SN55150, SN75150
DUAL LINE DRIVERS

D951, JANUARY 1971—REVISED SEPTEMBER 1986

- 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 Families
- Common Strobe Input
- Inverting Output
- Slew Rate can be Controlled with an External Capacitor at the Output
- Standard Supply Voltages . . . ±12 V

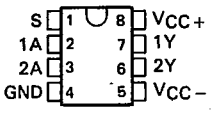
description

The SN55150 and SN75150 are monolithic dual line drivers 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 families. Operation is from +12-volt and −12-volt power supplies.

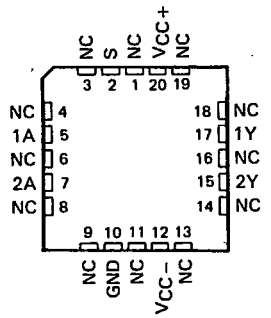
The SN55150 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN75150 is characterized for operation from 0°C to 70°C.

SN55150 . . . JG PACKAGE
SN75150 . . . D, JG, OR P PACKAGE
(TOP VIEW)

T-75-45-05

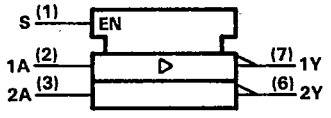


SN55150 . . . FK PACKAGE
(TOP VIEW)



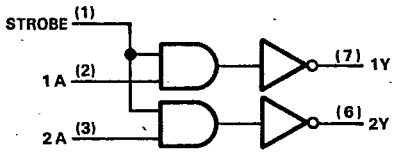
NC—No internal connection

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, JG, and P packages.

logic diagram (positive logic)



4 Line Drivers/Receivers

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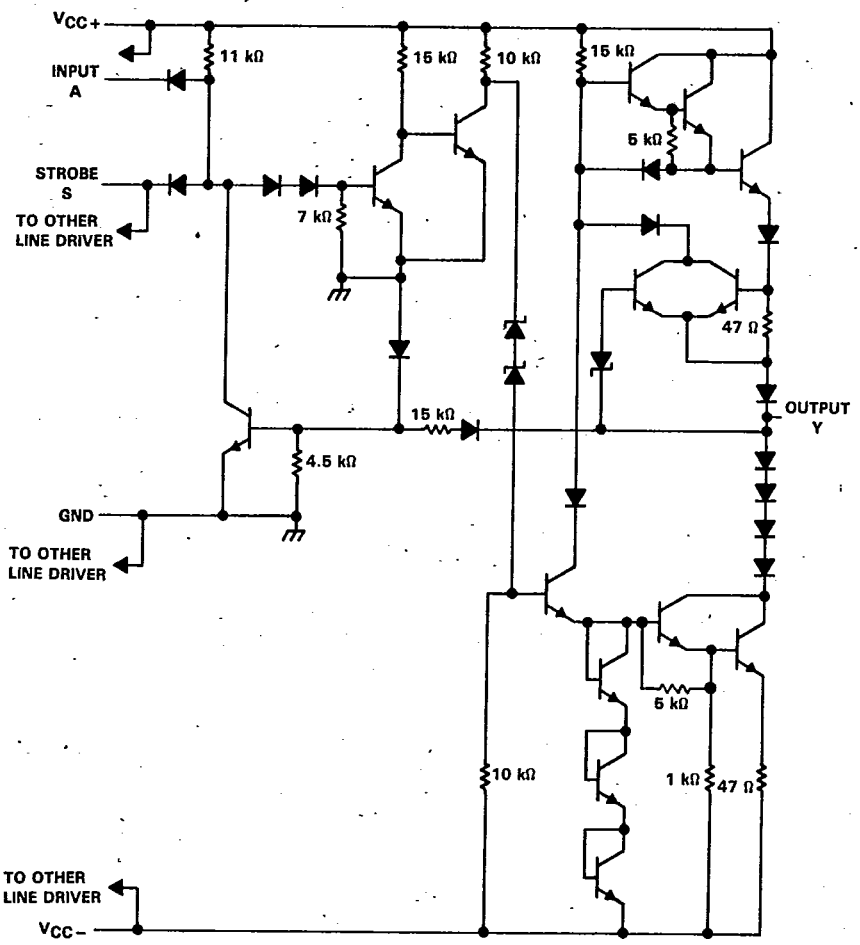
SN55150, SN75150
DUAL LINE DRIVERS

schematic (each line driver)



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T-75-45-05

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

		SN55150	SN75150	UNIT
Supply voltage V_{CC+} (see Note 1)		15	15	V
Supply voltage V_{CC-}		−15	−15	V
Input voltage		15	15	V
Applied output voltage		±25	±25	V
Continuous total dissipation at (or below) 25°C free-air temperature (see Note 2)	D package		725	mW
	FK package	1375		
	JG package	1050	825	
	P package		1000	
Operating free-air temperature range		−55 to 125	0 to 70	°C
Storage temperature range		−65 to 150	−65 to 150	°C
Case temperature for 60 seconds: FK package		260		°C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: JG package		300		°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: D or P package			260	°C

NOTES: 1. Voltage values are with respect to network ground terminal.
2. For operation above 25°C free-air temperature, refer to Dissipation Derating Curves in Appendix A. In the JG package, SN55150 chips are alloy mounted and SN75150 chips are glass mounted. In the P package use the 8.0-mW/°C curve for these devices.

