

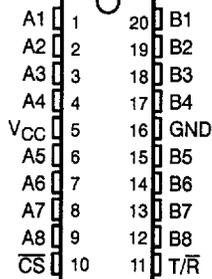
SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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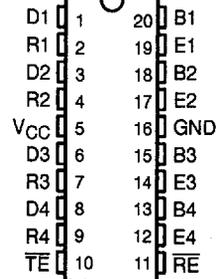
SUITABLE FOR IEEE STANDARD 896 APPLICATIONS†

- SN55ALS056 and SN75ALS056 are Octal Transceivers
- SN55ALS057 and SN75ALS057 are Quad Transceivers
- High-Speed Advanced Low-Power Schottky (ALS) Circuitry
- Low Power Dissipation:
SN55[†] Devices . . . 60 mW/Channel Max
SN75[†] Devices . . . 52.5 mW/Channel Max
- High-Impedance pnp Inputs
- Logic-Level 1-V Bus Swing Reduces Power Consumption
- Trapezoidal Bus Output Waveform Reduces Noise Coupling to Adjacent Lines
- Power-Up/Power-Down Protection (Glitch Free)
- Open-Collector Driver Outputs Allow Wired-OR Connections
- Designed to Be a Faster, Lower-Power Functional Equivalent of National DS3896, DS3897

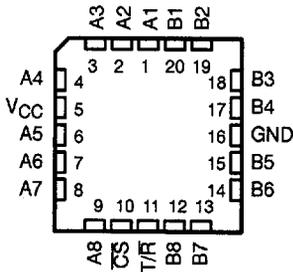
SN55ALS056 . . . J OR W PACKAGE
SN75ALS056 . . . DW OR N PACKAGE
(TOP VIEW)



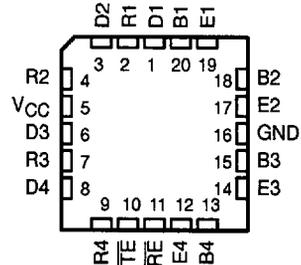
SN55ALS057 . . . J OR W PACKAGE
SN75ALS057 . . . DW OR N PACKAGE
(TOP VIEW)



SN55ALS056 . . . FK PACKAGE
(TOP VIEW)



SN55ALS057 . . . FK PACKAGE
(TOP VIEW)



† The transceivers are suitable for IEEE Standard 896 applications to the extent of the operating conditions and characteristics specified in this data sheet. Certain limits contained in the IEEE specification are not met or cannot be tested over the entire military temperature range.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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description

The SN55ALS056 and SN75ALS056 are 8-channel, monolithic, high-speed, advanced low-power Schottky (ALS) devices designed for 2-way data communication in a densely populated backplane. The SN55ALS057 and SN75ALS057 are 4-channel versions with independent driver-input (Dn) and receiver-output (Rn) pins and a separate driver disable for each driver (En).

These transceivers feature open-collector driver outputs with series Schottky diodes to reduce capacitive loading to the bus. By using a 2-V pullup termination on the bus, the output signal swing is approximately 1 V, which reduces the power necessary to drive the bus load capacitance. The driver outputs generate trapezoidal waveforms that reduce crosstalk between channels. The drivers are capable of driving an equivalent dc load as low as 18.5 Ω . The receivers have internal low-pass filters to further improve noise immunity.

The SN55ALS056 and SN55ALS057 are characterized over the full military operating range of -55°C to 125°C . The SN75ALS056 and SN75ALS057 are characterized for operation from 0°C to 70°C .

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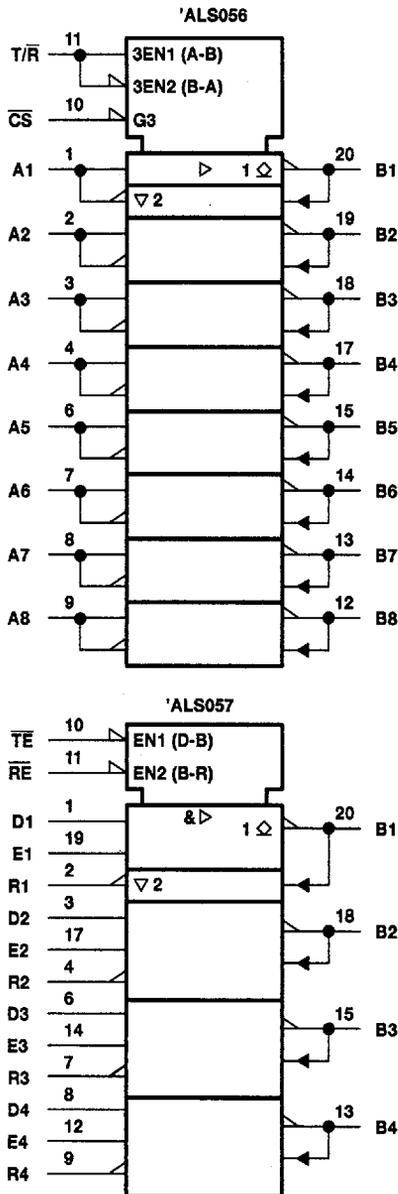
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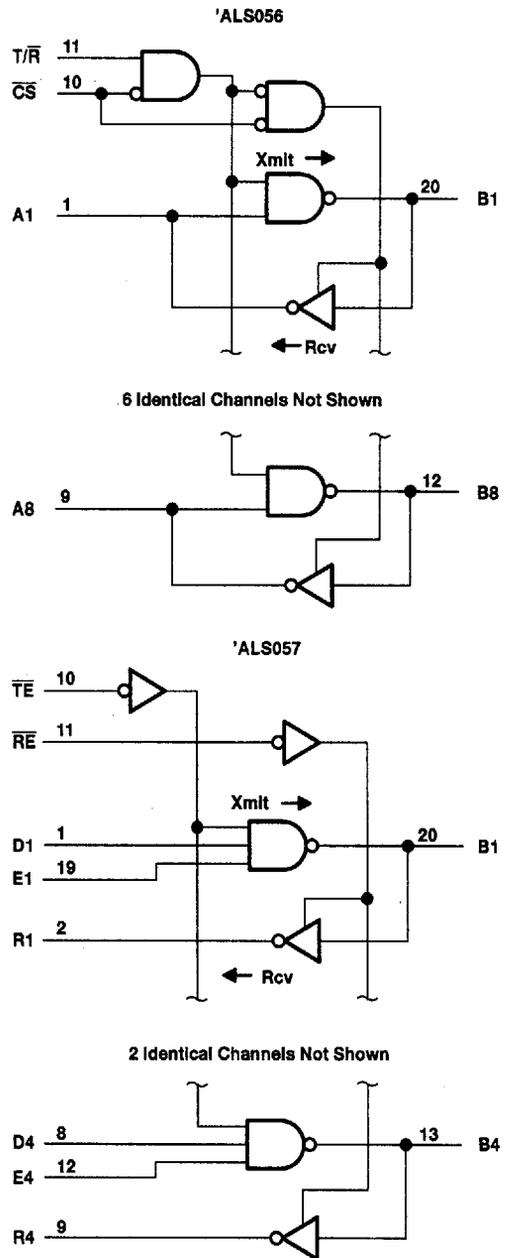
SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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logic symbols†



