

Important notice

Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

Instead of <http://www.nxp.com>, <http://www.philips.com/> or <http://www.semiconductors.philips.com/>, use **<http://www.nexperia.com>**

Instead of sales.addresses@www.nxp.com or sales.addresses@www.semiconductors.philips.com, use **salesaddresses@nexperia.com** (email)

Replace the copyright notice at the bottom of each page or elsewhere in the document, depending on the version, as shown below:

- © NXP N.V. (year). All rights reserved or © Koninklijke Philips Electronics N.V. (year). All rights reserved

Should be replaced with:

- © **Nexperia B.V. (year). All rights reserved.**

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via **salesaddresses@nexperia.com**). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

DATA SHEET

For a complete data sheet, please also download:

- The IC06 74HC/HCT/HCU/HCMOS Logic Family Specifications
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Information
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Outlines

74HC/HCT241

Octal buffer/line driver; 3-state

Product specification
File under Integrated Circuits, IC06

September 1993

Octal buffer/line driver; 3-state

74HC/HCT241

FEATURES

- Output capability: bus driver
- I_{CC} category: MSI

GENERAL DESCRIPTION

The 74HC/HCT241 are high-speed Si-gate CMOS devices and are pin compatible with low power Schottky TTL (LSTTL). They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT241 are octal non-inverting buffer/line drivers with 3-state outputs. The 3-state outputs are controlled by the output enable inputs $1\overline{OE}$ and $2OE$.

QUICK REFERENCE DATA

GND = 0 V; $T_{amb} = 25\text{ }^{\circ}\text{C}$; $t_r = t_f = 6\text{ ns}$

SYMBOL	PARAMETER	CONDITIONS	TYPICAL		UNIT
			HC	HCT	
t_{PHL} / t_{PLH}	propagation delay 1A _n to 1Y _n ; 2A _n to 2Y _n	$C_L = 15\text{ pF}$; $V_{CC} = 5\text{ V}$	7	11	ns
C_I	input capacitance		3.5	3.5	pF
C_{PD}	power dissipation capacitance per buffer	notes 1 and 2	30	30	pF

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μW):

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz

f_o = output frequency in MHz

$\sum (C_L \times V_{CC}^2 \times f_o)$ = sum of outputs

C_L = output load capacitance in pF

V_{CC} = supply voltage in V

2. For HC the condition is $V_I = \text{GND to } V_{CC}$

For HCT the condition is $V_I = \text{GND to } V_{CC} - 1.5\text{ V}$

ORDERING INFORMATION

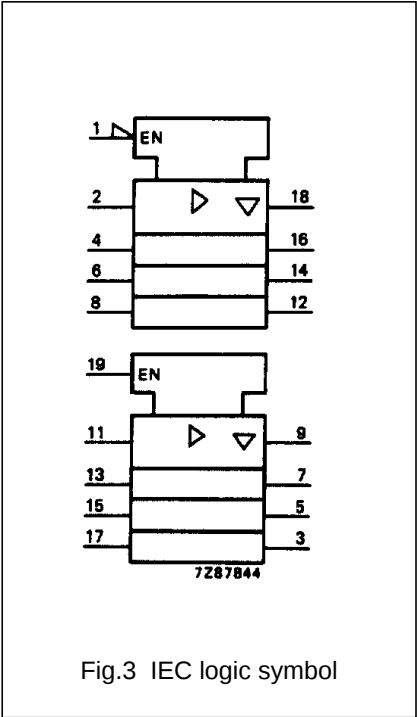
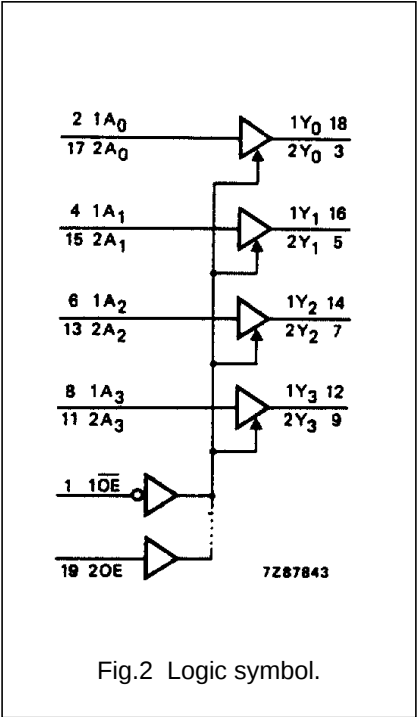
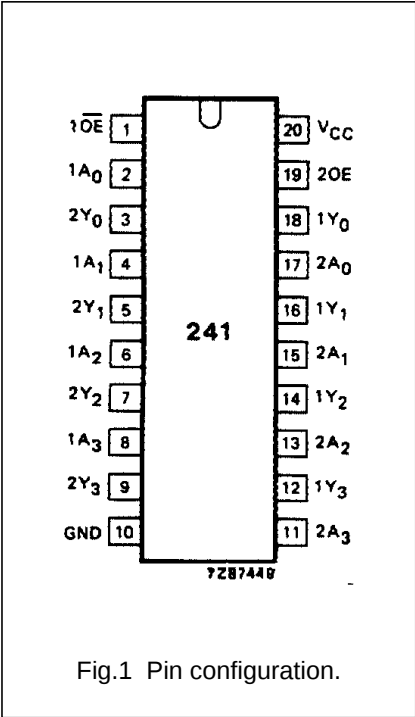
See "74HC/HCT/HCU/HCMOS Logic Package Information".

