- **Meets or Exceeds the Requirements of IBM™ System 360 Input/Output Interface Specification**
- **Operates From Single 5-V Supply**
- **TTL Compatible**
- **Built-In Input Threshold Hysteresis**
- **High Speed . . . Typical Propagation Delay Time = 20 ns**
- **Independent Channel Strobes**
- **Input Gating Increases Application Flexibility**
- **Designed for Use With Dual Line Driver SN75123**
- **Designed to Be Interchangeable With Signetics N8T24**

D OR N PACKAGE
(TOP VIEW)

1A	1	16	V_{CC}
1B	2	15	1S
2R	3	14	1R
2S	4	13	1Y
2A	5	12	3A
2B	6	11	3S
2Y	7	10	3R
GND	8	9	3Y
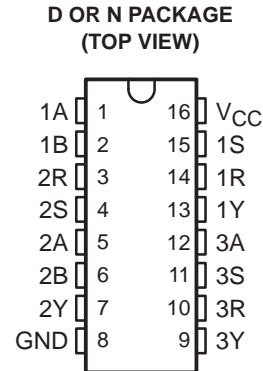
description

The SN75124 triple line receiver is specifically designed to meet the input/output interface specifications for IBM System 360. It is also compatible with standard TTL logic and supply voltage levels.

The SN75124 has receiver inputs with built-in hysteresis to provide increased noise margin for single-ended systems. An open line affects the receiver input as does a low-level input voltage, and the receiver input 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, hold the output low. The third receiver has only an A input that, if high, holds the output low.

See the SN751730 for new IBM 360/370 interface designs.

The SN75124 is characterized for operation from 0°C to 70°C.

FUNCTION 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

†B input and last two lines of the function table are applicable to receivers 1 and 2 only.

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SN75124
TRIPLE LINE RECEIVER

logic symbol†

logic diagram (positive logic)
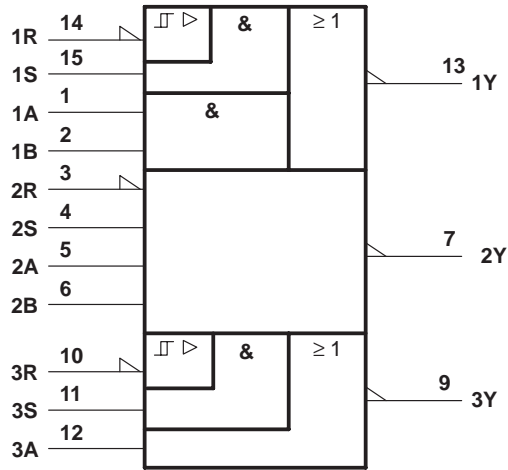
† This symbol is in accordance with ANSI/IEEE Std 91-1984
and IEC Publication 617-12.
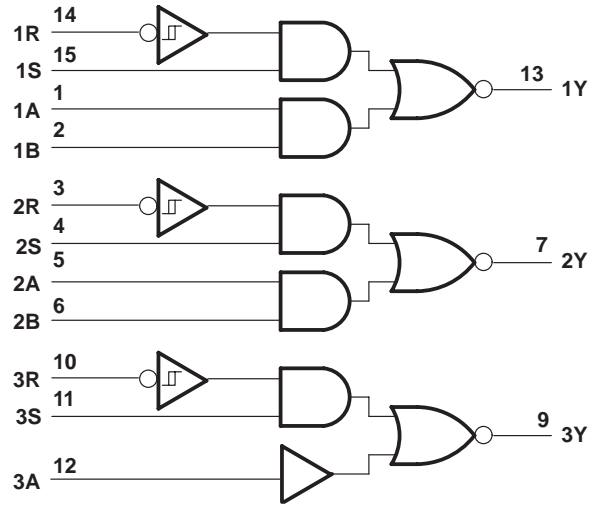
schematic (each receiver)

‡ B input is provided on receivers 1 and 2 only
Resistor values shown are nominal.

