

# SN54ALS08, SN54AS08, SN74ALS08, SN74AS08 QUADRUPLE 2-INPUT POSITIVE-AND GATES

SDAS191A – APRIL 1982 – REVISED DECEMBER 1994

- Package Options Include Plastic Small-Outline (D) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

## description

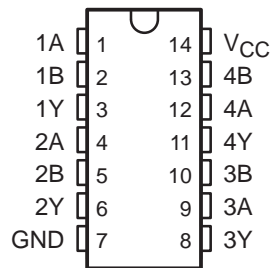
These devices contain four independent 2-input positive-AND gates. They perform the Boolean functions  $Y = A \bullet B$  or  $Y = \bar{A} + \bar{B}$  in positive logic.

The SN54ALS08 and SN54AS08 are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74ALS08 and SN74AS08 are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

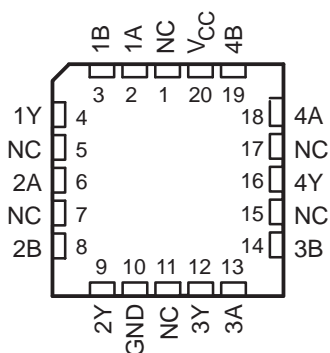
FUNCTION TABLE  
(each gate)

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

SN54ALS08, SN54AS08 . . . J PACKAGE  
SN74ALS08, SN74AS08 . . . D OR N PACKAGE  
(TOP VIEW)

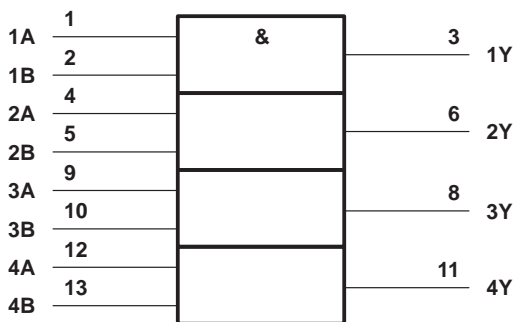


SN54ALS08, SN54AS08 . . . FK PACKAGE  
(TOP VIEW)

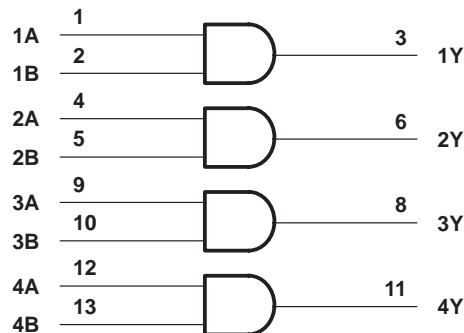


NC – No internal connection

## logic symbol†



## logic diagram (positive logic)



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

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

# SN54ALS08, SN54AS08, SN74ALS08, SN74AS08 QUADRUPLE 2-INPUT POSITIVE-AND GATES

SDAS191A – APRIL 1982 – REVISED DECEMBER 1994

## absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, $V_{CC}$	7 V
Input voltage, $V_I$	7 V
Operating free-air temperature range, $T_A$ : SN54ALS08	–55°C to 125°C
SN74ALS08	0°C to 70°C
Storage temperature range	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

## recommended operating conditions

		SN54ALS08			SN74ALS08			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
				0.7§				
$I_{OH}$	High-level output current			–0.4			–0.4	mA
$I_{OL}$	Low-level output current			4			8	mA
$T_A$	Operating free-air temperature	–55		125	0		70	°C

‡ Applies over temperature range –55°C to 70°C

§ Applies over temperature range 70°C to 125°C

## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	SN54ALS08			SN74ALS08			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
$V_{OL}$	$V_{CC} = 4.5 V$		0.25	0.4		0.25	0.4	V
		$I_{OL} = 4 mA$				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
$I_{O}^{\#}$	$V_{CC} = 5.5 V$ , $V_O = 2.25 V$	–20		–112	–30		–112	mA
$I_{CCH}$	$V_{CC} = 5.5 V$ , $V_I = 4.5 V$		1.3	2.4		1.3	2.4	mA
$I_{CCL}$	$V_{CC} = 5.5 V$ , $V_I = 0$		2.2	4		2.2	4	mA

