



# AiP74AC02

## Quad 2-Input Nor Gate

### Product Specification

**Specification Revision History:**

Version	Date	Description
2024-11-A0	2024-11	New
2025-03-A1	2025-03	Modify the parameters



# Contents

<b>1、 General Description.....</b>	<b>3</b>
<b>2、 Block Diagram And Pin Description .....</b>	<b>4</b>
2.1、 Block Diagram .....	4
2.2、 Pin Configurations.....	4
2.3、 Pin Description .....	4
2.4、 Function Table.....	5
<b>3、 Electrical Parameter .....</b>	<b>5</b>
3.1、 Absolute Maximum Ratings.....	5
3.2、 Recommended Operating Conditions.....	5
3.3、 Electrical Characteristics .....	6
3.3.1、 DC Characteristics .....	6
3.3.2、 AC Characteristics .....	6
<b>4、 Testing Circuit .....</b>	<b>7</b>
4.1、 AC Testing Circuit .....	7
4.2、 Test Data .....	7
4.3、 AC Testing Waveforms.....	8
4.4、 Measurement Points .....	8
<b>5、 Package Information .....</b>	<b>9</b>
5.1、 DIP14 .....	9
5.2、 SOP14 .....	10
5.3、 TSSOP14.....	11
<b>6、 Statements And Notes .....</b>	<b>12</b>
6.1、 The name and content of Hazardous substances or Elements in the product.....	12
6.2、 Notes .....	12



## 1、General Description

The AiP74AC02 is quad 2-input nor gate.

### Features:

- Supply voltage range:2V to 6V
- Input levels: CMOS 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
AiP74AC02DA14.TB	DIP14	74AC02	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
AiP74AC02SA14.TR	SOP14	74AC02	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP74AC02TA14.TR	TSSOP14	74AC02	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

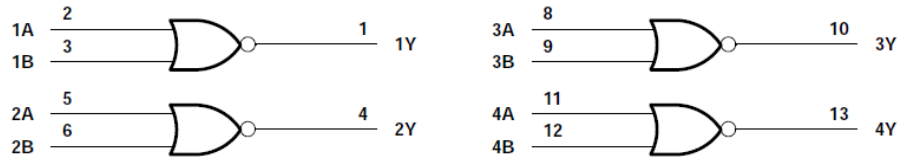


Figure 1. Logic symbol

### 2.2、Pin Configurations

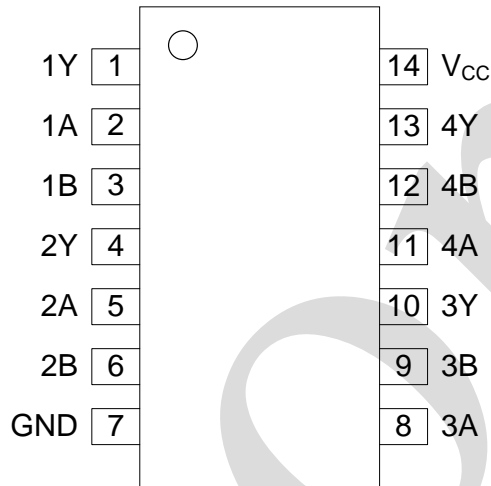


Figure 2. Pin configurations

### 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 <sub>CC</sub>	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	$I_{CC}$	-	-	200	mA
continuous ground current	$I_{GND}$	-	-200	-	mA
input clamping current	$I_{IK}$	$V_I < 0V$ or $V_I > V_{CC}$	-	$\pm 20$	mA
output clamping current	$I_{OK}$	$V_O < 0V$ or $V_O > V_{CC}$	-	$\pm 20$	mA
continuous output current	$I_O$	$V_O = 0$ to $V_{CC}$	-	$\pm 50$	mA
storage temperature	$T_{stg}$	-	-65	+150	$^{\circ}C$
soldering temperature	$T_L$	10s	DIP	245	$^{\circ}C$
			SOP/TSSOP	260	