logic diagrams (positive logic)



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

SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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Function Tables

'ALS056
TRANSMIT/RECEIVE

CONTROLS		CHANNELS A ↔ B
CS	T/R	
L	H	T (A → B)
L	L	R (B → A)
H	X	D

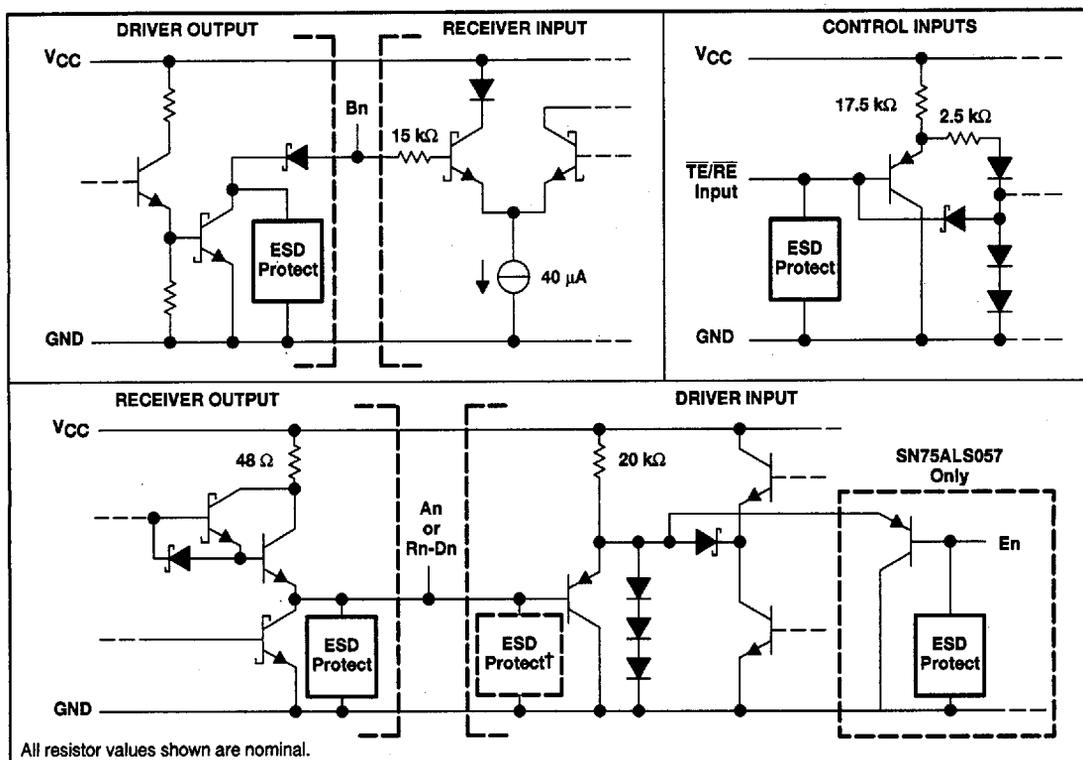
'ALS057
TRANSMIT/RECEIVE

CONTROLS			CHANNELS	
TE	RE	En	D → B	B → R
L	L	L	D	R
L	L	H	T	R
L	H	L	D	D
L	H	H	T	D
H	L	X	D	R
H	H	X	D	D

H = high level, L = low level, R = receive, T = transmit, D = disable, X = irrelevant

Direction of data transmission is from An to Bn for the 'ALS056 and from Dn to Bn for the 'ALS057. Direction of data reception is from Bn to An for the 'ALS056 and from Bn to Rn for the 'ALS057. Data transfer is inverting in both directions.

schematics of inputs and outputs



† Additional ESD protection is on the 'ALS057, which has separate receiver-output and driver-input pins.

SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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

Supply voltage, V_{CC} (see Note 1)	6 V
Control input voltage, V_I	5.5 V
Driver input voltage, V_I	5.5 V
Driver output voltage, V_O	2.5 V
Receiver input voltage, V_I	2.5 V
Receiver output voltage, V_O	5.5 V
Continuous total power dissipation	See Dissipation Rating Table
Operating free-air temperature range, T_A : SN55ALS05_	-55°C to 125°C
SN75ALS05_	0°C to 70°C
Storage temperature range, T_{stg}	-65°C to 150°C
Case temperature for 60 seconds, T_C : FK package	300 °C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds: DW or N package	260 °C
Lead temperature 1,6 mm (1/16 inch) from case for 60 seconds: J or W package	300 °C

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

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$	DERATING FACTOR	$T_A = 70^\circ\text{C}$	$T_A = 125^\circ\text{C}$
	POWER RATING	ABOVE $T_A = 25^\circ\text{C}$	POWER RATING	POWER RATING
DW	1025 mW	8.2 mW/°C	656 mW	—
FK	1375 mW	11.0 mW/°C	880 mW	275 mW
N	1150 mW	9.2 mW/°C	736 mW	—
J	1375 mW	11.0 mW/°C	880 mW	275 mW
W	1000 mW	8.0 mW/°C	640 mW	200 mW

recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	SN55ALS05_	4.5	5	5.5	V
	SN75ALS05_	4.75	5	5.25	
High-level driver and control input voltage, V_{IH}		2			V
Low-level driver and control input voltage, V_{IL}					0.8
Bus termination voltage		1.9		2.1	V
Operating free-air temperature, T_A	SN55ALS05_	-55		125	°C
	SN75ALS05_	0		70	

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

SN55ALS056

PARAMETER		TEST CONDITIONST	MIN	TYP†	MAX	UNIT
V_{IK}	Input clamp voltage at An, T/R, or CS	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$			-1.5	V
V_{IT}	Receiver input threshold voltage at Bn	$V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$	1.43		1.69	V
		$V_{CC} = 5 \text{ V}$, $T_A = -55^\circ\text{C}$ to 125°C	1.4		1.7	
V_{OH}	High-level output voltage at An	$V_{CC} = 4.5 \text{ V}$, CS at 0.8 V, $I_{OH} = -400 \mu\text{A}$ Bn at 1.2 V, T/R at 0.8 V,	2.4			V
V_{OL}	Low-level output voltage	An $V_{CC} = 4.5 \text{ V}$, CS at 0.8 V, $I_{OL} = 16 \text{ mA}$ Bn at 2 V, T/R at 0.8 V,			0.5	V
		Bn $V_{CC} = 4.5 \text{ V}$, CS at 0.8 V, See Figure 1 An at 2 V, T/R at 2 V,	0.75		1.2	
I_{IH}	High-level input current	An, T/R or CS $V_I = V_{CC} = 5.5 \text{ V}$			40	μA
		Bn $V_{CC} = 5.5 \text{ V}$, An at 0.8 V, $V_I = 2 \text{ V}$, T/R at 0.8 V			100	
I_{IL}	Low level input current at An, T/R, or CS	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$			-400	μA
I_{OS}	Short-circuit output current at An	$V_{CC} = 5.5 \text{ V}$, Bn at 1.2 V, T/R at 0.8 V, CS at 0.8 V,	-35		-125	mA
I_{CC}	Supply current	$V_{CC} = 5.5 \text{ V}$			85	mA
$C_{O(B)}$	Driver output capacitance			4.5		pF

SN75ALS056

PARAMETER		TEST CONDITIONST	MIN	TYP†	MAX	UNIT
V_{IK}	Input clamp voltage at An, T/R, or CS	$I_I = -18 \text{ mA}$			-1.5	V
V_{IT}	Receiver input threshold voltage at Bn		1.405		1.69	V
V_{OH}	High-level output voltage at An	Bn at 1.2 V, T/R at 0.8 V, CS at 0.8 V, $I_{OH} = -400 \mu\text{A}$	2.4			V
V_{OL}	Low-level output voltage	An Bn at 2 V, T/R at 0.8 V, CS at 0.8 V, $I_{OL} = 16 \text{ mA}$			0.5	V
		Bn An at 2 V, T/R at 2 V, $R_L = 18.5 \Omega$, CS at 0.8 V, $V_L = 2 \text{ V}$, See Figure 1	0.75		1.2	
I_{IH}	High-level input current	An, T/R or CS $V_I = V_{CC}$			40	μA
		Bn $V_I = 2 \text{ V}$, An at 0.8 V, $V_{CC} = 0$ or 5.25 V , T/R at 0.8 V			100	
I_{IL}	Low level input current at An, T/R, or CS	$V_I = 0.4 \text{ V}$			-400	μA
I_{OS}	Short-circuit output current at An	An at 0, CS at 0.8 V, Bn at 1.2 V, T/R at 0.8 V	-40		-120	mA
I_{CC}	Supply current				75	mA
$C_{O(B)}$	Driver output capacitance			4.5		pF

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

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

SN55ALS057

PARAMETER		TEST CONDITIONS	MIN	TYP†	MAX	UNIT
V _{IK}	Input clamp voltage at Dn, En, \overline{TE} , or \overline{RE}	V _{CC} = 4.5 V, I _I = -18 mA			-1.5	V
V _{IT}	Receiver input threshold voltage at Bn	V _{CC} = 5 V, T _A = 25°C	1.43		1.69	V
		V _{CC} = 5 V, T _A = -55°C to 125°C	1.4		1.7	
V _{OH}	High-level output voltage at Rn	V _{CC} = 4.5 V, RE at 0.8 V, Bn at 1.2 V, I _{OH} = -400 μA	2.4			V
V _{OL}	Low-level output voltage	Rn V _{CC} = 4.5 V, RE at 0.8 V, Bn at 2 V, I _{OL} = 16 mA			0.5	V
		Bn V _{CC} = 4.5 V, En at 2 V, TE at 0.8 V, See Figure 1	0.75		1.2	
I _{IH}	High-level input current	Dn, En, \overline{TE} , or \overline{RE} V _I = V _{CC} = 5.5 V			40	μA
		Bn V _{CC} = 5.5 V, V _I = 2 V, Dn at 0.8 V, En at 0.8 V, \overline{TE} at 0.8 V			100	
I _{IL}	Low-level input current at Dn, En, \overline{TE} , or \overline{RE}	V _{CC} = 5.5 V, V _I = 0.4 V			-400	μA
I _{OS}	Short-circuit output current at Rn	V _{CC} = 5.5 V, Rn at 0, Bn at 1.2 V, \overline{RE} at 0.8 V	-435		-125	mA
I _{CC}	Supply current	V _{CC} = 5.5 V			45	mA
C _{O(B)}	Driver output capacitance				4.5	pF

† All typical values are at V_{CC} = 5 V, T_A = 25°C.

