

- Permits Digital Data Transmission Over Coaxial Cable, Strip Line, or Twisted Pair
- Operates With 50-Ω to 500-Ω Transmission Lines
- TTL Compatible With 5-V Supply
- 2.4-V Output at $I_{OH} = -75\text{ mA}$
- Uncommitted Emitter-Follower Output Structure for Party-Line Operation
- IMPACT™ Low-Power Schottky Technology
- Improved Replacement for the SN75121 and Signetics 8T13
- Glitchless Power Up/Power Down
- Short-Circuit Protection
- AND-OR Logic Configuration
- High Speed . . . Maximum Propagation Delay Time of 14 ns at $C_L = 15\text{ pF}$

description

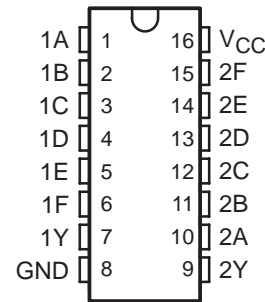
The SN75ALS121 dual line driver is designed for digital data transmission over lines having impedances from 50 to 500 Ω. It is compatible with standard TTL logic and supply voltage levels.

The low-impedance emitter-follower outputs drive terminated lines such as coaxial cable, strip line, or twisted pair. Having the outputs uncommitted allows wired-OR logic to be performed in party-line applications. Output short-circuit protection is provided by an internal clamping network that turns on when the output voltage drops below approximately 1.5 V. All inputs are in conventional TTL configuration. Gating can be used during power-up and power-down sequences to ensure that no noise is introduced on the line.

The SN75ALS121 employs the IMPACT™ process to achieve fast switching speeds, low power dissipation, and reduced input current requirements.

The SN75ALS121 is characterized for operation from 0°C to 70°C.

D OR N PACKAGE
(TOP VIEW)



NOT RECOMMENDED FOR NEW DESIGN

FUNCTION TABLE

INPUTS						OUTPUT
A	B	C	D	E	F	Y
H	H	H	H	X	X	H
X	X	X	X	H	H	H
All other input combinations						L

H = high level, L = low level, X = irrelevant

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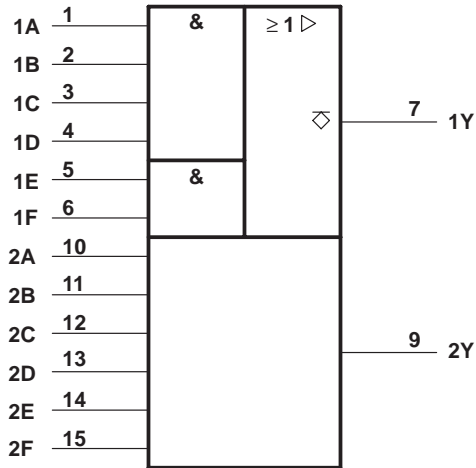
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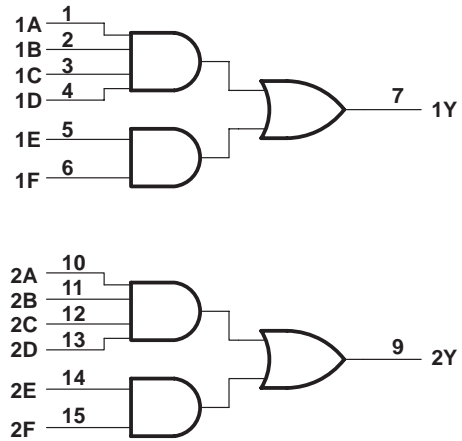
SN75ALS121 DUAL LINE DRIVER

