

SN54ALS1008A, SN54AS1008A, SN74ALS1008A, SN74AS1008A QUADRUPL 2-INPUT POSITIVE-AND BUFFERS/DRIVERS

D2661, DECEMBER 1982—REVISED MAY 1986

- 'ALS1008A is a Buffer Version of 'ALS08
- 'AS1008A is a Driver Version of 'AS08
- 'AS1008A Offers High Capacitive Drive Capability
- 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

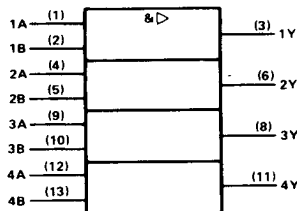
These devices contain four independent 2-input AND buffers/drivers. They perform the Boolean functions $Y = A \cdot B$ or $Y = \overline{A} + \overline{B}$ in positive logic.

The SN54ALS1008A and SN54AS1008A are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1008A and SN74AS1008A are characterized for operation from 0°C to 70°C .

FUNCTION TABLE
(each gate)

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

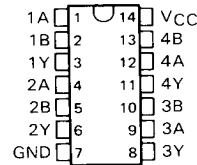
logic symbol†



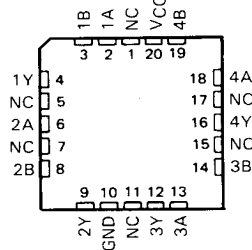
Pin numbers shown are for D, J, and N packages.

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

SN54ALS1008A, SN54AS1008A ... J PACKAGE
SN74ALS1008A, SN74AS1008A ... D OR N PACKAGE
(TOP VIEW)

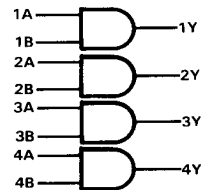


SN54ALS1008A, SN54AS1008A ... FK PACKAGE
(TOP VIEW)



NC—No internal connection

logic diagram (positive logic)



PRODUCTION DATA

This document contains 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
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

Copyright © 1982, Texas Instruments Incorporated

2-839

SN54ALS1008A, SN74ALS1008A
QUADRUPLE 2-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: SN54ALS1008A	-55°C to 125°C
SN74ALS1008A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS1008A			SN74ALS1008A			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	SN54ALS1008A			SN74ALS1008A			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				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}	$V_{CC} = 5.5 \text{ V}, V_I = 4.5 \text{ V}$		1.8	3		1.8	3	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}, V_I = 0 \text{ V}$		5.7	9.3		5.7	9.3	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} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 500 Ω, T _A = MIN to MAX				UNIT
			SN54ALS1008A		SN74ALS1008A		
			MIN	MAX	MIN	MAX	
t _{PLH}	A or B	Y	2	11	2	9	ns
t _{PHL}			3	11	3	9	

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

SN54AS1008A, SN74AS1008A QUADRUPLE 2-INPUT POSITIVE-AND DRIVERS

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: SN54AS1008A	-55°C to 125°C
SN74AS1008A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54AS1008A			SN74AS1008A			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			0.8			0.8	V
I_{OH}	High-level output current			-40			-48	mA
I_{OL}	Low-level output current			40			48	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	SN54AS1008A			SN74AS1008A			UNIT
		MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$			-1.2			-1.2	V
V_{OH}	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $I_{OH} = -2 \text{ mA}$	$V_{CC} - 2$			$V_{CC} - 2$			V
	$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -3 \text{ mA}$	2.4	3.2		2.4	3.2		
	$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -40 \text{ mA}$	2						
	$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -48 \text{ mA}$				2			
V_{OL}	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 40 \text{ mA}$	0.25	0.5					V
	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 48 \text{ mA}$				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}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$		-0.5			-0.5		mA
$I_O^{\dagger}$	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$	-50	-200		-50	-200		mA
I_{CCH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 4.5 \text{ V}$		5.6	9.5		5.6	9.5	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0 \text{ V}$		13.5	22		13.5	22	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)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_L = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54AS1008A		SN74AS1008A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y	1	6.5	1	6	ns
t_{PHL}			1	6.5	1	6	

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

TEXAS
INSTRUMENTS

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

2-841