HEX BUFFER/LINE DRIVER; 3-STATE; INVERTING

FEATURES

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

GENERAL DESCRIPTION

The 74HC/HCT366 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/HCT366 are hex inverting buffer/line drivers with 3-state outputs. The 3-state outputs (nY) are controlled by the output enable inputs ($\overline{OE}_1$, $\overline{OE}_2$).

A HIGH on $\overline{OE}_n$ causes the outputs to assume a high impedance OFF-state.

The "366" is identical to the "365" but has inverting outputs.

SYMBOL	PARAMETER	CONDITIONS	TYPICAL		UNIT
			HC	HCT	
t_{PHL}/ t_{PLH}	propagation delay nA to nY	C_L = 15 pF V_{CC} = 5 V	10	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

GND = 0 V; T_{amb} = 25 °C; t_r = t_f = 6 ns

Notes

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

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

f_i = input frequency in MHz C_L = output load capacitance in pF
f_o = output frequency in MHz V_{CC} = supply voltage in V
$\Sigma (C_L \times V_{CC}^2 \times f_o)$ = sum of outputs

2. For HC the condition is V_I = GND to V_{CC}
   For HCT the condition is V_I = GND to $V_{CC} - 1.5$ V

PACKAGE OUTLINES

16-lead DIL; plastic (SOT38Z).

16-lead mini-pack; plastic (SO16; SOT109A).

PIN DESCRIPTION

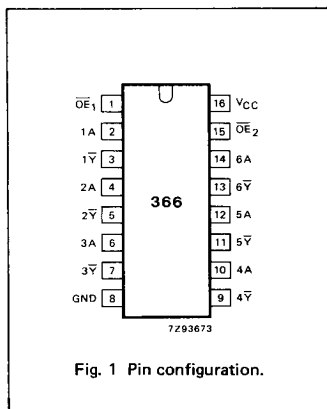| PIN NO.	SYMBOL	NAME AND FUNCTION
1, 15	$\overline{OE}_1$, $\overline{OE}_2$	output enable inputs (active LOW)
2, 4, 6, 10, 12, 14	1A to 6A	data inputs
3, 5, 7, 9, 11, 13	1Y to 6Y	data outputs
8	GND	ground (0 V)
16	V_{CC}	positive supply voltage

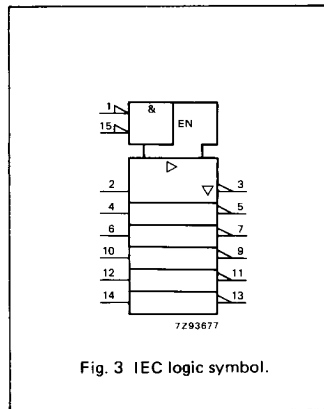
Fig. 1 Pin configuration.
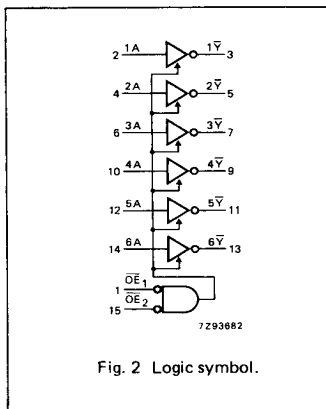
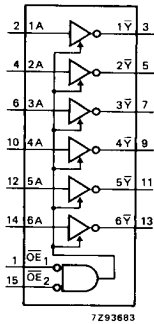Fig. 2 Logic symbol.

Fig. 3 IEC logic symbol.

"74HC366D-T"

FUNCTION TABLE

INPUTS			OUTPUT
$\overline{OE}_1$	$\overline{OE}_2$	nA	$n\overline{Y}$
L	L	L	H
L	L	H	L
X	H	X	Z
H	X	X	Z

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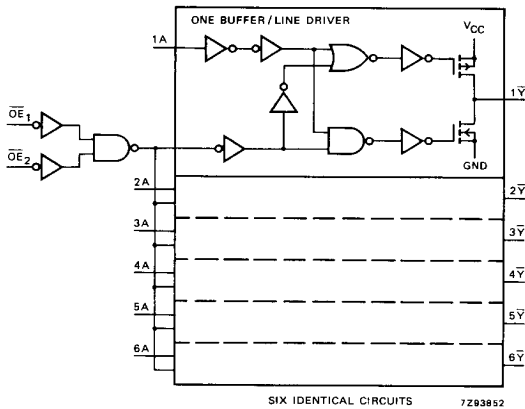Z = high impedance OFF-state

Fig. 4 Functional diagram.