### 3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	$V_{CC}$	-	2	-	6	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	$^{\circ}C$



## 3.3、Electrical Characteristics

### 3.3.1、DC Characteristics

( $T_{amb}=-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V <sub>CC</sub>	Conditions	Min.	Typ.	Max.	Unit
HIGH-level input voltage	V <sub>IH</sub>	3V	-	2.1	-	-	V
		4.5V	-	3.15	-	-	V
		5.5V	-	3.85	-	-	V
LOW-level input voltage	V <sub>IL</sub>	3V	-	-	-	0.9	V
		4.5V	-	-	-	1.35	V
		5.5V	-	-	-	1.65	V
HIGH-level output voltage	V <sub>OH</sub>	3V	I <sub>O</sub> =-50uA	2.9	-	-	V
			I <sub>O</sub> =-12mA	2.46	-	-	V
		4.5V	I <sub>O</sub> =-50uA	4.4	-	-	V
			I <sub>O</sub> =-24mA	3.76	-	-	V
		5.5V	I <sub>O</sub> =-50uA	5.4	-	-	V
			I <sub>O</sub> =-24mA	4.76	-	-	V
LOW-level output voltage	V <sub>OL</sub>	3V	I <sub>O</sub> =-50uA	-	-	0.1	V
			I <sub>O</sub> =-12mA	-	-	0.44	V
		4.5V	I <sub>O</sub> =50uA	-	-	0.1	V
			I <sub>O</sub> =24mA	-	-	0.44	V
		5.5V	I <sub>O</sub> =50uA	-	-	0.1	V
			I <sub>O</sub> =24mA	-	-	0.44	V
input leakage current	I <sub>I</sub>	5.5V	V <sub>I</sub> =V <sub>CC</sub> or GND	-	-	±1	uA
			supply current	I <sub>CC</sub>	5.5V	V <sub>I</sub> =V <sub>CC</sub> or GND; I <sub>O</sub> =0A	-

### 3.3.2、AC Characteristics

( $T_{amb}=-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	V <sub>CC</sub>	Conditions		Min.	Typ.	Max.	Unit
A or B to Y propagation delay	t <sub>PLH</sub>	3.3V	C <sub>L</sub> =50pF R <sub>L</sub> =500Ω	see Figure 4	-	-	14.6	ns
	t <sub>PHL</sub>				-	-	14.6	ns
	t <sub>PLH</sub>	5.5V			-	-	10.4	ns
	t <sub>PHL</sub>				-	-	10.4	ns



## 4、Testing Circuit

### 4.1、AC Testing Circuit

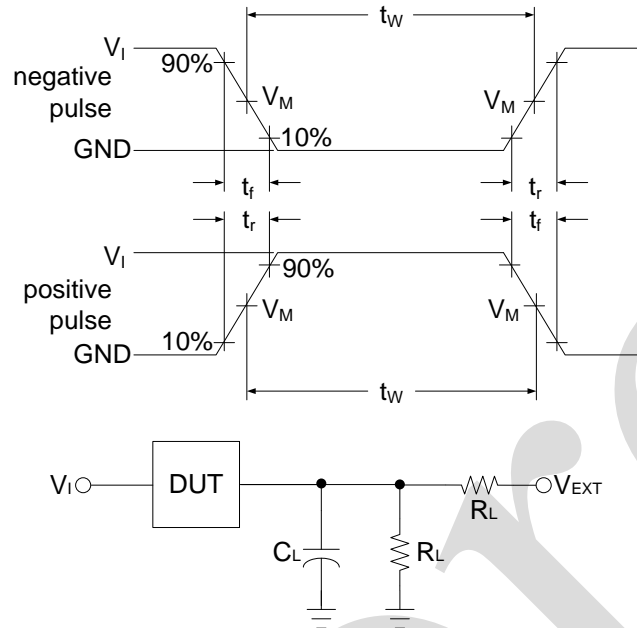


Figure 3. Test circuit for measuring switching times

$C_L$  includes probe and jig capacitance.

