

SN54ALS1003A, SN74ALS1003A QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS WITH OPEN-COLLECTOR OUTPUTS

SDAS239 – D2661, APRIL 1982 – REVISED MAY 1986

- Buffer Version of 'ALS03B
- 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

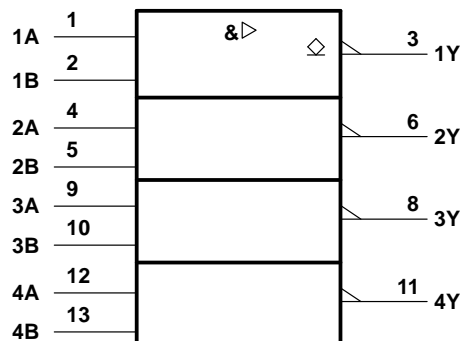
These devices contain four independent 2-input NAND buffers. They perform the Boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A + B}$ in positive logic. The open-collector outputs require pullup resistors to perform correctly. They may be connected to other open-collector outputs to implement active-low wired-OR or active-high wired-AND functions. Open-collector devices are often used to generate higher V_{OH} levels.

The SN54ALS1003A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1003A is characterized for operation from 0°C to 70°C .

FUNCTION TABLE
(each gate)

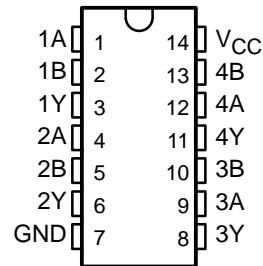
INPUTS		OUTPUT
A	B	Y
H	H	L
L	X	H
X	L	H

logic symbol†

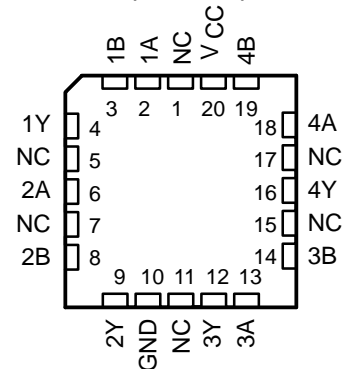


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, and N packages.

**SN54ALS1003A ... J PACKAGE
SN74ALS1003A ... D OR N PACKAGE**
(TOP VIEW)

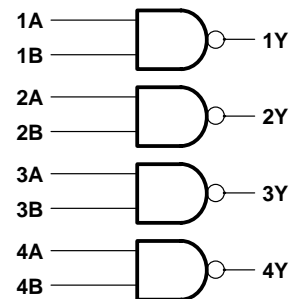


SN54ALS1003A ... FK PACKAGE
(TOP VIEW)



NC – No internal connection

logic diagram (positive logic)



SN54ALS1003A, SN74ALS1003A

QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

WITH OPEN-COLLECTOR OUTPUTS

SDAS239 – D2661, APRIL 1982 – 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
Off-state output voltage	7 V
Operating free-air temperature range: SN54ALS1003A	–55°C to 125°C
SN74ALS1003A	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

		SN54ALS1003A			SN74ALS1003A			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
V_{OH}	High-level output voltage			5.5			5.5	V
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		SN54ALS1003A		SN74ALS1003A		UNIT		
			MIN	TYP†	MAX	MIN		TYP†	MAX
V _{IK}	V _{CC} = 4.5 V,	I _I = −18 mA			−1.5		−1.5	V	
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 _{OH}	V _{CC} = 4.5 V,	V _{OH} = 5.5 V			0.1			0.1	mA
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 _{CCH}	V _{CC} = 5.5 V,	V _I = 0		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, $T_A = 25^\circ\text{C}$.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V},$ $C_L = 50\text{ pF},$ $R_L = 680\ \Omega,$ $T_A = 25^\circ\text{C}$	$V_{CC} = 4.5\text{ V to }5.5\text{ V},$ $C_L = 50\text{ pF},$ $R_L = 680\ \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			'ALS1003A	SN54ALS1003A		SN74ALS1003A		
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	18	10	40	10	33	ns
t_{PHL}	A or B	Y	7	2	18	2	12	ns

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



IMPORTANT NOTICE

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software 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, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

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

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI 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.