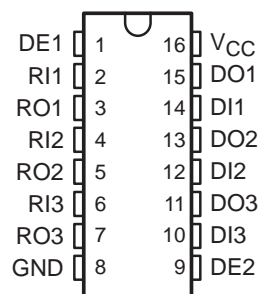


SN751730 TRIPLE LINE DRIVER/RECEIVER

SLLS062C – MAY 1990 – REVISED MAY 1995

- Meets or Exceeds the Requirements of IBM™ 360/370 Input/Output Interface Specification for 4.5 Mb/s Operation
- Single 5-V Supply
- Uncommitted Emitter-Follower Output Structure for Party-Line Operation
- Driver Output Short-Circuit Protection
- Driver Input/Receiver Output Compatible With TTL
- Receiver Input Resistance . . . 7.4 kΩ to 20 kΩ
- Ratio Specification for Propagation Delay Time, Low-to-High/High-to-Low

D OR N PACKAGE
(TOP VIEW)



description

The SN751730 triple line driver/receiver is specifically designed to meet the input/output interface specifications for IBM System 360/370. It is also compatible with standard TTL logic and supply voltage levels.

The low-impedance emitter-follower driver outputs of the SN751730 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 2.5 V.

An open line affects the receiver input as does a low-level input voltage.

All the driver inputs and receiver outputs 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 by pulling either DE1 or DE2 to a low level.

Function Tables

EACH DRIVER

INPUTS			OUTPUT DO
DI	DE1	DE2	
L	X	X	L
X	L	X	L
X	X	L	L
H	H	H	H

EACH DRIVER

INPUT RI	OUTPUT RO
L	H
H	L
Open	H

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



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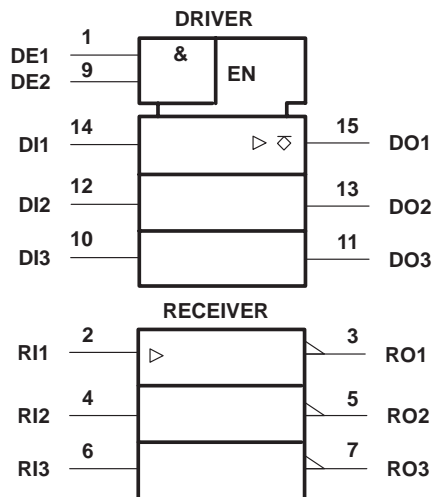
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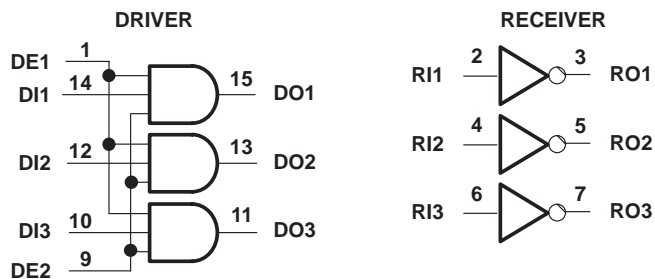
SN751730 TRIPLE LINE DRIVER/RECEIVER

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logic symbols†



logic diagrams (positive logic)

