Appendix 1A: Sample Datasheet (first page)

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

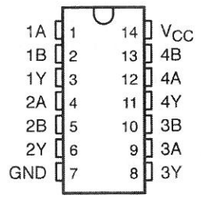
These devices contain four independent 2-input positive-AND gates. They perform the Boolean functions $Y = A \bullet B$ or $Y = \overline{A} + \overline{B}$ in positive logic.

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.

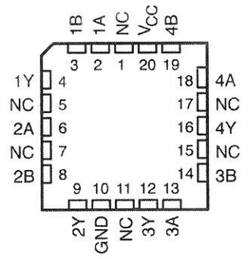
FUNCTION TABLE
(each gate)

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

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

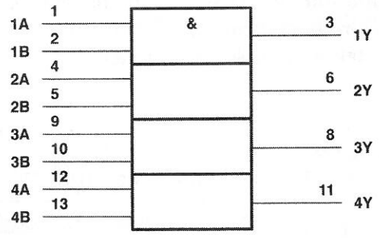


SN54ALS08, SN54AS08 . . . FK PACKAGE
(TOP VIEW)

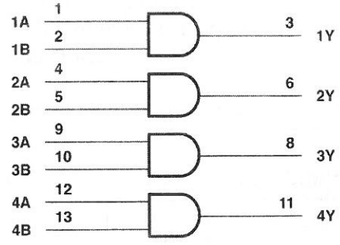


NC – No internal connection

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.

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Lab 2

Logic Switches and LED Indicators

Name _____ Class _____ Date _____

Objectives

- To create a circuit for a logic switch using DIP switches and SIP resistor networks.
- To demonstrate the operation of light-emitting diodes (LEDs).

Reference

Ken Reid and Robert Dueck, *Introduction to Digital Electronics*

- Chapter 2, Logic Function and Gates
- Section 2.5, Logic Switches and LED Indicators

Equipment Required

Qty.	Description
1	Digital trainer or 5-volt power supply
1	10 kΩ SIP resistor network
1	330Ω resistor
1	DIP switch
1	LED
1	74LS04 Hex Inverter Integrated Circuit

Experimental Notes

Logic Switches

Figure 2.1 shows a single-pole single-throw (SPST) switch connected as a logic switch.

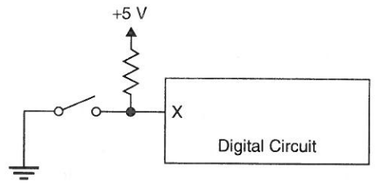

Figure 2.1 SPST Logic Switch

An important premise of the logic switch circuit is that the digital circuit input to which it is connected has a very high resistance to current. When the switch is open, the current flowing through the **pull-up resistor** from +5 volts to the digital circuit is very small. Since the current is small, Ohm's Law states that very little voltage drops across the pull-up resistor; the voltage is about the same at one end as at the other. Therefore, an open switch generates a logic HIGH at point X.

When the switch is closed, the majority of current flows to ground, limited only by the value of the pull-up resistor (typically between 1 kΩ and 10 kΩ). Point X is approximately at ground potential, or logic LOW. Thus, the switch generates a HIGH when open and a LOW when closed. The pull-up resistor provides a connection to +5 V in the HIGH state and limits power supply current in the LOW state.