = t_f = 6 \text{ ns}$)

Item	Symbol	V _{CC} (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min		
Propagation delay time	t _{PHL}	2.0	—	—	90	—	115	ns
		4.5	—	10	18	—	23	
		6.0	—	—	15	—	20	
	t _{PLH}	2.0	—	—	90	—	115	ns
		4.5	—	10	18	—	23	
		6.0	—	—	15	—	20	
Output enable time	t _{ZL}	2.0	—	—	150	—	190	ns
		4.5	—	11	30	—	38	
		6.0	—	—	26	—	33	
	t _{ZH}	2.0	—	—	150	—	190	ns
		4.5	—	12	30	—	38	
		6.0	—	—	26	—	33	
Output disable time	t _{LZ}	2.0	—	—	150	—	190	ns
		4.5	—	16	30	—	38	
		6.0	—	—	26	—	33	
	t _{HZ}	2.0	—	—	150	—	190	ns
		4.5	—	19	30	—	38	
		6.0	—	—	26	—	33	
Output rise/fall time	t _{TLH}	2.0	—	—	60	—	75	ns
	t _{THL}	4.5	—	4	12	—	15	
		6.0	—	—	10	—	13	
Input capacitance	C _{in}	—	—	5	10	—	10	pF

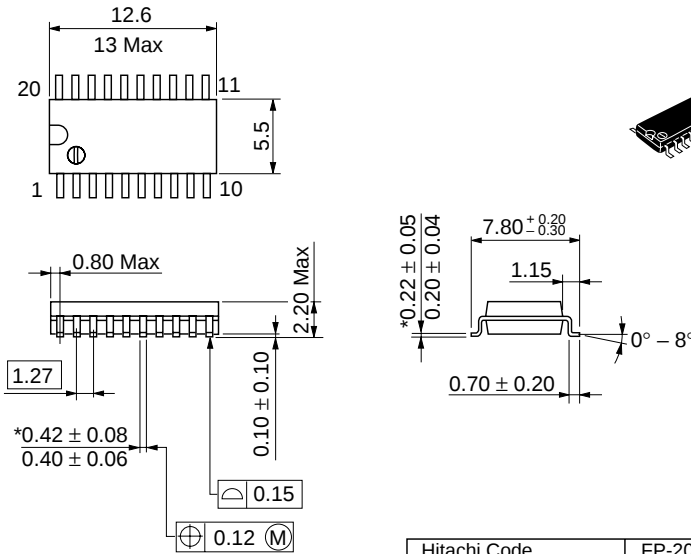
Package Dimensions

Unit: mm



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

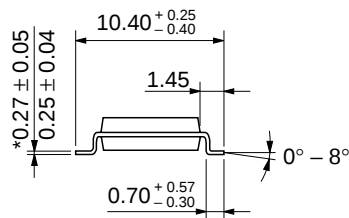
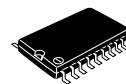
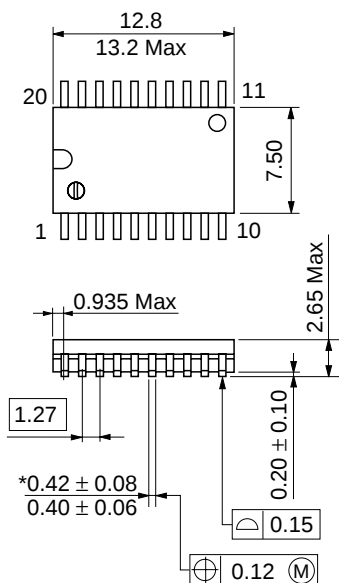
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

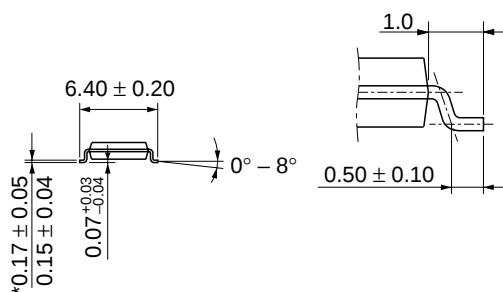
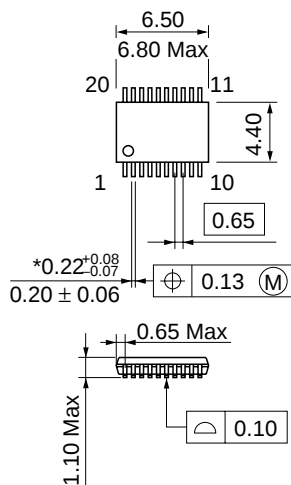
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	TTP-20DA
JEDEC	—
EIAJ	—
Mass (reference value)	0.07 g

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