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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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HD74HCT540/HD74HCT541

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



ADE-205-558 (Z)
1st. Edition
Sep. 2000

Description

The HD74HCT540 is an inverting buffer and the HD74HCT541 is a non-inverting buffer. The 3-state control gate operates as a two-input NOR such that if either G_1 or G_2 are high, all eight outputs are in the high-impedance state.

Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (A to Y) = 12 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 4.5$ to 5.5 V
- Low Input Current: $1 \mu\text{A}$ max
- Low Quiescent Supply Current: I_{CC} (static) = $4 \mu\text{A}$ max ($T_a = 25^\circ\text{C}$)

Function Table

Inputs			Outputs Y	
\overline{G}_1	\overline{G}_2	A	HD74HCT540	HD74HCT541
L	L	L	H	L
L	L	H	L	H
H	X	X	Z	Z
X	H	X	Z	Z

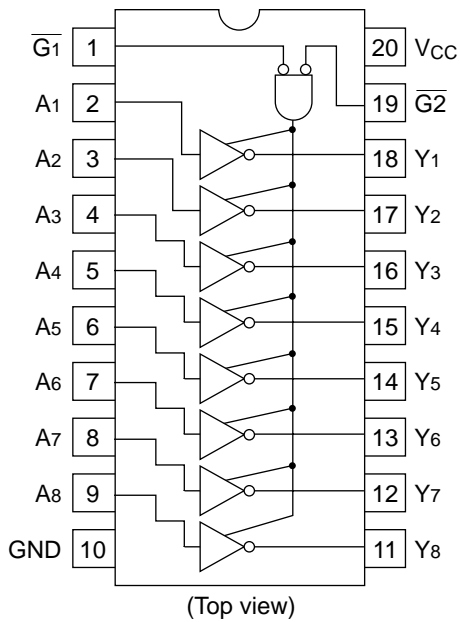
X : irrelevant

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

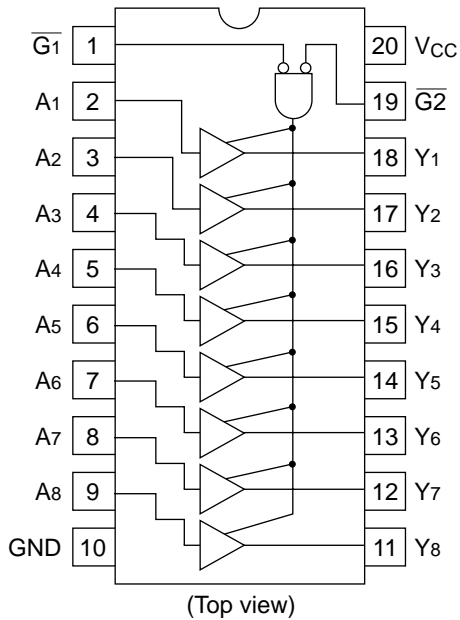
HD74HCT540/HD74HCT541

Pin Arrangement

HD74HCT540



HD74HCT541



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
Output current	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	T_{stg}	-65 to +150	$^{\circ}C$

DC Characteristics

Item	Symbol	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
		Min	Typ	Max	Min		Max	V_{CC} (V)
Input voltage	V_{IH}	2.0	—	—	2.0	—	V	4.5 to 5.5
	V_{IL}	—	—	0.8	—	0.8	V	4.5 to 5.5
Output voltage	V_{OH}	4.4	—	—	4.4	—	V	4.5 $V_{in} = V_{IH}$ or V_{IL} $I_{OH} = -20 \mu A$
		4.18	—	—	4.13	—		4.5 $I_{OH} = -6 mA$
	V_{OL}	—	—	0.1	—	0.1	V	4.5 $V_{in} = V_{IH}$ or V_{IL} $I_{OL} = 20 \mu A$
		—	—	0.26	—	0.33		4.5 $I_{OL} = 6 mA$
Off-state output current	I_{OZ}	—	—	± 0.5	—	± 5.0	μA	5.5 $V_{in} = V_{IH}$ or V_{IL} , $V_{out} = V_{CC}$ or GND
Input current	I_{in}	—	—	± 0.1	—	± 1.0	μA	5.5 $V_{in} = V_{CC}$ or GND
Quiescent current	I_{CC}	—	—	4.0	—	40	μA	5.5 $V_{in} = V_{CC}$ or GND, $I_{out} = 0 \mu A$

