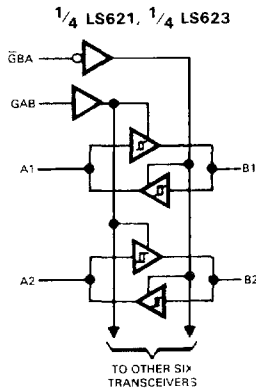
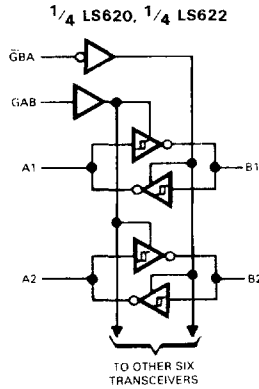




DESCRIPTION — The SN54LS/74LS620 thru SN54LS/74LS623 series are octal bus transceivers designed for asynchronous two-way communication between data buses. Control function implementation allows maximum timing flexibility. Enable inputs may be used to disable the device so that buses are effectively isolated. Depending on the Logic Levels at the enable inputs, Data transmission is allowed from the A bus to the B bus or from the B bus to the A bus. The dual-enable configuration gives the LS620 thru LS623 the capability to store data by simultaneous enabling of $\bar{G}BA$ and GAB. Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled all other data sources to the two 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 LS621 and LS623 devices or complementary for the LS620 and LS622.

BLOCK DIAGRAMS



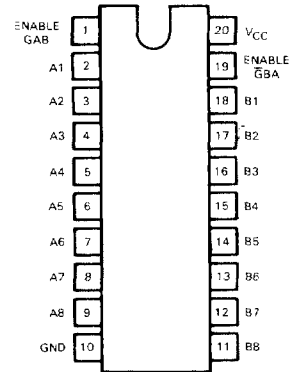
SN54LS/74LS620
SN54LS/74LS621
SN54LS/74LS622
SN54LS/74LS623

OCTAL BUS TRANSCEIVERS

LOW POWER SCHOTTKY

CONNECTION DIAGRAM

(TOP VIEW)



J Suffix — Case 732-03 (Ceramic)
 N Suffix — Case 738-01 (Plastic)

FUNCTION TABLE

ENABLE INPUTS		OPERATION	
$\bar{G}BA$	GAB	LS620, LS622	LS621, LS623
L	L	\bar{B} data to A bus	B data to A bus
H	H	\bar{A} data to B bus	A data to B bus
H	L	Isolation	Isolation
L	H	\bar{B} data to A bus, \bar{A} data to B bus	B data to A bus, A data to B bus

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

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GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V _{CC}	Supply Voltage	54	4.5	5.0	5.5	V
		74	4.75	5.0	5.25	
T _A	Operating Ambient Temperature Range	54	-55	25	125	°C
		74	0	25	70	
I _{OH}	Output Current — High	54,74			-3.0	mA
		54,74			-1.2 -15	
I _{OL}	Output Current — Low	54			12	mA
		74			24	

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER		LIMITS			UNITS	TEST CONDITIONS
			MIN	TYP	MAX		
V _{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage	54			0.5	V	Guaranteed Input LOW Voltage for All Inputs
		74			0.6		
V _{T+} -- V _{T-}	Hysteresis		0.2	0.4		V	V _{CC} = MIN
V _{IK}	Input Clamp Diode Voltage			-0.65	-1.5	V	V _{CC} = MIN, I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54,74	2.4	3.4		V	V _{CC} = MIN, I _{OH} = -3.0 mA
		54,74	2.0			V	V _{CC} = MIN, I _{OH} = MAX
V _{OL}	Output LOW Voltage	54,74		0.25	0.4	V	I _{OL} = 12 mA V _{CC} = V _{CC} MIN, V _{IN} = V _{IL} or V _{IH} per Truth Table
		74		0.35	0.5	V	I _{OL} = 24 mA
I _{OZH}	Output Off Current HIGH				20	μA	V _{CC} = MAX, V _{OUT} = 2.7 V
I _{OZL}	Output Off Current LOW				-400	μA	V _{CC} = MAX, V _{OUT} = 4.0 V
I _{IH}	Input HIGH Current	A or B, \bar{G} BA or GAB			20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
		\bar{G} BA or GAB			0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
		A or B			0.1	mA	V _{CC} = MAX, V _{IN} = 5.5 V
I _{IL}	Input LOW Current				-0.4	mA	V _{CC} = MAX, V _{IN} = 0.4 V
I _{OS}	Short Circuit Current		-40		-225	mA	V _{CC} = MAX
I _{CC}	Power Supply Current				70	mA	V _{CC} = MAX
	Total Output HIGH				90		
	Total at HIGH Z				95		

