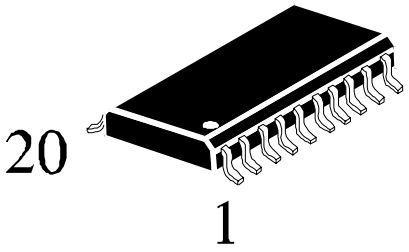
OCTAL BUFFER/LINE DRIVER, INV (3-STATE)



IN74VHC240D is high-speed logic IC made by CMOS technology and designed for use in high-performance calculating systems with a wide supply voltage range.

As for operation speed, IN74VHC240D can be compared with equivalent bipolar ICs based on Schottky TTL and two times surpasses ICs of IN74HC series.

IN74VHC240D tolerates operation under conditions when voltage on input is exceeded up to 7V without affecting characteristics and IC reliability. This possibility allows to use IN74VHC240D in radio-electronic devices for interfacing with supply voltages 5V and 3V, eliminate IC failure under supply voltage source emergency outage.

Use of output edge shaping block in the microcircuit allows to reduce noise amplitude of noises when switching outputs into the same state simultaneously.

Input and output levels of IN74VHC240D are compatible with CMOS levels

Features:

- Supply voltage range 2.0 to 5.5 V.
- Output current 8 mA.
- Low consumption current: 0.2 mkA (typical value) at Ta = 25 °C.
- Latchup current not less than 300 mA at Ta = 85 °C.
- Tolerable value of static potential not less than 2000 V as per human body model (HBM) and not less than 200 V as per machine model (MM).
- Ambient operation temperature minus 40 to plus 85 °C.
- Balanced signal propagation delay.
- Ensures voltage exceeding mode on input
- Low noise level at the simultaneous switching of outputs in the same state: V_{OLP} = 0.8 V (max).
- For pins and functions, compatible with IN74HC240.

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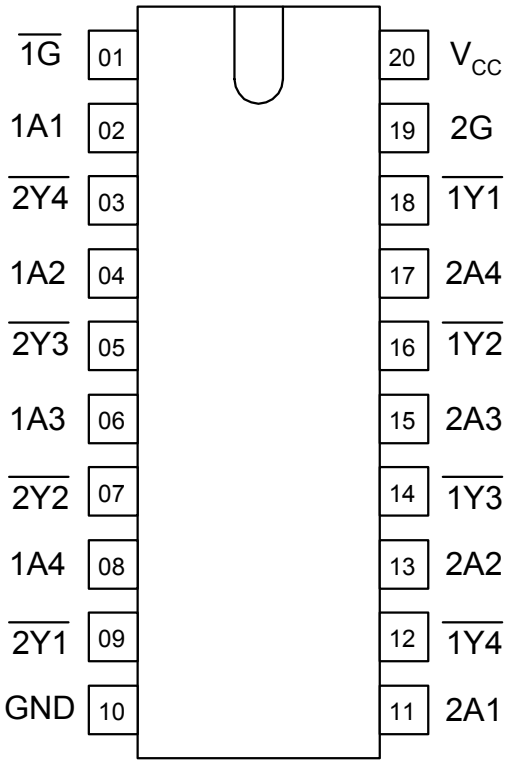
IN74VHC240D truth table

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

Note – H - high voltage level;
L – low voltage level;
X - any voltage level (low or high);
Z - output in the third

Pinout



Pins description in IN74VHC240D

Pin No.	Symbol	Description
01	$\overline{1G}$	Output enable input
02	1A1	Data input
03	$\overline{2Y4}$	Inverse data output
04	1A2	Data input
05	$\overline{2Y3}$	Inverse data output
06	1A3	Data input
07	$\overline{2Y2}$	Inverse data output
08	1A4	Data input
09	$\overline{2Y1}$	Inverse data output
10	GND	Common output
11	2A1	Data input
12	$\overline{1Y4}$	Inverse data output
13	2A2	Data input
14	$\overline{1Y3}$	Inverse data output
15	2A3	Data input
16	$\overline{1Y2}$	Inverse data output
17	2A4	Data input
18	$\overline{1Y1}$	Inverse data output
19	2G	Output enable input
20	VCC	Supply output from voltage source

Absolute maximum conditions*

Parameter, unit	Symbol	Value	
		min	max
Supply voltage, V	V_{CC}	-0.5	7.0
Input voltage, V	Vin	-0.5	7.0
Output voltage, V	Vout	-0.5	Vcc+0.5V
Input diode current, mA	Iik	–	-20
Current of common output and supply output, mA	Icc	–	± 75
Output current, mA	Iout	–	± 25
Output diode current, mA	Iok	–	± 20
Dissipated power, mW	Pd	–	180

*Under absolute maximum conditions operation of microcircuit is not guaranteed. Operation is guaranteed under maximum conditions

