

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
 - Class Q Military
 - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
 - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

SN54ALS620A THRU SN54ALS623A, SN54AS620 THRU SN54AS623 SN74ALS620A THRU SN74ALS623A, SN74AS620 THRU SN74AS623 OCTAL BUS TRANSCEIVERS

D2661, DECEMBER 1982 — REVISED MAY 1986

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Local Bus-Latch Capability
- Choice of True or Inverting Logic
- Choice of 3-State or Open-Collector Outputs
- Dependable Texas Instruments Quality and Reliability

DEVICE	OUTPUT	LOGIC
'ALS620A, 'AS620	3-State	Inverting
'ALS621A, 'AS621	Open-Collector	True
'ALS622A, 'AS622	Open-Collector	Inverting
'ALS623A, 'AS623	3-State	True

description

These octal bus transceivers are designed for asynchronous two-way communication between data buses. The control function implementation allows for maximum flexibility in timing.

These devices allow data transmission from A bus to the B bus or from the B bus to the A bus depending upon the logic levels at the enable inputs ($\overline{\text{GBA}}$ and GAB).

The enable inputs can be used to disable the device so that the buses are effectively isolated.

The dual-enable configuration gives the octal bus transceivers the capability to store data by simultaneous enabling of $\overline{\text{GBA}}$ and GAB. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the two sets of bus lines are at high impedance, both sets of bus lines (16 in all) will remain at their last states. The 8-bit codes appearing on the two sets of buses will be identical for the 'ALS621A, 'AS621 and 'ALS623A, 'AS623 or complementary for the 'ALS620A, 'AS620 and 'ALS622A, 'AS622.

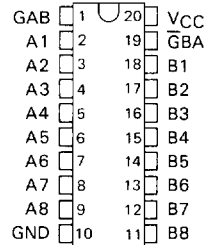
The -1 versions of the SN74ALS' parts are identical to their standard versions except that the recommended maximum I_{OL} is increased to 48 mA. There are no -1 versions of the SN54ALS' parts.

The SN54' family is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74' family is characterized for operation from 0°C to 70°C .

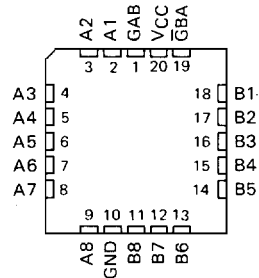
FUNCTION TABLE

ENABLE INPUTS		OPERATION	
$\overline{\text{GBA}}$	GAB	'ALS620A, 'ALS622A 'AS620, 'AS622	'ALS621A, 'ALS623A 'AS621, 'AS623
L	L	$\overline{\text{B}}$ data to A bus	B data to A bus
✓ H	H	$\overline{\text{A}}$ data to B bus	A data to B bus
• H	L	Isolation	Isolation
L	H	$\overline{\text{B}}$ data to A bus, $\overline{\text{A}}$ data to B bus	B data to A bus, A data to B bus

SN54ALS', SN54AS' . . . J PACKAGE
SN74ALS', SN74AS' . . . DW OR N PACKAGE
(TOP VIEW)

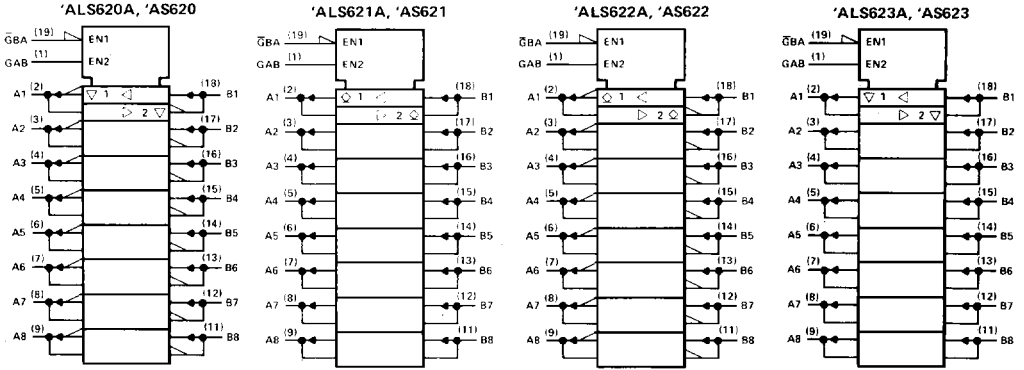


SN54ALS', SN54AS' . . . FK PACKAGE
(TOP VIEW)