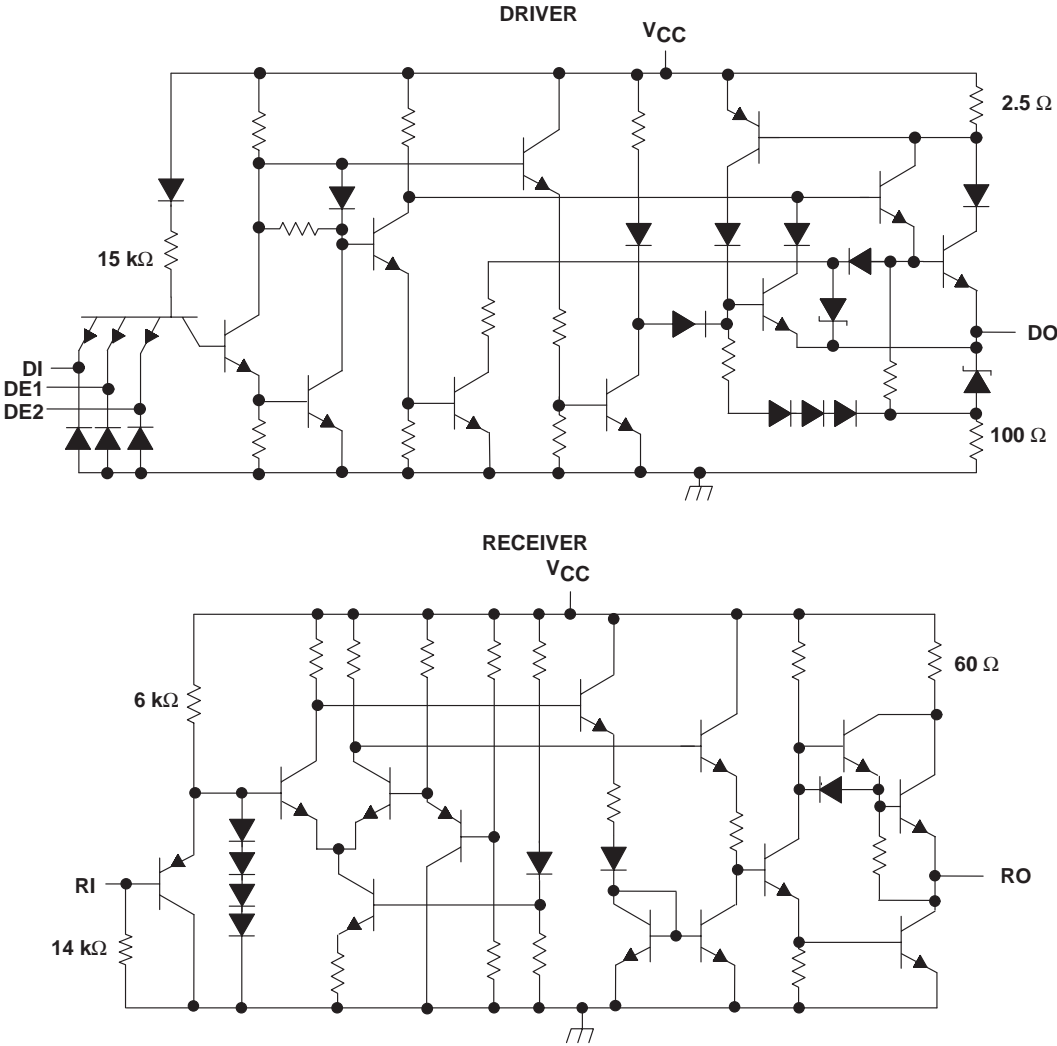


† These symbols are in accordance with ANSI/IEE Std 91-1984 and IEC Publication 617-12.

SN751730 TRIPLE LINE DRIVER/RECEIVER

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equivalent schematics of driver and receiver†



† All resistor values are nominal.

SN751730 TRIPLE LINE DRIVER/RECEIVER

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage range, V_I : Driver	-0.5 V to 7 V
Receiver	-0.5 V to 7 V
Output voltage range, V_O : Driver	-0.5 V to 7 V
Enable input voltage range	-0.5 V to 7 V
Continuous total power dissipation	See Dissipation Rating Table
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.

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

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	DERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING
D	950 mW	7.6 mW/°C	608 mW
N	1150 mW	9.2 mW/°C	736 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
High-level input voltage, V_{IH}	Driver, Enable			V
	Receiver			
Low-level input voltage, V_{IL}	Driver, Enable			V
	Receiver			
Operating free-air temperature, T_A	0		70	°C



