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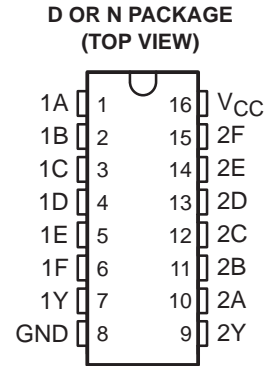- **Operate From Single 5-V Supply**
- **TTL Compatible**
- **3.11-V Output at I_{OH} = −59.3 mA**
- **Uncommitted Emitter-Follower Output Structure for Party-Line Operation**
- **Short-Circuit Protection**
- **AND-OR Logic Configuration**
- **Designed for Use With Triple Line Receiver SN75124**
- **Designed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

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)

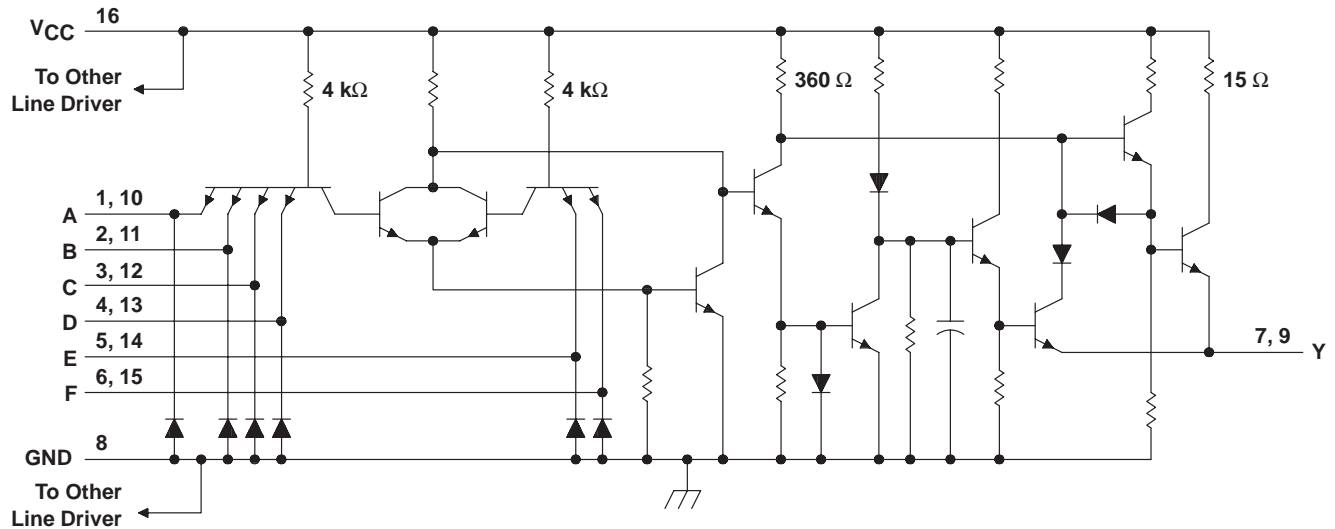![Texas Instruments logo]
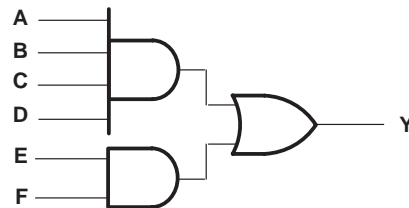
schematic (each driver)

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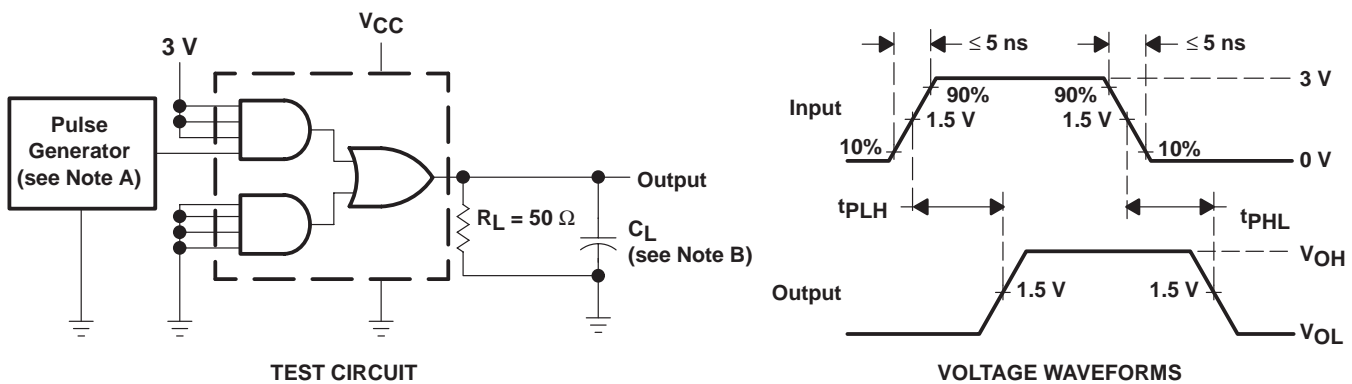
NOTES: A. The pulse generator has the following characteristics: Z_O = 50 Ω, t_w = 200 ns, duty cycle = 50%.
        B. C_L Includes probe and jig capacitance.