SN75ALS057

PARAMETER		TEST CONDITIONS	MIN	TYP†	MAX	UNIT
V _{IK}	Input clamp voltage at Dn, En, \overline{TE} , or \overline{RE}	I _I = -18 mA			-1.5	V
V _{IT}	Receiver input threshold voltage at Bn		1.41		1.69	V
V _{OH}	High-level output voltage at Rn	Bn at 1.2 V, RE at 0.8 V, I _{OH} = -400 μA	2.4			V
V _{OL}	Low-level output voltage	Rn Bn at 2 V, RE at 0.8 V, I _{OL} = 16 mA			0.5	V
		Bn Dn at 2 V, TE at 0.8 V, V _L = 2 V, R _L = 18.5 Ω, See Figure 1	0.75		1.2	
I _{IH}	High-level input current	Dn, En, \overline{TE} , or \overline{RE} V _I = V _{CC}			40	μA
		Bn V _I = 2 V, Dn at 0.8 V, TE at 0.8 V, V _{CC} = 0 or 5.25 V, En at 0.8 V			100	
I _{IL}	Low-level input current at Dn, En, \overline{TE} , or \overline{RE}	V _I = 0.4 V			-400	μA
I _{OS}	Short-circuit output current at Rn	Rn at 0, RE at 0.8 V, Bn at 1.2 V	-40		-120	mA
I _{CC}	Supply current				40	mA
C _{O(B)}	Driver output capacitance				4.5	pF

† All typical values are at V_{CC} = 5 V, T_A = 25°C.



SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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

SN55ALS056 driver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A †	MIN	TYP‡	MAX	UNIT	
t _{PLH1}	CS	Bn	An and T/R at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} = 500 Ω, C _L = 50 pF, See Figure 2	25°C			18	ns	
				Full range		30			
t _{PHL1}	CS	Bn	An and T/R at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} = 500 Ω, C _L = 50 pF, See Figure 2	25°C			20	ns	
				Full range		22			
t _{PLH2}	An	Bn	CS at 0.8 V, V _L = 2 V, R _{L2} = 500 Ω, See Figure 2	T/R at 2 V, R _{L1} = 18 Ω, C _L = 50 pF,	25°C		10	ns	
				Full range		40			
t _{PHL2}	An	Bn	CS at 0.8 V, V _L = 2 V, R _{L2} = 500 Ω, See Figure 2	T/R at 2 V, R _{L1} = 18 Ω, C _L = 50 pF,	25°C		12	ns	
				Full range		15			
t _{PLH2}	An	Bn	CS at 0.8 V, R _{L1} = 18 Ω, C _L = 50 pF, See Figure 2	T/R at 2 V, R _{L2} = 500 Ω, V _L = 2 V,	25°C	1	3	10	ns
				Full range		1	13		
t _{PHL2}	An	Bn	CS at 0.8 V, R _{L1} = 18 Ω, C _L = 50 pF, See Figure 2	T/R at 2 V, R _{L2} = 500 Ω, V _L = 2 V,	25°C	1	3	8	ns
				Full range		1	33		
t _{PLH3}	T/R	Bn	CS at 0.8 V, R _{L1} = 18 Ω, C _L = 50 pF,	V _L = 2 V, R _{L2} = 500 Ω, See Figure 3	25°C		18	ns	
				Full range		37			
t _{PHL3}	T/R	Bn	CS at 0.8 V, R _{L1} = 18 Ω, C _L = 50 pF,	V _L = 2 V, R _{L2} = 500 Ω, See Figure 3	25°C		18	ns	
				Full range		21			

SN75ALS056 driver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP§	MAX	UNIT	
t _{PLH1}	CS	Bn	An and T/R at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} not connected, See Figure 2			24	ns	
t _{PHL1}						20		
t _{PLH2}	An	Bn	CS at 0.8 V, V _L = 2 V, R _{L2} not connected, See Figure 2	T/R at 2 V, R _{L1} = 18 Ω, C _L = 30 pF,		19	ns	
t _{PHL2}						18		
t _{PLH3}	T/R	Bn	V _{I(An)} = 5 V, R _{L1} = 18 Ω, R _{L2} not connected, See Figure 3	CS at 0.8 V, C _L = 30 pF, V _L = 2 V,		25	ns	
t _{PHL3}						35		
t _{TLH}	An	Bn	CS at 0.8 V, V _L = 2 V, R _{L1} = 18 Ω, See Figure 2	T/R at 2 V, C _L = 30 pF, R _{L2} not connected,	1	3	11	ns
t _{THL}						1	3	

† Full range is -55°C to 125°C.

‡ Typical values are at V_{CC} = 5 V.

§ Typical values are at V_{CC} = 5 V, T_A = 25°C.

