- Designed for Digital Data Transmission Over 50-Ω to 500-Ω Coaxial Cable, Strip Line, or Twisted Pair
- High Speed t<sub>pd</sub> = 20 ns Maximum at C<sub>L</sub> = 15 pF
- TTL Compatible With Single 5-V Supply
- 2.4-V Output at I<sub>OH</sub> = -75 mA
- Uncommitted Emitter-Follower Output Structure for Party-Line Operation
- Short-Circuit Protection
- AND-OR Logic Configuration
- Designed for Use With Triple Line Receivers SN55122, SN75122
- Designed to Be Interchangeable With Signetics N8T13

#### description

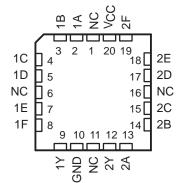
The SN55121 and SN75121 dual line drivers are designed for digital data transmission over lines having impedances from 50 to 500  $\Omega$ . They are also compatible with standard TTL logic and supply-voltage levels.

The low-impedance emitter-follower outputs of the SN55121 and SN75121 can drive terminated lines such as coaxial cable 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 of the inputs are in conventional TTL configuration and the gating can be used during power-up and power-down sequences to ensure that no noise is introduced to the line.

The SN55121 is characterized for operation over the full military temperature range of  $-55^{\circ}$ C to 125°C. The SN75121 is characterized for operation from 0°C to 70°C.

SN55121 J PACKAGE SN75121 D OR N PACKAGE (TOP VIEW)								
1A [ 1B [ 1C [ 1D [ 1E [ 1Y [ GND [	1 2 3 4 5 6 7 8	16 15 14 13 12 11 10 9	] V <sub>CC</sub> ] 2F ] 2E ] 2D ] 2C ] 2B ] 2A					
	0	Ŭ						

SN55121	FK PACKAGE				
(TOP VIEW)					



NC-No internal connection

#### THE SN75121 IS NOT RECOMMENDED FOR NEW DESIGNS



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### SN55121, SN75121 DUAL LINE DRIVERS

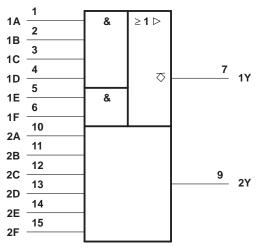
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FU	NCT	ION	TA	BLE	-

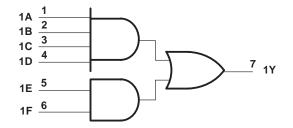
	FUNCTION TABLE								
		OUTPUT							
Α	В	С	D	Е	F	Y			
Н	Н	Н	Н	Х	Х	Н			
Х	Х	Х	Х	Н	Н	н			
	All othe	L							

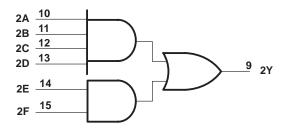
H = high level, L = low level, X = irrelevant

### logic symbol<sup>†</sup>



logic diagram (positive logic)

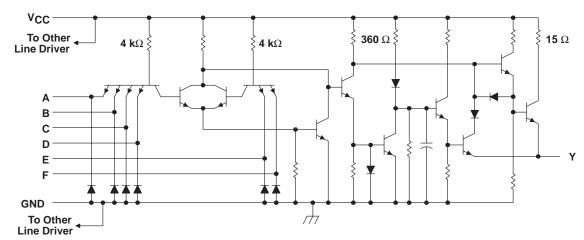




<sup>†</sup>This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for the D, J, and N packages.

#### schematic (each driver)



All resistor values shown are nominal.



#### absolute maximum ratings over operating free-air temperature (unless otherwise noted)<sup>†</sup>

Supply voltage, V <sub>CC</sub> (see Note 1) Input voltage Output voltage	6 V
Continuous total power dissipation	See Dissipation Rating Table
Case temperature for 60 seconds: FK package Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J package . Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or N package	

<sup>+</sup> 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.

NOTE 1: All voltage values are with respect to both ground terminals connected together.

DISSIPATION RATING TABLE								
PACKAGE	T <sub>A</sub> ≤ 25°C POWER RATING	DERATING FACTOR ABOVE T <sub>A</sub> = 25°C	T <sub>A</sub> = 70°C POWER RATING	T <sub>A</sub> = 125°C POWER RATING				
D	950 mW	7.6 mW/°C	608 mW	_				
FK‡	1375 mW	11.0 mW/°C	880 mW	275 mW				
J‡	1375 mW	11.0 mW/°C	880 mW	275 mW				
Ν	1150 mW	9.2 mW/°C	736 mW	—				

<sup>‡</sup> In the FK and J packages, SN55121 chips are either silver glass or alloy mounted.

