

N8T14, SN55122, SN75122 TRIPLE LINE RECEIVERS

SLLS075B – D1334, SEPTEMBER 1973 – REVISED FEBRUARY 1993

- Designed for Digital Data Transmission Over Coaxial Cable, Strip Line, or Twisted Pair
- Designed for Operation With 50- Ω to 500- Ω Transmission Lines
- TTL Compatible
- Single 5-V Supply
- Built-Input Threshold Hysteresis
- High-Speed . . . Typical Propagation Delay Time = 20 ns
- Independent Channel Strobes
- Input Gating Increases Application Flexibility
- Fanout to 10 Series 54/74 Standard Loads
- Can Be Used With Dual Line Drivers SN55121 and SN75121
- Interchangeable With Signetics N8T14

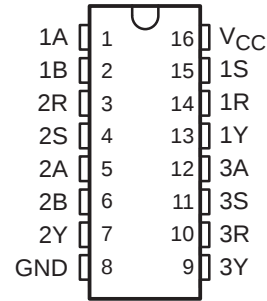
description

The N8T14, SN55122, and SN75122 are triple line receivers that are designed for digital data transmission over lines having impedances from 50 Ω to 500 Ω . They are also compatible with standard TTL-logic and supply voltage levels.

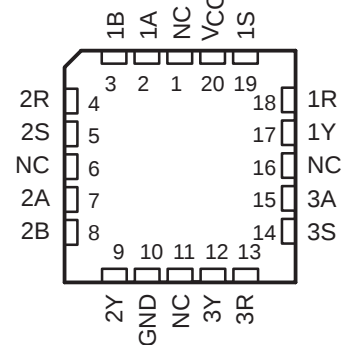
The N8T14, SN55122, and SN75122 have receiver inputs with built-in hysteresis to provide increased noise margin for single-ended systems. The high impedance of this input presents a minimum load to the driver and allows termination of the transmission line in its characteristic impedance to minimize line reflection. An open line will affect the receiver input as would a low-level voltage. The receiver can withstand a level of -0.15 V with power on or off. The other inputs are in TTL configuration. The S input must be high to enable the receiver input. Two of the line receivers have A and B inputs that, if both are high, will hold the output low. The third receiver has only an A input that, if high, will hold the output low.

The SN55122 is characterized for operation over the full military temperature range of -55°C to 125°C . The N8T14 and SN75122 are characterized for operation from 0°C to 70°C .

SN55122 . . . J PACKAGE
N8T14, SN75122 . . . D OR N PACKAGE
(TOP VIEW)



SN55122 . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

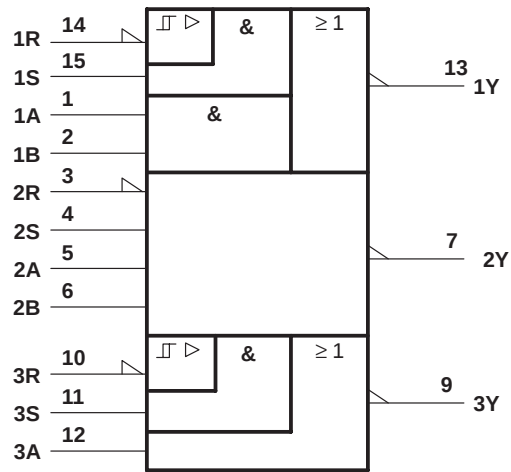
**THE N8T14 AND SN75122 ARE NOT
RECOMMENDED FOR NEW DESIGN**

