

Quad 2-input NAND gate

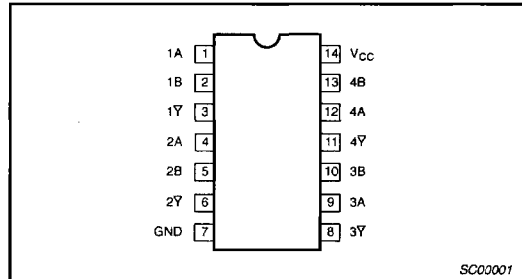
74ALS00A

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74ALS00A	4.0ns	1.0mA

ORDERING INFORMATION

DESCRIPTION	ORDER CODE	DRAWING NUMBER
	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$, $T_{amb} = 0^{\circ}C \text{ to } +70^{\circ}C$	
14-pin plastic DIP	74ALS00AN	SOT27-1
14-pin plastic SO	74ALS00AD	SOT108-1
14-pin plastic SSOP Type II	74ALS00ADB	SOT337-1

PIN CONFIGURATION

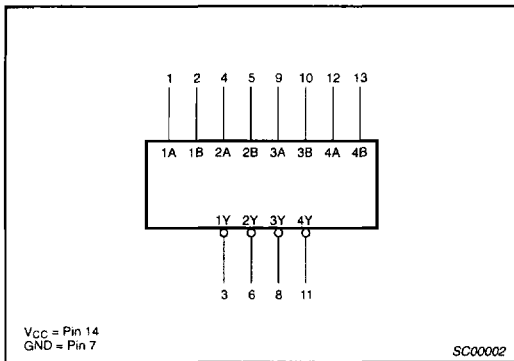


INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

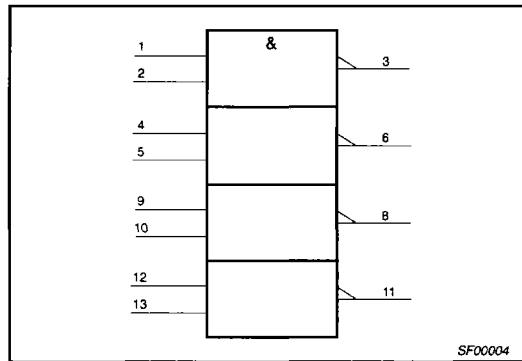
PINS	DESCRIPTION	74ALS (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
nA, nB	Data inputs	1.0/1.0	20 μ A/0.1mA
nY	Data output	20/80	0.4mA/8mA

NOTE: One (1.0) ALS unit load is defined as: 20 μ A in the High state and 0.1mA in the Low state.

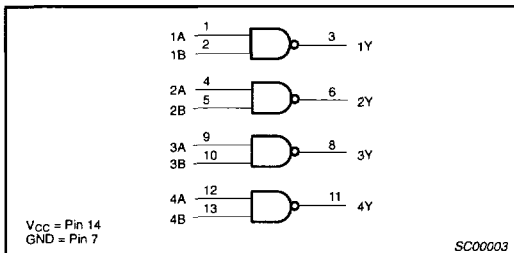
LOGIC SYMBOL



IEC/IEEE SYMBOL



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUT
nA	nB	nY
H	H	L
L	X	H
X	L	H

H = High voltage level
L = Low voltage level
X = Don't care

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ABSOLUTE MAXIMUM RATINGS

(Operation beyond the limit set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free-air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	-0.5 to +7.0	V
V_{IN}	Input voltage	-0.5 to +7.0	V
I_{IN}	Input current	-30 to +5	mA
V_{OUT}	Voltage applied to output in High output state	-0.5 to V_{CC}	V
I_{OUT}	Current applied to output in Low output state	16	mA
T_{amb}	Operating free air temperature range	0 to +70	°C
T_{stg}	Storage temperature range	-65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			UNIT
		MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5.0	5.5	V
V_{IH}	High-level input voltage	2.0			V
V_{IL}	Low-level input voltage			0.8	V
I_{IK}	Input clamp current			-18	mA
I_{OH}	High-level output current			-0.4	mA
I_{OL}	Low-level output current			8	mA
T_{amb}	Operating free-air temperature range	0		+70	°C

DC ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER	TEST CONDITIONS ¹	LIMITS			UNIT	
			MIN	TYP ²	MAX		
V_{OH}	High-level output voltage	$V_{CC} \pm 10\%$, $V_{IL} = \text{MAX}$, $V_{IH} = \text{MIN}$, $I_{OH} = -0.4 \text{ mA}$	$V_{CC} - 2$			V	
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}$, $V_{IL} = \text{MAX}$, $V_{IH} = \text{MIN}$		0.25	0.40	V	
				0.35	0.50	V	
V_{IK}	Input clamp voltage	$V_{CC} = \text{MIN}$, $I_I = I_{IK}$		-0.73	-1.5	V	
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX}$, $V_I = 7.0 \text{ V}$			0.1	mA	
I_{IH}	High-level input current	$V_{CC} = \text{MAX}$, $V_I = 2.7 \text{ V}$			20	μA	
I_{IL}	Low-level input current	$V_{CC} = \text{MAX}$, $V_I = 0.5 \text{ V}$			-0.1	mA	
I_O	Output current ³	$V_{CC} = \text{MAX}$, $V_O = 2.25 \text{ V}$	-30		-112	mA	
I_{CC}	Supply current (total)	I_{CCH}	$V_{CC} = \text{MAX}$	$V_I = \text{GND}$	0.5	0.85	mA
		I_{CCL}	$V_{CC} = \text{MAX}$	$V_I = 4.5 \text{ V}$	1.5	3.0	mA

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at $V_{CC} = 5 \text{ V}$, $T_{amb} = 25^\circ\text{C}$.
- The output conditions have been chosen to produce a current that closely approximate one half of the true short-circuit output current, I_{OS} .

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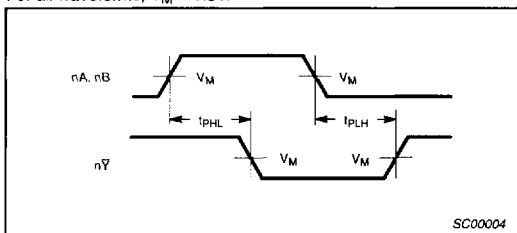
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AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS		UNIT
			T _{amb} = 0°C to +70°C V _{CC} = +5.0V ± 10% C _L = 50pF, R _L = 500Ω		
			MIN	MAX	
t _{PLH} t _{PHL}	Propagation delay nA, nB to nY	Waveform 1	2.0 2.0	11.0 8.0	ns

AC WAVEFORMS

For all waveforms, V_M = 1.3V.



Waveform 1. Propagation Delay for Data to Output

TEST CIRCUIT AND WAVEFORMS

Test Circuit for Totem-pole Outputs

Input Pulse Definition

DEFINITIONS:
 R_L = Load resistor; see AC electrical characteristics for value.
 C_L = Load capacitance includes jig and probe capacitance; see AC electrical characteristics for value.
 R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

Family	INPUT PULSE REQUIREMENTS					
	Amplitude	V _M	Rep.Rate	t _w	t _{TLH}	t _{THL}
74ALS	3.5V	1.3V	1MHz	500ns	2.0ns	2.0ns

SC00005