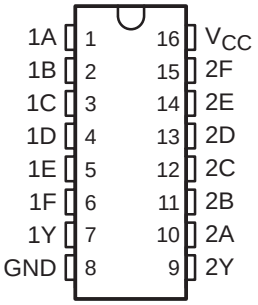
- **Meets or Exceeds the Requirements of IBM™ System 360 Input/Output Interface Specification**
- **Operate From Single 5-V Supply**
- **TTL Compatible**
- **3.11-V Output at I_{OH} = –59.3 mA**
- **Uncommitted Emitter-Follower Output Structure for Party-Line Operation**
- **Short-Circuit Protection**
- **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)



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.

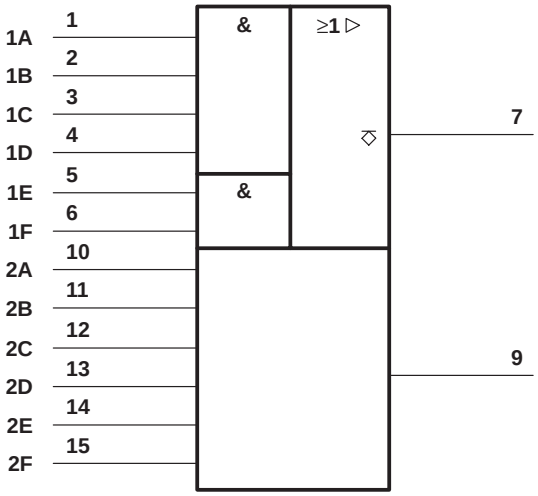
The SN75123 is characterized for operation from 0°C to 70°C.

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

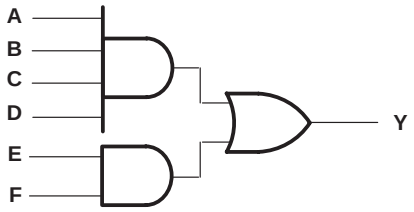
H = high level, L = low level, X = irrelevant

logic symbol†

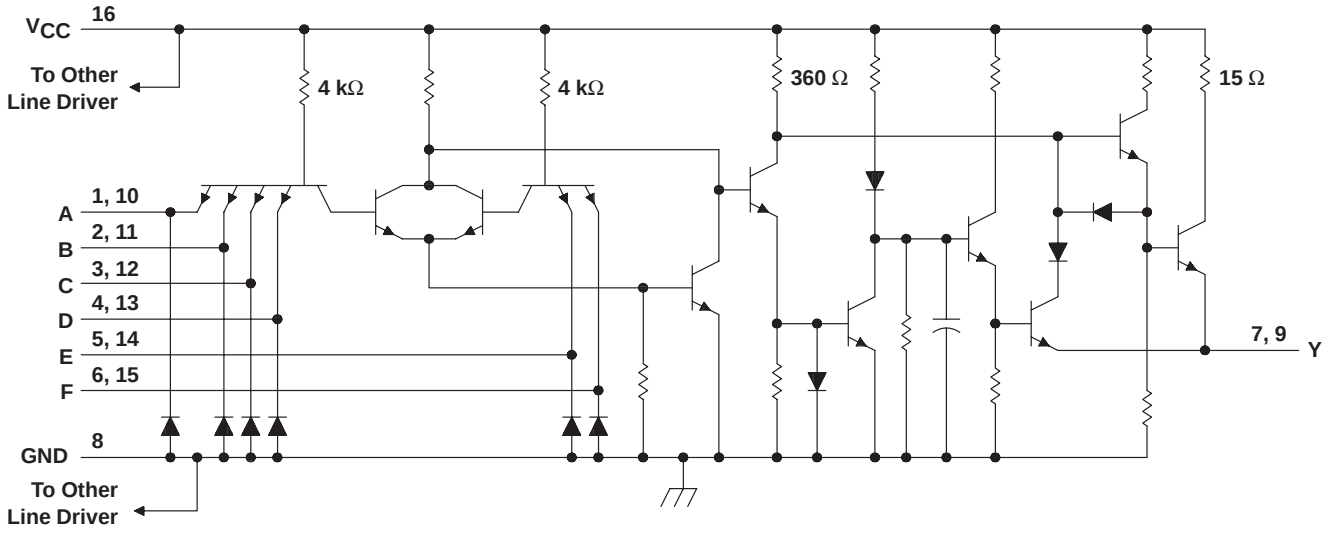


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

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

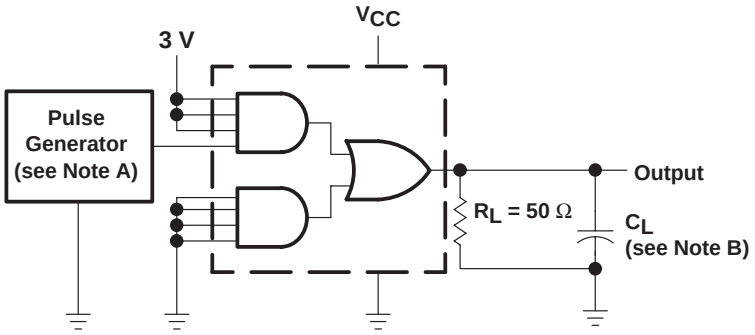
† Not more than one output should be shorted at a time.

