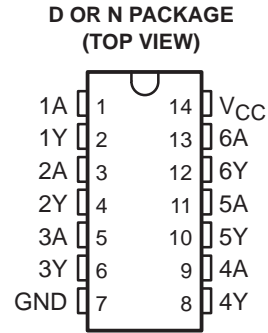- **Noninverter With Open-Collector Outputs**
- **Package Options Include Plastic Small-Outline (D) Packages and Standard Plastic (N) 300-mil DIPs**

D OR N PACKAGE
(TOP VIEW)

1A	1	14	V_{CC}
1Y	2	13	6A
2A	3	12	6Y
2Y	4	11	5A
3A	5	10	5Y
3Y	6	9	4A
GND	7	8	4Y

description

The SN74ALS35A contains six independent noninverters with open-collector outputs. They perform the Boolean function Y = A. The open-collector outputs require pullup resistors to perform correctly. These outputs may be connected to other open-collector outputs to implement active-low wired-OR or active-high wired-AND functions. Open-collector devices are often used to generate higher V_{OH} levels.
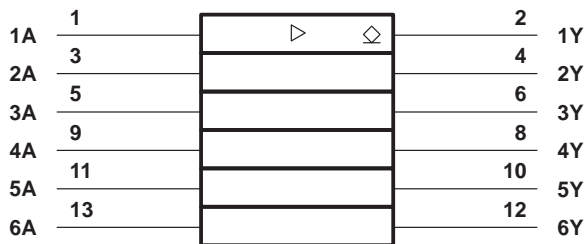
The SN74ALS35A is characterized for operation from 0°C to 70°C.
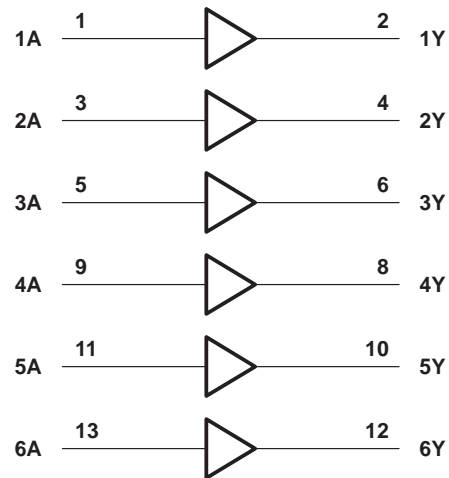
FUNCTION TABLE
(each buffer)

INPUT A	OUTPUT Y
H	H
L	L

logic symbol†

1A	1	▷ ◇	2	1Y
2A	3		4	2Y
3A	5		6	3Y
4A	9		8	4Y
5A	11		10	5Y
6A	13		12	6Y

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

logic diagram (positive logic)

1A	1	▷	2	1Y
2A	3	▷	4	2Y
3A	5	▷	6	3Y
4A	9	▷	8	4Y
5A	11	▷	10	5Y
6A	13	▷	12	6Y

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

Supply voltage, V_{CC} . . . . 7 V
Input voltage, V_I . . . . 7 V
Off-state output voltage . . . . 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
V_{OH}	High-level output voltage			5.5	V
I_{OL}	Low-level output current			8	mA
T_A	Operating free-air temperature	0		70	°C

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 V,	I_I = −18 mA			−1.2	V
V_{OL}	V_{CC} = 4.5 V	I_{OL} = 4 mA		0.25	0.4	V
		I_{OL} = 8 mA		0.35	0.5	
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20	μA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.4 V			−0.1	mA
I_{OH}	V_{CC} = 4.5 V,	V_{OH} = 5.5 V			0.1	mA
I_{CCH}	V_{CC} = 5.5 V,	V_I = 4.5 V		2.7	4.7	mA
I_{CCL}	V_{CC} = 5.5 V,	V_I = 0		4.1	6.3	mA

