



# Line Drivers/Receivers

## LM55122/LM75122 triple line receivers

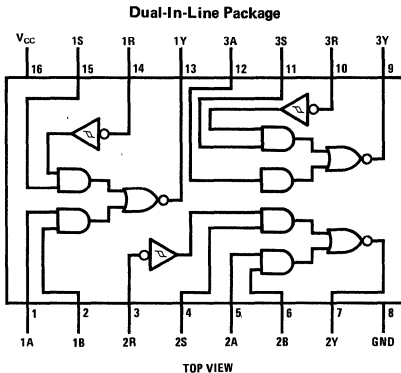
### general description

The LM55122/LM75122 are triple line receivers designed for digital data transmission with line impedances from 50Ω to 500Ω. Each receiver has one input with built-in hysteresis which provides a large noise margin. The other inputs on each receiver are in a standard TTL configuration. The LM55122/LM75122 are compatible with standard TTL logic and supply voltage levels.

### features

- Built-in input threshold hysteresis
- High speed . . . typical propagation delay time 20 ns
- Independent channel strobes
- Input gating increases application flexibility
- Single 5.0V supply operation
- Fanout to 10 series 54/74 standard loads
- Plug-in replacement for the SN55122 and the 8T14

### connection diagram



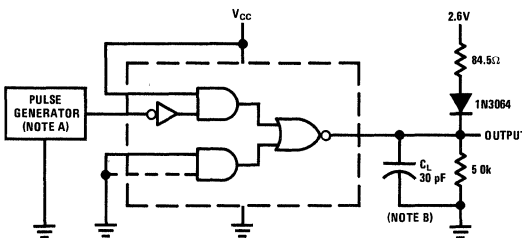
Order Number LM55122J, LM75122J  
See Package 17  
Order Number LM75122N  
See Package 23

### truth table

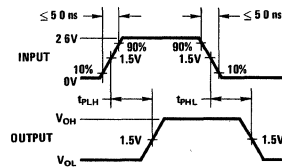
INPUTS				OUTPUT
A	B†	R	S	Y
H	H	X	X	L
X	X	L	H	L
L	X	H	X	H
L	X	X	L	H
X	L	H	X	H
X	L	X	L	H

H = high level, L = low level, X = irrelevant  
†B input and last two lines of the truth table are applicable to receivers 1 and 2 only

### ac test circuit and switching time waveforms



Note A. The pulse generator has the following characteristics  
 $Z_{OUT} \approx 50\Omega$ ,  $t_w = 200$  ns, duty cycle = 50%,  $t_r = t_f = 5.0$  ns.  
Note B  $C_L$  includes probe and jig capacitance



**absolute maximum ratings**

(Notes 1 and 2)

Supply Voltage, $V_{CC}$	6.0V
Input Voltage	
R Input	6.0V
A, B, or S Input	5.5V
Output Voltage	6.0V
Output Current	$\pm 100$ mA
Continuous Total Power Dissipation at (or below) 25°C Free-Air Temperature (Note 5)	800 mW
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

**operating conditions**

	MIN	MAX	UNITS
Supply Voltage, $V_{CC}$	4.75	5.25	V
Operating Temperature, $T_A$			
LM55122	-55	+125	°C
LM75122	0	+75	°C
High Level Output Current, $I_{OH}$		-500	$\mu$ A
Low Level Output Current, $I_{OL}$		16	mA

**electrical characteristics** (Note 3)  $V_{CC} = 4.75$  V to 5.25V (unless otherwise noted)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
High Level Input Voltage ( $V_{IH}$ ) A, B, R, or S		2.0			V
Low Level Input Voltage ( $V_{IL}$ ) A, B, R, or S				0.8	V
Hysteresis ( $V_{T+} - V_{T-}$ ) R	$V_{CC} = 5.0$ V, $T_A = 25^\circ$ C (Note 7)	0.3	0.6		V
Input Clamp Voltage ( $V_I$ ) A, B, or S	$V_{CC} = 5.0$ V, $I_I = -12$ mA			-1.5	V
Input Breakdown Voltage ( $V_{(BR)I}$ ) A, B, or S	$V_{CC} = 5.0$ V, $I_I = 10$ mA	5.5			V
High Level Output Voltage ( $V_{OH}$ )	$V_{IH} = 0$ V, $V_{IL} = 0.8$ V, $I_{OH} = -500$ $\mu$ A, (Note 4)	2.6			V
	$V_{I(A)} = 0$ V, $V_{I(B)} = 0$ V, $V_{I(S)} = 2.0$ V, $V_{I(R)} = 1.45$ V, (Note 8), $I_{OH} = -500$ $\mu$ A	2.6			V
Low Level Output Voltage ( $V_{OL}$ )	$V_{IH} = 2.0$ V, $V_{IL} = 0.8$ V, $I_{OL} = 16$ mA, (Note 4)			0.4	V
	$V_{I(A)} = 0$ V, $V_{I(B)} = 0$ V, $V_{I(S)} = 2.0$ V, $V_{I(R)} = 1.45$ V, (Note 9), $I_{OL} = 16$ mA			0.4	V
High Level Input Current ( $I_{IH}$ ) A, B, or S	$V_I = 4.5$ V			40	$\mu$ A
R	$V_I = 3.8$ V			170	$\mu$ A
Low Level Input Current ( $I_{IL}$ ) A, B, or S	$V_I = 0.4$ V	-0.1		-1.6	mA
Short Circuit Output Current ( $I_{OS}$ )	$V_{CC} = 5.0$ V, $T_A = 25^\circ$ C, (Note 6)	-50		-100	mA
Supply Current ( $I_{CC}$ )	$V_{CC} = 5.25$ V			72	mA