Figure 1. Test Circuit and Voltage Waveforms

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

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
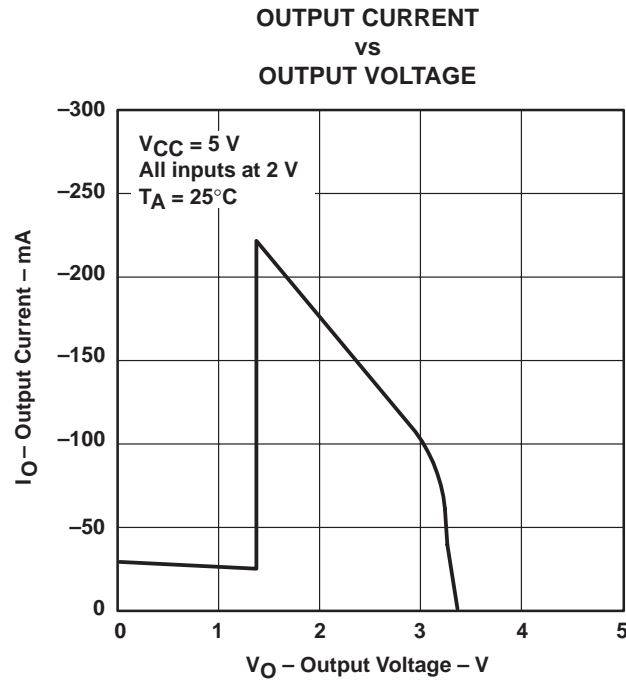
Figure 2

APPLICATION INFORMATION

95-Ω Coaxial Cable

95 Ω

95 Ω

1/2 SN75123

Strobe

A
B

1/3 SN75124

Y

A
B
C
D
E
F
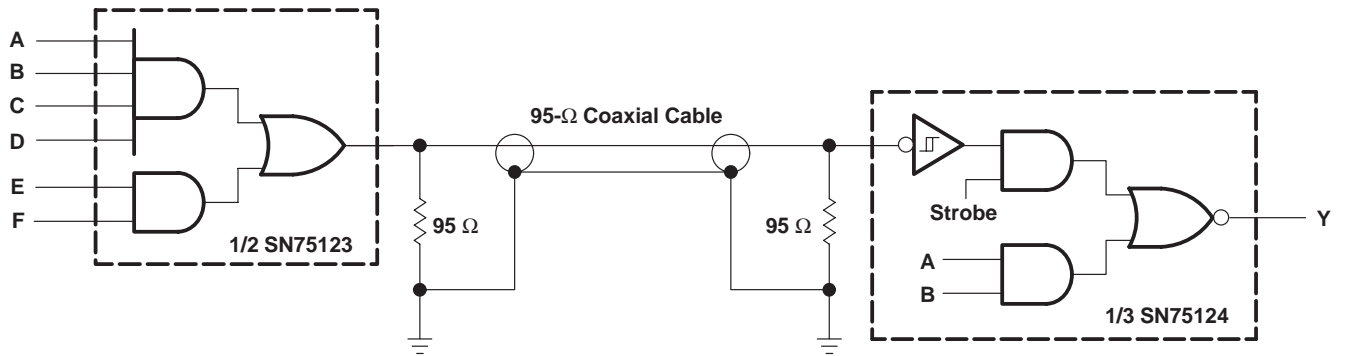
Figure 3. Unbalanced Line Communication Using SN75123 and SN75124

PACKAGE OPTION ADDENDUM

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SN75123D	OBSOLETE	SOIC	D	16		TBD	Call TI	Call TI	0 to 70		
SN75123DR	OBSOLETE	SOIC	D	16		TBD	Call TI	Call TI	0 to 70		
SN75123N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN75123N	Samples

(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 - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
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.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

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

C

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)

Gauge Plane

0.200 (5,08) MAX

Seating Plane

0.010 (0,25) NOM

0.125 (3,18) MIN

0.100 (2,54)

0.430 (10,92) MAX

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

⊕ 0.010 (0,25) Ⓜ

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

0.394 (10,00)
0.386 (9,80)
/C\

16 9

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

0.157 (4,00)
0.150 (3,80) /D\

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)
0.005 (0,13)

Gauge Plane

△ | 0.004 (0,10)

Seating Plane

0.010 (0,25) 0°−8°

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

4040047−6/M 06/11

NOTES: A. All linear dimensions are in inches (millimeters).
        B. This drawing is subject to change without notice.
    /C\ Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall
         not exceed 0.006 (0,15) each side.
    /D\ Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
        E. Reference JEDEC MS−012 variation AC.

TEXAS
INSTRUMENTS
www.ti.com

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have *not* been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products		Applications	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		