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

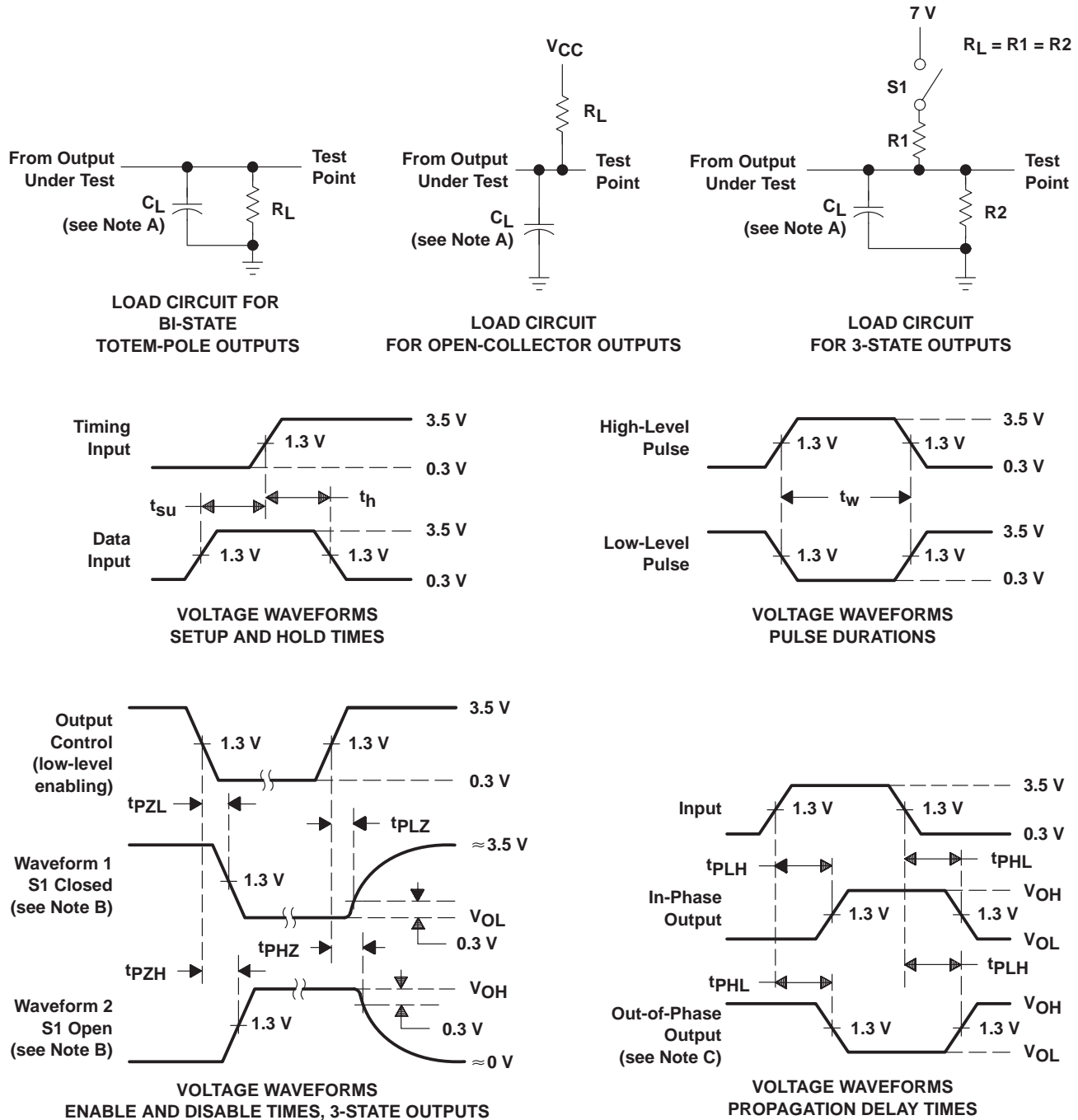## switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 2 kΩ, T_A = MIN to MAX§		UNIT
			MIN	MAX	
t_{PLH}	A	Y	20	50	ns
t_{PHL}			2	14	

§ 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

LOAD CIRCUIT FOR
BI-STATE
TOTEM-POLE OUTPUTS

LOAD CIRCUIT
FOR OPEN-COLLECTOR OUTPUTS

LOAD CIRCUIT
FOR 3-STATE OUTPUTS

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

VOLTAGE WAVEFORMS
PULSE DURATIONS

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS

VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

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 ≤ 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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