Octal buffer/line driver; 3-state

74HC/HCT241

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1	$\overline{1OE}$	output enable input (active LOW)
2, 4, 6, 8	$1A_0$ to $1A_3$	data inputs
3, 5, 7, 9	$2Y_0$ to $2Y_3$	bus outputs
10	GND	ground (0 V)
17, 15, 13, 11	$2A_0$ to $2A_3$	data inputs
18, 16, 14, 12	$1Y_0$ to $1Y_3$	bus outputs
19	2OE	output enable input (active HIGH)
20	V_{CC}	positive supply voltage



Octal buffer/line driver; 3-state

74HC/HCT241

FUNCTION TABLES

INPUTS		OUTPUT
$\overline{1OE}$	$1A_n$	$1Y_n$
L	L	L
L	H	H
H	X	Z

INPUTS		OUTPUT
$2OE$	$2A_n$	$2Y_n$
H	L	L
H	H	H
L	X	Z

- Note**
- H = HIGH voltage level
L = LOW voltage level
X = don't care
Z = high impedance OFF-state

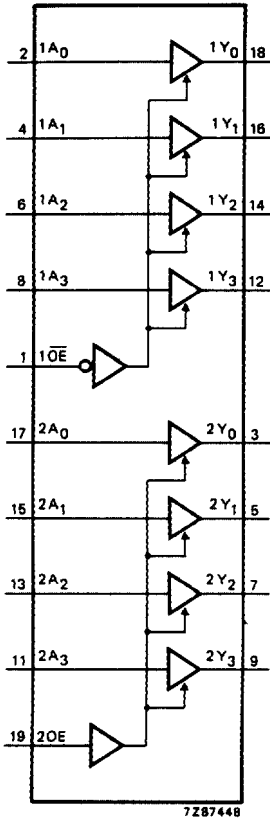


Fig.4 Functional diagram.

Octal buffer/line driver; 3-state

74HC/HCT241

DC CHARACTERISTICS FOR 74HC

For the DC characteristics see *"74HC/HCT/HCU/HCMOS Logic Family Specifications"*.