### 4.2、Test Data

Supply voltage	Input		Load		$V_{EXT}$		
$V_{CC}$	$V_I$	$t_r = t_f$	$C_L$	$R_L$	$t_{PLH}/t_{PHL}$	$t_{PLZ}/t_{PZL}$	$t_{PHZ}/t_{PZH}$
2V to 6V	$V_{CC}$	3.0ns	50pF	500 $\Omega$	Open	$2 \times V_{CC}$	GND



## 4.3、AC Testing Waveforms

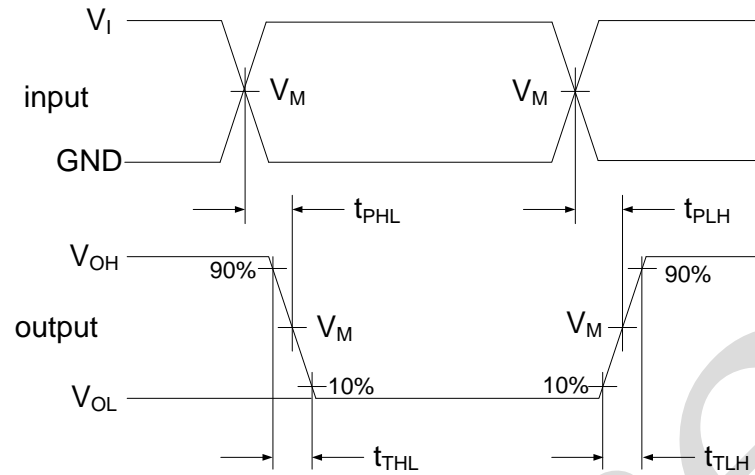


Figure 4. The data input (A) to output (Y) propagation delays

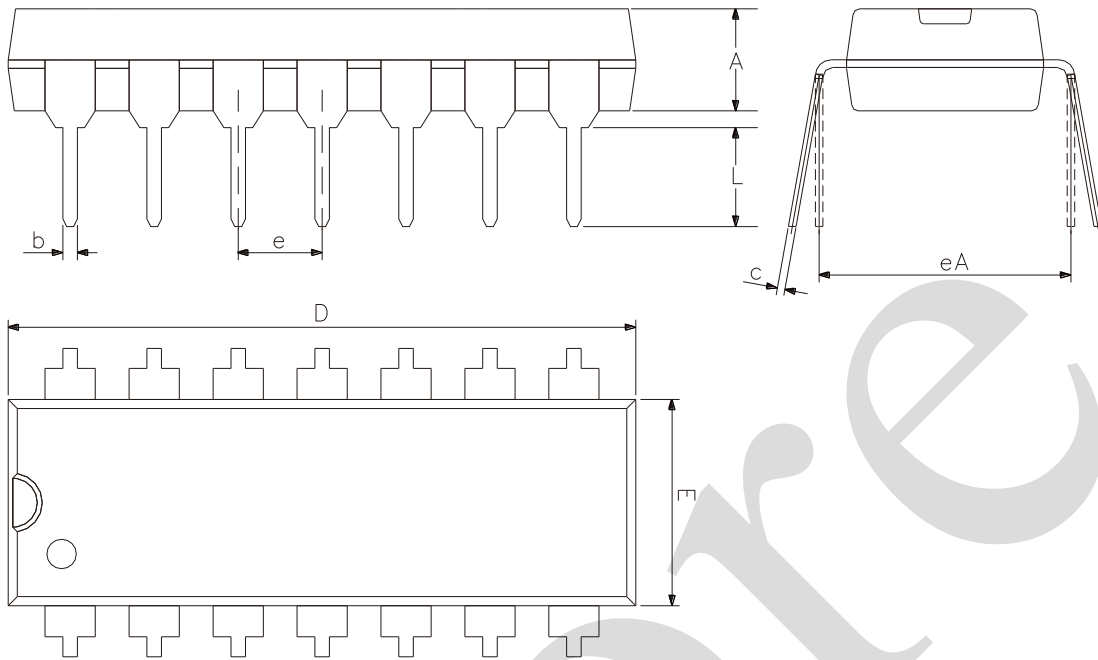
## 4.4、Measurement Points

Supply voltage	Input	Output
$V_{CC}$	$V_M$	$V_M$
2V to 6V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$



