AiP74ACT02
Quad 2-Input Nor Gate

Product Specification

Specification Revision History：

Version	Date	Description
2024-11-A0	2024-11	New
2025-05-A1	2025-05	Modify the parameters

Contents

1、General Description

The AiP74ACT02 is quad 2-input nor gate.

Features:

- Supply voltage range:4.5V to 5.5V
- Input levels:TTL level
- Temperature range:-40℃ to +125℃
- Packaging information: DIP14/SOP14/TSSOP14

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74ACT02DA14.TB	DIP14	74ACT02	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74ACT02SA14.TR	SOP14	74ACT02	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP74ACT02TA14.TR	TSSOP14	74ACT02	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

Note: If the physical information is inconsistent with the ordering information, please refer to the actual product.

2、Block Diagram And Pin Description

2.1、Block Diagram

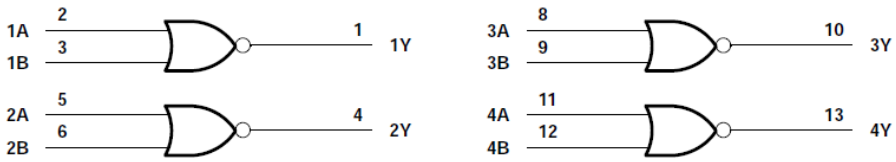
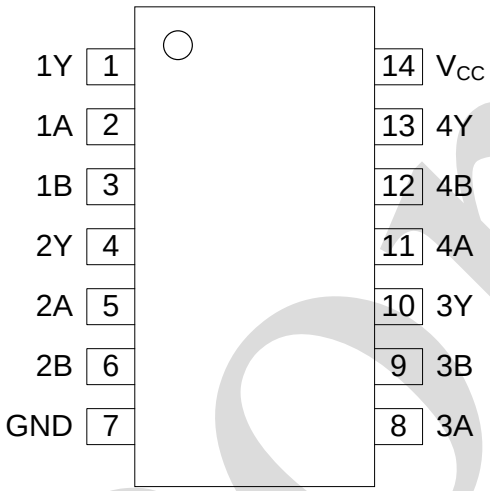


Figure 1. Logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	1Y	data output
2	1A	data input
3	1B	data input
4	2Y	data output
5	2A	data input
6	2B	data input
7	GND	ground (0V)
8	3A	data input
9	3B	data input
10	3Y	data output
11	4A	data input
12	4B	data input
13	4Y	data output
14	V_{CC}	supply voltage

2.4、Function Table

Input		Output
nA	**nB**	**nY**
H	X	L
X	H	L
L	L	H

Note: H=HIGH voltage level; L=LOW voltage level; X=Don't care.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Max.	Unit
supply voltage	V_{CC}	-		-0.5	+7	V
continuous supply current	I_{CC}	-		-	100	mA
continuous ground current	I_{GND}	-		-100	-	mA
input clamping current	I_{IK}	V_I<0V or V_I>V_{CC}		-	±20	mA
output clamping current	I_{OK}	V_O<0V or V_O>V_{CC}		-	±20	mA
continuous output current	I_O	V_O=0 to V_{CC}		-	±50	mA
storage temperature	T_{stg}	-		-65	+150	℃
soldering temperature	T_L	10s	DIP	245		℃
			SOP/TSSOP	260		

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	4.5	-	5.5	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
High-level output current	I_{OH}	-	-	-	-24	mA
Low-level output current	I_{OL}	-	-	-	24	mA
ambient temperature	T_{amb}	-	-40	-	+125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V_{CC}	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	4.5~5.5V	-	2.5	-	-	V
LOW-level input voltage	V_{IL}	4.5~5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	I_O=-50uA	4.4	-	-	V
			I_O=-24mA	3.76	-	-	V
		5.5V	I_O=-50uA	5.4	-	-	V
			I_O=-24mA	4.76	-	-	V
			I_O=-75mA	3.85	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	-	0.1	V
			I_O=24mA	-	-	0.44	V
		5.5V	I_O=50uA	-	-	0.1	V
			I_O=24mA	-	-	0.44	V
			I_O=75mA		-	1.65	V
input leakage current	I_I	5.5V	V_I=V_{CC} or GND	-	-	±20	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; I_O=0A	-	-	200	uA
additional supply current	ΔI_{CC}	5.5V	One input at V_I=V_{CC}-2.1V; Other inputs at V_{CC} or GND;I_O=0A	-	-	1.5	mA