Output capability: bus driver

I_{CC} category: MSI

AC CHARACTERISTICS FOR 74HC

GND = 0 V; t_r = t_f = 6 ns; C_L = 50 pF

SYMBOL	PARAMETER	T _{amb} (°C)							UNIT	TEST CONDITIONS	
		74HC								V _{CC} (V)	WAVEFORMS
		+25			−40 to +85		−40 to +125				
		min.	typ.	max.	min.	max.	min.	max.			
t _{PHL} / t _{PLH}	propagation delay 1A _n to 1Y _n ; 2A _n to 2Y _n		25 9 7	100 20 17		125 25 21		150 30 26	ns	2.0 4.5 6.0	Fig.5
t _{PZH} / t _{PZL}	3-state output enable time 1 $\overline{\text{OE}}$ to 1Y _n ; 2OE to 2Y _n		30 11 9	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig.6
t _{PHZ} / t _{PLZ}	3-state output disable time 1 $\overline{\text{OE}}$ to 1Y _n ; 2OE to 2Y _n		39 14 11	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig.6
t _{THL} / t _{TLH}	output transition time		14 5 4	60 12 10		75 15 13		90 18 15	ns	2.0 4.5 6.0	Fig.5

Octal buffer/line driver; 3-state

74HC/HCT241

DC CHARACTERISTICS FOR 74HCT

For the DC characteristics see *"74HC/HCT/HCU/HCMOS Logic Family Specifications"*.

Output capability: bus driver

I_{CC} category: MSI

Note to HCT types

The value of additional quiescent supply current (ΔI_{CC}) for a unit load of 1 is given in the family specifications. To determine ΔI_{CC} per input, multiply this value by the unit load coefficient shown in the table below.

INPUT	UNIT LOAD COEFFICIENT
1A _n	0.70
2A _n	0.70
1OE	0.70
2OE	1.50

AC CHARACTERISTICS FOR 74HCT

GND = 0 V; t_r = t_f = 6 ns; C_L = 50 pF

SYMBOL	PARAMETER	T _{amb} (°C)								UNIT	TEST CONDITIONS	
		74HCT									V _{CC} (V)	WAVEFORMS
		+25			−40 to +85		−40 to +125					
		min.	typ.	max.	min.	max.	min.	max.				
t _{PHL} / t _{PLH}	propagation delay 1A _n to 1Y _n ; 2A _n to 2Y _n		13	22		28		33	ns	4.5	Fig.5	
t _{PZH} / t _{PZL}	3-state output enable time 1 $\overline{\text{OE}}$ to 1Y _n ; 2OE to 2Y _n		15	30		38		45	ns	4.5	Fig.6	
t _{PHZ} / t _{PLZ}	3-state output disable time 1 $\overline{\text{OE}}$ to 1Y _n ; 2OE to 2Y _n		18	30		38		45	ns	4.5	Fig.6	
t _{THL} / t _{TLH}	output transition time		5	12		15		18	ns	4.5	Fig.5	

Octal buffer/line driver; 3-state

74HC/HCT241

AC WAVEFORMS

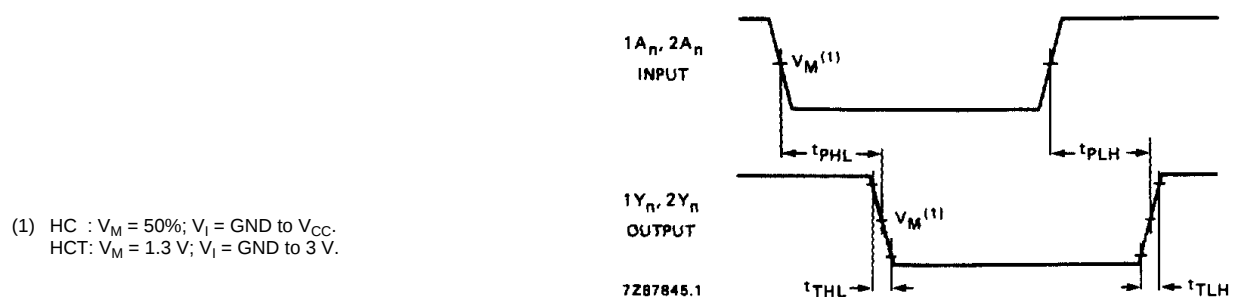


Fig.5 Waveforms showing the input ($1A_n, 2A_n$) to output ($1Y_n, 2Y_n$) propagation delays and the output transition times.

