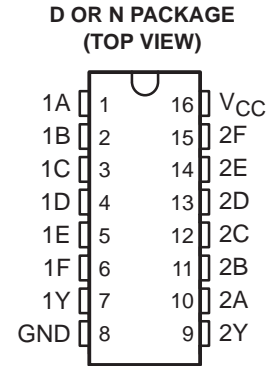# SN75123
DUAL LINE DRIVER

- **Meets or Exceeds the Requirements of IBM™ System 360 Input/Output Interface Specification**
- **Operate From Single 5-V Supply**
- **TTL Compatible**
- **3.11-V Output at I_{OH} = −59.3 mA**
- **Uncommitted Emitter-Follower Output Structure for Party-Line Operation**
- **Short-Circuit Protection**
- **AND-OR Logic Configuration**
- **Designed for Use With Triple Line Receiver SN75124**
- **Designed to Be Interchangeable With N8T13 and N8T23**

D OR N PACKAGE
(TOP VIEW)

1A	1	16	V_{CC}
1B	2	15	2F
1C	3	14	2E
1D	4	13	2D
1E	5	12	2C
1F	6	11	2B
1Y	7	10	2A
GND	8	9	2Y

THE SN751730 IS RECOMMENDED FOR NEW IBM 360/370 INTERFACE DESIGNS.

description

The SN75123 is a dual line driver specifically designed to meet the input/output interface specifications for IBM System 360. It also is compatible with standard-TTL logic and supply-voltage levels.

The SN75123 low-impedance emitter-follower outputs 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 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 SN75123 is characterized for operation from 0°C to 70°C.

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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TEXAS INSTRUMENTS

SN75123
DUAL LINE DRIVER
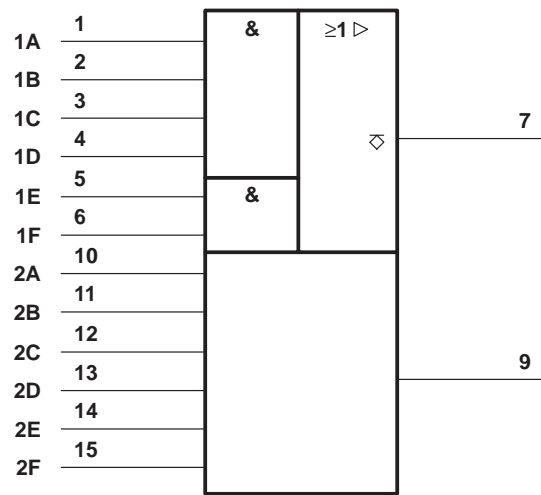
logic symbol†

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

logic diagram (positive logic)

---

schematic (each driver)

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 . . . . 5.5 V
Output voltage, V_O . . . . 7 V
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 2): D package . . . . . 950 mW
N package . . . . 1150 mW
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.
NOTES: 1. All voltage values, except differential input voltage, are with respect to network ground terminal.
        2. For operation above 25°C free-air temperature, derate the D package to 608 mW at 70°C at the rate of 7.6 mW/°C and the N package
            to 736 mW at 70°C at the rate of 9.2 mW/°C.

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}			−100	mA
Operating free-air temperature, T_A	0		70	°C

SN75123
DUAL LINE DRIVER

electrical characteristics, V_{CC} = 4.75 V to 5.25 V, T_A = 0°C to 70°C (unless otherwise noted)

