

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

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

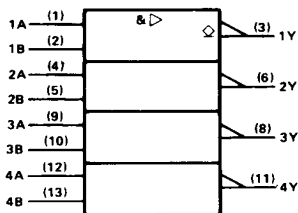
These devices contain four independent 2-input NAND buffers. They perform the Boolean functions $Y = A \cdot B$ or $Y = \bar{A} + \bar{B}$ in positive logic. The open-collector outputs require pull-up resistors to perform correctly. They may be connected to other open-collector outputs to implement active-low 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†

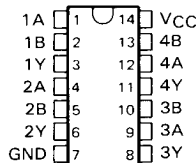


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

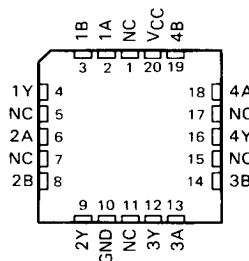
Pin numbers shown are for D, J, and N packages.

SN54ALS1003A . . . J PACKAGE
SN74ALS1003A . . . D OR N PACKAGE

(TOP VIEW)

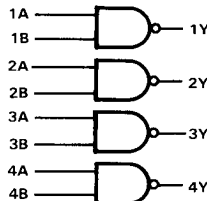


SN54ALS1003A . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

logic diagram (positive logic)



PRODUCTION DATA documents contain information 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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SN54ALS1003A, SN74ALS1003A **QUADRUPLE 2-INPUT POSITIVE-NAND GATES** **WITH OPEN-COLLECTOR OUTPUTS**

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
I_{OH}	$V_{CC} = 4.5$ V,	$V_{OH} = 5.5$ V		0.1			0.1		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_{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, $T_A = 25^\circ\text{C}$.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R _L = 680 Ω, T _A = 25 °C	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 680 Ω, T _A = 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.