N8T14, SN55122, SN75122

TRIPLE LINE RECEIVERS

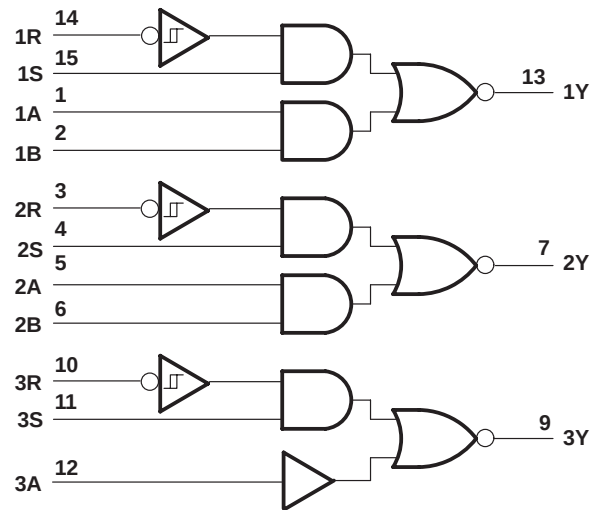
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logic symbol†



† 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.

logic diagram

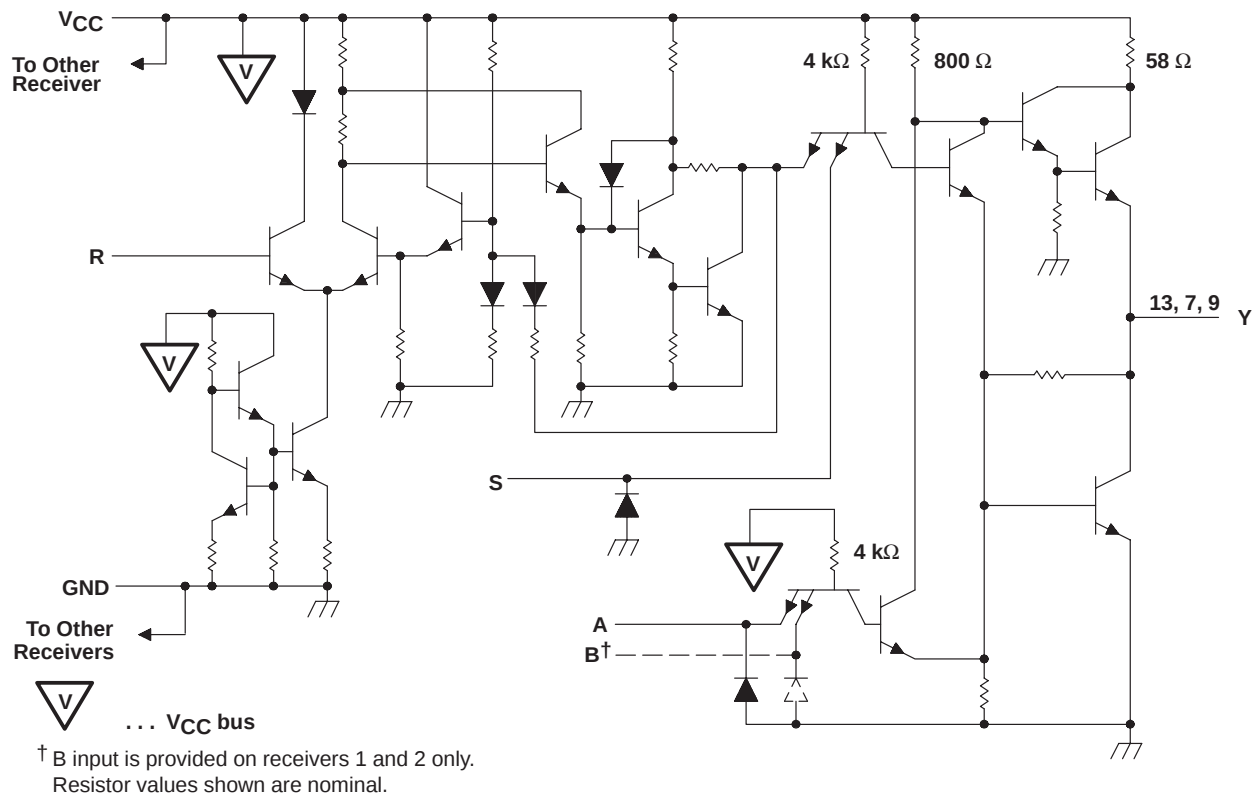


FUNCTION TABLE

INPUTS				OUTPUT Y
A	B [‡]	R	S	
H	H	X	X	L
X	X	L	H	L
L	X	H	X	H
L	X	X	L	H
X	L	H	X	H
X	L	X	L	H

[‡] B input and last two lines of the function table are applicable to receivers 1 and 2 only.
H = high level, L = low level, X = irrelevant

schematic diagram (each receiver)