recommended operating conditions

	SN55150			SN75150			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC+}	10.8	12	13.2	10.8	12	13.2	V
Supply voltage, V_{CC-}	−10.8	−12	−13.2	−10.8	−12	−13.2	V
High-level input voltage, V_{IH}	2		5.5	2		5.5	V
Low-level input voltage, V_{IL}	0		0.8	0		0.8	V
Applied output voltage, V_O			±15			±15	V
Operating free-air temperature, T_A	−55		125	0		70	°C

SN55150, SN75150
DUAL LINE DRIVERS

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

PARAMETER		TEST CONDITIONS			MIN	TYP†	MAX	UNIT
V_{OH}	High-level output voltage	V_{CC+} = 10.8 V, V_{IL} = 0.8 V,	V_{CC-} = −13.2 V, R_L = 3 kΩ to 7 kΩ		5	8		V
V_{OL}	Low-level output voltage (see Note 3)	V_{CC+} = 10.8 V, V_{IH} = 2 V,	V_{CC-} = −10.8 V, R_L = 3 kΩ to 7 kΩ			−8	−5	V
I_{IH}	High-level input current	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	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‡	V_{CC+} = 13.2 V, V_{CC-} = −13.2 V		V_O = 25 V		2	8	mA
				V_O = −25 V		−3	−8	
				V_O = 0, V_I = 3 V	10	15	30	
				V_O = 0, V_I = 0	−10	−15	−30	
I_{CCH+}	Supply current from V_{CC+}, high-level output	V_{CC+} = 13.2 V, V_I = 0, T_A = 25°C	V_{CC-} = −13.2 V, R_L = 3 kΩ,			10	22	mA
I_{CCH-}	Supply current from V_{CC-}, high-level output					−1	−10	
I_{CCL+}	Supply current from V_{CC+}, low-level output	V_{CC+} = 13.2 V, V_I = 3 V, T_A = 25°C	V_{CC-} = −13.2 V, R_L = 3 kΩ,			8	17	mA
I_{CCL-}	Supply current from V_{CC-}, low-level output					−9	−20	

†All typical values are at V_{CC+} = 12 V, V_{CC-} = −12 V, T_A = 25°C.
‡Not more than one output should be shorted at a time.
NOTE 3: The algebraic convention, in which the less positive (more negative) limit is designated as minimum, 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.

switching characteristics, V_{CC+} = 12 V, V_{CC-} = −12 V, T_A = 25°C (see Figure 1)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{TLH}	Transition time, low-to-high-level output	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	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	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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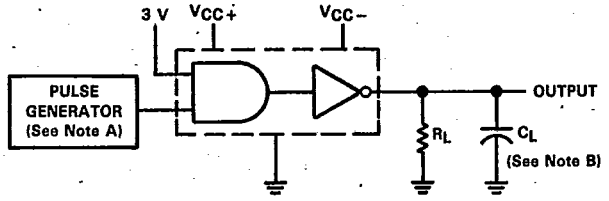
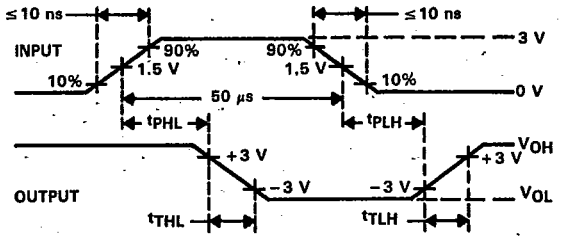
PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

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

FIGURE 1. SWITCHING CHARACTERISTICS

TYPICAL CHARACTERISTICS

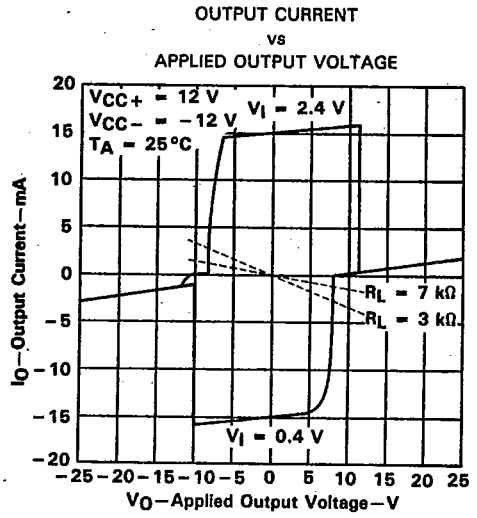


FIGURE 2

TYPICAL APPLICATION DATA

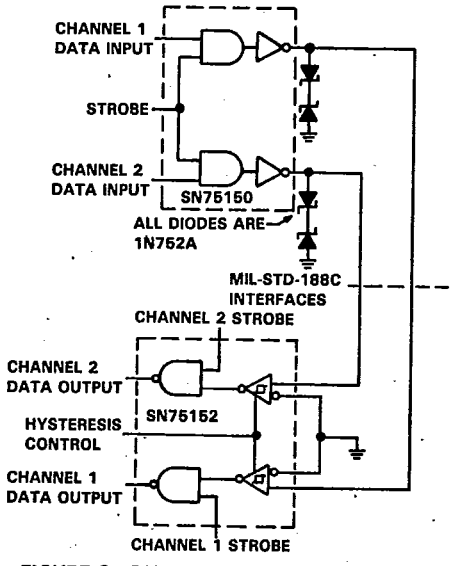


FIGURE 3. DUAL-CHANNEL SINGLE-ENDED INTERFACE CIRCUIT MEETING MIL-STD-188C, PARAGRAPH 7.2.

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