

SN54ALS1002A, SN74ALS1002A QUADRUPLE 2-INPUT POSITIVE-NOR BUFFERS

SDAS238 – D2661, DECEMBER 1983 – REVISED MAY 1986

- Quad Versions of 'ALS805A
- Buffer Version of 'ALS02
- 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

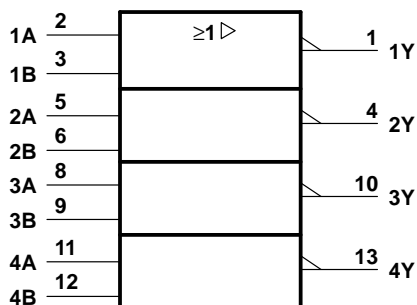
These devices contain four independent 2-input NOR buffers. They perform the Boolean functions $Y = \overline{A + B}$ or $Y = \overline{A} \cdot \overline{B}$ in positive logic.

The SN54ALS1002A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1002A is characterized for operation from 0°C to 70°C .

FUNCTION TABLE
(each gate)

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

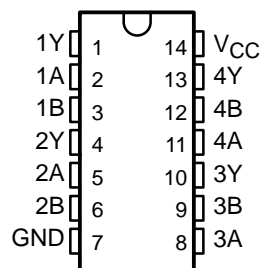
logic symbol†



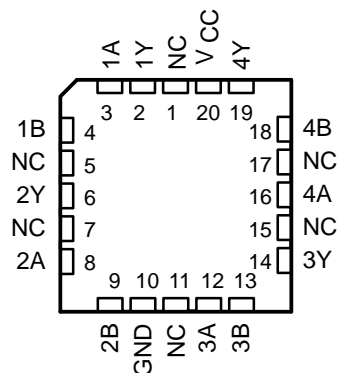
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

SN54ALS1002A ... J PACKAGE
SN74ALS1002A ... D OR N PACKAGE
(TOP VIEW)

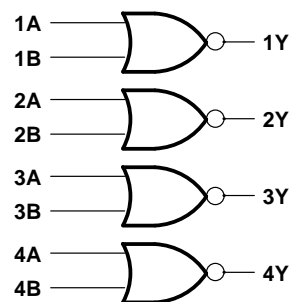


SN54ALS1002A ... FK PACKAGE
(TOP VIEW)



NC – No internal connection

logic diagram (positive logic)



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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:	SN54ALS1002A -55°C to 125°C
	SN74ALS1002A 0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS1002A			SN74ALS1002A			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	$^{\circ}\text{C}$

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

PARAMETER	TEST CONDITIONS		SN54ALS1002A			SN74ALS1002A			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$				-1.5			-1.5	V
V_{OH}	$V_{CC} = 4.5\text{ V}$ to 5.5 V , $I_{OH} = -0.4\text{ mA}$		$V_{CC}-2$			$V_{CC}-2$			V
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -1\text{ mA}$		2.4	3.3					
	$V_{CC} = 4.5\text{ V}$, $I_{OH} = -2.6\text{ mA}$					2.4	3.2		
V_{OL}	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 12\text{ mA}$		0.25	0.4		0.25	0.4		V
	$V_{CC} = 4.5\text{ V}$, $I_{OL} = 24\text{ mA}$					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}	$V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$			-0.1			-0.1		mA
I_{O}^{\dagger}	$V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$		-30	-112		-30	-112		mA
I_{CCH}	$V_{CC} = 5.5\text{ V}$, $V_I = 0\text{ V}$		1.7	2.8		1.7	2.8		mA
I_{CCL}	$V_{CC} = 5.5\text{ V}$, $V_I = 4.5\text{ V}$		5.6	9		5.6	9		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)	$V_{CC} = 5\text{ V},$ $C_L = 50\text{ pF},$ $R_L = 500\ \Omega,$ $T_A = 25^{\circ}\text{C}$	$V_{CC} = 4.5\text{ V to }5.5\text{ V},$ $C_L = 50\text{ pF},$ $R_L = 500\ \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			'ALS1002A	SN54ALS1002A		SN74ALS1002A		
			TYP	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	4	2	10	2	8	ns
t_{PHL}	A or B	Y	4	2	10	2	7	ns

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

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