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

SN55ALS056 receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A †	MIN	MAX	UNIT
t _{PLH4}	Bn	An	CS at 0.8 V, R _{L1} = 500 Ω, C _L = 50 pF,	T/R at 0.8 V, R _{L2} = 500 Ω, See Figure 4	25°C	20	ns
t _{PHL4}					Full range	22	
				25°C	18		
				Full range	20		
t _{PLZ1}	T/R	An	Bn at 2 V, V _L = 5 V, R _{L2} = 500 Ω, See Figure 3	CS at 0.8 V, R _{L1} = 500 Ω, C _L = 50 pF,	25°C	17	ns
t _{PZL1}					Full range	20	
				25°C	25		
				Full range	40		
t _{PHZ1}	T/R	An	Bn at 0.8 V, V _L = 0, R _{L2} = 500 Ω, See Figure 3	CS at 0.8 V, R _{L1} = 500 Ω, C _L = 50 pF,	25°C	12	ns
					Full range	13	
t _{PZH1}	T/R	An	Bn at 0.8 V, R _{L1} open, C _L = 50 pF,	CS at 0.8 V, R _{L2} = 500 Ω, See Figure 3	25°C	15	ns
					Full range	22	
t _{PLZ2}	CS	An	Bn at 2 V, R _{L1} = 500 Ω, C _L = 50 pF, See Figure 5	T/R at 0.8 V, R _{L2} = 500 Ω, V _L = 5 V,	25°C	20	ns
t _{PZL2}					Full range	22	
				25°C	13		
				Full range	14		
t _{PHZ2}	CS	An	Bn at 0.8 V, V _L = 0, R _{L1} = R _{L2} = 500 Ω,	T/R at 0.8 V, C _L = 50 pF, See Figure 5	25°C	12	ns
t _{PZH2}					Full range	13	
				25°C	14		
				Full range	22		
t _{w(NR)}	Bn	An	V _L = 5 V, R _{L2} = 500 Ω, See Figure 6	R _{L1} = 500 Ω, C _L = 50 pF,	25°C	4	ns
					Full range	2	

† Full range is -55°C to 125°C.



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

SN75ALS056 receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	MAX	UNIT
t _{PLH4}	Bn	An	\overline{CS} at 0.8 V, $R_{L1} = 390 \Omega$, $R_{L2} = 1.6 k\Omega$, $C_L = 30 pF$, T/\overline{R} at 0.8 V, $C_L = 30 pF$, $R_{L1} = 390 \Omega$, See Figure 4	18	ns	
t _{PHL4}				18		
t _{PLZ1}	T/\overline{R}	An	\overline{CS} at 0.8 V, $R_{L1} = 390 \Omega$, $C_L = 15 pF$, $V_I(Bn) = 2 V$, R_{L2} not connected, See Figure 3, $V_L = 5 V$	20	ns	
t _{PZL1}	T/\overline{R}	An	\overline{CS} at 0.8 V, $R_{L1} = 390 \Omega$, $C_L = 30 pF$, $V_I(Bn) = 2 V$, $R_{L2} = 1.6 k\Omega$, See Figure 3, $V_L = 5 V$	40	ns	
t _{PHZ1}	T/\overline{R}	An	\overline{CS} at 0.8 V, $R_{L1} = 390 \Omega$, $C_L = 15 pF$, $V_I(Bn) = 0$, R_{L2} not connected, See Figure 3, $V_L = 0$	17	ns	
t _{PZH1}	T/\overline{R}	An	\overline{CS} at 0.8 V, R_{L1} not connected, $C_L = 30 pF$, $V_I(Bn) = 0$, See Figure 3, $V_L = 0$, $R_{L2} = 1.6 k\Omega$	15	ns	
t _{PLZ2}	\overline{CS}	An	Bn at 2 V, $V_L = 5 V$, R_{L2} not connected, T/\overline{R} at 0.8 V, $R_{L1} = 390 \Omega$, See Figure 5, $C_L = 5 pF$	18	ns	
t _{PZL2}	\overline{CS}	An	Bn at 2 V, $V_L = 5 V$, See Figure 5, T/\overline{R} at 0.8 V, $R_{L1} = 390 \Omega$, $C_L = 30 pF$, $R_{L2} = 1.6 k\Omega$	15	ns	
t _{PHZ2}	\overline{CS}	An	Bn at 0.8 V, $V_L = 0$, R_{L2} not connected, T/\overline{R} at 0.8 V, $R_{L1} = 390 \Omega$, See Figure 5, $C_L = 5 pF$	8	ns	
t _{PZH2}	\overline{CS}	An	Bn at 0.8 V, $V_L = 0$, $R_{L2} = 1.6 k\Omega$, T/\overline{R} at 0.8 V, R_{L1} not connected, See Figure 5, $C_L = 30 pF$	17	ns	
t _{w(NR)}	Bn	An	\overline{CS} at 0.8 V, $R_{L2} = 1.6 k\Omega$, See Figure 6, T/\overline{R} at 0.8 V, $C_L = 30 pF$, $R_{L1} = 390 \Omega$, $V_L = 5 V$	3	ns	

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SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

SLLS028E - AUGUST 1987 - REVISED MAY 1995

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

SN55ALS057 driver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A †	MIN	TYP‡	MAX	UNIT
t _{PLH1}	TE	Bn	Dn, En, RE at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} = 500 Ω, C _L = 50 pF, See Figure 2	25°C			10	ns
				Full range			27	
t _{PHL1}				25°C			17	ns
				Full range			19	
t _{PLH2}	Dn or En	Bn	TE at 0.8 V, RE at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} = 500 Ω, C _L = 50 pF, See Figure 2	25°C			10	ns
						Full range		
t _{PHL2}				25°C			12	ns
				Full range			15	
t _{TLH}	Dn or En	Bn	RE at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} = 500 Ω, C _L = 50 pF, See Figure 2	25°C	1	3	8	ns
						Full range	1	
t _{THL}				25°C	1	3	10	ns
				Full range	1		13	

† Full range is -55°C to 125°C.