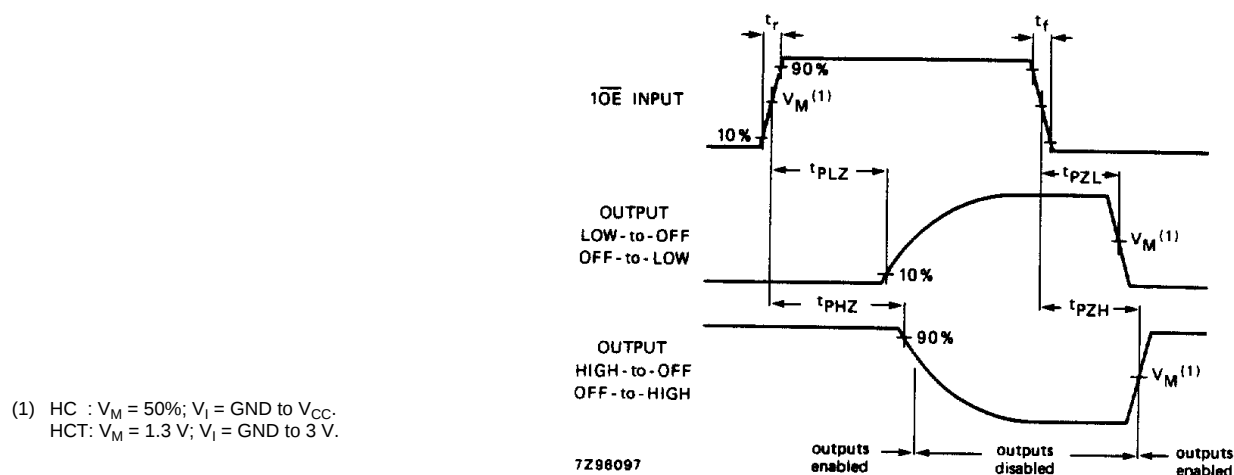


Fig.6 Waveform showing the 3-state enable and disable times for input $1\overline{OE}$.

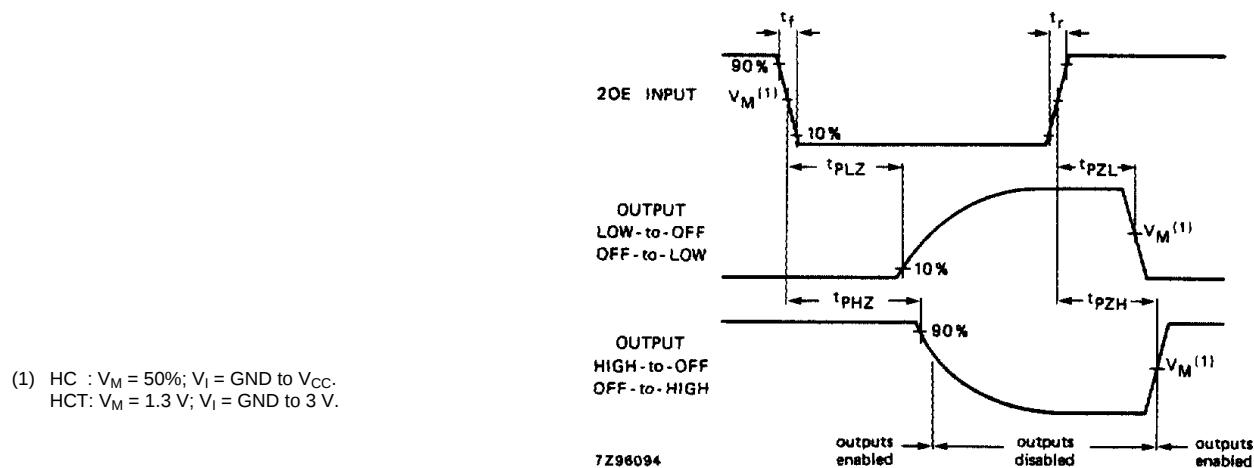


Fig.7 Waveform showing the 3-state enable and disable times for input $2\overline{OE}$.

Octal buffer/line driver; 3-state

74HC/HCT241

PACKAGE OUTLINES

See *"74HC/HCT/HCU/HCMOS Logic Package Outlines"*.