Maximum conditions

Parameter, unit	Symbol	Value	
		min	max
Supply voltage, V	V_{CC}	2.0	5.5
Input voltage,V	Vin	0	V_{CC}
Output voltage, V	Vout	0	V_{CC}
Output current, mA	Iout	–	± 8.0
Input rise and fall time, ns/V at Vcc = (3.3 ± 0.3) V at Vcc = (5.0 ± 0.5) V	t_{LH}, t_{HL}	 0 0	 100 20

DC electrical characteristics

Symbol	Parameter	Test conditions	V_{CC}, V	Value				Unit
				25 °C		–40 to 85 °C		
				min	max	min	max	
V_{IH}	High input voltage	–	2.0	1.5	–	1.5	–	V
			3.0-5.5	0.7Vcc	–	0.7Vcc	–	
V_{IL}	Low input voltage	–	2.0	–	0.5	–	0.5	
			3.0-5.5	–	0.3Vcc	–	0.3Vcc	
V_{OH}	High output voltage	V_I = V_{IH} or V_{IL} I_O = -50 mkA	2.0	1.92	–	1.9	–	
			3.0	2.92	–	2.9	–	
			4.5	4.42	–	4.4	–	
			5.5	5.52	–	5.4	–	
		V_I = V_{IH} or V_{IL}; I_O = -4 mA	3.0	2.58	–	2.48	–	
		V_I = V_{IH} or V_{IL}; I_O = -8 mA	4.5	3.94	–	3.80	–	
V_{OL}	Low output voltage	V_I = V_{IH} orV_{IL} I_O = 50 mkA	2.0	–	0.09	–	0.1	
			3.0	–	0.09	–	0.1	
			4.5	–	0.09	–	0.1	
			5.5	–	0.09	–	0.1	
		V_I = V_{IH} or V_{IL} I_O = 4 mA	3.0	–	0.36	–	0.44	
		V_I = V_{IH} or V_{IL} I_O = 8 mA	4.5	–	0.36	–	0.44	
I_{OZ}	Output current in "off" state	V_I = V_{IH} or V_{IL} V_O = V_{CC} or 0V	5.5	-	±0.25	-	±2.5	mkA
I_I	Input current	V_I = 5.5V or 0V	0 – 5.5	-	±0.1	-	±1.0	
I_{CC}	Consumption current	V_I =V_{CC} or 0V	5.5	-	4.0	-	40.0	

AC electrical characteristics (t_{LH} = t_{HL} = 3.0 ns)

Symbol	Parameter	Test conditions	V_{CC}, V	C_L, pF	Value				Unit
					25 °C		–40 to 85 °C		
					min	max	min	max	
t_{PHL}, t_{PLH}	Propagation delay time when switching "on", "off"	Figure 1	3.3 ± 0.3	15	–	7.5	–	9.0	ns
				50	–	11.0	–	12.5	
			5.0 ± 0.5	15	–	5.5	–	6.5	
				50	–	7.5	–	8.5	
t_{PHZ} , t_{PLZ}	Propagation delay time under transition from high , low level into "off" state	Figure 2	3.3 ± 0.3	50	–	14.0	–	16.0	
			5.0 ± 0.5	50	–	9.2	–	10.5	
t_{PZH} , t_{PZL}	Propagation delay time under transition from «off» state into high, low level	Figure 2	3.3 ± 0.3	15	–	10.6	–	12.5	
				50	–	14.1	–	16.0	
			5.0 ± 0.5	15	–	7.3	–	8.5	
				50	–	9.3	–	10.5	
t_{OSLH}, t_{OSHL}	Propagation delays difference between outputs	–	3.3 ± 0.3	50	–	1.5	–	1.5	
			5.5 ± 0.5	50	–	1.0	–	1.0	

Capacitance characteristics

Symbol	Parameter	Test conditions	V_{CC}, V	Value		Unit
				25 °C		
				min	max	
C_I	Input capacity	-	5.0		10	pF
C_O	Output capacity	-	5.0		12	pF
C_{PD}	Dynamic capacity	V_I = 0 V orV_{CC}	5.0		34	pF

Noise characteristics (C_L = 50 pF)

Symbol	Parameter	V_{CC}, V	Value		Unit
			min	max	
V_{OLP}	Positive noise of low output voltage	5.0	-	0.9	V
V_{OLV}	Negative noise of low output voltage	5.0	-0.9	-	
V_{IHD}	Input dynamic high voltage	5.0	3.5	-	
V_{ILD}	Input dynamic low voltage	5.0	-	1.5	