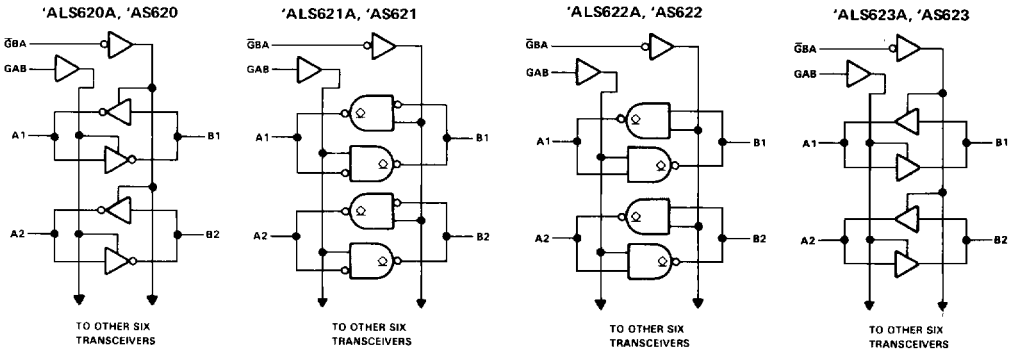
SN54ALS620A THRU SN54ALS623A, SN54AS620 THRU SN54AS623 SN74ALS620A THRU SN74ALS623A, SN74AS620 THRU SN74AS623 OCTAL BUS TRANSCEIVERS

logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin numbers shown are for DW, J, and N packages.

logic diagrams (positive logic)



2 ALS and AS Circuits

SN54ALS620A, SN54ALS623A, SN74ALS620A, SN74ALS623A OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage: All inputs	7 V
I/O ports	5.5 V
Operating free-air temperature range: SN54ALS620A, SN54ALS623A	-55 °C to 125 °C
SN74ALS620A, SN74ALS623A	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54ALS620A SN54ALS623A			SN74ALS620A SN74ALS623A			UNIT		
		MIN	NOM	MAX	MIN	NOM	MAX			
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V		
V_{IH}	High-level input voltage	2			2			V		
V_{IL}	Low-level input voltage				0.8			V		
I_{OH}	High-level output current				-15			mA		
I_{OL}	Low-level output current				48†			mA		
T_A	Operating free-air temperature	-55			125			0	70	°C

†The extended limits apply only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48-mA limit applies for the SN74ALS620A-1 and SN74ALS623A-1 only.

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

PARAMETER	TEST CONDITIONS	SN54ALS620A SN54ALS623A			SN74ALS620A SN74ALS623A			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	$V_{CC} = 4.5$ V, $I_I = -18$ mA	-1.5			-1.5			V
V_{OH}	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -0.4$ mA	$V_{CC}-2$			$V_{CC}-2$			V
	$V_{CC} = 4.5$ V, $I_{OH} = -3$ mA	2.4	3.2		2.4	3.2		
	$V_{CC} = 4.5$ V, $I_{OH} = -12$ mA	2						
	$V_{CC} = 4.5$ V, $I_{OH} = -15$ mA				2			
V_{OL}	$V_{CC} = 4.5$ V, $I_{OL} = 12$ mA	0.25	0.4		0.25	0.4	V	
	$V_{CC} = 4.5$ V, $I_{OL} = 24$ mA ($I_{OL} = 48$ mA for -1 versions)				0.35	0.5		
I_I	Control inputs	$V_{CC} = 5.5$ V, $V_I = 7$ V			0.1			mA
	A or B ports	$V_{CC} = 5.5$ V, $V_I = 5.5$ V			0.1			
I_{IH}	Control inputs				20			μ A
	A or B ports‡	$V_{CC} = 5.5$ V, $V_I = 2.7$ V			20			
I_{IL}	Control inputs	$V_{CC} = 5.5$ V, $V_I = 0.4$ V			-0.1			mA
	A or B ports‡				-0.1			
I_{O}^{\dagger}	$V_{CC} = 5.5$ V, $V_O = 2.25$ V	-30	-112		-30	-112	mA	
I_{CC}	'ALS620A	$V_{CC} = 5.5$ V	Outputs high	24	39	24	34	mA
			Outputs low	31	49	31	44	
			Outputs disabled	33	52	33	47	
	'ALS623A	$V_{CC} = 5.5$ V	Outputs high	32	48	32	43	
			Outputs low	39	55	39	50	
			Outputs disabled	42	60	42	55	

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

§For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

†The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

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ALS and AS Circuits

SN54ALS620A, SN54ALS623A, SN74ALS620A, SN74ALS623A OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

'ALS620A switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS620A		SN74ALS620A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	2	12	2	10	ns
t_{PHL}			2	12	2	10	
t_{PLH}	B	A	2	12	2	10	ns
t_{PHL}			2	12	2	10	
t_{PZH}	$\bar{G}BA$	A	3	23	3	17	ns
t_{PZL}			5	31	5	25	
t_{PHZ}	$\bar{G}BA$	A	2	14	2	12	ns
t_{PLZ}			3	22	3	18	
t_{PZH}	GAB	B	3	23	3	18	ns
t_{PZL}			5	31	5	25	
t_{PHZ}	GAB	B	2	14	2	12	ns
t_{PLZ}			3	22	3	18	