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

Supply voltage, V_{CC} (see Note 1)	6 V
Input voltage: R input	6 V
A, B, or S input	5.5 V
Output voltage	6 V
Output current	± 100 mA
Continuous total power dissipation (see Note 2)	See Dissipation Rating Table
Operating free-air temperature range: SN55122	-55°C to 125°C
N8T14, SN75122	0°C to 70°C
Storage temperature range	-65°C to 150°C
Case temperature for 60 seconds: FK package	260°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J package	300°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or N package	260°C

- NOTES: 1. Voltage values are with respect to network ground terminal.
2. The SN55122 chips are alloy mounted, and the SN75122 chips are glass mounted.

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^{\circ}\text{C}$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25^{\circ}\text{C}$	$T_A = 70^{\circ}\text{C}$ POWER RATING	$T_A = 125^{\circ}\text{C}$ POWER RATING
D	950 mW	7.6 mW/ $^{\circ}\text{C}$	608 mW	—
FK	1375 mW	11.0 mW/ $^{\circ}\text{C}$	880 mW	275 mW
J	1375 mW	11.0 mW/ $^{\circ}\text{C}$	880 mW	275 mW
N	1150 mW	9.2 mW/ $^{\circ}\text{C}$	736 mW	—

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recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4.75	5	5.25	V
High-level input voltage, V_{IH}	A, B, R, or S	2			V
Low-level input voltage, V_{IL}	A, B, R, or S			0.8	V
High-level output current, I_{OH}				–500	μ A
Low-level output current, I_{OL}				16	mA
Operating free-air temperature, T_A	SN55122	–55		125	$^{\circ}$ C
	SN75122	0		70	

electrical characteristics over recommended operating free-air temperature, $V_{CC} = 4.75$ V to 5.25 V (unless otherwise noted)

PARAMETER			TEST CONDITIONS			MIN	TYP [†]	MAX	UNIT
V_{hys}	Hysteresis ($V_{T+} - V_{T-}$)	R	$V_{CC} = 5$ V, $T_A = 25^{\circ}$ C, See Figures 2 and 4			0.3	0.6		V
V_{IK}	Input clamp voltage	A, B, or S	$V_{CC} = 5$ V, $I_I = -12$ mA					–1.5	V
$V_{I(BR)}$	Input breakdown voltage	A, B, or S	$V_{CC} = 5$ V, $I_I = 10$ mA			5.5			V
V_{OH}	High-level output voltage		$V_{IH} = 2$ V, $V_{IL} = 0.8$ V, $I_{OH} = -500$ μ A			2.6			V
			$V_{I(A)} = 0$, $V_{I(B)} = 0$, $V_{I(S)} = 2$ V, $V_{I(R)} = 1.45$ V, $I_{OH} = -500$ μ A, See Note 3			2.6			
V_{OL}	Low-level output voltage		$V_{IH} = 2$ V, $V_{IL} = 0.8$ V, $I_{OL} = 16$ mA					0.4	V
			$V_{I(A)} = 0$, $V_{I(B)} = 0$, $V_{I(S)} = 2$ V, $V_{I(R)} = 1.45$ V, $I_{OL} = 16$ mA, See Note 4					0.4	
I_{IH}	High-level input current	A, B, or S	$V_I = 4.5$ V					40	μ A
		R	$V_I = 3.8$ V					170	
I_{IL}	Low-level input current	A, B, or S	$V_I = 0.4$ V, $V_{IR} = 0.8$ V			–0.1		–1.6	mA
$I_{OS}^{\ddagger}$	Short-circuit output current		$V_{CC} = 5$ V, $T_A = 25^{\circ}$ C			–50		–100	mA
I_{CCH}	High-level supply current		$V_{CC} = \text{MAX}$, All inputs at 0.8 V, Outputs open					72	mA
I_{CCL}	Low-level supply current		$V_{CC} = \text{MAX}$, All inputs at 2 V, Outputs open					100	mA

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

[‡] Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

NOTES: 3. The receiver input is high immediately before being reduced to 1.45 V.

