

SCAS001A – JUNE 1987 – REVISED APRIL 1993

- description**

The 54AC11030 is characterized for operation over the full military temperature range of -55°C to 125°C . The 74AC11030 is characterized for operation from -40°C to 85°C .

INPUTS A THRU H	OUTPUT Y
All inputs H	L
One or more inputs L	H

Diagram illustrating a bus system with 16 data lines and 5 control lines.

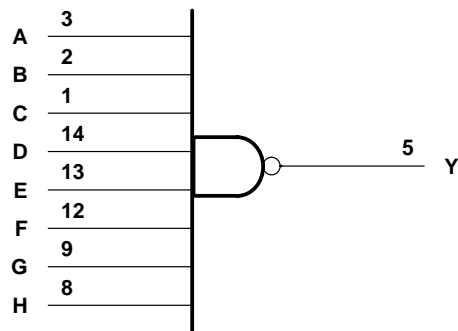
Line	Value
A	3
B	2
C	1
D	14
E	13
F	12
G	9
H	8

Control lines: 5 Y

Pin numbers shown are for the D, J, and N packages.

Pin	Label
1	C
2	B
3	A
4	GND
5	Y
6	NC
7	NC
8	H
9	G
10	NC
11	V _{CC}
12	F
13	E
14	D

logic diagram (positive logic)



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

54AC11030, 74AC11030

8-INPUT POSITIVE-NAND GATES

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC}	–0.5 V to 6 V
Input voltage range, V_I (see Note 1)	–0.5 V to $V_{CC} + 0.5$ V
Output voltage range, V_O (see Note 1)	–0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	±50 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±50 mA
Continuous current through V_{CC} or GND	±100 mA
Storage temperature range	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions

			54AC11030			74AC11030			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC}	Supply voltage		3	5	5.5	3	5	5.5	V
V _{IH}	High-level input voltage	V _{CC} = 3 V	2.1			2.1			V
		V _{CC} = 4.5 V	3.15			3.15			
		V _{CC} = 5.5 V	3.85			3.85			
V _{IL}	Low-level input voltage	V _{CC} = 3 V	0.9			0.9			V
		V _{CC} = 4.5 V	1.35			1.35			
		V _{CC} = 5.5 V	1.65			1.65			
V _I	Input voltage		0	V _{CC}		0	V _{CC}		V
V _O	Output voltage		0	V _{CC}		0	V _{CC}		V
I _{OH}	High-level output current	V _{CC} = 3 V	−4			−4			mA
		V _{CC} = 4.5 V	−24			−24			
		V _{CC} = 5.5 V	−24			−24			
I _{OL}	Low-level output current	V _{CC} = 3 V	12			12			mA
		V _{CC} = 4.5 V	24			24			
		V _{CC} = 5.5 V	24			24			
Δt/Δv	Input transition rise or fall rate		0	10		0	10		ns/V
T _A	Operating free-air temperature		−55	125		−40	85		°C

54AC11030, 74AC11030 8-INPUT POSITIVE-NAND GATES

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			54AC11030		74AC11030		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = – 50 µA	3 V	2.9			2.9		2.9		V
		4.5 V	4.4			4.4		4.4		
		5.5 V	5.4			5.4		5.4		
	I _{OH} = – 4 mA	3 V	2.58			2.4		2.48		
		4.5 V	3.94			3.7		3.8		
	I _{OH} = – 24 mA	4.5 V	3.94			4.7		4.8		
		5.5 V				3.85				
V _{OL}	I _{OL} = 50 µA	3 V			0.1		0.1		0.1	V
		4.5 V			0.1		0.1		0.1	
		5.5 V			0.1		0.1		0.1	
	I _{OL} = 12 mA	3 V			0.36		0.5		0.44	
		4.5 V			0.36		0.5		0.44	
	I _{OL} = 24 mA	4.5 V			0.36		0.5		0.44	
		5.5 V			0.36		0.5		0.44	
I _I	V _I = V _{CC} or GND	5.5 V			±0.1		±1		±1	µA
		5.5 V			4		80		40	
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V			4		80		40	µA
C _i	V _I = V _{CC} or GND	5 V		3.5						pF

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

switching characteristics over recommended operating free-air temperature range,
V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			54AC11030		74AC11030		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	Any	Y	1.5	6.9	9.1	1.5	10.6	1.5	9.9	ns
t _{PHL}			1.5	6.4	8.8	1.5	10.6	1.5	9.8	

switching characteristics over recommended operating free-air temperature range,
V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			54AC11030		74AC11030		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	Any	Y	1.5	4.8	6.7	1.5	7.7	1.5	7.2	ns
t _{PHL}			1.5	4.8	6.7	1.5	8	1.5	7.4	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

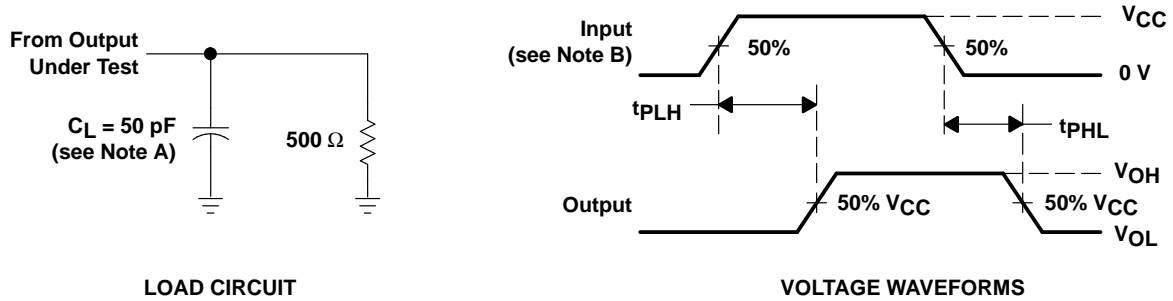
PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance per gate	C _L = 50 pF, f = 1 MHz	42	pF

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8-INPUT POSITIVE-NAND GATES

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PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.

B. Input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_O = 50 \Omega$, $t_r = 3 \text{ ns}$, $t_f = 3 \text{ ns}$.

C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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