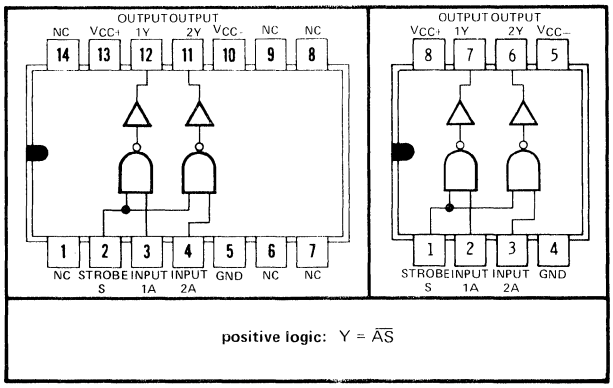
CIRCUIT TYPE SN75150
DUAL LINE DRIVER

SATISFIES REQUIREMENTS OF EIA STANDARD RS-232-C

- Withstands Sustained Output Short-Circuit to any Low-Impedance Voltage between −25 V and 25 V
- 2 μs Max Transition Time through the +3 V to −3 V Transition Region under Full 2500-pF Load
- Inputs Compatible with Most TTL and DTL Families
- Common Strobe Input
- Inverting Output
- Slew Rate can be Controlled with an External Capacitor at the Output
- Standard Supply Voltages . . . ±12 V

J OR N
DUAL-IN-LINE PACKAGE
(TOP VIEW)



P
DUAL-IN-LINE PACKAGE
(TOP VIEW)

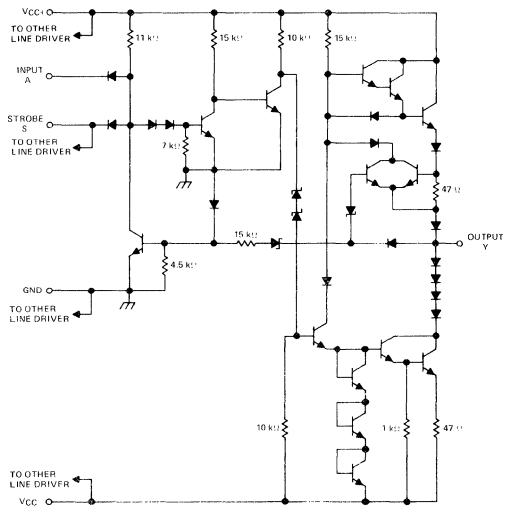
positive logic: $Y = \overline{AS}$

NC—No internal connection

description

The SN75150 is a monolithic dual line driver designed to satisfy the requirements of the standard interface between data terminal equipment and data communication equipment as defined by EIA Standard RS-232-C. A rate of 20,000 bits per second can be transmitted with a full 2500-pF load. Other applications are in data-transmission systems using relatively short single lines, in level translators, and for driving MOS devices. The logic input is compatible with most TTL and DTL families. Operation is from +12-volt and −12-volt power supplies. The SN75150 is characterized for operation from 0°C to 70°C.

schematic (each line driver)



Component values shown are nominal.

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

Supply voltage V_{CC+} (see Note 1)	15 V
Supply voltage V_{CC-} (see Note 1)	−15 V
Input voltage (see Note 1)	15 V
Applied output voltage (see Note 1)	±25 V
Operating free-air temperature range	0°C to 70°C
Storage temperature range	−65°C to 150°C

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

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage V_{CC+}	10.8	12	13.2	V
Supply voltage V_{CC-}	−10.8	−12	−13.2	V
Input voltage, V_I	0		5.5	V
Applied output voltage, V_O			±15	V
Operating free-air temperature, T_A	0	25	70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST FIGURE	TEST CONDITIONS		MIN	TYP†	MAX (SEE NOTE 2)	UNIT
V_{IH}	High-level input voltage	1			2			V
V_{IL}	Low-level input voltage	2					0.8	V
V_{OH}	High-level output voltage	2	V_{CC+} = 10.8 V, V_{CC-} = −13.2 V, V_{IL} = 0.8 V, R_L = 3 kΩ to 7 kΩ		5	8		V
V_{OL}	Low-level output voltage	1	V_{CC+} = 10.8 V, V_{CC-} = −10.8 V, V_{IH} = 2 V, R_L = 3 kΩ to 7 kΩ			−8	−5	V
I_{IH}	High-level input current	3	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V, V_I = 2.4 V	Data input		1	10	μA
				Strobe input		2	20	
I_{IL}	Low-level input current	3	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V, V_I = 0.4 V	Data input		−1	−1.6	mA
				Strobe input		−2	−3.2	
I_{OS}	Short-circuit output current	4	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V	V_O = 25 V		2		mA
				V_O = −25 V		−3		
				V_O = 0 V, V_I = 3 V		15		
				V_O = 0 V, V_I = 0 V		−15		
I_{CCH+}	Supply current from V_{CC+}, high-level output	5	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V, V_I = 0 V, R_L = 3 kΩ, T_A = 25°C			10	22	mA
I_{CCH-}	Supply current from V_{CC-}, high-level output					−1	−10	mA
I_{CCL+}	Supply current from V_{CC+}, low-level output	5	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V, V_I = 3 V, R_L = 3 kΩ, T_A = 25°C			8	17	mA
I_{CCL-}	Supply current from V_{CC-}, low-level output					−9	−20	mA

NOTE 2: The algebraic convention where the most-positive (least-negative) limit is designated as maximum is used in this data sheet for logic levels only, e.g., when −5 V is the maximum, the typical value is a more-negative voltage.