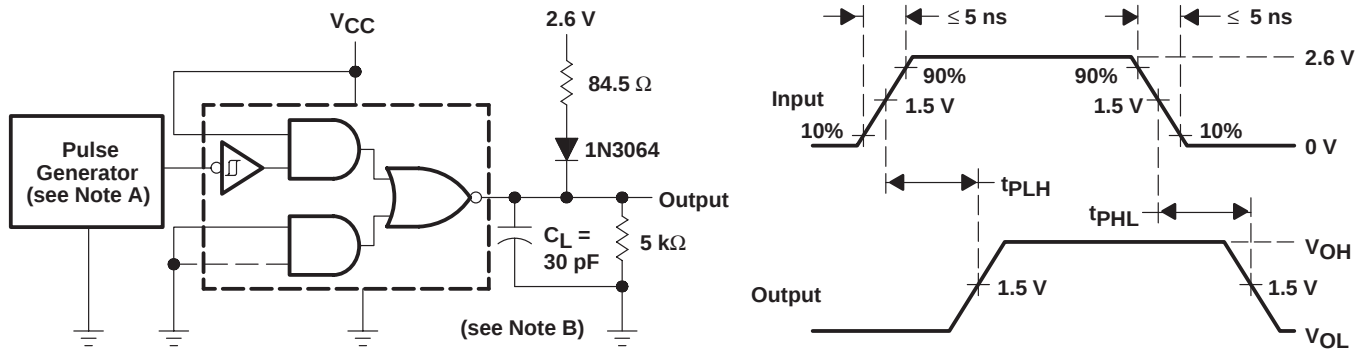
4. The receiver input is low immediately before being increased to 1.45 V.

switching characteristics, $V_{CC} = 5$ V, $T_A = 25^{\circ}$ C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output from R input	See Figure 1		20	30	ns
t_{PHL}	Propagation delay time, high-to-low-level output from R input			20	30	



PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT

VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics: $Z_O = 50 \Omega$, $t_W = 200$ ns, duty cycle = 50%, $PRR \leq 500$ kHz.
B. C_L includes probe and jig capacitance.