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.

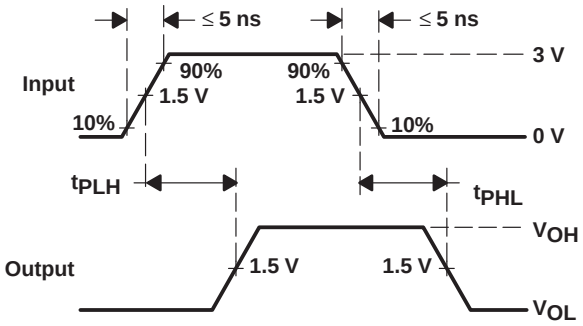
switching characteristics, V_{CC} = 5 V, T_A = 25°C

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



TEST CIRCUIT



VOLTAGE WAVEFORMS

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

TYPICAL CHARACTERISTICS

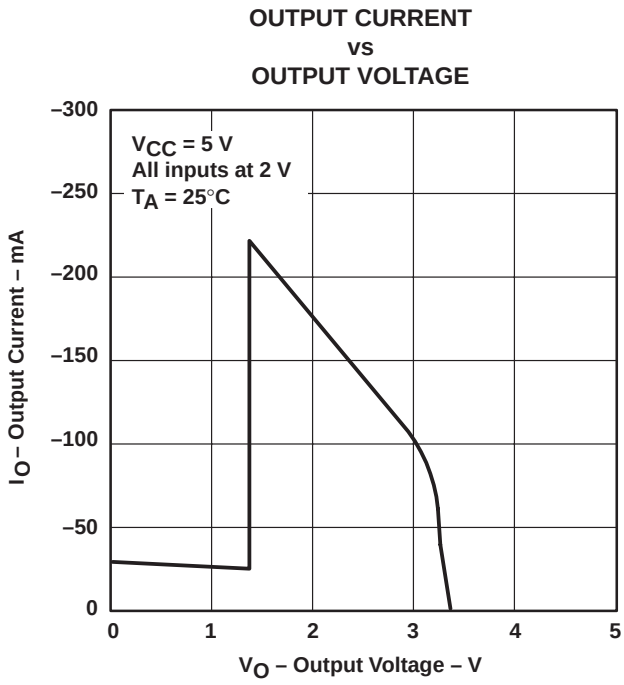


Figure 2

APPLICATION INFORMATION

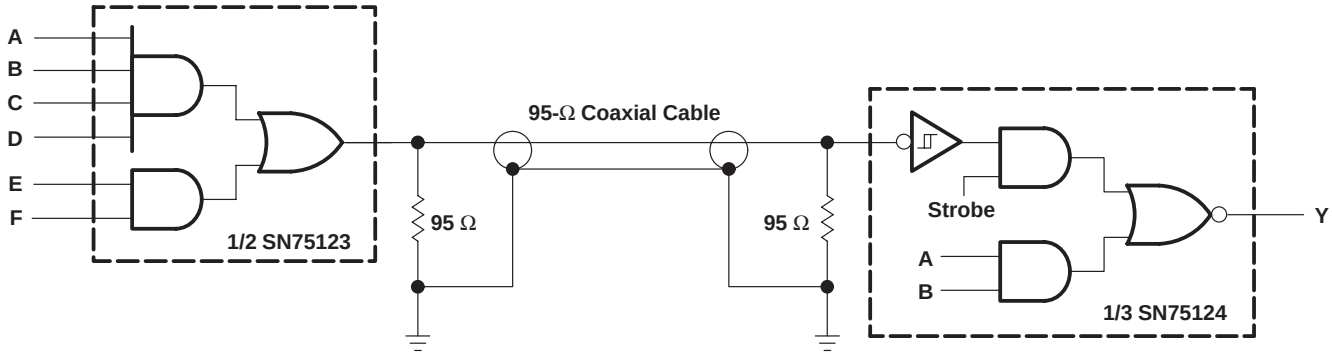


Figure 3. Unbalanced Line Communication Using SN75123 and SN75124

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgement, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

CERTAIN APPLICATIONS USING SEMICONDUCTOR PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE ("CRITICAL APPLICATIONS"). TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS. INCLUSION OF TI PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE CUSTOMER'S RISK.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. 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 of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.