SLLS030A – D1334, SEPTEMBER 1987 – REVISED AUGUST 1989

logic symbol†

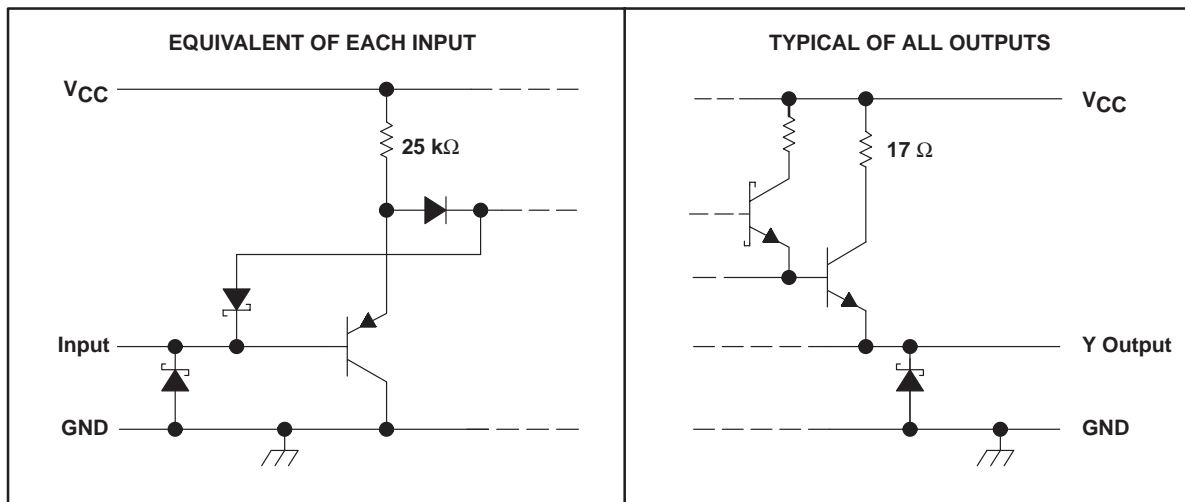


logic diagram (positive logic)



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

schematics of inputs and outputs



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

Supply voltage, V_{CC} (see Note 1)	6 V
Input voltage	6 V
Output voltage	6 V
Continuous total dissipation at (or below) 25°C free air temperature	See Dissipation Rating Table
Operating free-air temperature range	0°C to 70°C
Storage temperature range	– 65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

NOTE 1: All voltage values are with respect to network ground terminal.

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING
D	950 mW	7.6 mW/°C	608 mW
N	1150 mW	9.2 mW/°C	736 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
High-level input voltage, V_{IH}	2			V
Low-level input voltage, V_{IL}			0.8	V
High-level output current, I_{OH}			– 75	mA
Operating free-air temperature range, T_A	0		70	°C

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS			MIN	TYP†	MAX	UNIT
V_{IK} Input clamp voltage	$V_{CC} = 5\text{ V}$,	$I_I = -12\text{ mA}$				– 1.5	V
$V_{(BR)I}$ Input breakdown voltage	$V_{CC} = 5\text{ V}$,	$I_I = 10\text{ mA}$		5.5			V
V_{OH} High-level output voltage	$V_{IH} = 2\text{ V}$,	$I_{OH} = -75\text{ mA}$,	See Note 2	2.4	3.2		V
I_{OH} High-level output current	$V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$,	$V_{IH} = 4.5\text{ V}$, See Note 2	$V_{OH} = 2\text{ V}$,	– 100	– 200	– 250	mA
I_{OL} Low-level output current	$V_{IL} = 0.8\text{ V}$,	$V_{OL} = 0.4\text{ V}$,	See Note 2			– 800	μA
$I_{O(off)}$ Off-state output current	$V_{CC} = 3\text{ V}$,	$V_O = 3\text{ V}$				500	μA
I_{IH} High-level input current	$V_I = 4.5\text{ V}$					40	μA
I_{IL} Low-level input current	$V_I = 0.4\text{ V}$					– 250	μA
I_{OS} Short-circuit output current	$V_{CC} = 5\text{ V}$				– 5	– 30	mA
I_{CCH} Supply current, outputs high	$V_{CC} = 5.25\text{ V}$,	All inputs at 2 V,	No load		9	14	mA
I_{CCL} Supply current, outputs low	$V_{CC} = 5.25\text{ V}$,	All inputs at 0.8 V,	No load		13	30	mA

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

NOTE 2: The output voltage and current limits are ensured for any appropriate combination of high and low inputs specified by the function table for the desired output.