3.3.2、AC Characteristics

(T_{amb}=-40℃ to +125℃, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V_{CC}	Conditions		Min.	Typ.	Max.	Unit
nA or nB to nY propagation delay	t_{PLH}, t_{PHL}	5.5V	C_L=50pF RL=500Ω	see Figure 4	-	-	12.2	ns

4、Testing Circuit

4.1、AC Testing Circuit

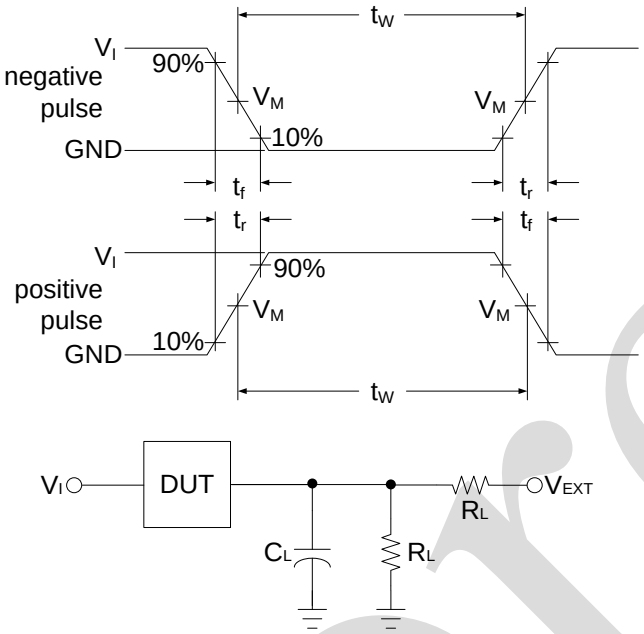


Figure 3. Test circuit for measuring switching times

C_L includes probe and jig capacitance.

4.2、Test Data

Supply voltage	Input		Load		V_{EXT}
V_{CC}	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}/t_{PHL}
5.5V	V_{CC}	≤2.5ns	50pF	500Ω	Open

