

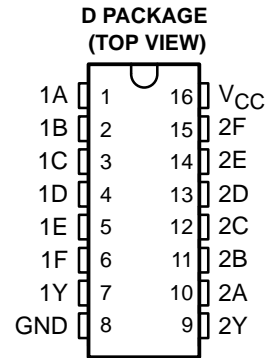
- Meets IBM 360 Input Interface Specifications
- Permits Digital Data Transmission Over Coaxial Cable, Strip Line, or Twisted Pair
- TTL Compatible With 5-V Supply
- 3.11-V Output at  $I_{OH} = -59.3$  mA
- Uncommitted Emitter-Follower Output Structure for Party-Line Operation
- IMPACT™ Low-Power Schottky Technology
- Improved Replacement for the SN75123 and Signetics 8T13
- Glitchless Power-Up/Power-Down Protection
- Short-Circuit Protection
- AND-OR Logic Configuration
- High Speed . . . Maximum Propagation Delay Time of 14 ns at  $C_L = 15$  pF

## description

The SN75ALS123 dual line driver is specifically designed to meet the input interface specifications for the IBM System 360. It is compatible with standard TTL logic and supply voltage levels. The low-impedance, emitter-follower outputs drive terminated lines such as coaxial cable, strip line, or twisted pair. The uncommitted output 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 inputs are in conventional TTL configuration. Gating can be used during power-up and power-down sequences to ensure that no noise is introduced on the line.

The SN75ALS123 employs the IMPACT™ process to achieve fast switching speeds, low power dissipation, and reduced input current requirements.

The SN75ALS123 is characterized for operation from 0°C to 70°C.



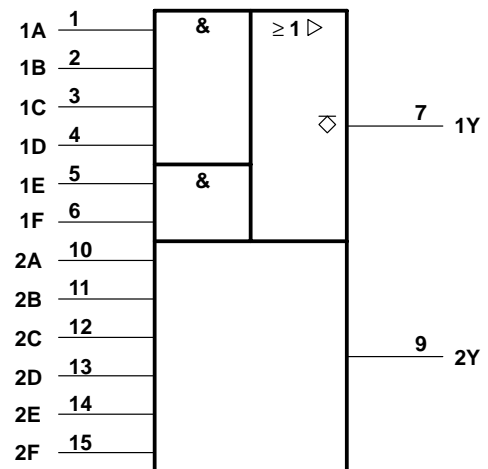
**NOT RECOMMENDED FOR NEW DESIGN**

**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

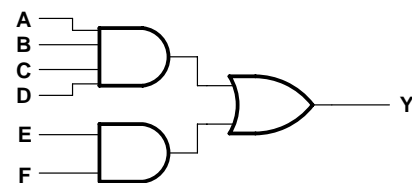
H = high level    L = low level    X = irrelevant

## logic symbol



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

## logic diagram, each driver (positive logic)



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**TEXAS  
INSTRUMENTS**

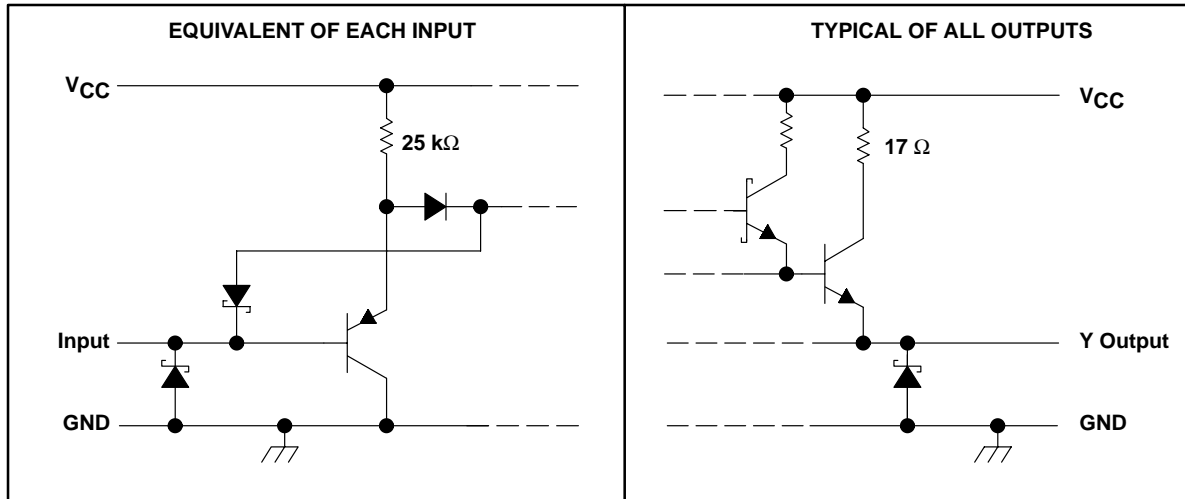
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# SN75ALS123 DUAL LINE DRIVER

