

HD74BC240A

Octal Buffers/Line Drivers With 3 State Outputs

HITACHI

ADE-205-006A(Z)
2nd Edition
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Description

The HD74BC240A provides high drivability and operation equal to or better than high speed bipolar standard logic IC by using Bi-CMOS process. The device features low power dissipation that is about 1/5 of high speed bipolar logic IC, when the frequency is 10 MHz. The device has eight inverter drivers with three state outputs in a 20 pin package. This device is a non inverting buffer and has two active low enables ($1\bar{G}$ and $2\bar{G}$). Each enable independently controls 4 buffers.

Features

- Input/Output are at high impedance state when power supply is off.
- Built in input pull up circuit can make input pins be open, when not used.
- TTL level input
- Wide operating temperature range
 $T_a = -40$ to $+85^{\circ}\text{C}$

Function Table

Inputs

\bar{G}	A	Output \bar{Y}
H	X	Z
L	H	L
L	L	H

H : High level

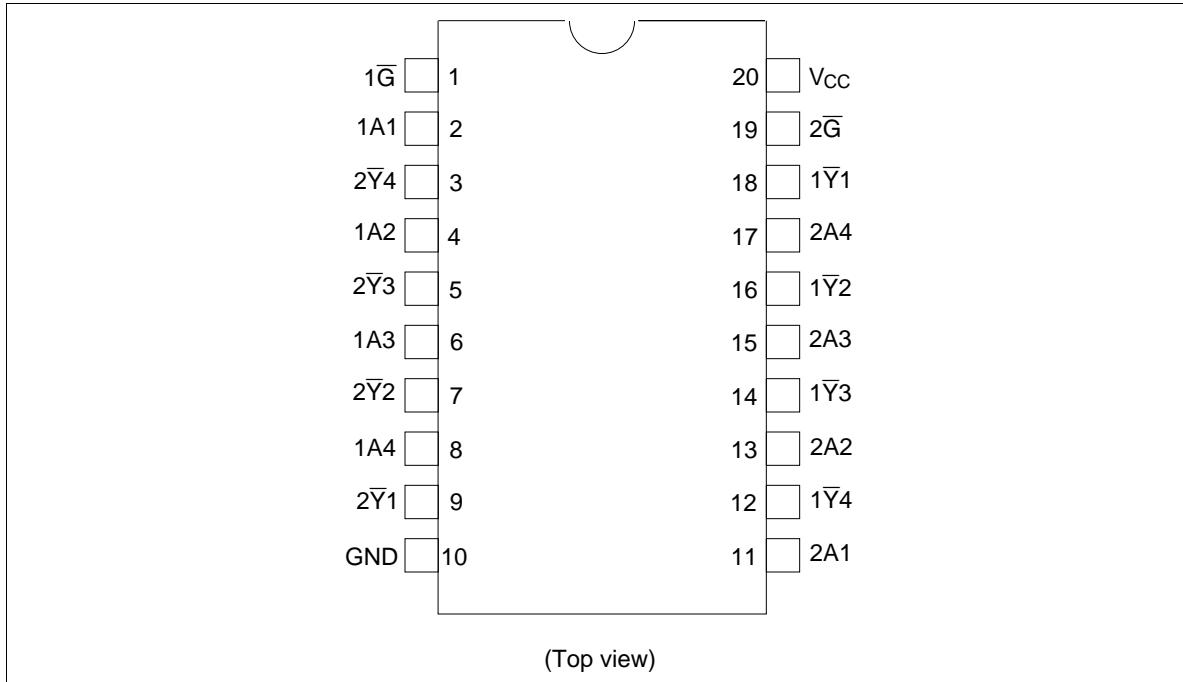
L : Low level

X : Immaterial

Z : High impedance

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Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V_{CC}	–0.5 to +7.0	V
Input diode current	I_{IK}	±30	mA
Input voltage	V_{IN}	–0.5 to +7.5	V
Output voltage	V_{OUT}	–0.5 to +7.5	V
Off state output voltage	$V_{OUT(off)}$	–0.5 to +5.5	V
Storage temperature	T_{STG}	–65 to +150	°C