- Time diagram of input and output pulses

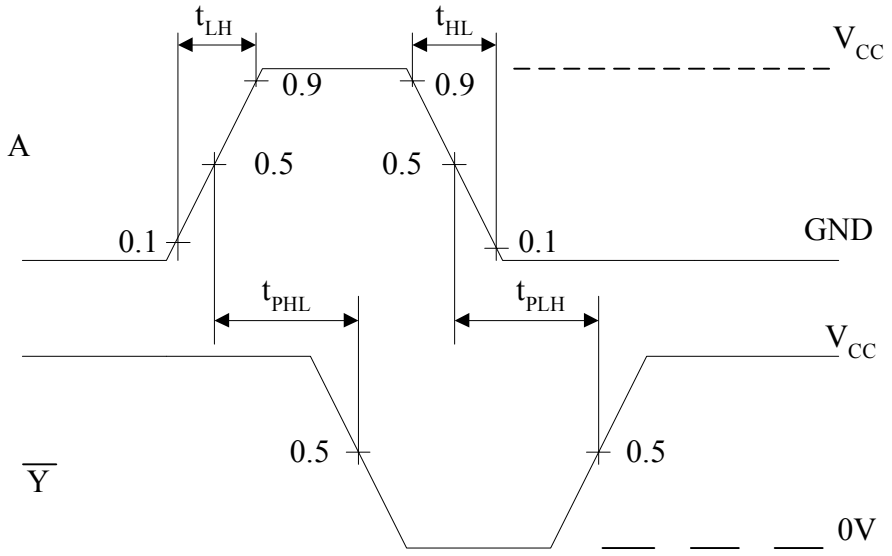


Fig. 1

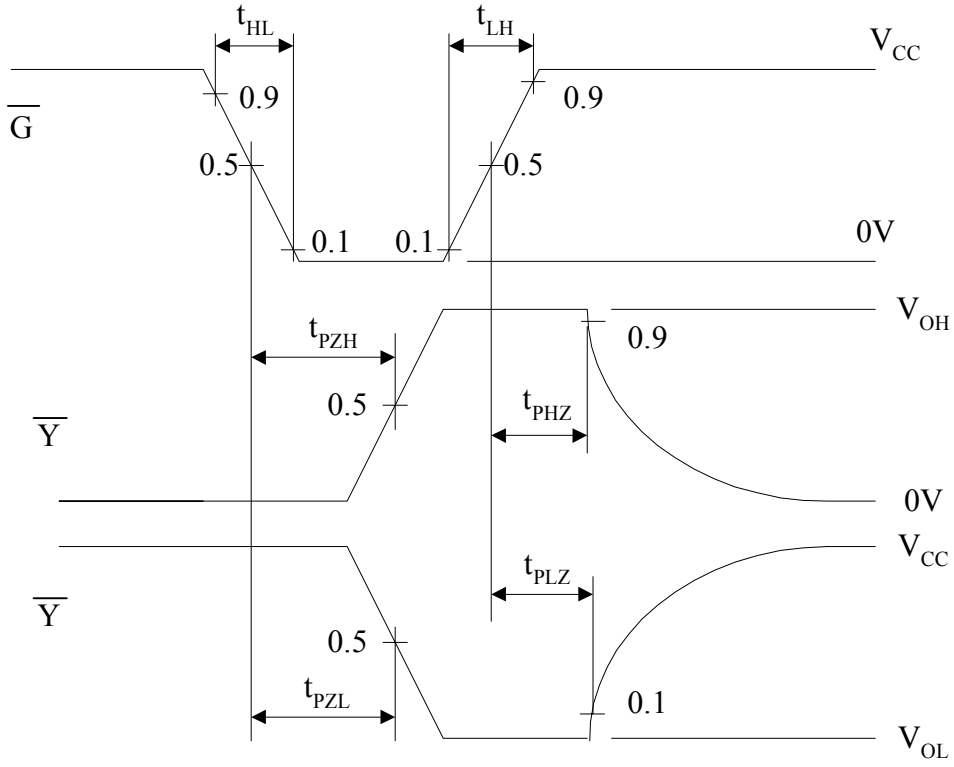


Fig.2

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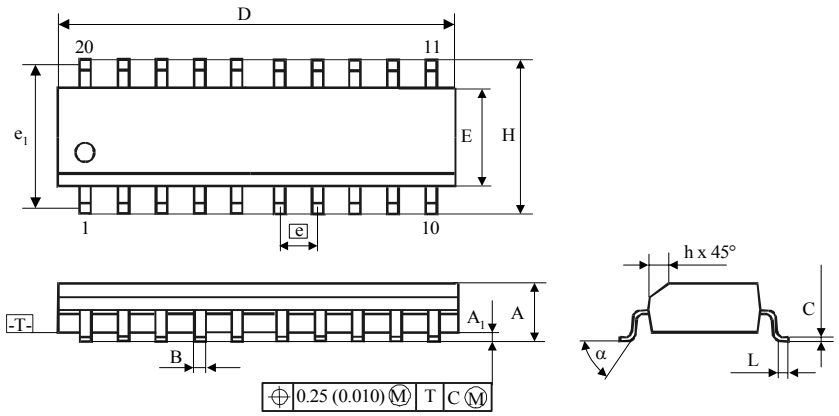
MS-013AC Package dimensions



	A	A_1	**B**	C	D	E	e	e_1	H	h	L	α
					mm							°
min	2.35	0.10	0.33	0.23	12.60	7.40	1.27	9.53	10.00	0.25	0.40	0
max	2.65	0.30	0.51	0.32	13.00	7.60	(nom)	(nom)	10.65	0.75	1.27	8

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