DRIVER SECTION

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

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
V _{IK}	Input clamp voltage	V _{CC} = 4.75 V,	I _{IL} = -18 mA		-1.5	V
V _{OH}	High-level output voltage	V _{CC} = 4.75 V,	V _{IH} = 2 V,	3.11		V
		I _{OH} = -59.3 mA	T _A = 25°C			
		V _{CC} = 5.25 V,	V _{IH} = 2 V,	4.10		
		I _{OH} = -78.1 mA				
		V _{CC} = 4.75 V,	V _{IH} = 2 V,	3.05		
		R _L = 51.4 Ω				
		V _{CC} = 5.25 V,	V _{IH} = 2 V,	4.20		
		R _L = 56.9 Ω				
V _{ODH}	Differential high-level output voltage	R _L = 46.3 Ω or 56.9 Ω		0.50		V
V _{OL}	Low-level output voltage	V _{CC} = 5.25 V,	I _{OL} = -0.24 mA	0.15		V
		V _{IL} = 0.8 V,	R _L = 56.9 Ω	0.15		
		V _{IH} = 4.5 V				
I _{IH}	High-level input current	V _{CC} = 5.25 V,	V _{IH} = 2.7 V	20		μA
				60		
I _{IL}	Low-level input current	V _{CC} = 5.25 V,	V _{IH} = 0.4 V	-400		μA
				-1200		
I _{OH}	High-level output current	V _{CC} = 4.75 V,	V _{IL} = 0	100		μA
			V _{OH} = 5 V	V _{IH} = 4.5 V	100	
I _{OS}	Short-circuit output current†	V _{CC} = 5.25 V	V _{IH} = 4.5 V	-30		mA
I _{CCH}	Supply current (total package)	V _{CC} = 5.25 V,	V _{I(D)} = 4.5 V,	47		mA
I _{CCL}			No load	V _{I(R)} = 0		
				V _{I(D)} = 0,	80	
			V _{I(R)} = 4.5 V			

† No more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

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

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t _{PLH}	Propagation delay time, low- to high-level output	R _L = 47.5 Ω,	See Figure 1	6.5	12	18.5	ns
t _{PHL}	Propagation delay time, high- to low-level output			6.5	12	18.5	ns
Δt _{pd}	Differential propagation delay time‡					10	ns
t _r	Output rise time	V _{CC} = 5 V,	V _O = 0.15 V to 3.05 V,	5	10		ns
		R _L = 47.5 Ω,	C _L = 10.2 pF,				
t _f	Output fall time	See Figure 1		5	13		ns
SR	Slew rate	V _O = 1 V to 3 V average,				0.65	V/ns
		R _L = 47.5 Ω,	C _L = 10.2 pF,				
		See Figure 1					

‡ Δt_{pd} = |t_{PLH} - t_{PHL}|



SN751730

TRIPLE LINE DRIVER/RECEIVER

SLLS062C – MAY 1990 – REVISED MAY 1995

RECEIVER SECTION

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

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
V _{OH}	High-level output voltage	V _{CC} = 4.75 V, I _{OH} = -400 μA	V _I = 1.15 V,	2.7		V
V _{OL}	Low-level output voltage	V _{CC} = 4.75 V, V _{IH} = 1.55 V	I _{OL} = 8 mA	0.5		V
			I _{OL} = 4 mA	0.4		
r _I	Input resistance	V _{CC} = 0,	V _I = 0.15 V to 3.9 V	7.4	20	kΩ
I _{IH}	High-level input current	V _{CC} = 4.75 V,	V _{IH} = 3.11 V		0.42	mA
I _{IL}	Low-level input current	V _{CC} = 5.25 V,	V _{IL} = 0.15 V	-0.24	0.04	mA
I _{OS} [†]	Short-circuit output current	V _{CC} = 5.25 V,	V _{IL} = 0	-20	-100	mA
I _{CCH}	Supply current (total package)	V _{CC} = 5.25 V, No load	V _{I(D)} = 4.5 V, V _{I(R)} = 0		47	mA
I _{CCL}			V _{I(D)} = 0, V _{I(R)} = 4.5 V		80	

[†] Only one output should be shorted at a time, and duration of the short circuit should not exceed one second.