Note: 1. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

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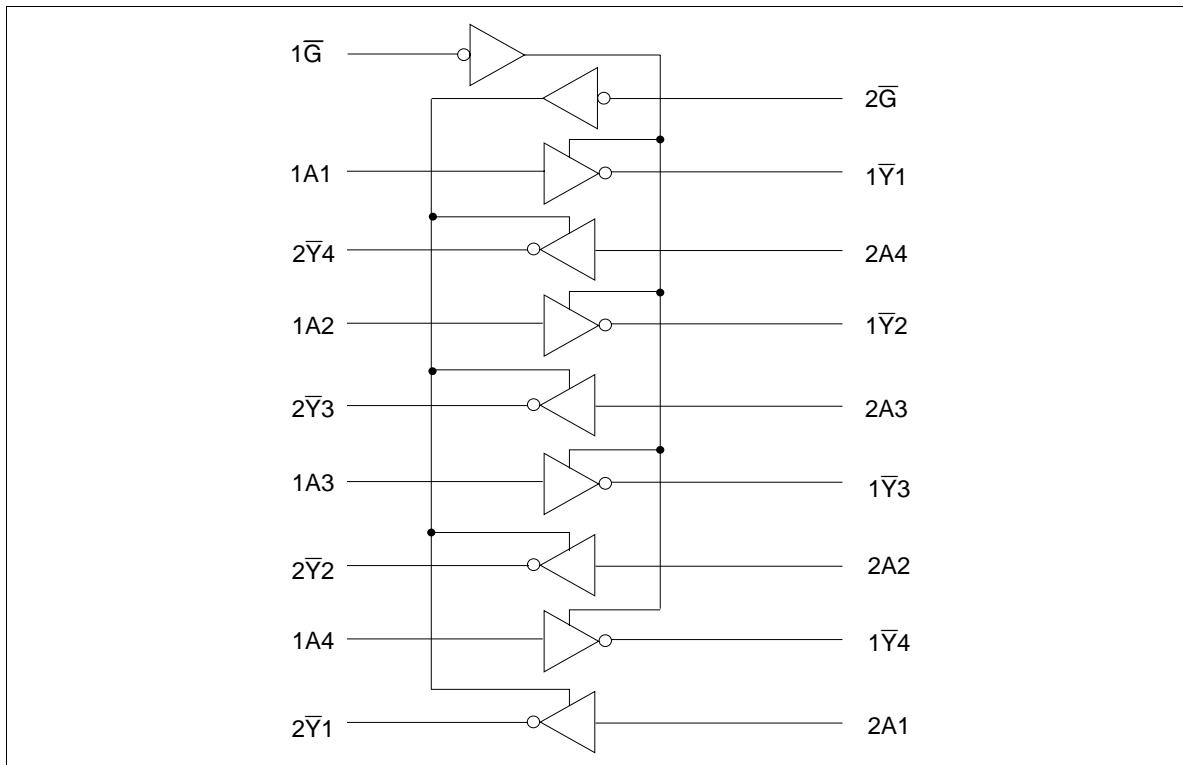
Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.5	5.0	5.5	V
Input voltage	V_{IN}	0	—	V_{CC}	V
Output voltage	V_{OUT}	0	—	V_{CC}	V
Operating temperature	$Topr$	-40	—	85	°C
Input rise/fall time* ¹	t_r, t_f	0	—	8	ns/V

Note: 1. This item guarantees maximum limit when one input switches.

Waveform: Refer to test circuit of switching characteristics.

Logic Diagram



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Electrical Characteristics (Ta = -40°C to +85°C)

Item	Symbol	V _{cc} (V)	Min	Max	Unit	Test Conditions
Input voltage	V _{IH}	2.0	—	—	V	
	V _{IL}	—	0.8	—	V	
Output voltage	V _{OH}	4.5	2.4	—	V	I _{OH} = -3 mA
		4.5	2.0	—	V	I _{OH} = -15 mA
	V _{OL}	4.5	—	0.5	V	I _{OL} = 48 mA
		4.5	—	0.55	V	I _{OL} = 64 mA
Input diode voltage	V _{IK}	4.5	—	-1.2	V	I _{IN} = -18 mA
Input current	I _I	5.5	—	-250	μA	V _{IN} = 0 V
		5.5	—	1.0	μA	V _{IN} = 5.5 V
		5.5	—	100	μA	V _{IN} = 7.0 V
Short circuit output current ^{*1}	I _{OS}	5.5	-100	-225	mA	V _{IN} = 0 or 5.5 V
Off state output current	I _{OZH}	5.5	—	50	μA	V _O = 2.7 V
	I _{OZL}	5.5	—	-50	μA	V _O = 0.5 V
Supply current	I _{CCL}	5.5	—	27.5	mA	V _{IN} = 0 or 5.5 V All outputs is "L"
	I _{CCH}	5.5	—	2.5	mA	V _{IN} = 0 or 5.5 V All outputs is "H"
	I _{CCZ}	5.5	—	2.5	mA	V _{IN} = 0 or 5.5 V All outputs is "Z"
I _{CCT} ^{*2}	5.5	—	1.5	mA	—	V _{IN} = 3.4 or 0.5 V