‡ Typical values are at V_{CC} = 5 V, T_A = 25°C.

SN75ALS057 driver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP‡	MAX	UNIT
t _{PLH1}	TE	Bn	Dn, En, RE at 2 V, V _L = 2 V, R _{L2} not connected, R _{L1} = 18 Ω, C _L = 30 pF, See Figure 2			24	ns
t _{PHL1}						20	
t _{PLH2}	Dn or En	Bn	TE at 0.8 V, RE at 2 V, V _L = 2 V, R _{L1} = 18 Ω, R _{L2} not connected, C _L = 30 pF, See Figure 2			19	ns
t _{PHL2}						18	
t _{TLH}	Dn or En	Bn	RE at 2 V, V _L = 2 V, TE at 0.8 V, R _{L1} = 18 Ω, R _{L2} not connected, C _L = 30 pF, See Figure 2	1	3	11	ns
t _{THL}						1	

‡ Typical values are at V_{CC} = 5 V, T_A = 25°C.



**TEXAS
INSTRUMENTS**

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SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057 TRAPEZOIDAL-WAVEFORM INTERFACE BUS TRANSCEIVERS

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

SN55ALS057 receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A †	MIN	MAX	UNIT		
t _{PLH4}	Bn	Rn	\overline{RE} at 0.8 V, V _L = 5 V, R _{L2} = 500 Ω, See Figure 4	25°C		20	ns		
t _{PHL4}						Full range		22	
t _{PLZ2}	\overline{RE}	Rn		Bn at 2 V, V _L = 5 V, R _{L2} = 500 Ω, See Figure 5	25°C			15	ns
t _{PZL2}								Full range	
t _{PHZ2}	\overline{RE}	Rn	Bn at 0.8 V, V _L = 0, R _{L2} = 500 Ω, See Figure 5	25°C		12	ns		
t _{PZH2}						Full range		13	
t _{w(NR)}	Bn	Rn	V _L = 5 V, R _{L2} = 500 Ω, See Figure 6	25°C		4		ns	
						Full range			2

† Full range is -55°C to 125°C.

SN75ALS057 receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	MAX	UNIT	
t _{PLH4}	Bn	Rn	\overline{RE} at 0.8 V, R _{L1} = 390 Ω, See Figure 4	25°C		18	ns
t _{PHL4}						Full range	
t _{PLZ2}	\overline{RE}	Rn	Bn at 2 V, C _L = 5 pF, R _{L2} not connected, See Figure 5	25°C		18	ns
t _{PZL2}	\overline{RE}	Rn	Bn at 2 V, C _L = 30 pF, See Figure 5	25°C		15	ns
t _{PHZ2}	\overline{RE}	Rn	Bn at 0.8 V, C _L = 5 pF, R _{L2} not connected, See Figure 5	25°C		17	ns
t _{PZH2}	\overline{RE}	Rn	Bn at 0.8 V, C _L = 30 pF, R _{L2} = 1.6 kΩ, See Figure 5	25°C		17	ns
t _{w(NR)}	Bn	Rn	\overline{TE} at 2 V, R _{L1} = 390 Ω, See Figure 6	25°C		3	ns

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

SN55ALS057 driver plus receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	T _A †	MIN	MAX	UNIT
t _{PLH5} Propagation delay time, low-to-high-level output	Dn	Rn	\overline{RE} at 0.8 V, \overline{TE} at 0.8 V, $V_L = 2$ V, $R_{L1} = 500 \Omega$, $R_{L2} = 500 \Omega$, $C_L = 50$ pF, See Figure 7	25°C		25	ns
t _{PHL5} Propagation delay time, high-to-low-level output				Full range		35	
				25°C		25	
Full range					44		

† Full range is -55°C to 125°C.

SN75ALS057 driver plus receiver

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	MAX	UNIT
t _{PLH6} Propagation delay time, low-to-high-level output	Dn	Rn	\overline{RE} at 0.8 V, \overline{TE} at 0.8 V, $R_{L1} = 390 \Omega$, $R_{L2} = 1.6$ k Ω , $C_L = 30$ pF, See Figure 8		40	ns
t _{PHL6} Propagation delay time, high-to-low-level output					40	

PARAMETER MEASUREMENT INFORMATION

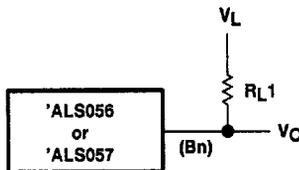
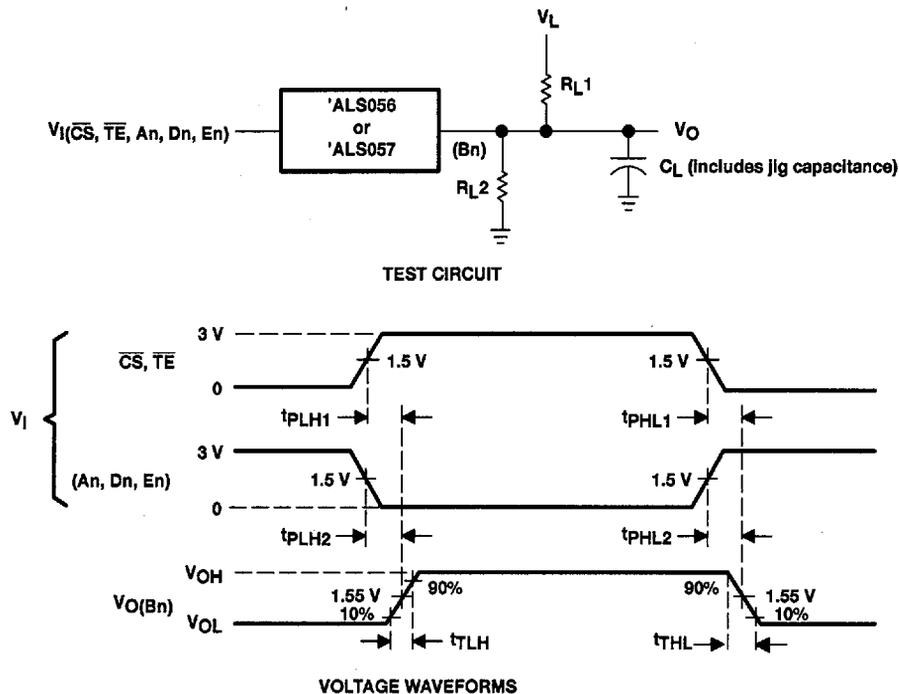


