

SN74ALS8003A DUAL 2-INPUT POSITIVE-NAND GATE

SDAS136A – JULY 1983 – REVISED JANUARY 1995

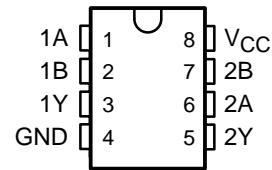
- Package Options Include Plastic Small-Outline (D) Packages and Standard Plastic (P) 300-mil DIPs

description

This device contains two independent 2-input positive-NAND gates. It performs the Boolean functions $Y = \overline{A \bullet B}$ or $Y = \overline{A} + \overline{B}$ in positive logic.

The SN74ALS8003A is characterized for operation from 0°C to 70°C.

D OR P PACKAGE
(TOP VIEW)



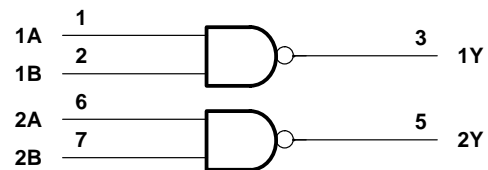
FUNCTION TABLE
(each gate)

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

logic symbol†



logic diagram (positive logic)



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

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	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

	MIN	NOM	MAX	UNIT
V_{CC} Supply voltage	4.5	5	5.5	V
V_{IH} High-level input voltage	2			V
V_{IL} Low-level input voltage			0.8	V
I_{OH} High-level output current			–0.4	mA
I_{OL} Low-level output current			8	mA
T_A Operating free-air temperature	0		70	°C

PRODUCTION DATA information is 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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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP†	MAX	UNIT
V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$			-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
V_{OL}	$V_{CC} = 4.5 \text{ V}$		0.25	0.4	V
			0.35	0.5	
I_I	$V_{CC} = 5.5 \text{ V}$, $V_I = 7 \text{ V}$			0.1	mA
I_{IH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 2.7 \text{ V}$			20	μA
I_{IL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$			-0.1	mA
$I_{O\ddagger}$	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$	-30		-112	mA
I_{CCH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0$		0.22	0.43	mA
I_{CCL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 4.5 \text{ V}$		0.81	1.5	mA

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

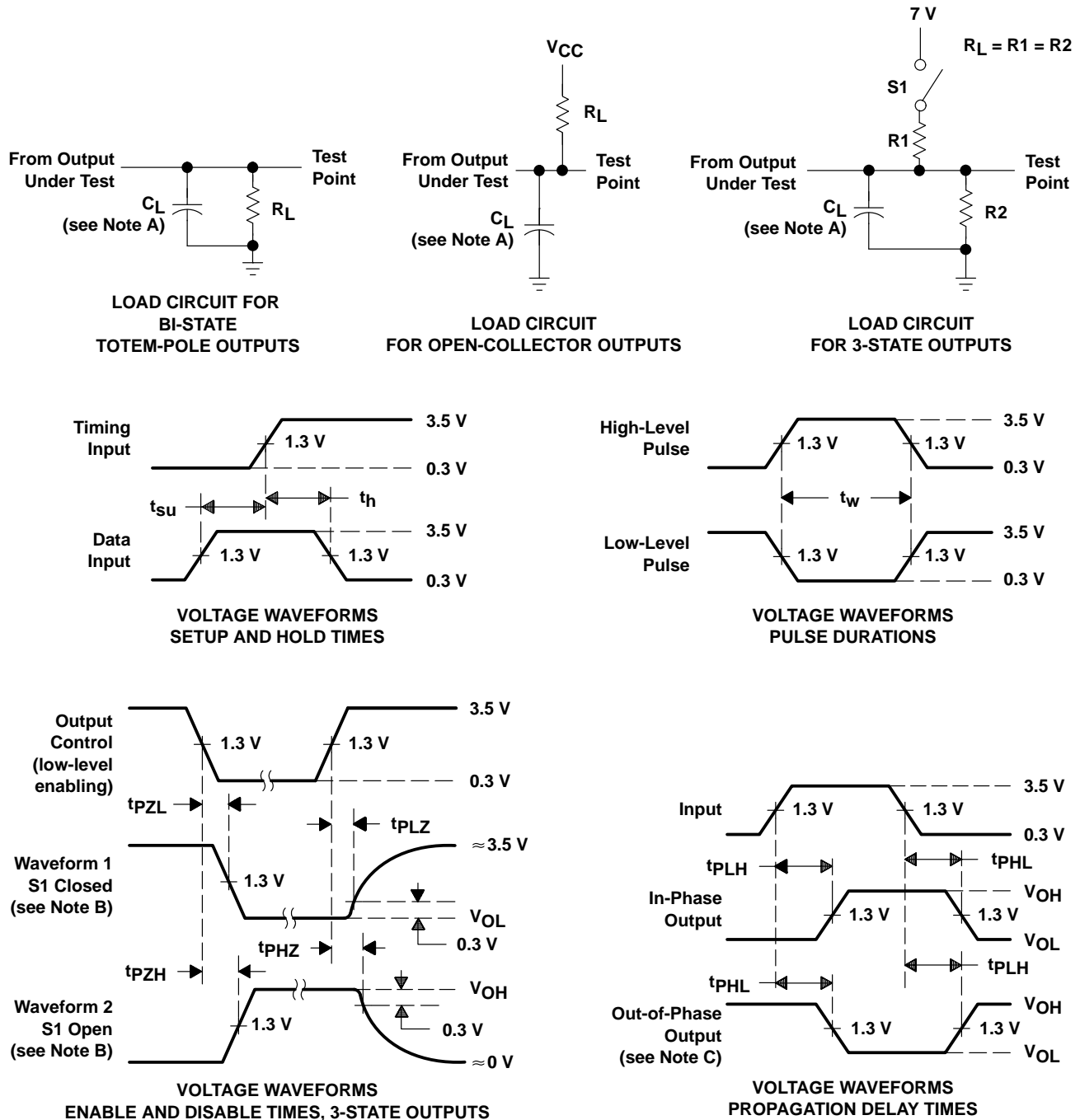
‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$, $T_A = \text{MIN to MAX}\S$		UNIT
			MIN	MAX	
t_{PLH}	A or B	Y	3	11	ns
t_{PHL}			2	8	

§ 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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