

SN54ALS28A, SN74ALS28A QUADRUPLE 2-INPUT POSITIVE-NOR BUFFERS

D2661, APRIL 1982—REVISED MAY 1986

- 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

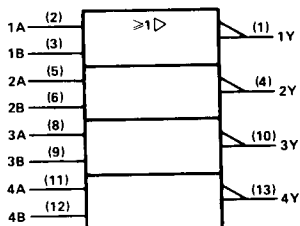
These devices contain four independent 2-input NOR buffer gates. They perform the Boolean functions $Y = \overline{A+B}$ or $Y = \overline{A \cdot B}$ in positive logic.

The SN54ALS28A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS28A is characterized for operation from 0°C to 70°C .

FUNCTION TABLE (each gate)

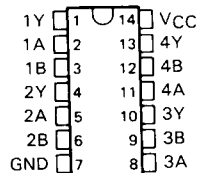
INPUTS		OUTPUT
A	B	Y
H	X	L
X	H	L
L	L	H

logic symbol†

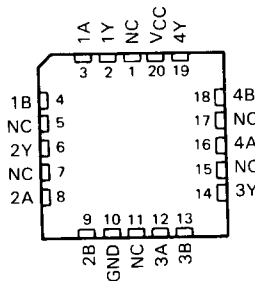


†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, and N packages.

SN54ALS28A . . . J PACKAGE
SN74ALS28A . . . D OR N PACKAGE
(TOP VIEW)

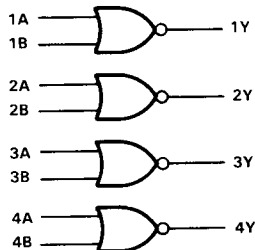


SN54ALS28A . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

logic diagram (positive logic)



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SN54ALS28A, SN74ALS28A QUADRUPLE 2-INPUT POSITIVE-NOR 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: SN54ALS28A	-55°C to 125°C
SN74ALS28A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS28A			SN74ALS28A			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			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	SN54ALS28A			SN74ALS28A			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}	$V_{CC} = 4.5 V, I_I = -18 mA$	-1.5			-1.5			V
V_{OH}	$V_{CC} = 4.5 V$ to 5.5 V, $I_{OH} = -0.4 mA$	$V_{CC} - 2$			$V_{CC} - 2$			V
	$V_{CC} = 4.5 V, I_{OH} = -1 mA$	2.4	3.3					
	$V_{CC} = 4.5 V, I_{OH} = -2.6 mA$				2.4	3.3		
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_O^{\ddagger}	$V_{CC} = 5.5 V, V_O = 2.25 V$	-30	-112	-30	-112	mA		
I_{CCH}	$V_{CC} = 5.5 V, V_I = 0 V$	1.7 2.8			1.7 2.8			mA
I_{CCL}	$V_{CC} = 5.5 V, V_I = 4.5 V$	5.6 9			5.6 9			mA

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

‡ 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)	$V_{CC} = 5 V,$ $C_L = 50 pF,$ $R_L = 500 \Omega,$ $T_A = 25^\circ C$	$V_{CC} = 4.5 V$ to 5.5 V, $C_L = 50 pF,$ $R_L = 500 \Omega,$ $T_A = MIN$ to MAX				UNIT
				'ALS28A		SN74ALS28A		
				TYP	MIN	MAX	MIN	
t_{PLH}	A or B	Y	4	1	16	2	8	ns
t_{PHL}	A or B	Y	4	1	10	2	7	

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

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ALS and AS Circuits