Figure 1. Driver Low-Level-Output-Voltage Test Circuit

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PARAMETER MEASUREMENT INFORMATION



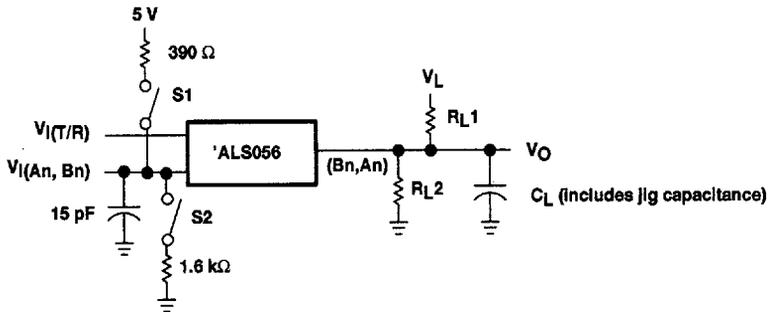
NOTE: $t_r = t_f \leq 5$ ns from 10% to 90%

Figure 2. Driver Test Circuit and Voltage Waveforms

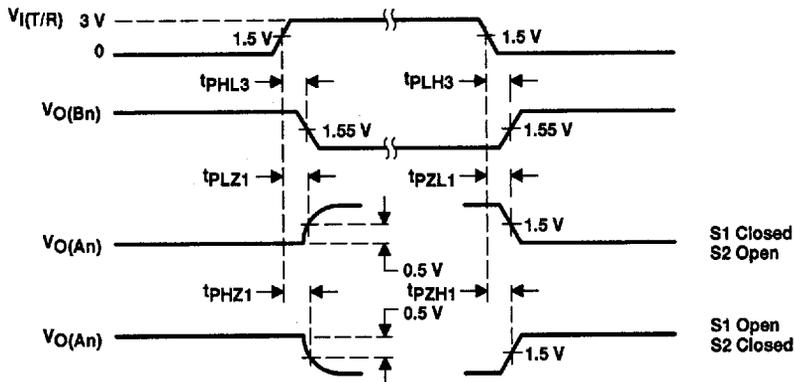
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PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTE: $t_r = t_f \leq 5$ ns from 10% to 90%

Figure 3. Propagation Delay From T/R to An or Bn Test Circuit and Voltage Waveforms

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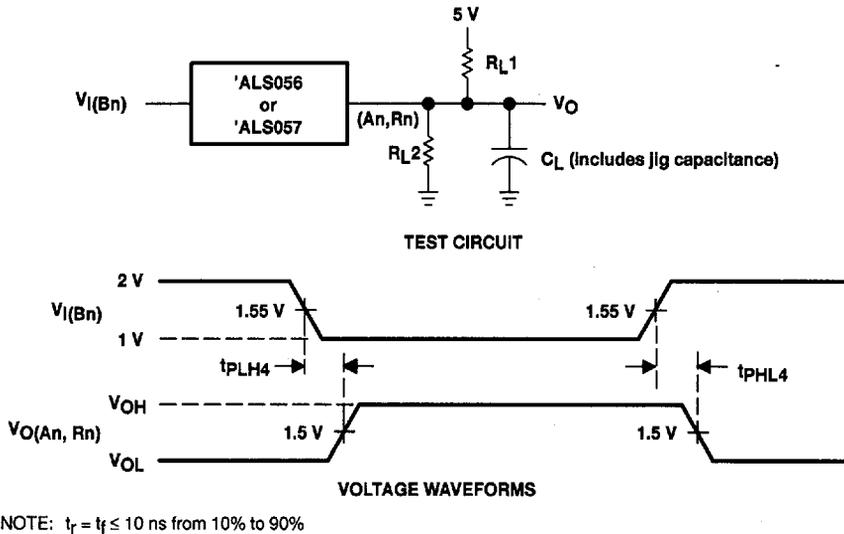


Figure 4. Receiver Test Circuit and Voltage Waveforms

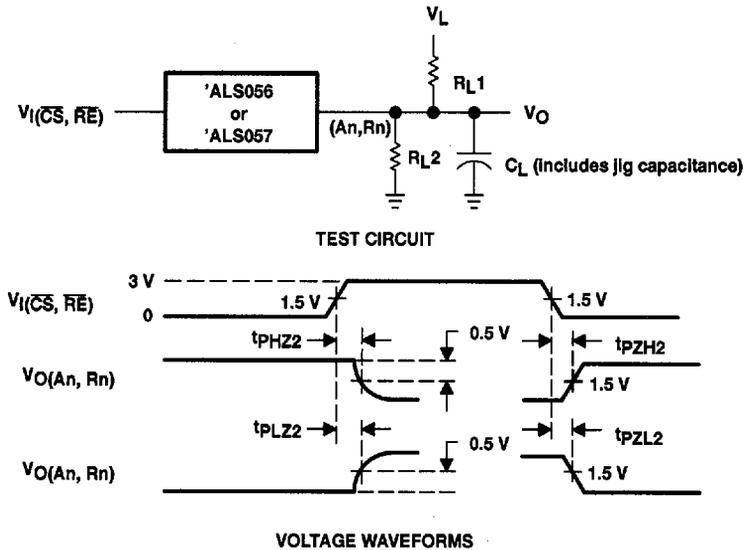


Figure 5. Propagation Delay From \overline{CS} to An or \overline{RE} to Rn Test Circuit and Voltage Waveforms