Notes: 1. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

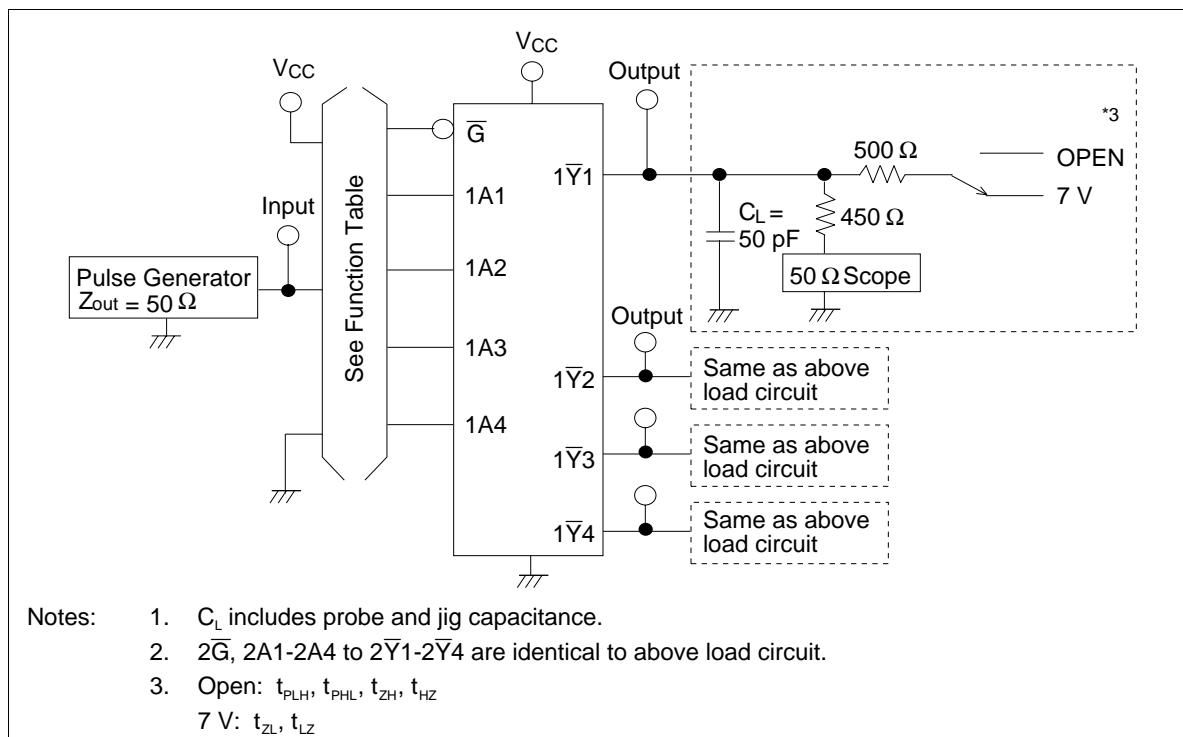
2. When input by the TTL level, it shows I_{CC} increase at per one input pin.

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Switching Test Method ($C_L = 50 \text{ pF}$)

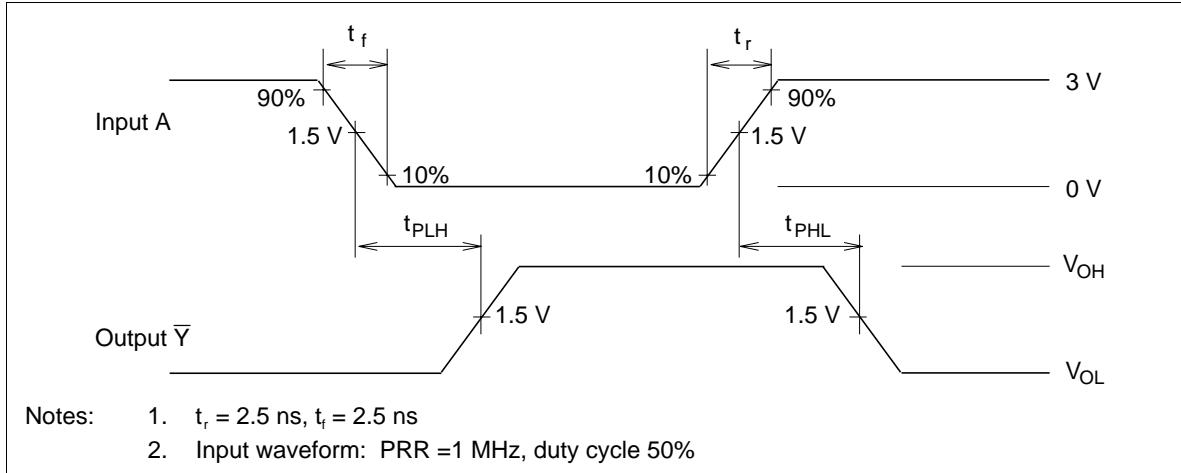
Item	Symbol	Ta = 25°C V _{CC} = 5.0 V		Ta = -40 to 85°C V _{CC} = 5.0 V ±10%		Unit	Test Conditions
		Min	Max	Min	Max		
Propagation delay time	t _{PLH}	3.0	6.0	3.0	7.0	ns	See under figure
	t _{PHL}	3.0	6.0	3.0	7.0		
Output enable time	t _{ZH}	3.0	8.0	3.0	10.0	ns	
	t _{ZL}	3.0	8.0	3.0	10.0		
Output disable time	t _{HZ}	3.0	7.0	3.0	9.0	ns	
	t _{LZ}	3.0	7.0	3.0	9.0		
Input capacitance	C _{IN}	3.0(Typ)		—		pF	V _{IN} = V _{CC} or GND
Output capacitance	C _O	15.0(Typ)		—		pF	V _O = V _{CC} or GND