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

# The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .



# SN54ALS08, SN54AS08, SN74ALS08, SN74AS08 QUADRUPLE 2-INPUT POSITIVE-AND GATES

SDAS191A – APRIL 1982 – REVISED DECEMBER 1994

## switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5\text{ V to }5.5\text{ V},$ $C_L = 50\text{ pF},$ $R_L = 500\ \Omega,$ $T_A = \text{MIN to MAX}^\dagger$				UNIT
			SN54ALS08		SN74ALS08		
			MIN	MAX	MIN	MAX	
$t_{PLH}$	A or B	Y	2	14	4	14	ns
$t_{PHL}$			2	12.5	3	10	

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

## absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>‡</sup>

Supply voltage, $V_{CC}$	7 V
Input voltage, $V_I$	7 V
Operating free-air temperature range, $T_A$ : SN54AS08	-55°C to 125°C
SN74AS08	0°C to 70°C
Storage temperature range	-65°C to 150°C

<sup>‡</sup> Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

## recommended operating conditions

	SN54AS08			SN74AS08			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			-2			-2	mA
$I_{OL}$ Low-level output current			20			20	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	SN54AS08			SN74AS08			UNIT
		MIN	TYP <sup>§</sup>	MAX	MIN	TYP <sup>§</sup>	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
$V_{OL}$	$V_{CC} = 4.5\text{ V},$ $I_{OL} = 20\text{ mA}$	0.35	0.5		0.35	0.5		V
$I_I$	$V_{CC} = 5.5\text{ V},$ $V_I = 7\text{ V}$		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
$I_{O}^{\parallel}$	$V_{CC} = 5.5\text{ V},$ $V_O = 2.25\text{ V}$	-30	-112		-30	-112		mA
$I_{CCH}$	$V_{CC} = 5.5\text{ V},$ $V_I = 4.5\text{ V}$		5.8	9.3		5.8	9.3	mA
$I_{CCL}$	$V_{CC} = 5.5\text{ V},$ $V_I = 0$		14.9	24		14.9	24	mA

<sup>§</sup> All typical values are at  $V_{CC} = 5\text{ V}, T_A = 25^\circ\text{C}.$