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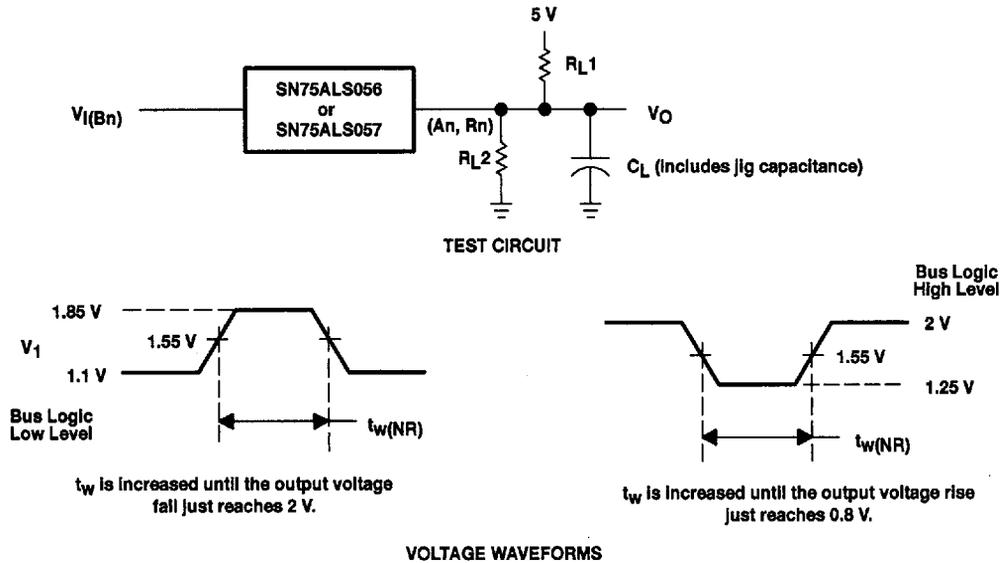


Figure 6. Receiver Noise Immunity Test Circuit and Voltage Waveforms

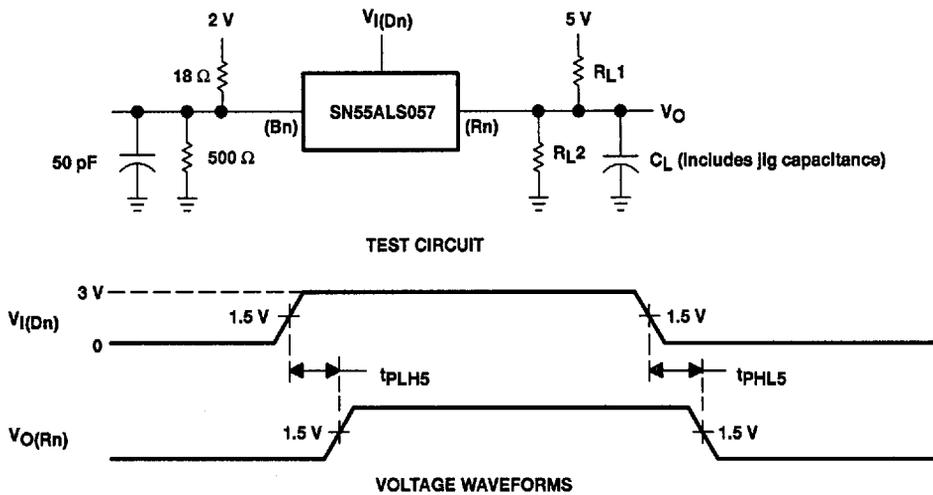
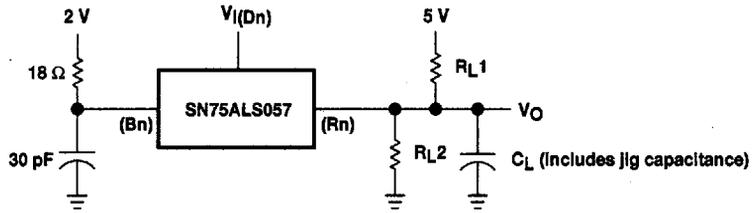


Figure 7. Driver Plus Receiver Delay Times Test Circuits and Voltage Waveforms

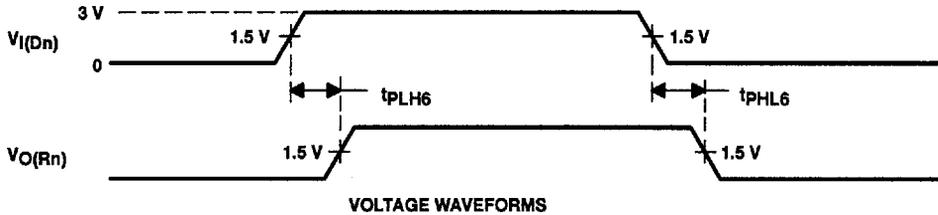
**SN55ALS056, SN55ALS057, SN75ALS056, SN75ALS057
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PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



NOTE: $t_r = t_f \leq 5$ ns from 10% to 90%

Figure 8. Driver Plus Receiver Delay Times Test Circuits and Voltage Waveforms