

SN54ALS1010A, SN74ALS1010A TRIPLE 3-INPUT POSITIVE-NAND BUFFERS

D2661, APRIL 1982—REVISED MAY 1986

- Buffer Version of 'ALS10A
- Package Options Include Plastic "Small Outline" DIPs and Ceramic Chip Carriers in Addition to the Standard 300-mil Plastic and Ceramic DIPs.
- Dependable Texas Instruments Quality and Reliability

description

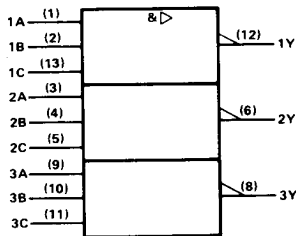
These devices contain three independent 3-input NAND buffers. They perform the Boolean functions $Y = \overline{A \cdot B \cdot C}$ or $Y = \overline{\overline{A} + \overline{B} + \overline{C}}$ in positive logic.

The SN54ALS1010A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1010A is characterized for operation from 0°C to 70°C .

FUNCTION TABLE (EACH GATE)

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

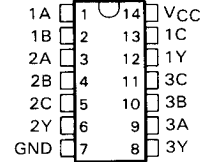
logic symbol†



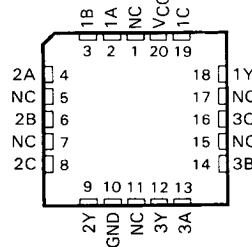
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

SN54ALS1010A . . . J PACKAGE
SN74ALS1010A . . . D OR N PACKAGE
(TOP VIEW)

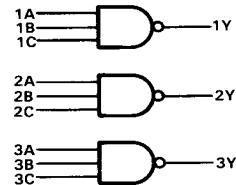


SN54ALS1010A . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

logic diagram (positive logic)



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INSTRUMENTS

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SN54ALS1010A, SN74ALS1010A
TRIPLE 3-INPUT POSITIVE-NAND BUFFERS

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: SN54ALS1010A	-55°C to 125°C
SN74ALS1010A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS1010A			SN74ALS1010A			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		SN54ALS1010A			SN74ALS1010A			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}	$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $I_{OH} = -0.4\text{ mA}$		$V_{CC}-2$			$V_{CC}-2$			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}	$V_{CC} = 5.5\text{ V}$, $V_I = 0\text{ V}$			0.65	1.2		0.65	1.2	mA
I_{CCL}	$V_{CC} = 5.5\text{ V}$, $V_I = 4.5\text{ V}$			3.6	5.8		3.6	5.8	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 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		
			ALS1010A	SN54ALS1010A	SN74ALS1010A			
			TYP	MIN	MAX		MIN	MAX
t _{PLH}	Any	Y	5	2	12	2	8	ns
t _{PHL}			5	2	12	2	8	

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