## 5、Package Information

### 5.1、DIP14

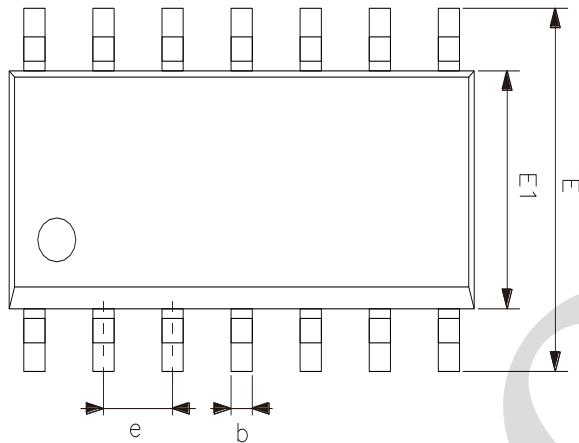
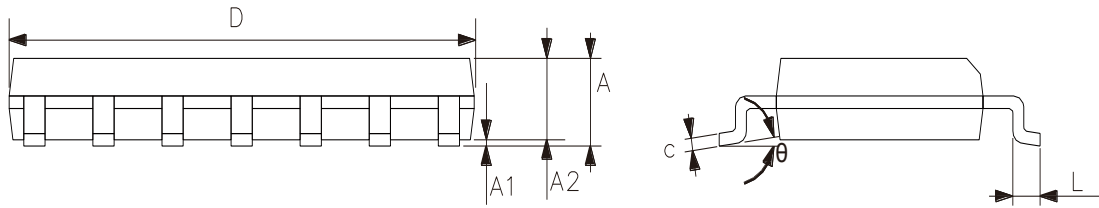


2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	3.05	3.60
b	0.33	0.56
c	0.20	0.36
D	18.80	19.40
E	6.20	6.60
e	2.54	
eA	7.62	10.90
L	2.92	—

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

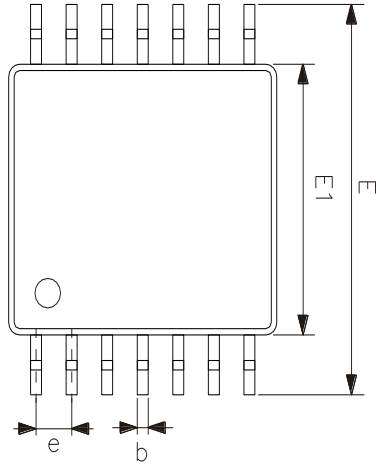
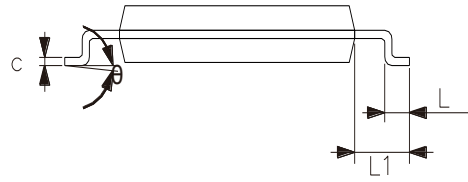
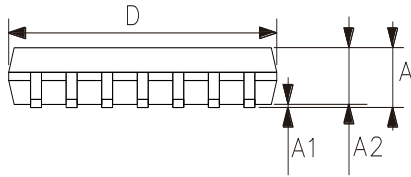


2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	1.50	1.75
A1	0.05	0.25
A2	1.30	—
b	0.33	0.50
c	0.19	0.25
D	8.43	8.76
E	5.80	6.25
E1	3.75	4.00
e	1.27	
L	0.40	0.89
θ	0°	8°

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	
$\theta$	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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