<sup>¶</sup> The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}.$



# SN54ALS08, SN54AS08, SN74ALS08, SN74AS08 QUADRUPLE 2-INPUT POSITIVE-AND GATES

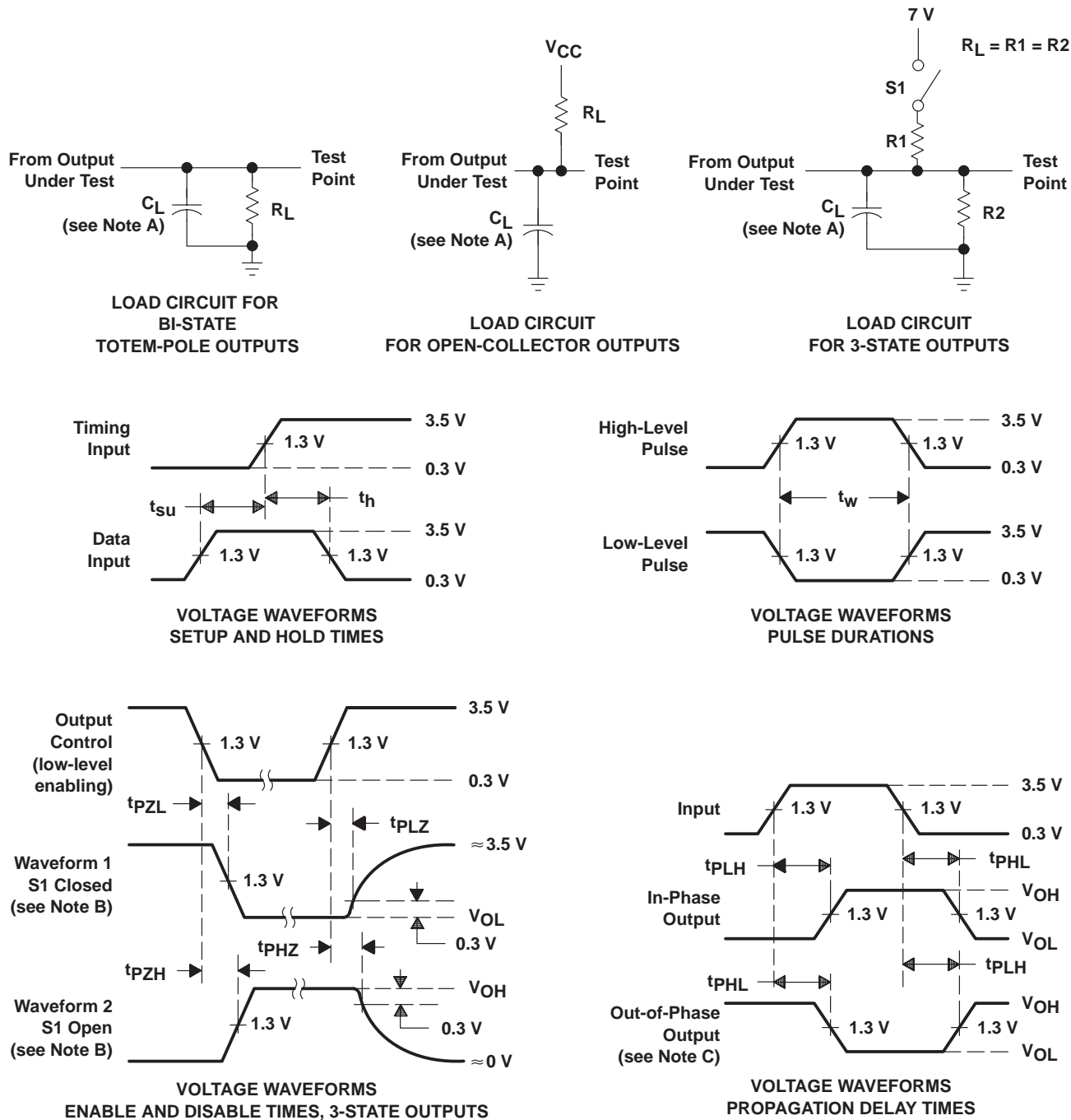
SDAS191A – APRIL 1982 – REVISED DECEMBER 1994

## switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_L = 500 \Omega,$ $T_A = \text{MIN to MAX}^\dagger$				UNIT
			SN54AS08		SN74AS08		
			MIN	MAX	MIN	MAX	
$t_{PLH}$	A or B	Y	1	6.5	1	5.5	ns
$t_{PHL}$			1	6.5	1	5.5	

<sup>†</sup> For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

PARAMETER MEASUREMENT INFORMATION  
 SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.  
 C. When measuring propagation delay items of 3-state outputs, switch S1 is open.  
 D. All input pulses have the following characteristics:  $PRR \leq 1$  MHz,  $t_r = t_f = 2$  ns, duty cycle = 50%.  
 E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

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PRODUCT SUPPORT: [TRAINING](#)

## SN74AS08, Quadruple 2-Input Positive-AND Gates

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54AS08	SN74AS08
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.5 to 5.5
Input Level	TTL	TTL
Output Level	TTL	TTL
Output Drive (mA)		-2/20
No. of Gates	4	4
Static Current		16.65
tpd max (ns)		5.5

### FEATURES

[▲Back to Top](#)

- Package Options Include Plastic Small-Outline (D) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

### DESCRIPTION

[▲Back to Top](#)

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

The SN54ALS08 and SN54AS08 are characterized for operation over the full military temperature range of -55°C to 125°C. The SN74ALS08 and SN74AS08 are characterized for operation from 0°C to 70°C.