SLLS031B – D1332, SEPTEMBER 1987 – REVISED FEBRUARY 1993

## schematics of inputs and outputs



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

Supply voltage, $V_{CC}$ (see Note 1)	7 V
Input voltage	5.5 V
Output voltage	6 V
Continuous total dissipation at (or below) 25°C free air temperature (see Note 2)	950 mW
Operating free-air temperature range	0°C to 70°C
Storage temperature range	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

NOTES: 1. All voltage values are with respect to network ground terminal.

2. For operation above 25°C free-air temperature, derate to 608 mW at 70°C at the rate of 7.6 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 range, $T_A$	0		70	°C

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

PARAMETER	TEST CONDITIONS	MIN	TYP†	MAX	UNIT
$V_{IK}$ Input clamp voltage	$V_{CC} = 5\text{ V}$ , $I_I = -12\text{ mA}$			-1.5	V
$V_{(BR)I}$ Input breakdown voltage	$V_{CC} = 5\text{ V}$ , $I_I = 10\text{ mA}$	5.5			V
$V_{OH}$ High-level output voltage	$V_{CC} = 5\text{ V}$ , See Note 3			2.9	V
	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $V_{IH} = 2\text{ V}$ , See Note 3			3.1 3.3	
$V_{OL}$ Low-level output voltage	$V_{IL} = 0.8\text{ V}$ , $I_{OL} = -240\text{ }\mu\text{A}$ , See Note 3			0.15	V
$I_{OH}$ High-level output current	$V_{CC} = 5\text{ V}$ , $T_A = 25^\circ\text{C}$ , $V_{IH} = 4.5\text{ V}$ , See Note 3	-100	-200	-250	mA
$I_{O(off)}$ Off-state output current	$V_{CC} = 0$ , $V_O = 3\text{ V}$			40	$\mu\text{A}$
$I_{IH}$ High-level input current	$V_I = 4.5\text{ V}$			40	$\mu\text{A}$
$I_{IL}$ Low-level input current	$V_I = 0.4\text{ V}$			-250	$\mu\text{A}$
$I_{OS}$ Short-circuit output current	$V_{CC} = 5\text{ V}$			-5 -30	mA
$I_{CCH}$ Supply current, outputs high	$V_{CC} = 5.25\text{ V}$ , All inputs at 2 V, No load			9 14	mA
$I_{CCL}$ Supply current, outputs low	$V_{CC} = 5.25\text{ V}$ , All inputs at 0.8 V, No load			13 30	mA