'ALS623A switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS623A		SN74ALS623A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	2	15	2	13	ns
t_{PHL}			3	13	3	11	
t_{PLH}	B	A	2	15	2	13	ns
t_{PHL}			3	13	3	11	
t_{PZH}	$\bar{G}BA$	A	5	25	5	22	ns
t_{PZL}			5	25	5	22	
t_{PHZ}	$\bar{G}BA$	A	2	19	2	16	ns
t_{PLZ}			2	23	2	19	
t_{PZH}	GAB	B	5	25	5	22	ns
t_{PZL}			5	25	5	22	
t_{PHZ}	GAB	B	2	19	2	16	ns
t_{PLZ}			2	23	2	19	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

SN54ALS621A, SN54ALS622A, SN74ALS621A, SN74ALS622A OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage: All inputs and I/O ports	7 V
Operating free-air temperature range: SN54ALS621A, SN54ALS622A	-55°C to 125°C
SN74ALS621A, SN74ALS622A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54ALS621A SN54ALS622A			SN74ALS621A SN74ALS622A			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage	0.7			0.8			V
V_{OH}	High-level output voltage	5.5			5.5			V
I_{OL}	Low-level output current	12			24			mA
					48†			
T_A	Operating free-air temperature	-55	125		0	70		°C

†The extended limits apply only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48-mA limit applies for the SN74ALS621A-1 and SN74ALS622A-1 only.

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

PARAMETER	TEST CONDITIONS	SN54ALS621A SN54ALS622A			SN74ALS621A SN74ALS622A			UNIT
		MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	$V_{CC} = 4.5$ V, $I_I = -18$ mA	-1.5			-1.5			V
I_{OH}	$V_{CC} = 4.5$ V, $V_{OH} = 5.5$ V	0.1			0.1			mA
V_{OL}	$V_{CC} = 4.5$ V, $I_{OL} = 12$ mA	0.25	0.4		0.25	0.4		V
	$V_{CC} = 4.5$ V, $I_{OL} = 24$ mA ($I_{OL} = 48$ mA for -1 versions)				0.35	0.5		
I_I	Control inputs $V_{CC} = 5.5$ V, $V_I = 7$ V	0.1			0.1			mA
	A or B ports $V_{CC} = 5.5$ V, $V_I = 5.5$ V	0.1			0.1			
I_{IH}	Control inputs $V_{CC} = 5.5$ V, $V_I = 2.7$ V	20			20			µA
	A or B ports‡ $V_{CC} = 5.5$ V, $V_I = 2.7$ V	20			20			
I_{IL}	Control inputs $V_{CC} = 5.5$ V, $V_I = 0.4$ V	-0.1			-0.1			mA
	A or B ports‡ $V_{CC} = 5.5$ V, $V_I = 0.4$ V	-0.1			-0.1			
I_{CC}	ALS621A $V_{CC} = 5.5$ V	Outputs high	29	45	29	40		mA
		Outputs low	35	53	35	48		
	ALS622A $V_{CC} = 5.5$ V	Outputs high	11	20	11	15		
		Outputs low	20	33	20	28		

‡All typical values are at $V_{CC} = 5$ V, $T_A = 25$ °C.
§For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

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ALS and AS Circuits

SN54ALS621A, SN54ALS622A, SN74ALS621A, SN74ALS622A
OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

'ALS621A switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_L = 680 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS621A		SN74ALS621A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	10	45	10	33	ns
t_{PHL}			5	24	5	20	
t_{PLH}	B	A	10	45	10	33	ns
t_{PHL}			5	24	5	20	
t_{PLH}	$\bar{G}BA$	A	10	47	10	39	ns
t_{PHL}			12	40	12	35	
t_{PLH}	GAB	B	10	47	10	39	ns
t_{PHL}			12	40	12	35	

'ALS622A switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$ $C_L = 50 \text{ pF},$ $R_L = 680 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS622A		SN74ALS622A		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	8	42	8	35	ns
t_{PHL}			5	23	5	19	
t_{PLH}	B	A	8	42	8	35	ns
t_{PHL}			5	23	5	19	
t_{PLH}	$\bar{G}BA$	A	8	45	8	38	ns
t_{PHL}			10	40	10	35	
t_{PLH}	GAB	B	8	45	8	38	ns
t_{PHL}			10	40	10	35	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