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AC CHARACTERISTICS: T_A = 25°C, V_{CC} = 5.0 V

SYMBOL	PARAMETER	LS620			LS623			UNITS	TEST CONDITIONS
		LIMITS			LIMITS				
		MIN	TYP	MAX	MIN	TYP	MAX		
t _{PLH}	Propagation Delay A to B		6.0	10		8.0	15	ns	C _L = 45 pF, R _L = 667 Ω
t _{PHL}			8.0	15		11	15		
t _{PLH}	Propagation Delay B to A		6.0	10		8.0	15		
t _{PHL}			8.0	15		11	15		
t _{PZL}	Output Enable Time \bar{G} BA to A		31	40		31	40		
t _{PZH}			23	40		26	40		
t _{PZL}	Output Enable Time GAB to B		31	40		31	40		
t _{PZH}			23	40		26	40		
t _{PLZ}	Output Disable Time \bar{G} BA to A		15	25		15	25	ns	C _L = 5.0 pF
t _{PHZ}			15	25		15	25		
t _{PLZ}	Output Disable Time GAB to B		15	25		15	25		
t _{PHZ}			15	25		15	25		

GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V _{CC}	Supply Voltage	54 74	4.5 4.75	5.0 5.0	5.5 5.25	V
T _A	Operating Ambient Temperature Range	54 74	-55 0	25 25	125 70	°C
V _{OH}	Output Voltage — High	54, 74			5.5	mA
I _{OL}	Output Current — Low	54 74			12 24	mA

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	LIMITS			UNITS	TEST CONDITIONS
		MIN	TYP	MAX		
V _{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage	54		0.5	V	Guaranteed Input LOW Voltage for All Inputs
		74		0.6		
V _{T+} —V _{T-}	A or B Input	0.2	0.4		V	V _{CC} = MIN
V _{IK}	Input Clamp Diode Voltage		-0.65	-1.5	V	V _{CC} = MIN, I _{IN} = -18 mA
I _{OH}	Output HIGH Current	54, 74		100	μA	V _{CC} = MIN, V _{OH} = MAX
V _{OL}	Output LOW Voltage	54, 74	0.25	0.4	V	I _{OL} = 12 mA, V _{CC} = V _{CC} MIN, V _{IN} = V _{IL} or V _{IH} per Truth Table
		74	0.35	0.5	V	I _{OL} = 24 mA
I _{IH}	Input HIGH Current			20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
				+0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
I _{IL}	Input LOW Current			-0.4	mA	V _{CC} = MAX, V _{IN} = 0.4 V
I _{CC}	Power Supply Current Total, Output HIGH			70	mA	V _{CC} = MAX
	Total, Output LOW			90	mA	V _{CC} = MAX

AC CHARACTERISTICS: T_A = 25°C, V_{CC} = 5.0 V

SYMBOL	PARAMETER	LS621			LS622			UNITS	TEST CONDITIONS
		LIMITS			LIMITS				
		MIN	TYP	MAX	MIN	TYP	MAX		
t _{PLH}	Propagation Delay A to B		17	25		19	25	ns	C _L = 45 pF, R _L = 667 Ω
t _{PHL}	Propagation Delay B to A		16	25		14	25		
t _{PLH}	Propagation Delay B to A		17	25		19	25	ns	
t _{PHL}	Propagation Delay A to B		16	25		14	25		
t _{PLH}	Output Disable Time G _A to A		23	40		26	40	ns	
t _{PHL}	Output Disable Time G _B to A		34	50		43	60		
t _{PLH}	Output Disable Time G _A to B		25	40		28	40	ns	
t _{PHL}	Output Disable Time G _B to B		37	50		39	60		