

SN54ALS1808A, SN54AS1808, SN74ALS1808A, SN74AS1808 HEX 2-INPUT AND DRIVERS

AUGUST 1984—REVISED MAY 1986

- High Capacitive Drive Capability
- 'ALS1808A Has Typical Delay Time of 4.8 ns ($C_L = 50$ pF) and Typical Power Dissipation of 4.5 mW per Gate
- 'AS1808 Has Typical Delay Time of 3.2 ns ($C_L = 50$ pF) and Typical Power Dissipation of Less than 13 mW per Gate
- Center VCC and GND Configuration Provides Minimum Lead Inductance in High Current Switching Applications
- 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 six independent 2-input AND drivers. They perform the Boolean functions $Y = A \cdot B$ or $Y = \bar{A} \cdot \bar{B}$ in positive logic.

The center pin configuration used in the 'ALS1808A and 'AS1808 provides a reduction of lead inductance when compared to the 'ALS808A and 'AS808B. This reduction of lead inductance will minimize noise generated onto either the VCC or GND bus. This reduction is significant in high current switching applications.

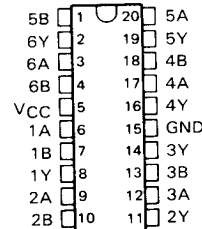
The SN54ALS1808A and SN54AS1808 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1808A and SN74AS1808 are characterized for operation from 0°C to 70°C .

FUNCTION TABLE (each driver)

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

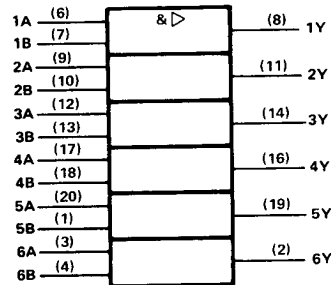
SN54ALS1808A, SN54AS1808 ... J PACKAGE
SN74ALS1808A, SN74AS1808 ... N PACKAGE

(TOP VIEW)



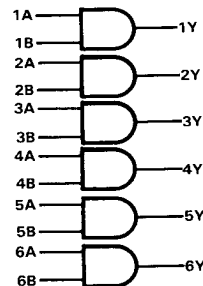
Use 'ALS808A or 'AS808B for chip carrier option.

logic symbol†



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

logic diagram (positive logic)



PRODUCTION DATA documents contain 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.

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INSTRUMENTS

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SN54ALS1808A, SN75ALS1808A HEX 2-INPUT 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: SN54ALS1808A	-55°C to 125°C
SN74ALS1808A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS1808A			SN74ALS1808A			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			-12			-15	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		SN54ALS1808A			SN74ALS1808A			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA		-1.2			-1.2			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} = -3 mA		2.4	3.2		2.4	3.2		
	V _{CC} = 4.5 V, I _{OH} = -12 mA		2						
	V _{CC} = 4.5 V, I _{OH} = -15 mA					2			
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 [†]	V _{CC} = 5.5 V, V _O = 2.25 V		-30	-112		-30	-112	mA	
I _{CCH}	V _{CC} = 5.5 V, V _I = 4.5 V		4.5	7		4.5	7	mA	
I _{CCL}	V _{CC} = 5.5 V, V _I = 0 V		8	16		8	16	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		
			ALS1808A	SN54ALS1808A	SN74ALS1808A			
			TYP	MIN	MAX		MIN	MAX
t_{PLH}	A or B	Y	6	2	11	2	9	ns
t_{PHL}			4	1	10	1	8	

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

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: SN54AS1808	-55°C to 125°C
SN74AS1808	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54AS1808			SN74AS1808			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		SN54AS1808			SN74AS1808			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
$I_{O\ddagger}$	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$		-50		-200	-50		-200	mA
I_{CCH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 4.5 \text{ V}$			8	13		8	13	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0 \text{ V}$			20	33		20	33	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
			SN54AS1808		SN74AS1808		
			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.