2 ALS and AS Circuits

SN54AS620, SN54AS623, SN74AS620, SN74AS623

OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

'AS620 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54AS620		SN74AS620		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	1	8	1	7	ns
t_{PHL}			2	7	2	6	
t_{PLH}	B	A	1	8	1	7	ns
t_{PHL}			2	7	2	6	
t_{PZH}	$\bar{G}BA$	A	2	8.5	2	8	ns
t_{PZL}			2	10	2	9	
t_{PHZ}	$\bar{G}BA$	A	1	7.5	1	6	ns
t_{PLZ}			2	15	2	12	
t_{PZH}	GAB	B	2	9	2	8	ns
t_{PZL}			2	10.5	2	9	
t_{PHZ}	GAB	B	1	6.5	1	6	ns
t_{PLZ}			2	16	2	13	

'AS623 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54AS623		SN74AS623		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	1	10	1	9	ns
t_{PHL}			1	9	1	8	
t_{PLH}	B	A	1	10	1	9	ns
t_{PHL}			1	9.5	1	8.5	
t_{PZH}	$\bar{G}BA$	A	2	11.5	2	11	ns
t_{PZL}			2	11	2	10	
t_{PHZ}	$\bar{G}BA$	A	1	8.5	1	7.5	ns
t_{PLZ}			1	13.5	1	11.5	
t_{PZH}	GAB	B	2	13	2	11.5	ns
t_{PZL}			2	12	2	11	
t_{PHZ}	GAB	B	1	8	1	7	ns
t_{PLZ}			1	10.5	1	9	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

2 ALS and AS Circuits

SN54AS621, SN54AS622, SN74AS621, SN74AS622

OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage: All inputs and I/O ports	7 V
Operating free-air temperature range: SN54AS621, SN54AS622	-55 °C to 125 °C
SN74AS621, SN74AS622	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

		SN54AS621 SN54AS622			SN74AS621 SN74AS622			UNIT	
		MIN	NOM	MAX	MIN	NOM	MAX		
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V	
V_{IH}	High-level input voltage	2			2			V	
V_{IL}	Low-level input voltage	0.8			0.8			V	
V_{OH}	High-level output voltage	5.5			5.5			V	
I_{OL}	Low-level output current	48			64			mA	
T_A	Operating free-air temperature	-55			0			70	°C

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

PARAMETER	TEST CONDITIONS	SN54AS621 SN54AS622			SN74AS621 SN74AS622			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
		V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$	-1.2			-1.2	
I_{OH}	$V_{CC} = 4.5 \text{ V}$, $V_{OH} = 5.5 \text{ V}$	0.1			0.1			mA
V_{OL}	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 48 \text{ mA}$	0.30			0.5			V
	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 64 \text{ mA}$				0.35			
I_I	Control inputs A or B ports	$V_{CC} = 5.5 \text{ V}$, $V_I = 7 \text{ V}$	0.1		0.1			mA
		$V_{CC} = 5.5 \text{ V}$, $V_I = 5.5 \text{ V}$	0.1		0.1			
I_{IH}	Control inputs A or B ports‡	$V_{CC} = 5.5 \text{ V}$, $V_I = 2.7 \text{ V}$	20		20			μA
			70		70			
I_{IL}	Control inputs A or B ports‡	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$	-0.5		-0.5			mA
			-0.75		-0.75			
I_{CC}	'AS621	$V_{CC} = 5.5 \text{ V}$	Outputs high	48	79	48	79	mA
			Outputs low	116	189	116	189	
	'AS622		Outputs high	24	39	24	39	
			Outputs low	63	103	63	103	

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

‡For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

SN54AS621, SN54AS622, SN74AS621, SN74AS622
OCTAL BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

'AS621 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$, $T_A = \text{MIN to MAX}$				UNIT
			SN54AS621		SN74AS621		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	5	28.5	5	24	ns
t_{PHL}			1	8.5	1	7.5	
t_{PLH}	B	A	5	23	5	21	ns
t_{PHL}			1	8.5	1	7.5	
t_{PLH}	$\bar{G}BA$	A	5	24	5	21	ns
t_{PHL}			1	10	1	9	
t_{PLH}	GAB	B	5	26	5	22	ns
t_{PHL}			1	11	1	10	

'AS622 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$, $T_A = \text{MIN to MAX}$				UNIT
			SN54AS622		SN74AS622		
			MIN	MAX	MIN	MAX	
t_{PLH}	A	B	5	28.5	5	24.5	ns
t_{PHL}			1	8.5	1	8	
t_{PLH}	B	A	5	30	5	25	ns
t_{PHL}			1	8.5	1	8	
t_{PLH}	$\bar{G}BA$	A	5	26	5	22	ns
t_{PHL}			1	11.5	1	10	
t_{PLH}	GAB	B	5	26	5	23	ns
t_{PHL}			1	11.5	1	10.5	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.