### TECHNICAL DOCUMENTS

[▲Back to Top](#)

To view the following documents, [Acrobat Reader 4.0](#) is required.

To download a document to your hard drive, right-click on the link and choose 'Save'.

### DATASHEET

[▲Back to Top](#)

Full datasheet in Acrobat PDF: [sn74as08.pdf](#) (94 KB, Rev.A) (Updated: 12/01/1994)

### APPLICATION NOTES

[▲Back to Top](#)

- [Advanced Schottky \(ALS and AS\) Logic Families](#) (SDAA010 - Updated: 08/01/1995)
- [Advanced Schottky Load Management](#) (SDYA016 - Updated: 02/01/1997)
- [Designing With Logic \(Rev. C\)](#) (SDYA009C - Updated: 06/01/1997)
- [Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits](#) (SZZA026 - Updated: 06/20/2001)
- [Input and Output Characteristics of Digital Integrated Circuits](#) (SDYA010 - Updated: 10/01/1996)
- [Live Insertion](#) (SDYA012 - Updated: 10/01/1996)

**RELATED DOCUMENTS**[▲Back to Top](#)View Related Documentation for [Digital Logic](#)

- [Logic Reference Guide](#) (SCYB004, 1032 KB - Updated: 10/23/2001)
- [Logic Selection Guide Second Half 2002 \(Rev. R\)](#) (SDYU001R, 4274 KB - Updated: 07/19/2002)
- [Military Semiconductors Selection Guide 2002 \(Rev. B\)](#) (SGYC003B, 1648 KB - Updated: 04/22/2002)

**PRICING/AVAILABILITY/PKG**[▲Back to Top](#)

DEVICE INFORMATION							TI INVENTORY STATUS AS OF 3:00 PM GMT, 26 Sep 2002			REPORTED DISTRIBUTOR INVENTORY AS OF 3:00 PM GMT, 26 Sep 2002		
ORDERABLE DEVICE	STATUS	PACKAGE TYPE PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY   SUS	STD PACK QTY	IN STOCK	IN PROGRESS QTY DATE	LEAD TIME	DISTRIBUTOR COMPANY REGION	IN STOCK	PURCHASE
SN74AS08D	ACTIVE	<a href="#">SOP (D)</a>   14	0 TO 70	<a href="#">View Contents</a>	1KU   0.32	50	1750	1350   19 Sep	5 WKS	<a href="#">Avnet</a>   AMERICA	> 1k	<a href="#">BUY NOW</a>
								4418   07 Oct				
								> 10k   14 Oct				
SN74AS08DR	ACTIVE	<a href="#">SOP (D)</a>   14	0 TO 70	<a href="#">View Contents</a>	1KU   0.35	2500	<a href="#">N/A*</a>	1580   25 Sep	5 WKS	<a href="#">Avnet</a>   AMERICA	> 1k	<a href="#">BUY NOW</a>
								4418   03 Oct				
								> 10k   10 Oct				
SN74AS08N	ACTIVE	<a href="#">PDIP (N)</a>   14	0 TO 70	<a href="#">View Contents</a>	1KU   0.28	25	<a href="#">N/A*</a>	4418   09 Oct	5 WKS	<a href="#">Avnet</a>   AMERICA	> 1k	<a href="#">BUY NOW</a>
								> 10k   10 Oct		<a href="#">DigiKey</a>   AMERICA	107	<a href="#">BUY NOW</a>
SN74AS08N3	OBSOLETE	<a href="#">PDIP (N)</a>   14	0 TO 70	<a href="#">View Contents</a>	1KU		<a href="#">N/A*</a>		Not Available			
SN74AS08NSR	ACTIVE	<a href="#">SOP (NS)</a>   14		<a href="#">View Contents</a>	1KU   0.28	2000	<a href="#">N/A*</a>	4418   07 Oct	5 WKS			
								> 10k   14 Oct				

Table Data Updated on: 9/26/2002