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

Supply voltage, V_{CC} (see Note 1) . . . . 7 V
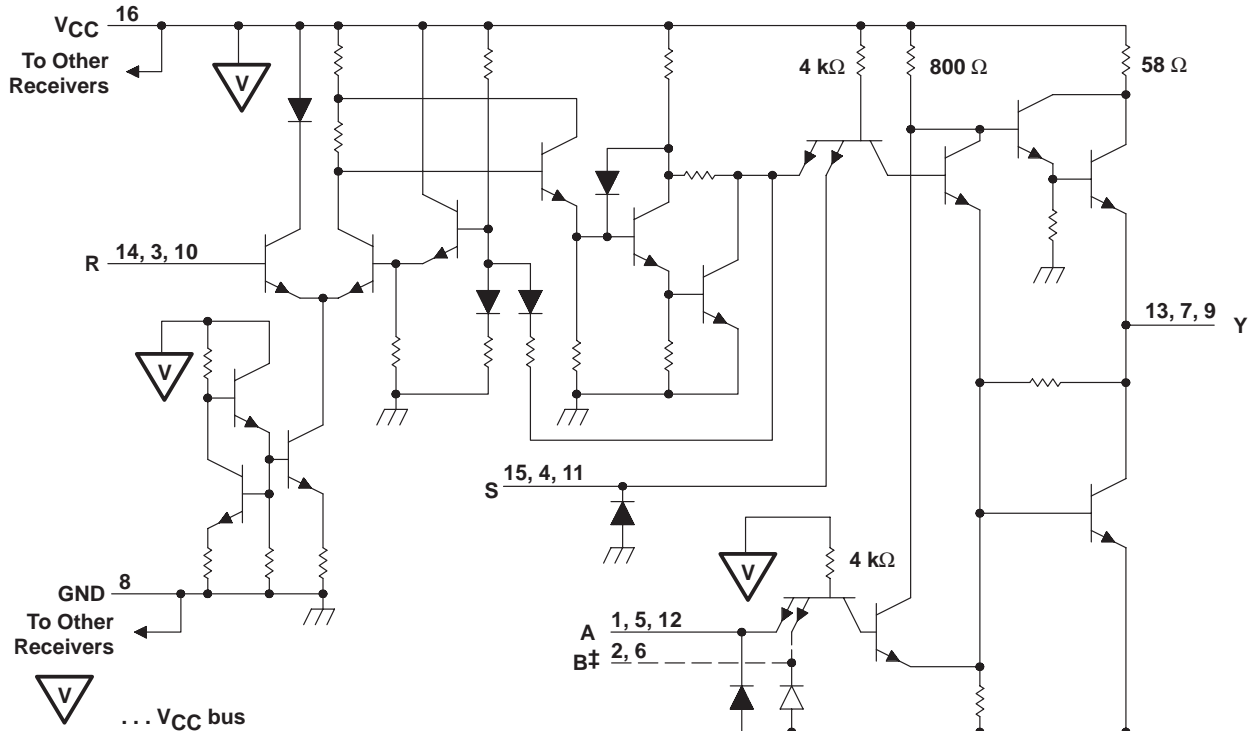Input voltage, V_I: R input with V_{CC} applied . . . . 7 V
R input with V_{CC} not applied . . . . 6 V
A, B, or S input . . . . 5.5 V
Output voltage, V_O . . . . 7 V
Output current, I_O . . . . ±100 mA
Continuous total dissipation . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . 0°C to 70°C
Storage temperature range, T_{stg} . . . . −65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . 260°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.

NOTE 1:   Voltage values are with respect to network ground terminal

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25°C$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ 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}	A, B, or S	2			V
	R	1.7			
Low-level input voltage, V_{IL}	A, B, or S			0.8	V
	R			0.7	
High-level output current, I_{OH}				−800	µA
Low-level output current, I_{OL}				16	mA
Operating free-air temperature, T_A		0		70	°C

TEXAS INSTRUMENTS

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

|	PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
V_{hys}	Hysteresis voltage ($V_{IT+} - V_{IT-}$)	R	$V_{CC} = 5$ V,	$T_A = 25°C$	0.2	0.5		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		$V_{IH} = V_{IH}min,$ $I_{OH} = -800$ µA,	$V_{IL} = V_{IL}max,$ See Note 2	2.6			V
V_{OL}	Low-level output voltage		$V_{IH} = V_{IH}min,$ $I_{OL} = 16$ mA,	$V_{IL} = V_{IL}max,$ See Note 2			0.4	V
I_I	Input current at maximum input voltage	R	$V_I = 7$ V				5	mA
			$V_I = 6$ V,	$V_{CC} = 0$			5	
I_{IH}	High-level input current	A, B, or S	$V_I = 4.5$ V				40	µA
		R	$V_I = 3.11$ 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}	Short-circuit output current†					−50	−100	mA
I_{CC}	Supply current		All inputs = 0.8 V				72	mA
			All inputs = 2 V				100	

† Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.
NOTE 2: The output voltage and current limits are characterized for any appropriate combination of high and low inputs specified by the function table for the desired output.

switching characteristics, $V_{CC} = 5$ V, $T_A = 25°C$

	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
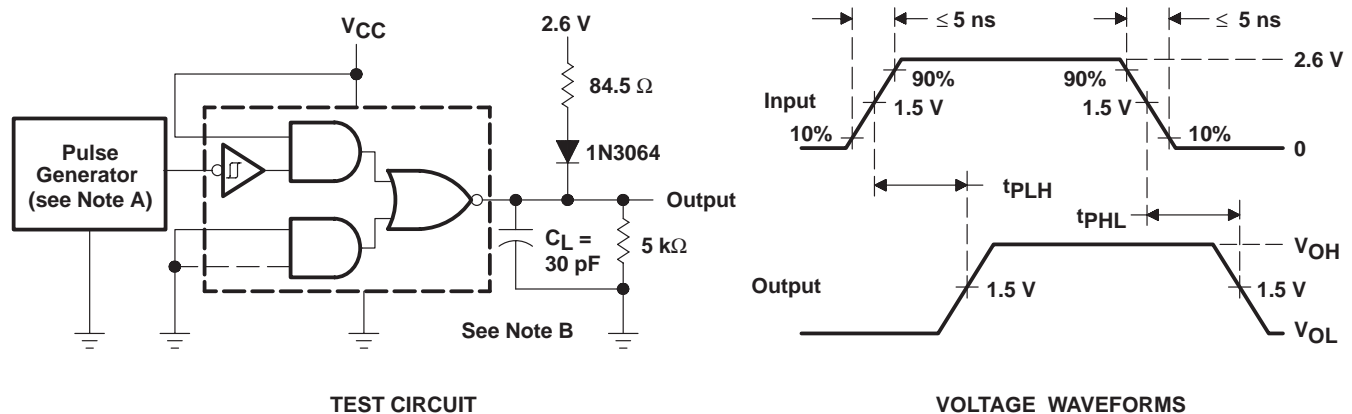
VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics: $Z_O \approx 50$ Ω, PRR ≤ 5 MHz, duty cycle = 50%.
B. C_L includes probe and jig capacitance.

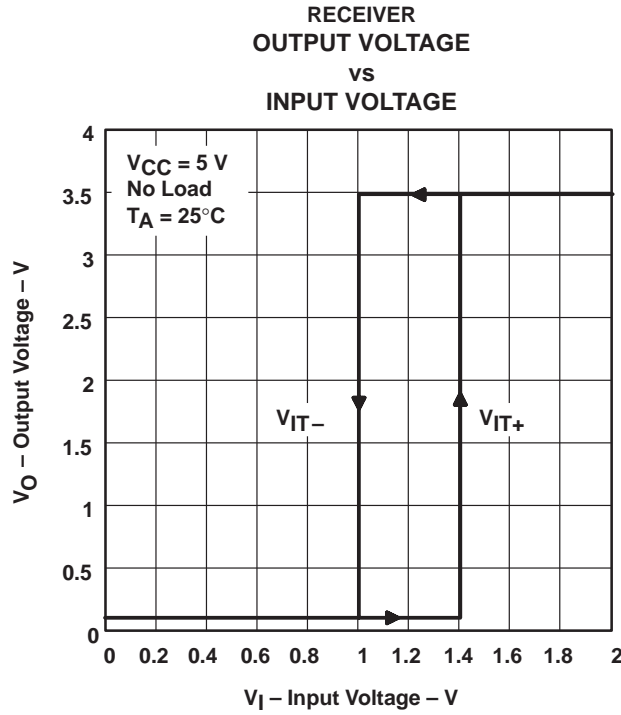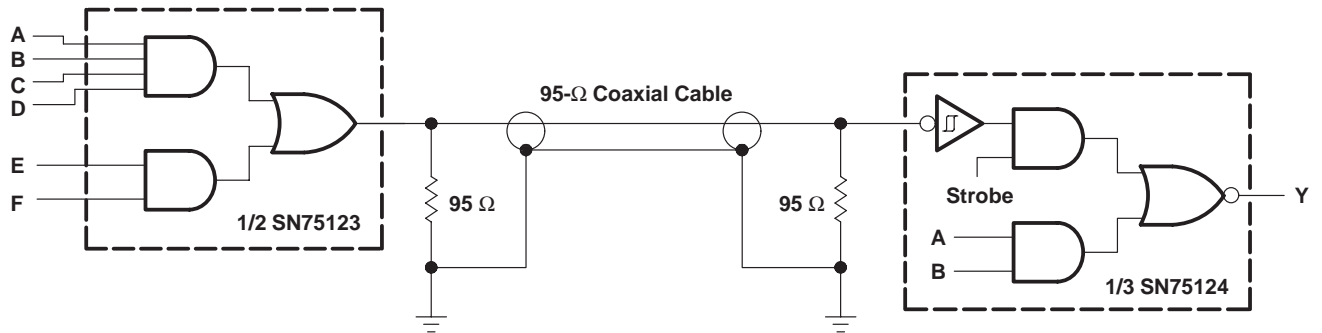**Figure 1. Test Circuit and Voltage Waveforms**