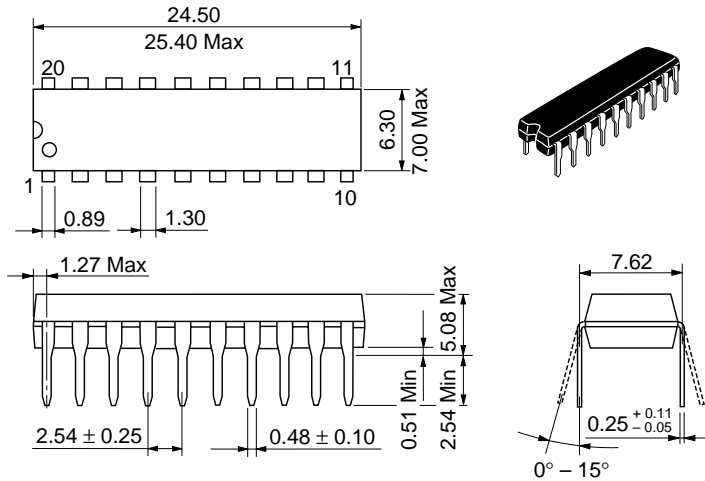
HD74HCT540/HD74HCT541

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

Item	Symbol	Ta = -40 to +85°C				Unit	Test Conditions		
		Ta = 25°C			Max		V _{cc} (V)		
		Min	Typ	Max	Min	Max			
Propagation delay	t _{PLH}	—	11	20	—	25	ns	4.5	HD74HCT540 only
time	t _{PHL}	—	12	20	—	25		4.5	
	t _{PLH}	—	10	23	—	29	ns	4.5	HD74HCT541 only
	t _{PHL}	—	13	23	—	29		4.5	
Output enable	t _{ZL}	—	16	30	—	38	ns	4.5	
time	t _{ZH}	—	20	30	—	38		4.5	
Output disable	t _{LZ}	—	15	30	—	38	ns	4.5	
time	t _{HZ}	—	15	30	—	38		4.5	
Output rise/fall	t _{TLH}	—	4	12	—	15	ns	4.5	
time	t _{THL}	—	4	12	—	15		4.5	
Input capacitance	C _{in}	—	5	10	—	10	pF	—	

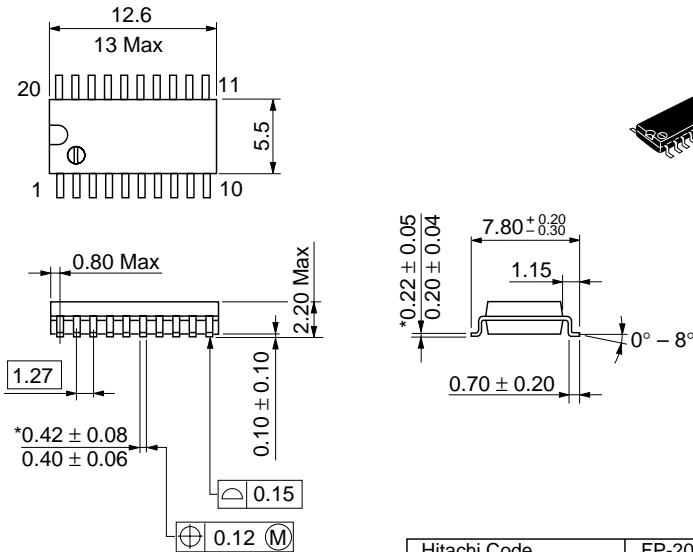
Package Dimensions

Unit: mm



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

Unit: mm

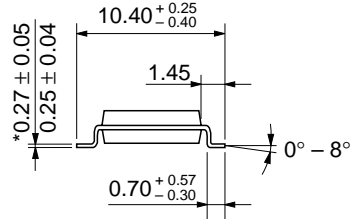
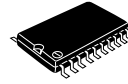
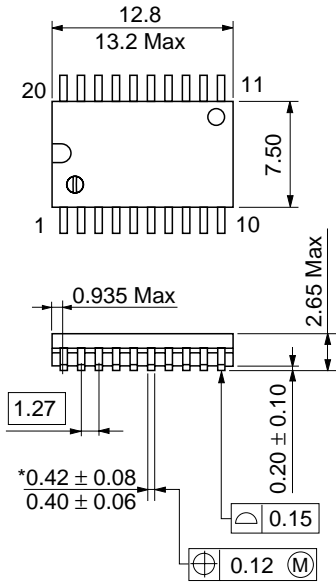


*Dimension including the plating thickness
Base material dimension

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

HD74HCT540/HD74HCT541

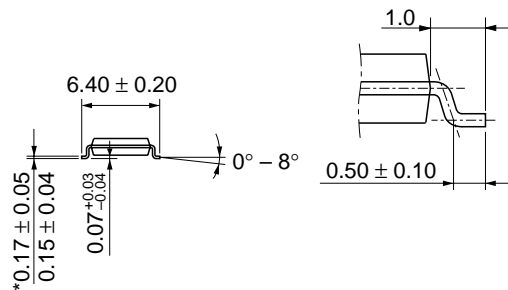
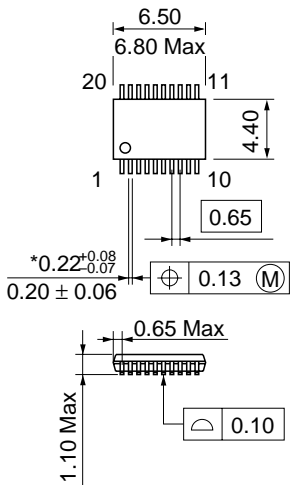
Unit: mm



*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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