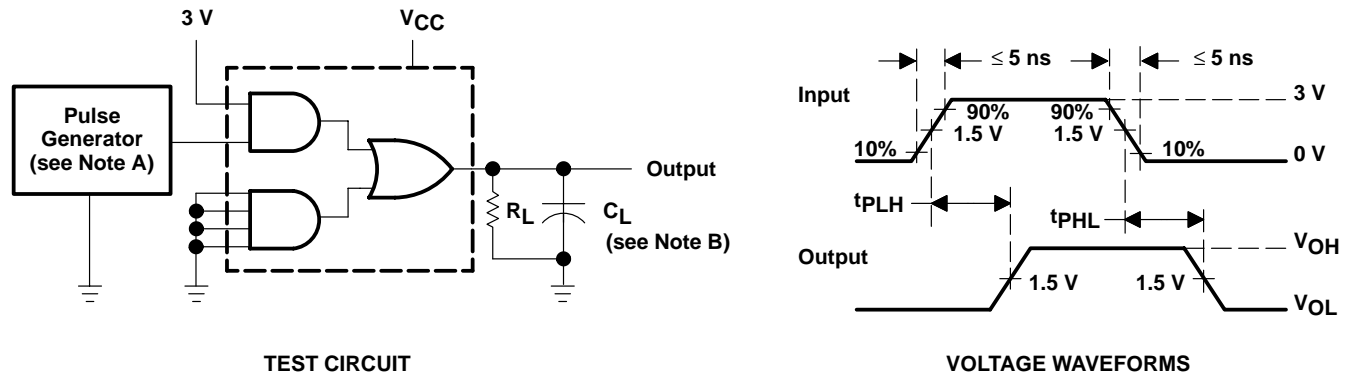
NOTE 3: The output voltage and current limits are ensured for any appropriate combination of high and low inputs specified by the function table for the desired output.

**switching characteristics over recommended ranges of supply voltage and operating free-air temperature**

PARAMETER	TEST CONDITIONS	MIN	TYP†	MAX	UNIT
$t_{PLH}$ Propagation delay time, low-to-high-level output	$R_L = 50\text{ }\Omega$ , $C_L = 15\text{ pF}$ , See Figure 1		4	14	ns
$t_{PHL}$ Propagation delay time, high-to-low-level output			5	14	
$t_{PLH}$ Propagation delay time, low-to-high-level output	$R_L = 50\text{ }\Omega$ , $C_L = 100\text{ pF}$ , See Figure 1		8	20	ns
$t_{PHL}$ Propagation delay time, high-to-low-level output			8	20	

† All typical values are at  $V_{CC} = 5\text{ V}$  and  $T_A = 25^\circ\text{C}$ .

### PARAMETER MEASUREMENT INFORMATION



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

NOTES: A. The pulse generator has the following characteristics:  $Z_O = 50\text{ }\Omega$ ,  $t_w = 200\text{ ns}$ , duty cycle = 50%.  
B.  $C_L$  includes probe and jig capacitance.

# SN75ALS123 DUAL LINE DRIVER

SLLS031B – D1332, SEPTEMBER 1987 – REVISED FEBRUARY 1993

## TYPICAL CHARACTERISTICS

OUTPUT CURRENT  
vs  
OUTPUT VOLTAGE

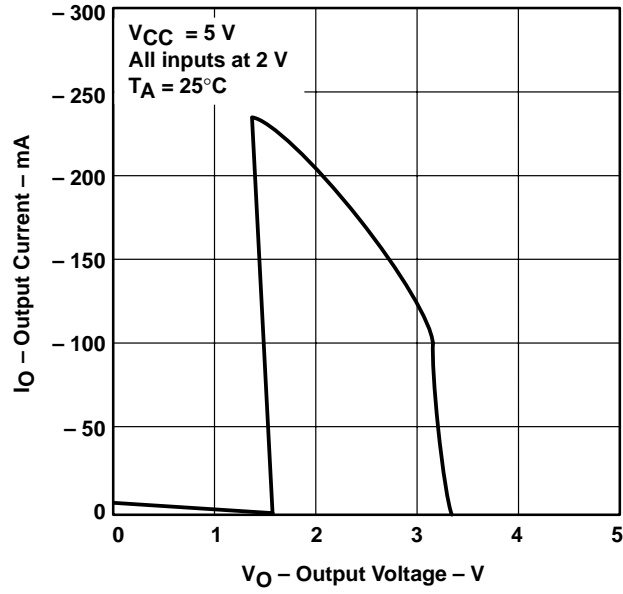


Figure 2

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