Test Circuit

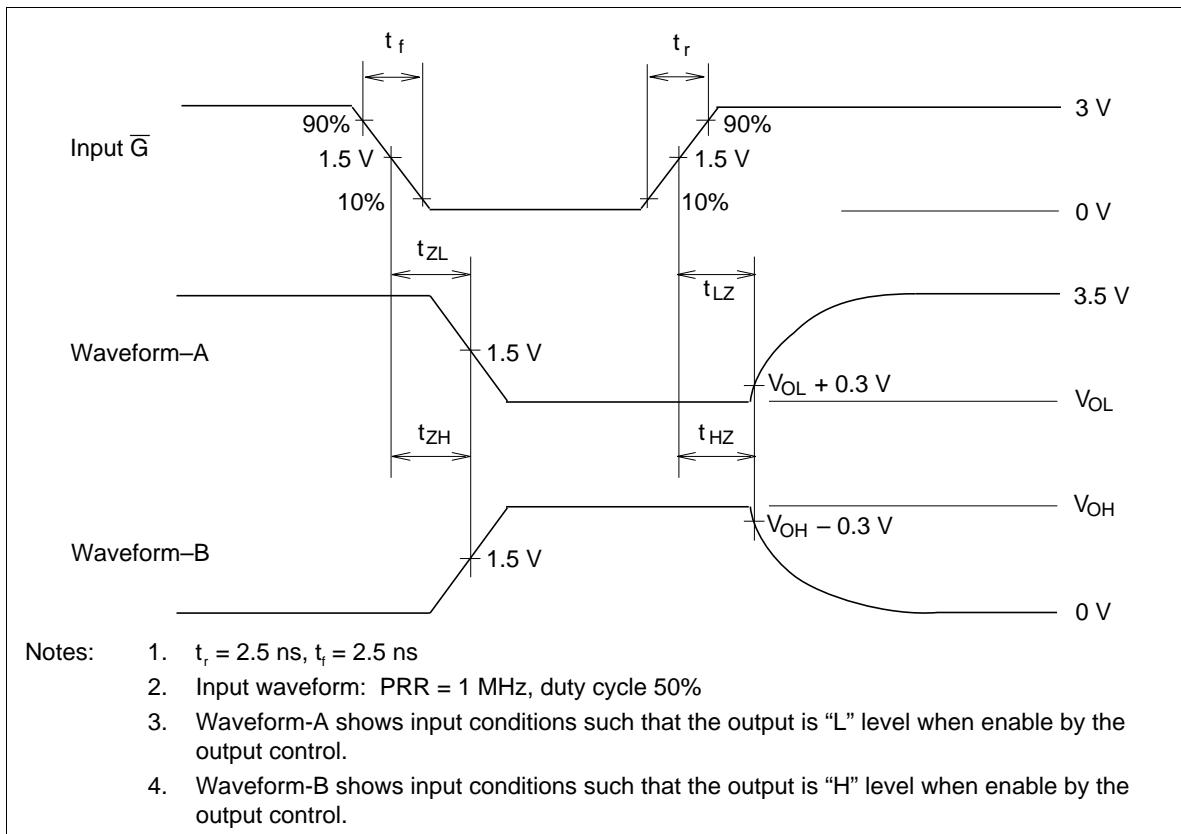


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Waveforms-1



Waveforms-2



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Package Dimensions

Unit: mm



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