TYPICAL CHARACTERISTICS

RECEIVER
OUTPUT VOLTAGE
vs
INPUT VOLTAGE

Figure 2

APPLICATION INFORMATION

Figure 3. Unbalanced Line Communication Using SN75123 and SN75124

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PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SN75124D	OBSOLETE	SOIC	D	16		None	Call TI	Call TI
SN75124N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN75124NSR	ACTIVE	SO	NS	16	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - May not be currently available - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
None: Not yet available Lead (Pb-Free).
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDECindustry standard classifications, and peak solder temperature.

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N (R−PDIP−T**)

16 PINS SHOWN

PLASTIC DUAL−IN−LINE PACKAGE

DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS−001 VARIATION	AA	BB	AC	AD

A

16   9

0.260 (6,60)
0.240 (6,10)

1   8

0.070 (1,78)
0.045 (1,14) △D

0.045 (1,14)
0.030 (0,76) △D

0.020 (0,51) MIN

0.325 (8,26)
0.300 (7,62)

0.015 (0,38)

0.200 (5,08) MAX

Gauge Plane

Seating Plane

0.125 (3,18) MIN

0.010 (0,25) NOM

0.100 (2,54)

0.021 (0,53)
0.015 (0,38)

⊕ 0.010 (0,25) Ⓜ

0.430 (10,92) MAX

14/18 Pin Only
20 Pin vendor option △D

4040049/E 12/2002

NOTES: A. All linear dimensions are in inches (millimeters).
        B. This drawing is subject to change without notice.
     △C Falls within JEDEC MS−001, except 18 and 20 pin minimum body length (Dim A).
     △D The 20 pin end lead shoulder width is a vendor option, either half or full width.

D (R−PDSO−G16)   **PLASTIC SMALL−OUTLINE PACKAGE**

0.394 (10,00)
0.386 (9,80)

16   9

0.244 (6,20)
0.228 (5,80)

0.157 (4,00)
0.150 (3,80)

1   8

Pin 1
Index Area

0.050 (1,27)

0.020 (0,51)
0.012 (0,31)

⊕ | 0.010 (0,25) Ⓜ

0.069 (1,75) Max

0.010 (0,25)
0.004 (0,10)

0.010 (0,25)
0.007 (0,17)

0.004 (0,10)

Gauge Plane

Seating Plane

0.010 (0,25)   0°−8°

0.050 (1,27)
0.016 (0,40)

4040047−4/F   07/2004

NOTES: A.   All linear dimensions are in inches (millimeters).
          B.   This drawing is subject to change without notice.
          C.   Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
          D.   Falls within JEDEC MS−012 variation AC.

NS (R-PDSO-G)**

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN

DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.
        B. This drawing is subject to change without notice.
        C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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