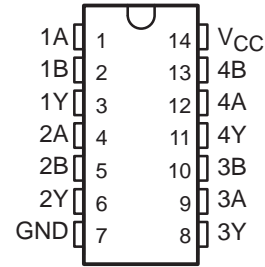


SN54ALS1000A, SN74ALS1000A, SN54AS1000A, SN74AS1000A QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS/DRIVERS

SDAS056A – D2661, APRIL 1984 – REVISED MAY 1986

- 'ALS1000A is a Buffer Version of 'ALS00B
- 'AS1000A is a Driver Version of 'AS00
- 'AS1000A Offers High Capacitive-Driver Capability
- Package Options Include Plastic Small Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

SN54ALS1000A, SN54AS1000A . . . J PACKAGE
SN74ALS1000A, SN74AS1000A . . . D OR N PACKAGE
(TOP VIEW)



description

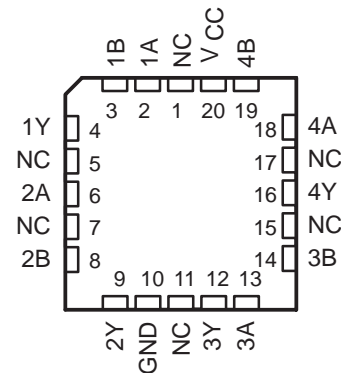
These devices contain four independent 2-input NAND buffers/drivers. They perform the Boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A + B}$ in positive logic.

The SN54ALS1000A and SN54AS1000A are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1000A and SN74AS1000A are characterized for operation from 0°C to 70°C .

FUNCTION TABLE
(each gate)

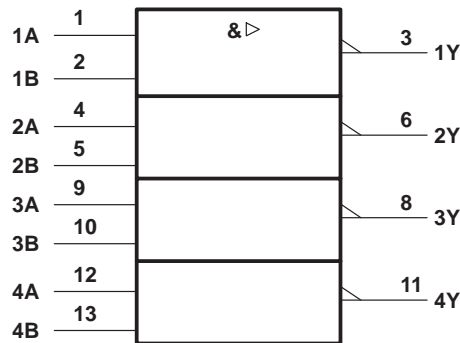
INPUTS		OUTPUT
A	B	Y
H	H	L
L	X	H
X	L	H

SN54ALS1000A, SN54AS1000A . . . FK PACKAGE
(TOP VIEW)

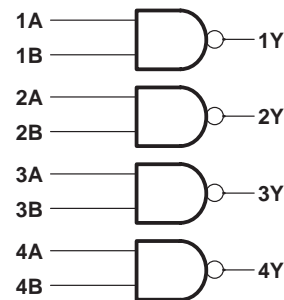


NC – No internal connection

logic symbol †



logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

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.

TEXAS
INSTRUMENTS

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5BASIC

SN54ALS1000A, SN74ALS1000A QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

SDAS056A – D2661, APRIL 1984 – REVISED MAY 1986

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

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Operating free-air temperature range:	
SN54ALS1000A	–55°C to 125°C
SN74ALS1000A	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

		SN54ALS1000A			SN74ALS1000A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			–1			–2.6	mA
I_{OL}	Low-level output current			12			24	mA
T_A	Operating free-air temperature	–55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS	SN54ALS1000A			SN74ALS1000A			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5$ V, $I_I = -18$ mA			–1.5			–1.5	V
V_{OH}	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -0.4$ mA	$V_{CC}-2$			$V_{CC}-2$			V
	$V_{CC} = 4.5$ V, $I_{OH} = -1$ mA	2.4	3.3		2.4	3.3		
	$V_{CC} = 4.5$ V, $I_{OH} = -2.6$ mA							
V_{OL}	$V_{CC} = 4.5$ V, $I_{OL} = 12$ mA		0.25	0.4		0.25	0.4	V
	$V_{CC} = 4.5$ V, $I_{OL} = 24$ mA					0.35	0.5	
I_I	$V_{CC} = 5.5$ V, $V_I = 7$ V			0.1			0.1	mA
I_{IH}	$V_{CC} = 5.5$ V, $V_I = 2.7$ V			20			20	μA
I_{IL}	$V_{CC} = 5.5$ V, $V_I = 0.4$ V			–0.1			–0.1	mA
I_{O}^{\dagger}	$V_{CC} = 5.5$ V, $V_O = 2.25$ V	–30		–112	–30		–112	mA
I_{CCH}	$V_{CC} = 5.5$ V, $V_I = 0$ V		0.86	1.6		0.86	1.6	mA
I_{CCL}	$V_{CC} = 5.5$ V, $V_I = 4.5$ V		4.8	7.8		4.8	7.8	mA

† All typical values are at $V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$.

‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5$ V, $C_L = 50$ pF, $R_L = 500$ Ω, $T_A = 25^\circ\text{C}$		$V_{CC} = 4.5$ V to 5.5 V, $C_L = 50$ pF, $R_L = 500$ Ω, $T_A = \text{MIN to MAX}$				UNIT
			ALS1000A		SN54ALS1000A		SN74ALS1000A		
			TYP		MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	4		2	10	2	8	ns
t_{PHL}	A or B	Y	5		2	10	2	7	ns

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.



SN54AS1000A, SN74AS1000A QUADRUPLE 2-INPUT POSITIVE-NAND DRIVERS

SDAS056A – D2661, APRIL 1984 – REVISED MAY 1986

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

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Operating free-air temperature range: SN54AS1000A	–55°C to 125°C
SN74AS1000A	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

		SN54AS1000A			SN74AS1000A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{OH}	High-level output current			–40			–48	mA
I_{OL}	Low-level output current			40			48	mA
T_A	Operating free-air temperature	–55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS	SN54AS1000A			SN74AS1000A			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			–1.2			–1.2	V
V_{OH}	$V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $I_{OH} = -2\text{ mA}$	$V_{CC}-2$			$V_{CC}-2$			V
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -3\text{ mA}$	2.4	3.2		2.4	3.2		
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -40\text{ mA}$	2						
	$V_{CC} = 4.5\text{ V}$, $I_{OL} = -48\text{ mA}$				2			
V_{OL}	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 40\text{ mA}$		0.25	0.5				V
	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 48\text{ mA}$					0.35	0.5	
I_I	$V_{CC} = 5.5\text{ V}$, $V_I = 7\text{ V}$			0.1			0.1	mA
I_{IH}	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			20			20	μA
I_{IL}	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$			–0.5			–0.5	mA
I_{O}^{\dagger}	$V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$	–30		–200	–30		–200	mA
I_{CCH}	$V_{CC} = 5.5\text{ V}$, $V_I = 0\text{ V}$		2.2	3.5		2.2	3.5	mA
I_{CCL}	$V_{CC} = 5.5\text{ V}$, $V_I = 4.5\text{ V}$		12	19		12	19	mA

† All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_L = 500\ \Omega$, $T_A = \text{MIN to MAX}$				UNIT
			SN54AS1000A		SN74AS1000A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	1	5	1	4	ns
t_{PHL}	A or B	Y	1	5	1	4	ns

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.



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SN54ALS1000A, Quad 2 Input With OC Outputs

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54ALS1000A
Voltage Nodes (V)	5

FEATURES

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- 'ALS1000A is a Buffer Version of 'ALS00B
- 'AS1000A is a Driver Version of 'AS00
- 'AS1000A Offers High Capacitive-Driver Capability
- Package Options Include Plastic Small Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

DESCRIPTION

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These devices contain four independent 2-input

NAND buffers/drivers. They perform the Boolean functions $Y = A \cdot B$ or $Y = A + B$ in positive logic.

The SN54ALS1000A and SN54AS1000A are characterized for operation over the full military temperature range of -55°C to 125°C. The SN74ALS1000A and SN74AS1000A are characterized for operation from 0°C to 70°C.

TECHNICAL DOCUMENTS

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DATASHEET

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Full datasheet in Acrobat PDF: [sdas056a.pdf](#) (56 KB) (Updated: 05/01/1986)

Full datasheet in Zipped PostScript: [sdas056a.psz](#) (63 KB)

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- [Logic Selection Guide Second Half 2000](#) (SDYU001N, 5035 KB - Updated: 04/17/2000)
- [MicroStar Junior BGA Design Summary](#) (SCET004, 167 KB - Updated: 07/28/2000)
- [More Power In Less Space - Technical Article](#) (SCAU001A, 850 KB - Updated: 03/01/1996)

PRICING/AVAILABILITY

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ORDERABLE DEVICE	PACKAGE	PINS	TEMP (°C)	STATUS	BUDGETARY PRICE US\$/UNIT QTY= 1000+	PACK QTY	DSCC NUMBER	PRICING/AVAILABILITY
JM38510/38401B2A	<u>FK</u>	20	-55 TO 125	ACTIVE	10.23	1		Check stock or order
JM38510/38401BCA	<u>J</u>	14	-55 TO 125	ACTIVE	6.65	500		Check stock or order

Table Data Updated on: 11/10/2000

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