SN75ALS121 DUAL LINE DRIVER

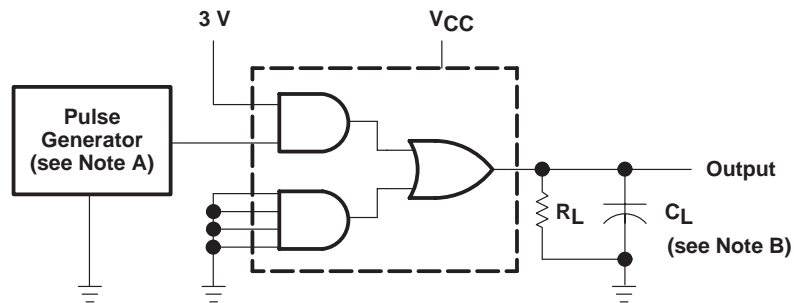
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switching characteristics over recommended ranges of supply voltage and operating free-air temperature

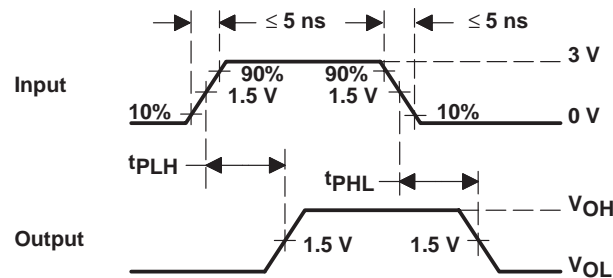
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} Propagation delay time, low-to-high-level output	$R_L = 37 \Omega$, $C_L = 15 \text{ pF}$, See Figure 1		6	14	ns
t_{PHL} Propagation delay time, high-to-low-level output			4	14	ns
t_{PLH} Propagation delay time, low-to-high-level output	$R_L = 37 \Omega$, $C_L = 1000 \text{ pF}$, See Figure 1		18	30	ns
t_{PHL} Propagation delay time, high-to-low-level output			29	50	ns

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

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics: $Z_O = 50 \Omega$, $t_W = 200 \text{ ns}$, duty cycle = 50%.
B. C_L includes probe and jig capacitance.

Figure 1. Test Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

OUTPUT CURRENT
vs
OUTPUT VOLTAGE

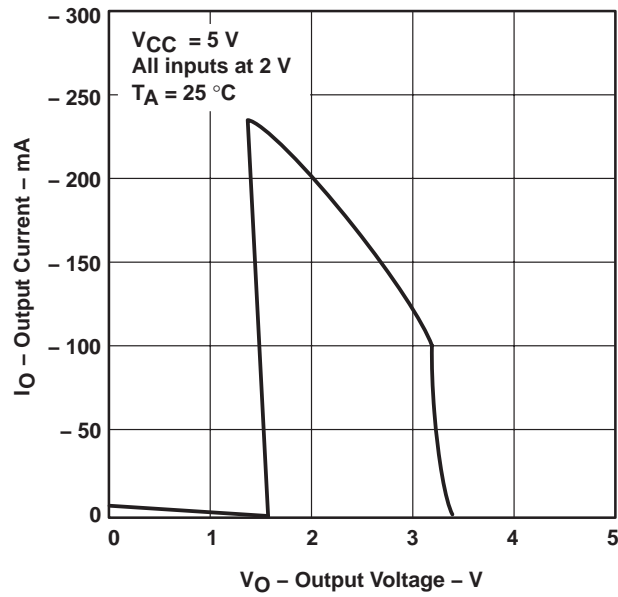


Figure 2

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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