| PARAMETER		TEST CONDITIONS			MIN	MAX	UNIT
V_{IK}	Input clamp voltage	V_{CC} = 5 V,	I_I = −12 mA			−1.5	V
$V_{I(BR)}$	Input breakdown voltage	V_{CC} = 5 V,	I_I = 10 mA		5.5		V
V_{OH}	High-level output voltage	V_{CC} = 5 V, V_{IH} = 2 V, I_{OH} = −59.3 mA, See Note 3	T_A = 25°C		3.11		V
			T_A = 0°C to 70°C		2.9		
V_{OL}	Low-level output voltage	V_{IL} = 0.8 V,	I_{OL} = −240 µA,	See Note 3		0.15	V
I_{OH}	High-level output current	V_{CC} = 5 V, V_{IH} = 4.5 V, V_{OH} = 2 V, T_A = 25°C, See Note 3			−100	−250	mA
$I_{O(off)}$	Off-state output current	V_{CC} = 0,	V_O = 3 V			40	µA
I_{IH}	High-level input current	V_I = 4.5 V				40	µA
I_{IL}	Low-level input current	V_I = 0.4 V			−0.1	−1.6	mA
I_{OS}	Short-circuit output current†	V_{CC} = 5 V,	T_A = 25°C			−30	mA
I_{CCH}	Supply current, outputs high	V_{CC} = 5.25 V,	All inputs at 2 V,	Outputs open		28	mA
I_{CCL}	Supply current, outputs low	V_{CC} = 5.25 V,	All inputs at 0.8 V,	Outputs open		60	mA

† Not more than one output should be shorted at a time.

NOTE 3: 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_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low- to high-level output	R_L = 50 Ω,	C_L = 15 pF,	See Figure 1		12	20	ns
t_{PHL}	Propagation delay time, high- to low-level output	R_L = 50 Ω,	C_L = 15 pF,	See Figure 1		12	20	ns
t_{PLH}	Propagation delay time, low- to high-level output	R_L = 50 Ω,	C_L = 100 pF,	See Figure 1		20	35	ns
t_{PHL}	Propagation delay time, high- to low-level output	R_L = 50 Ω,	C_L = 100 pF,	See Figure 1		15	25	ns

PARAMETER MEASUREMENT INFORMATION
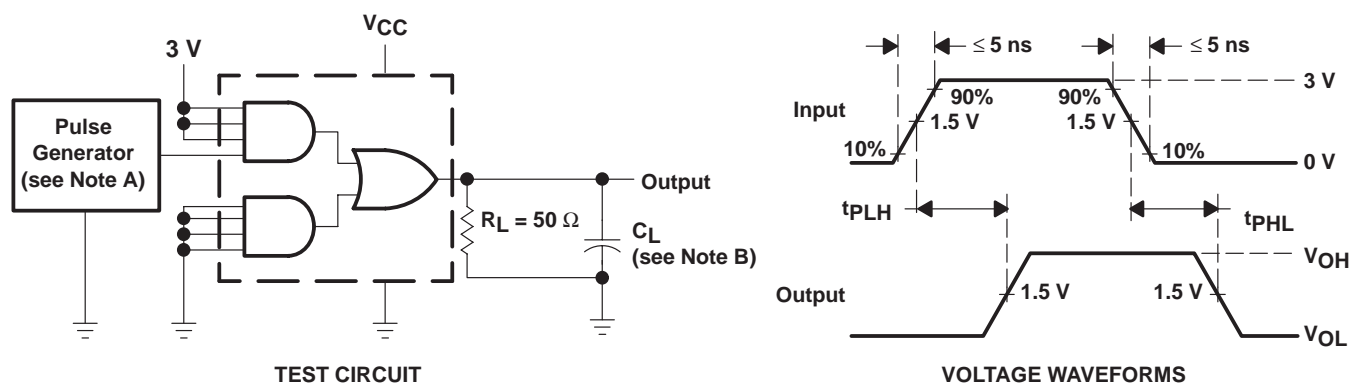
NOTES: A. The pulse generator has the following characteristics: Z_O = 50 Ω, t_w = 200 ns, duty cycle = 50%.
B. C_L Includes probe and jig capacitance.

