

SN54ALS1011A, SN74ALS1011A TRIPLE 3-INPUT POSITIVE-AND BUFFERS

D2661, APRIL 1982 - REVISED MAY 1986

- Buffer Version of 'ALS11
- 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

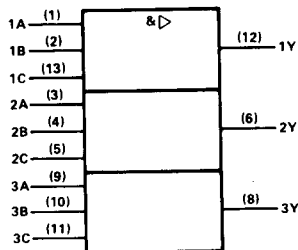
These devices contain three independent 3-input AND buffers. They perform the Boolean functions $Y = A \cdot B \cdot C$ or $Y = \overline{A + B + C}$ in positive logic.

The SN54ALS1011A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1011A is characterized for operation from 0°C to 70°C .

FUNCTION TABLE (each gate)

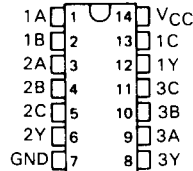
INPUTS			OUTPUT
A	B	C	Y
H	H	H	H
L	X	X	L
X	L	X	L
X	X	L	L

logic symbol†

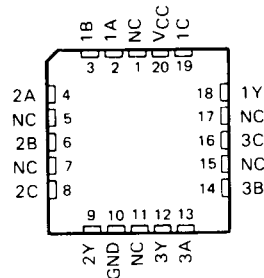


†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, and N packages.

SN54ALS1011A . . . J PACKAGE
SN74ALS1011A . . . D OR N PACKAGE
(TOP VIEW)

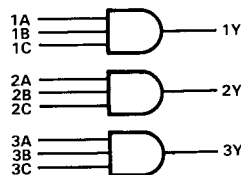


SN54ALS1011A . . . FK PACKAGE
(TOP VIEW)



NC - No internal connection

logic diagram (positive logic)



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INSTRUMENTS

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ALS and AS Circuits

SN54ALS1011A, SN74ALS1011A

TRIPLE 3-INPUT POSITIVE-AND 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: SN54ALS1011A	-55 °C to 125 °C
SN74ALS1011A	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54ALS1011A			SN74ALS1011A			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	SN54ALS1011A			SN74ALS1011A			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+}	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$	-30		-112	-30		-112	mA
I_{CCH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 4.5 \text{ V}$		1.4	2.3		1.4	2.3	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0 \text{ V}$		4.3	7		4.3	7	mA

†All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25 \text{ °C}$.

‡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} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 500 Ω, T _A = MIN to MAX				UNIT
			SN54ALS1011A		SN74ALS1011A		
			MIN	MAX	MIN	MAX	
t _{PLH}	Any	Y	2	12	2	10	ns
t _{PHL}			3	11	3	9	

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