† All typical values are at V_{CC+} = 12 V, V_{CC-} = −12 V, T_A = 25°C.

switching characteristics, V_{CC+} = 12 V, V_{CC-} = −12 V, T_A = 25°C

PARAMETER		TEST FIGURE	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{TLH}	Transition time, low-to-high-level output	6	C_L = 2500 pF, R_L = 3 kΩ to 7 kΩ	0.2	1.4	2	μs
t_{THL}	Transition time, high-to-low-level output			0.2	1.5	2	μs
t_{TLH}	Transition time, low-to-high-level output	6	C_L = 15 pF, R_L = 7 kΩ		40		ns
t_{THL}	Transition time, high-to-low-level output				20		ns
t_{PLH}	Propagation delay time, low-to-high-level output	6	C_L = 15 pF, R_L = 7 kΩ		60		ns
t_{PHL}	Propagation delay time, high-to-low-level output				45		ns

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PARAMETER MEASUREMENT INFORMATION

d-c test circuits‡

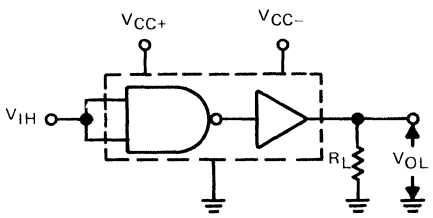
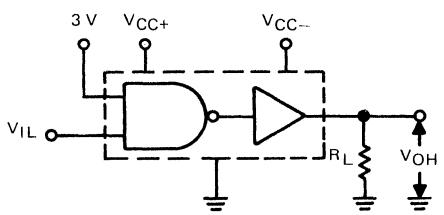
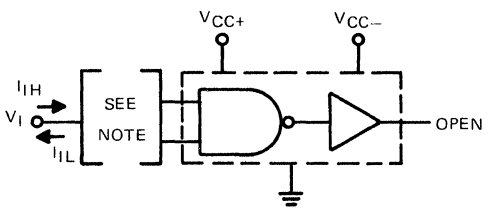


FIGURE 1–V_{IH}, V_{OL}



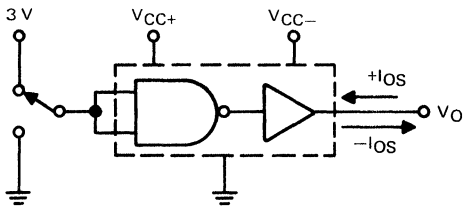
Each input is tested separately.

FIGURE 2–V_{IL}, V_{OH}



NOTE: When testing I_{IH}, the other input is at 3 V; when testing I_{IL}, the other input is open.

FIGURE 3–I_{IH}, I_{IL}



I_{OS} is tested for both input conditions at each of the specified output conditions.

FIGURE 4–I_{OS}

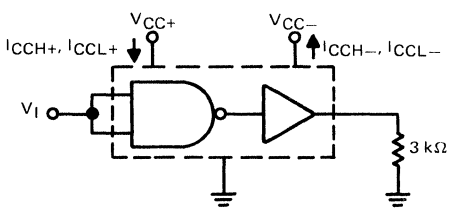
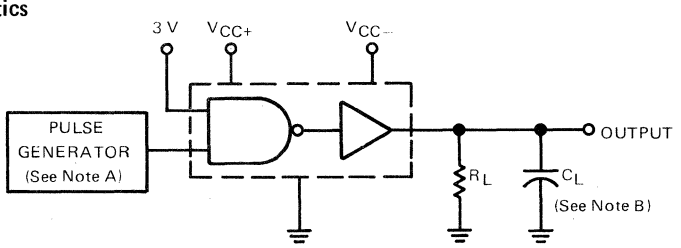


FIGURE 5–I_{CCH+}, I_{CCH-}, I_{CCL+}, I_{CCL-}

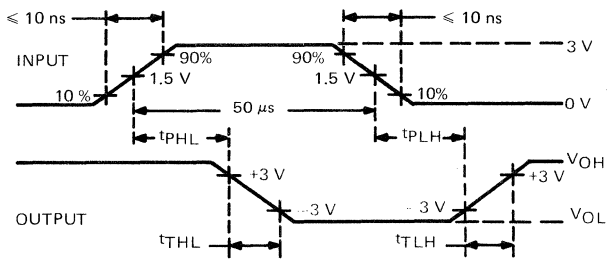
‡Arrows indicate actual direction of current flow. Current into a terminal is a positive value.

PARAMETER MEASUREMENT INFORMATION

switching characteristics



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics: duty cycle ≤ 50%, $Z_{out} \approx 50\ \Omega$.
B. C_L includes probe and jig capacitance.

FIGURE 6–SWITCHING CHARACTERISTICS

TYPICAL CHARACTERISTICS

OUTPUT CURRENT
vs
APPLIED OUTPUT VOLTAGE

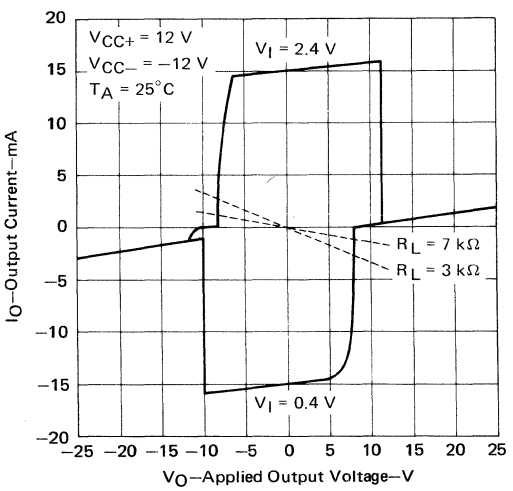


FIGURE 7

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