Fig. 5 Logic diagram.

"74HC366D-T"

DC CHARACTERISTICS FOR 74HC

For the DC characteristics see chapter "HCMOS family characteristics", section "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 nA to nȲ		33 12 10	100 20 17		125 25 21		150 30 26	ns	2.0 4.5 6.0	Fig. 6
t_{PZH}/ t_{PZL}	3-state output enable time $\overline{OE}_n$ to nȲ		44 16 13	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig. 7
t_{PHZ}/ t_{PLZ}	3-state output disable time $\overline{OE}_n$ to nȲ		55 20 16	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig. 7
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. 6

DC CHARACTERISTICS FOR 74HCT

For the DC characteristics see chapter "HCMOS family characteristics", section "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.
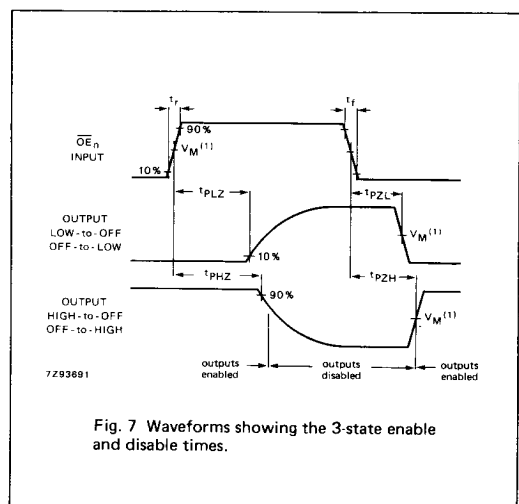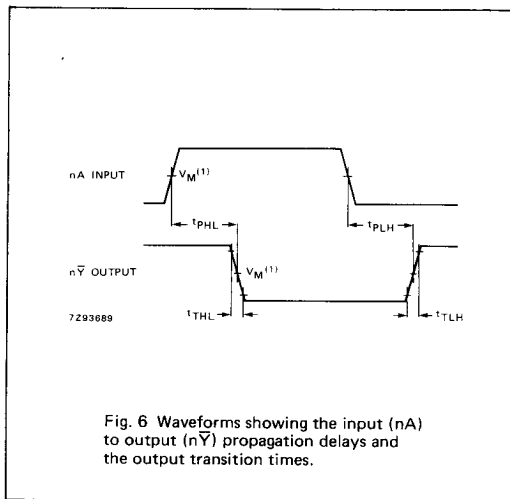
INPUT	UNIT LOAD COEFFICIENT
$\overline{OE}_1$ $\overline{OE}_2$ nA	1.00 0.90 1.00

"74HC366D-T"

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 nA to nY̅		13	24		30		36	ns	4.5	Fig. 6
$t_{PZH}/$ t_{PZL}	3-state output enable time O̅E̅$_n$ to nY̅		16	35		44		53	ns	4.5	Fig. 7
$t_{PHZ}/$ t_{PLZ}	3-state output disable time O̅E̅$_n$ to nY̅		20	35		44		53	ns	4.5	Fig. 7
$t_{THL}/$ t_{TLH}	output transition time		5	12		15		18	ns	4.5	Fig. 6

AC WAVEFORMS

Fig. 6 Waveforms showing the input (nA) to output (nY̅) propagation delays and the output transition times.

Fig. 7 Waveforms showing the 3-state enable and disable times.

Note to AC waveforms

(1) HC : V_M = 50%; V_I = GND to V_{CC}.
HCT: V_M = 1.3 V; V_I = GND to 3 V.