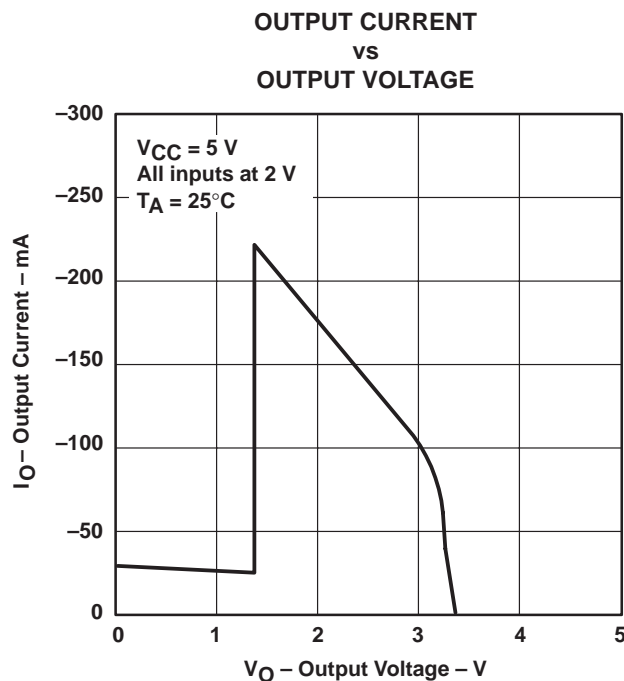**Figure 1. Test Circuit and Voltage Waveforms**

TEXAS
INSTRUMENTS
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TYPICAL CHARACTERISTICS

OUTPUT CURRENT
vs
OUTPUT VOLTAGE

V_{CC} = 5 V
All inputs at 2 V
T_A = 25°C

I_O – Output Current – mA

V_O – Output Voltage – V

Figure 2

APPLICATION INFORMATION

95-Ω Coaxial Cable

A
B
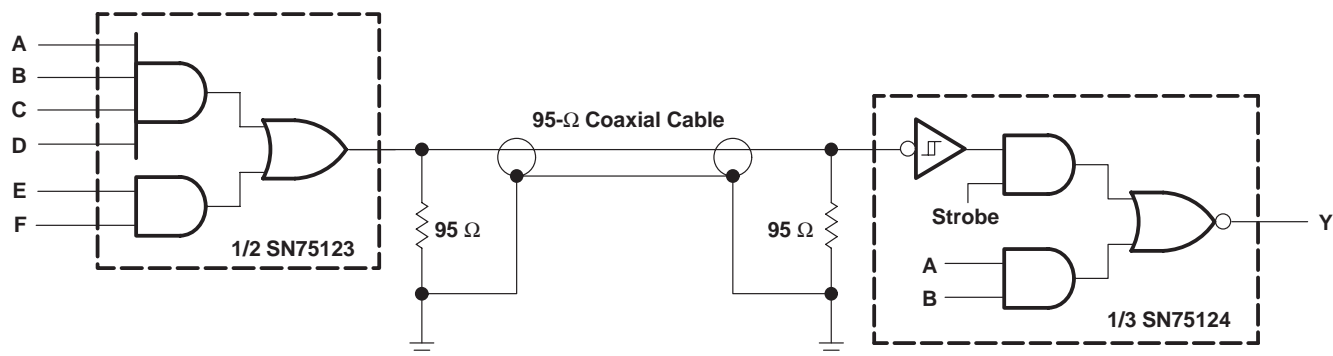C
D
E
F

1/2 SN75123

95 Ω

95 Ω

Strobe

A
B

1/3 SN75124

Y

Figure 3. Unbalanced Line Communication Using SN75123 and SN75124

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN75123N	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN75123N
SN75123N.A	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN75123N

(1) Status: For more details on status, see our product life cycle.

(2) Material type: When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) RoHS values: Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) Lead finish/Ball material: Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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PACKAGE MATERIALS INFORMATION

TUBE

T - Tube height

L - Tube length

W - Tube width

B - Alignment groove width

*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN75123N	N	PDIP	16	25	506	13.97	11230	4.32
SN75123N.A	N	PDIP	16	25	506	13.97	11230	4.32

N (R−PDIP−T**)
16 PINS SHOWN

PLASTIC DUAL−IN−LINE PACKAGE

PINS ** DIM	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

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

0.070 (1,78)
0.045 (1,14)

0.045 (1,14)
0.030 (0,76)

0.020 (0,51) MIN

0.200 (5,08) MAX

Seating Plane

0.125 (3,18) MIN

0.100 (2,54)

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

⊕ 0.010 (0,25) Ⓜ

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

0.015 (0,38)

Gauge Plane

0.010 (0,25) NOM

0.430 (10,92) MAX

14/18 Pin Only
20 Pin vendor option

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.

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Last updated 10/2025