4.3、AC Testing Waveforms

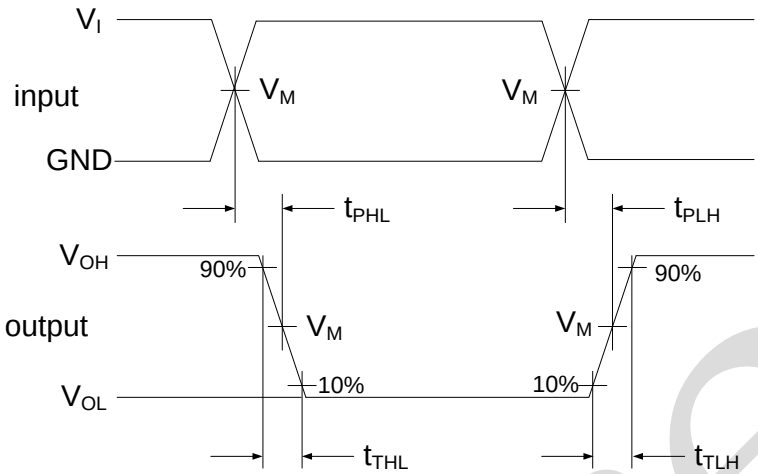


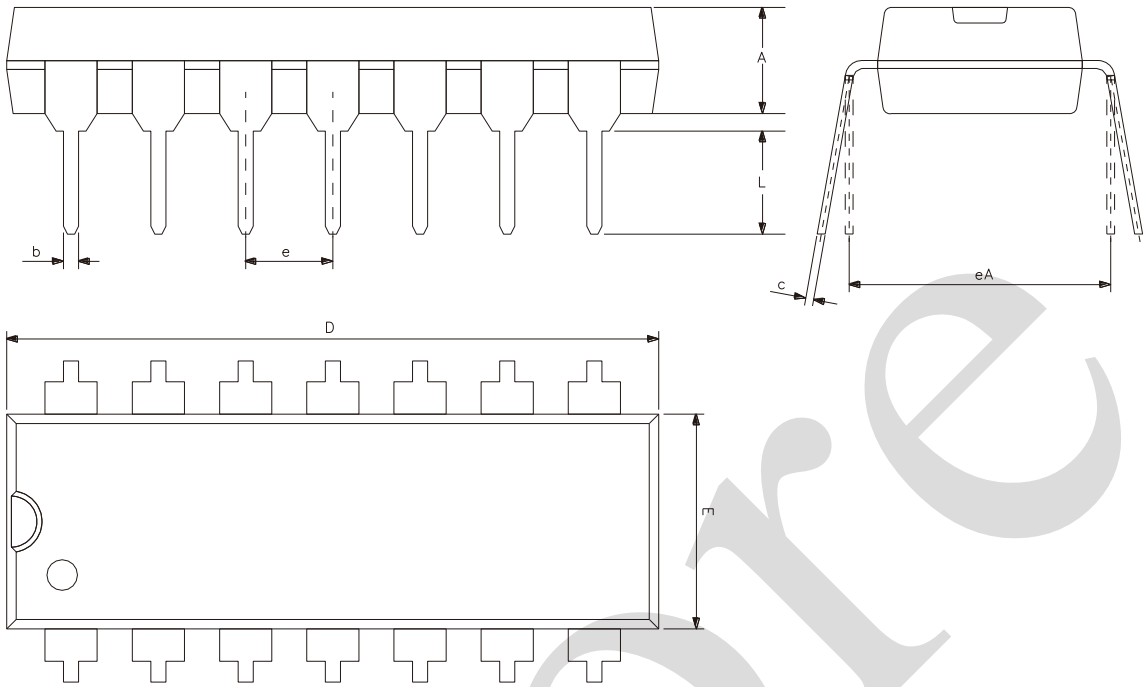
Figure 4. The data input (A or B) to output (Y) propagation delays

4.4、Measurement Points

Supply voltage	Input	Output
V_{CC}	V_M	V_M
5.5V	$0.5\times V_{CC}$	$0.5\times V_{CC}$

5、Package Information

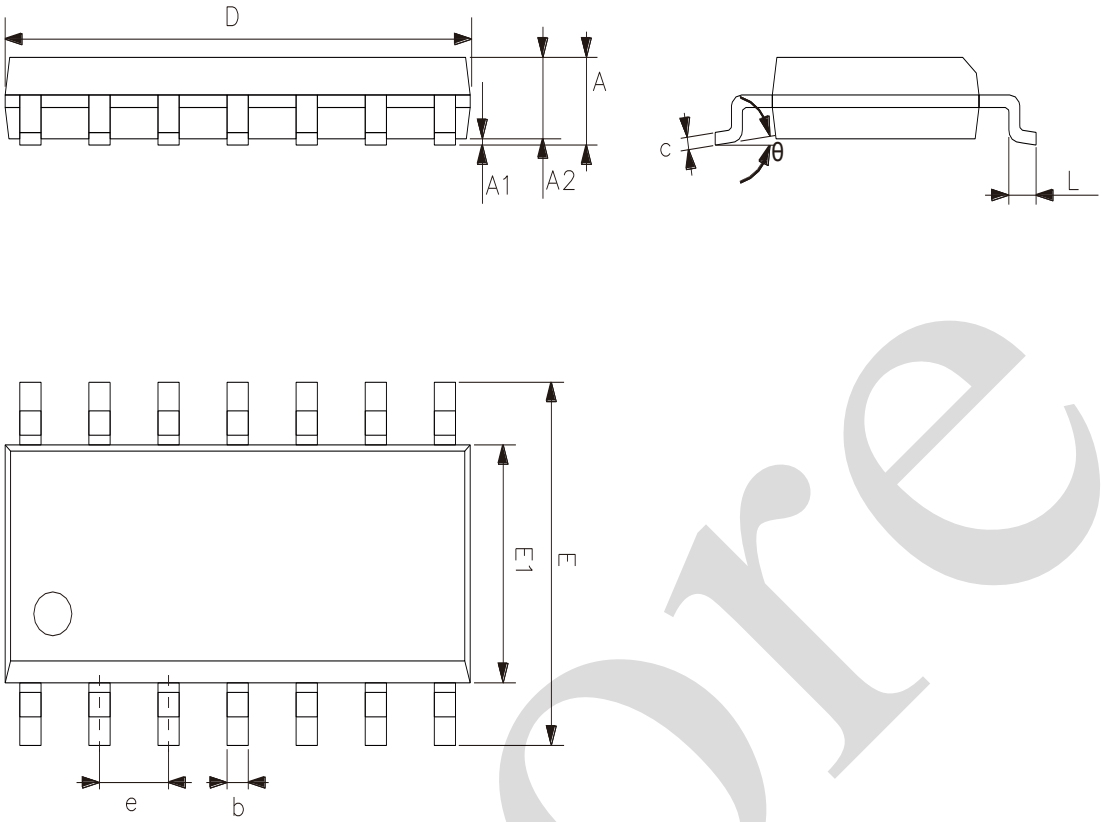
5.1、DIP14



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	3.05	3.60
b	0.33	0.56
c	0.20	0.36
D	18.80	19.40
E	6.20	6.60
e	2.54	
eA	7.62	10.90
L	2.92	—

Note: The package dimensions do not include flash and burrs, and the dimensions of flash and burrs shall not exceed 0.15mm.

