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**

description

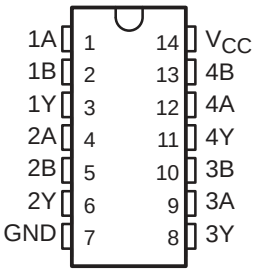
These devices contain four independent 2-input NAND buffers/drivers. They perform the Boolean functions $Y = \overline{A \bullet B}$ or $Y = \overline{A}+\overline{B}$ in positive logic.

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.

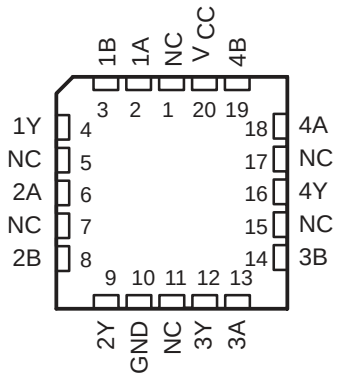
FUNCTION TABLE
(each gate)

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

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

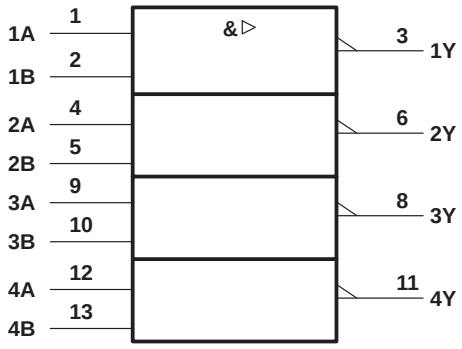


SN54ALS1000A, SN54AS1000A . . . FK PACKAGE
(TOP VIEW)

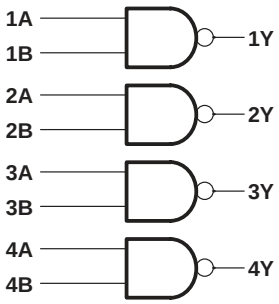


NC – No internal connection

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.

Copyright © 1988, Texas Instruments Incorporated
5BASIC

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

		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			0.7			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					
	V_{CC} = 4.5 V,	I_{OH} = –2.6 mA				2.4	3.3		
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†	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°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°C	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = 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.

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 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}	V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –2 mA	V_{CC}–2			V_{CC}–2			V
	V_{CC} = 4.5 V,	I_{OH} = –3 mA	2.4	3.2		2.4	3.2		
	V_{CC} = 4.5 V,	I_{OH} = –40 mA	2						
	V_{CC} = 4.5 V,	I_{OL} = –48 mA				2			
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 40 mA		0.25	0.5				V
	V_{CC} = 4.5 V,	I_{OL} = 48 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			–0.5			–0.5	mA
I_O†	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–200	–30		–200	mA
I_{CCH}	V_{CC} = 5.5 V,	V_I = 0 V		2.2	3.5		2.2	3.5	mA
I_{CCL}	V_{CC} = 5.5 V,	V_I = 4.5 V		12	19		12	19	mA

† All typical values are at V_{CC} = 5 V, T_A = 25°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 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = 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.

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.

Copyright © 1998, Texas Instruments Incorporated

GO GO GO
All Semiconductors
Advanced Search
TI Home | TI_ME | Employment
Tech Support | Comments | Site Map | TI Global

PRODUCT FOLDER | PRODUCT INFO: FEATURES | DESCRIPTION | DATASHEETS | PRICING/AVAILABILITY | APPLICATION NOTES | RELATED DOCUMENTS

PRODUCT SUPPORT: TRAINING

SN54ALS1000A, Quad 2 Input With OC Outputs

DEVICE STATUS: ACTIVE

PARAMETER NAME	SN54ALS1000A
Voltage Nodes (V)	5

FEATURES

Back to Top

- '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

Back to Top

These devices contain four independent 2-input

NAND buffers/drivers. They perform the Boolean functions Y = A\•\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

Back to Top

To view the following documents, Acrobat Reader 3.x is required.
To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET

Back to Top

Full datasheet in Acrobat PDF: sdas056a.pdf (56 KB) (Updated: 05/01/1986)
Full datasheet in Zipped PostScript: sdas056a.psz (63 KB)

APPLICATION NOTES

Back to Top

View Application Reports for Digital Logic

- Advanced Schottky (ALS and AS) Logic Families (SDAA010 - Updated: 08/01/1995)
- Bus-Interface Devices With Output-Damping Resistors Or Reduced-Drive Outputs (SCBA012A - Updated: 08/01/1997)
- Designing With Logic (SDYA009C - Updated: 06/01/1997)
- Input and Output Characteristics of Digital Integrated Circuits (SDYA010 - Updated: 10/01/1996)
- Live Insertion (SDYA012 - Updated: 10/01/1996)

RELATED DOCUMENTS

Back to Top

- Documentation Rules (SAP) And Ordering Information (SZZU001B, 4 KB - Updated: 05/06/1999)
- 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

Back to Top

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

Table Data Updated on: 11/ 10/ 2000

© Copyright 2000 Texas Instruments Incorporated. All rights reserved. Trademarks | Privacy Policy | Important Notice