**switching characteristics**  $V_{CC} = 5.0$  V,  $T_A = 25^\circ$  C

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Propagation Delay Time, Low to High Level Output from R Input ( $t_{PLH}$ )	(See AC Test Circuit and Switching Time Waveforms)		20	30	ns
Propagation Delay Time, High to Low Level Output from R Input ( $t_{PHL}$ )			20	30	ns

**Note 1:** "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

**Note 2:** All currents into device pins are shown as positive, currents out of device pins shown as negative, all voltage values are referenced with respect to network ground terminal, unless otherwise noted. All values shown as max or min on absolute value basis.

**Note 3:** Min/max limits apply across the guaranteed operating temperature range of -55°C to +125°C for LM55122 and 0°C to +75°C for LM75122, unless otherwise specified. Typical values are for  $V_{CC} = 5.0$  V,  $T_A = 25^\circ$  C. Positive current is defined as current into the referenced pin.

**Note 4:** The output voltage and current limits are guaranteed for any appropriate combination of high and low inputs specified by the truth table for the desired output.

**Note 5:** For operating at elevated temperatures, the cavity DIP package (J) has a maximum junction temperature of +150°C and must be derated based on a thermal resistance of +85°C/W, junction to ambient. The molded DIP package (N) has a maximum junction temperature of +150°C and must be derated based on a thermal resistance of +150°C/W, junction to ambient.

**Note 6:** Not more than one output should be shorted at a time.

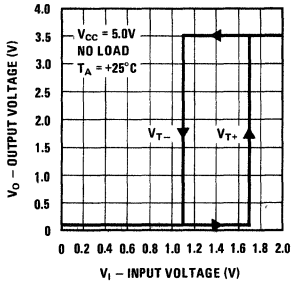
**Note 7:** Hysteresis is the difference between the positive going input threshold voltage,  $V_{T+}$ , and the negative going input threshold voltage,  $V_{T-}$ .

**Note 8:** Receiver input was at a high level immediately before being reduced to 1.45V.

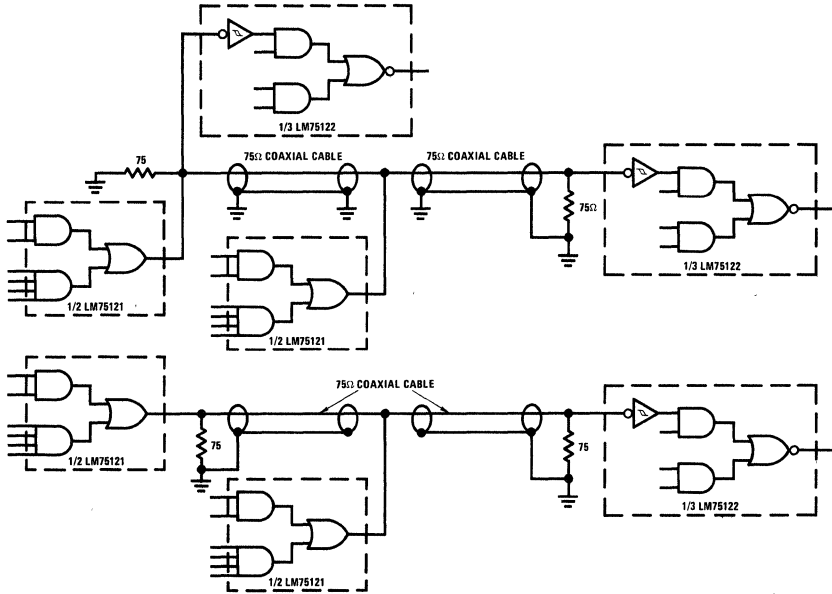
**Note 9:** Receiver input was at a low level immediately before being raised to 1.45V.

typical performance characteristics

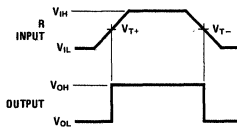
Output Voltage vs Receiver Input Voltage



typical applications



Single-Ended Party Line Circuits



THE HIGH GAIN AND BUILT IN HYSTERESIS OF THE LM55122/LM75122 LINE RECEIVERS ENABLE THEM TO BE USED AS SCHMITT TRIGGERS IN SQUARING UP PULSES

Pulse Squaring