Figure 1. Test Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

OUTPUT VOLTAGE vs INPUT VOLTAGE

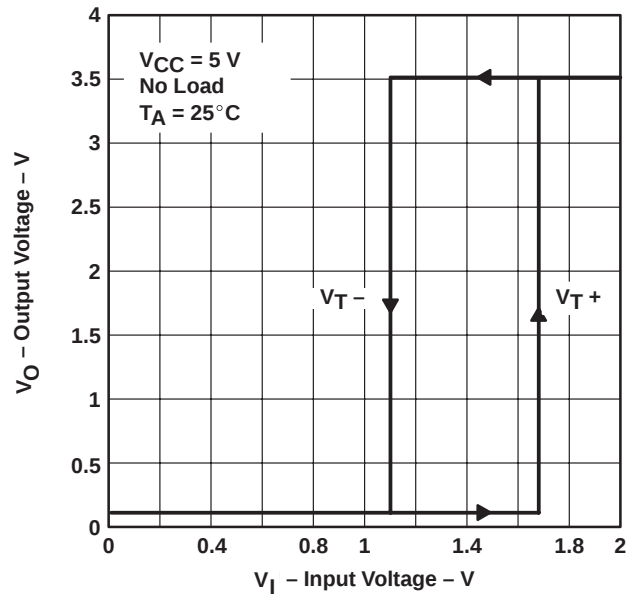


Figure 2

APPLICATION INFORMATION

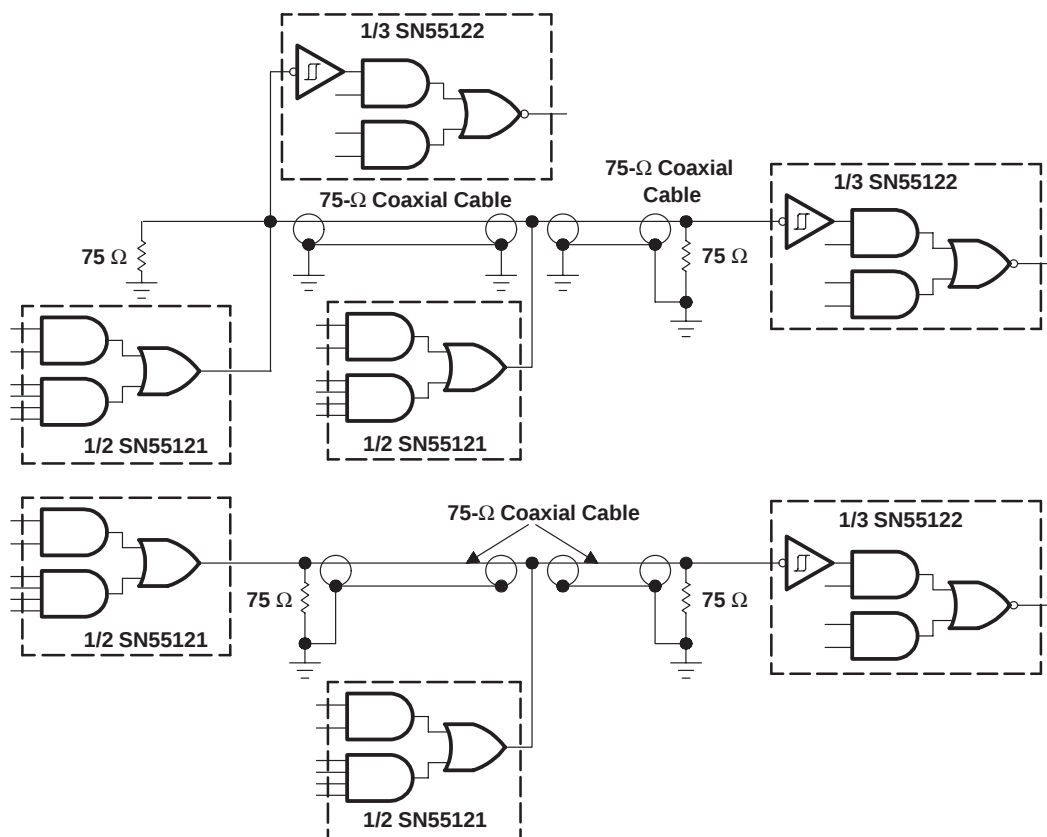
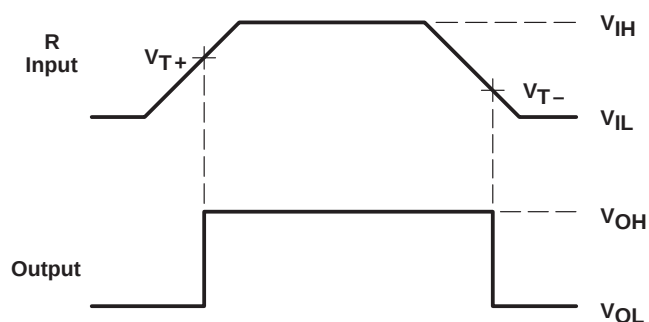


Figure 3. Single-Ended Party Line Circuits



NOTE: The high gain and built-in hysteresis of the SN55122 and SN75122 line receivers enable them to be used as Schmitt triggers in squaring pulses.

Figure 4. Pulse Squaring

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