#### recommended operating conditions

	SN55121			SN75121			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Supply voltage, V <sub>CC</sub>	4.75	5	5.25	4.75	5	5.25	V
High-level input voltage, V <sub>IH</sub>	2			2			V
Low-level input voltage, VIL			0.8			0.8	V
High-level output current, IOH			-75			-75	mA
Operating free-air temperature, T <sub>A</sub>	-55		125	0		70	°C



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

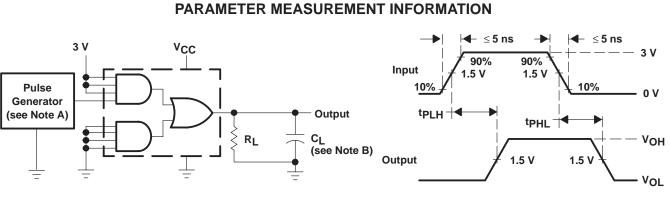
	PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT	
VIK	Input clamp voltage	V <sub>CC</sub> = 5 V,	lj = -12 mA			-1.5	V
V <sub>(BR)</sub>	Breakdown voltage	V <sub>CC</sub> = 5 V,	lj = 10 mA		5.5		V
VOH	High-level output voltage	V <sub>IH</sub> = 2 V,	I <sub>OH</sub> = -75 mA,	See Note 2	2.4		V
IOH	High-level output current	$V_{CC} = 5 V,$ $T_A = 25^{\circ}C,$	V <sub>IH</sub> = 4.5 V, See Note 2	V <sub>OH</sub> = 2 V,	-100	-250	mA
IOL	Low-level output current	V <sub>IL</sub> = 0.8 V,	V <sub>OL</sub> = 0.4 V,	See Note 2		-800	μA
IO(off)	Off-state output current	V <sub>CC</sub> = 3 V,	V <sub>O</sub> = 3 V			500	μA
Iн	High-level output current	V <sub>I</sub> = 4.5 V				40	μA
Ι <sub>Ι</sub>	Low-level output current	V <sub>I</sub> = 0.4 V			-0.1	-1.6	mA
los	Short-circuit output current <sup>†</sup>	V <sub>CC</sub> = 5 V,	T <sub>A</sub> = 25°C			-30	mA
ІССН	Supply current, outputs high	V <sub>CC</sub> = 5.25 V,	All inputs at 2 V,	Outputs open		28	mA
ICCL	Supply current, outputs low	V <sub>CC</sub> = 5.25 V,	All inputs at 0.8 V,	Outputs open		60	mA

<sup>†</sup> Not more than one output should be shorted at a time.

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

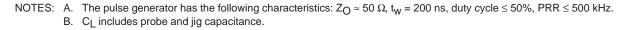
### switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = $25^{\circ}$ C

	PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
<sup>t</sup> PLH	Propagation delay time, low-to-high level output	$P_{1} = 27.0$	C <sub>I</sub> = 15 pF,	See Figure 1		11	20	00
<sup>t</sup> PHL	Propagation delay time, high-to-low level output	$K_{L} = 57.52$ ,	$C_{L} = 15  \text{pr},$	See Figure 1		8	20	ns
<sup>t</sup> PLH	Propagation delay time, low-to-high level output	$P_{1} = 27.0$	C 1000 pE	Soo Eiguro 1		22	50	-
<sup>t</sup> PHL	Propagation delay time, high-to-low level output	$K_{L} = 57.52$ ,	C <sub>L</sub> = 1000 pF,	See Figure 1		20	50	ns



