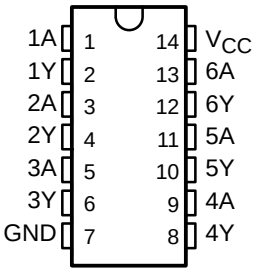
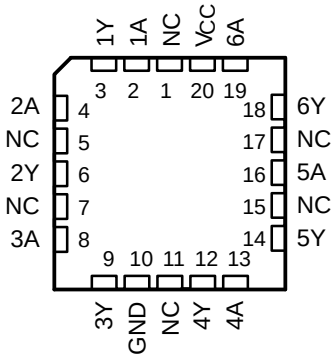
- **Converts TTL-Voltage Levels to MOS Levels**
- **High Sink-Current Capability**
- **Input Clamping Diodes Simplify System Design**
- **Open-Collector Driver for Indicator Lamps and Relays**
- **Package Options Include "Small Outline" Packages, Ceramic Chip Carriers, and Standard and Ceramic 300-mil DIPs**

SN54LS07 . . . J PACKAGE
SN74LS07, SN74LS17 . . . D OR N PACKAGE
(T0P VIEW)



SN54LS07 . . . FK PACKAGE
(T0P VIEW)



NC – No internal connection

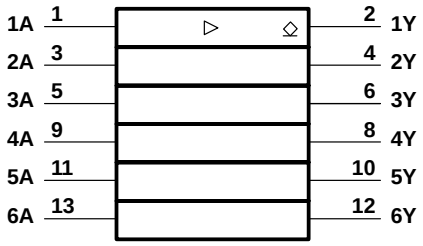
description

These monolithic hex buffers/drivers feature high-voltage open-collector outputs to interface with high-level circuits or for driving high-current loads. They are also characterized for use as buffers for driving TTL inputs. The ′LS07 has a rated output voltage of 30 V and the ′LS17 has a rated output voltage of 15 V. The maximum sink current is 30 mA for the SN54LS07 and 40 mA for the SN74LS07 and SN74LS17.

These circuits are compatible with most TTL families. Inputs are diode-clamped to minimize transmission-line effects, which simplifies design. Typical power dissipation is 140 mW and average propagation delay time is 12 ns.

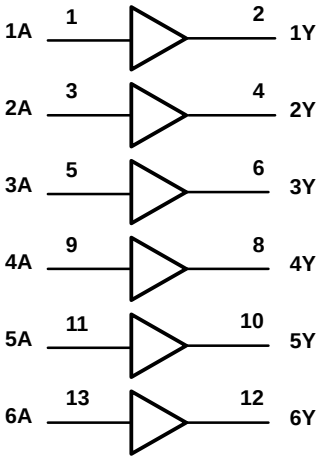
The SN54LS07 is characterized over the full military temperature range of –55°C to 125°C. The SN74LS07 and SN74LS17 are characterized for operation from 0°C to 70°C.

logic symbol†

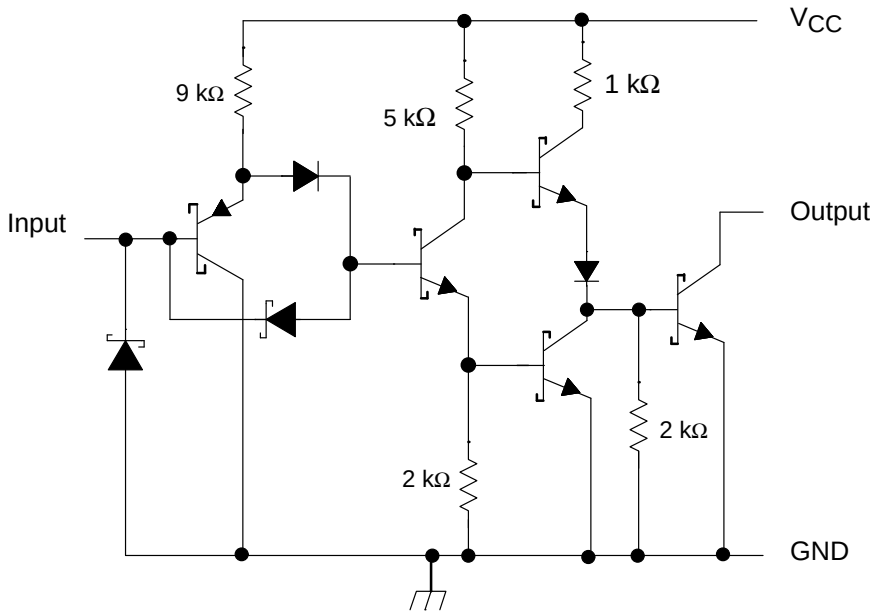


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, and N packages.

logic diagram (positive logic)



schematic (each gate)



Resistor values shown are nominal.

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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I (see Note 1) . . . . . 5.5 V
Output voltage, V_O (see Notes 1 and 2): SN54LS07, SN74LS07 . . . . . 30 V
SN74LS17 . . . . . 15 V
Operating free-air temperature range: SN54LS07 . . . . . −55°C to 125°C
SN54LS07, SN74LS17 . . . . . 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.

NOTES: 1. Voltage values are with respect to network ground terminal.
2. This is the maximum voltage that should be applied to any output when it is in the off state.

recommended operating conditions

			SN54LS07			SN74LS07 SN74LS17			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.8			0.8	V
V_{OH}	High-level output voltage	’LS07			30			30	V
		’LS17						15	
I_{OL}	Low-level output current				30			40	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†			SN54LS07			SN74LS07 SN74LS17			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	V_{CC} = MIN,	I_I = –12 mA				–1.5			–1.5	V
I_{OH}	V_{CC} = MIN,	V_{IH} = 2 V	'LS07, V_{OH} = 30 V			0.25			0.25	mA
			'LS17, V_{OH} = 15 V			0.25			0.25	
V_{OL}	V_{CC} = MIN,	V_{IL} = 0.8 V	I_{OL} = 16 mA			0.4			0.4	V
			I_{OL} = MAX§			0.7			0.7	
I_I	V_{CC} = MAX,	V_I = 7 V				1			1	mA
I_{IH}	V_{CC} = MAX,	V_I = 2.4 V				20			20	µA
I_{IL}	V_{CC} = MAX,	V_I = 0.4 V				–0.2			–0.2	mA
I_{CCH}	V_{CC} = MAX					14			14	mA
I_{CCL}	V_{CC} = MAX					45			45	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ I_{OL} = 30 mA for SN54 series parts and 40 mA for SN74 series parts.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	A	Y	R_L = 110 Ω, C_L = 15 pF		6	10	ns
t_{PHL}					19	30	

NOTE 3: Load circuit and voltage waveforms are shown in Section 1 of *TTL Logic Data Book,* 1988.

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