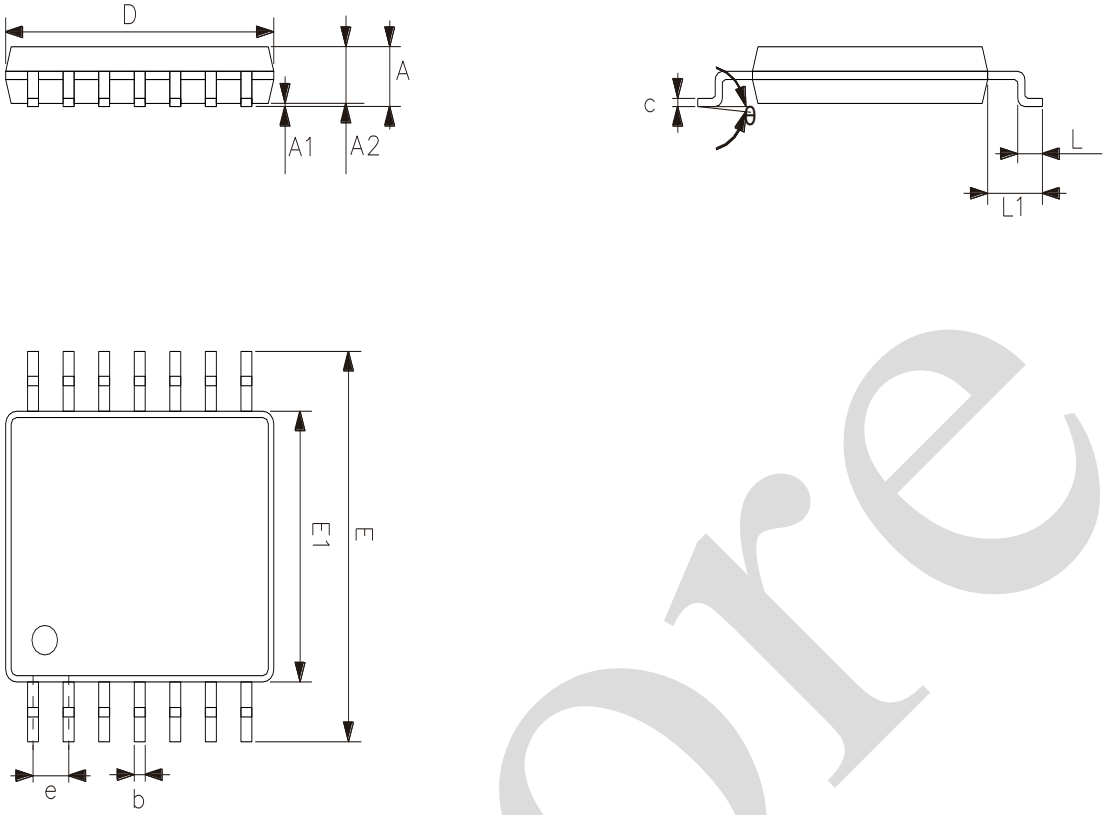
5.2、SOP14



2023/12/A	Dimensions In Millimeters	
Symbol	**Min.**	**Max.**
A	1.50	1.75
A1	0.05	0.25
A2	1.30	—
b	0.33	0.50
c	0.19	0.25
D	8.43	8.76
E	5.80	6.25
E1	3.75	4.00
e	1.27	
L	0.40	0.89
θ	0°	8°

Note: The package dimensions do not include flash and burrs, and the dimensions of flash and burrs shall not exceed 0.15mm.

5.3、TSSOP14



2023/12/A	Dimensions In Millimeters	
Symbol	**Min**	**Max**
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°

Note: The package dimensions do not include flash and burrs, and the dimensions of flash and burrs shall not exceed 0.15mm.

6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○：Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×：Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

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