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

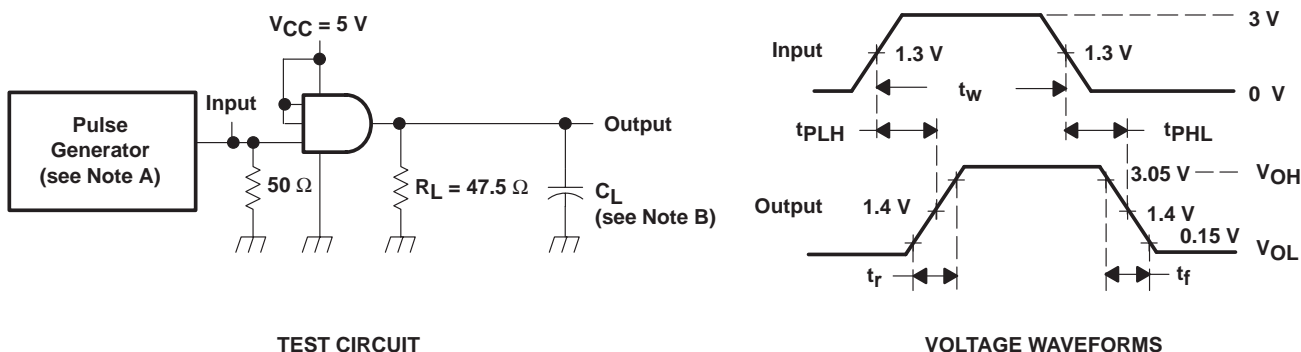
PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t _{PLH}	Propagation delay time, low- to high-level output	R _L = 2 kΩ, C _L = 15 pF, See Figure 2		7.5	12	19.5	ns
t _{PHL}	Propagation delay time, high- to low-level output			7.5	12	19.5	ns
Δt _{pd} [‡]	Differential propagation delay time					10	ns

[‡] Δt_{pd} = |t_{PLH} - t_{PHL}|



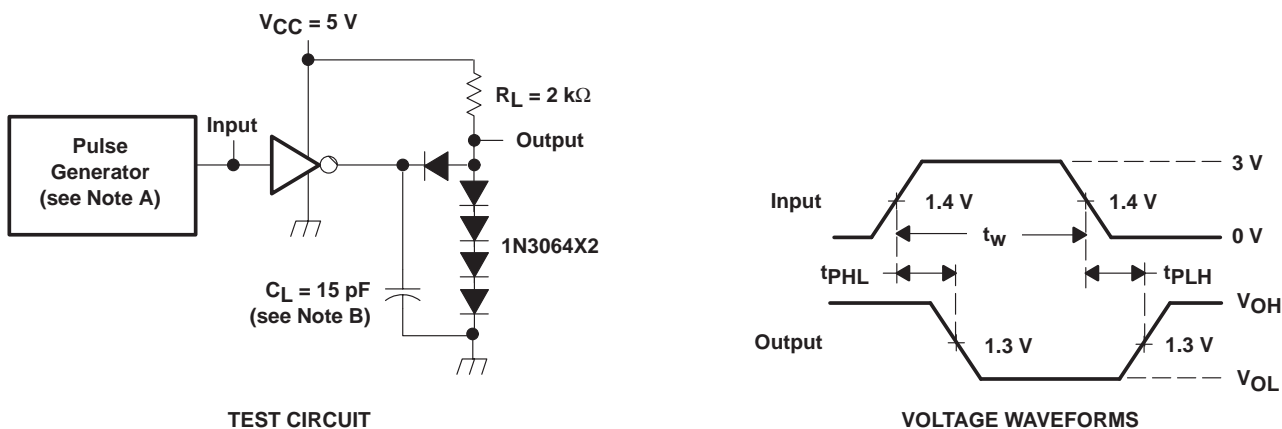
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PARAMETER MEASUREMENT INFORMATION



NOTES: A. The pulse generator has the following characteristics: $Z_O \approx 50 \Omega$, $t_w \leq 500 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$, $t_f \leq 6 \text{ ns}$, $t_r \leq 15 \text{ ns}$.
B. C_L includes probe and jig capacitance.

Figure 1. Driver Test Circuit and Voltage Waveforms



NOTES: A. The pulse generator has the following characteristics: $Z_O \approx 50 \Omega$, $t_w \leq 500 \text{ ns}$, $\text{PRR} \leq 1 \text{ MHz}$, $t_f \leq 10 \text{ ns}$, $t_r \leq 10 \text{ ns}$.
B. C_L includes probe and jig capacitance.

Figure 2. Receiver Test Circuit and Voltage Waveforms

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