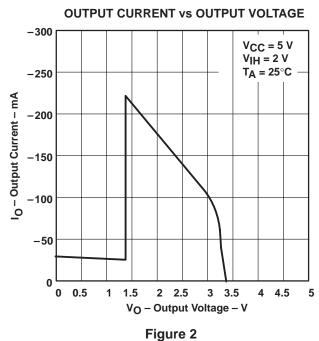


**VOLTAGE WAVEFORMS** 



#### Figure 1. Test Circuit and Voltage Waveforms









### SN55121, SN75121 DUAL LINE DRIVERS

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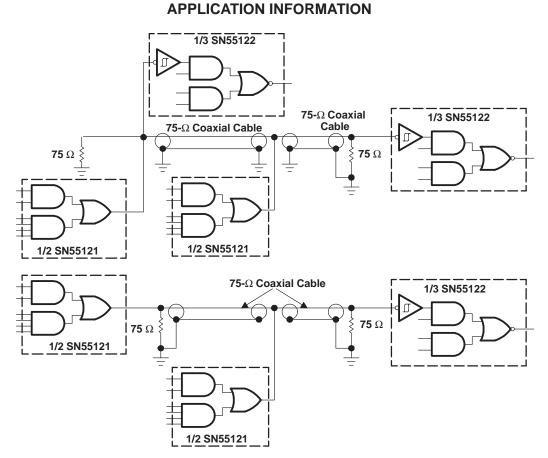


Figure 3. Single-Ended Party-Line Circuits



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### SN75121, DUAL LINE DRIVERS

**Device Status: Active** 

- > Description
- > Features
- > Datasheets
- > <u>Pricing/Samples/Availability</u>
- > Application Notes
- > Related Documents
- > Development Tools
- > Applications

### Description

The SN55121 and SN75121 dual line drivers are designed for digital data transmission over lines having impedances from 50 to 500  $\Omega$ . They are also compatible with standard TTL logic and supply-voltage levels.

The low-impedance emitter-follower outputs of the SN55121 and SN75121 can drive terminated lines such as coaxial cable 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 of the inputs are in conventional TTL configuration and the gating can be used during power-up and power-down sequences to ensure that no noise is introduced to the line.

The SN55121 is characterized for operation over the full military temperature range of  $-55^{\circ}$  C to  $125^{\circ}$ C. The SN75121 is characterized for operation from  $0^{\circ}$ C to  $70^{\circ}$ C.

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

#### Features

- Designed for Digital Data Transmission Over 50-**\U00e1** to 500-**\U00e1** Coaxial Cable, Strip Line, or Twisted Pair
- High Speed
- $t_{pd} = 20$  ns Maximum at  $C_L = 15 \text{ pF}$
- TTL Compatible With Single 5-V Supply
- 2.4-V Output at  $I_{OH} = -75 \text{ mA}$

- Short-Circuit Protection
- AND-OR Logic Configuration
- Designed for Use With Triple Line Receivers SN55122, SN75122
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To view the following documents, <u>Acrobat Reader 3.x</u> is required. To download a document to your hard drive, right-click on the link and choose 'Save'.

# Datasheets

Full datasheet in Acrobat PDF: <u>slls074c.pdf</u> (117 KB) Full datasheet in Zipped PostScript: <u>slls074c.psz</u> (103 KB)

# Pricing/Samples/Availability

Orderable Device	Package	<u>Pins</u>	<u>Temp (°C)</u>	<u>Status</u>	<u>Price/unit</u> <u>USD (100-999)</u>	Pack Qty	<u>Availability / Samples</u>
SN75121D	D	16	0 TO 70	ACTIVE	2.00	40	Check stock or order
SN75121N	N	16	0 TO 70	ACTIVE	2.00	25	Check stock or order
SN75121NS	<u>NS</u>	16	0 TO 70	ACTIVE			Check stock or order

# **Application Reports**

- 422 AND 485 OVERVIEW AND SYSTEM CONFIGURATIONS (SLLA070 Updated: 02/15/2000)
- ANALOG APPLICATIONS JOURNAL, FEBRUARY 2000 (SLYT012A Updated: 03/23/2000)
- ANALOG APPLICATIONS JOURNAL, NOVEMBER 1999 (SLYT010A Updated: 03/23/2000)
- <u>COMPARING BUS SOLUTIONS</u> (SLLA067 Updated: 03/06/2000)
- ELECTROSTATIC DISCHARGE APPLICATION NOTE (SSYA008 Updated: 05/05/1999)
- JITTER ANALYSIS (SLLA075 Updated: 03/31/2000)
- <u>SKEW DEFINITIONS</u> (SLLA060 Updated: 08/13/1999)
- <u>THERMAL CHARACTERISTICS OF LINEAR AND LOGIC PACKAGES USING JEDEC PCB</u> <u>DESIGNS</u> (SZZA017A - Updated: 09/15/1999)

# **Related Documents**

• <u>A STATISTICAL SURVEY OF COMMON-MODE NOISE</u> (SLLA057, 131 KB - Updated: 12/23/1999)

## Table Data Updated on: 6/2/2000

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