

# TYPES SN54AS2620, SN54AS2623, SN74AS2620, SN74AS2623 OCTAL BUS TRANSCEIVERS/MOS DRIVER

DECEMBER 1983

- Bidirectional Octal Bus Transceivers For Driving MOS Devices
- I/O Ports Have 25 Ohm Series Resistors So No External Resistors Are Required
- Local Bus-Latch Capability
- Choice of True or Inverting Logic
- Dependable Texas Instruments Quality and Reliability

## description

These octal bus transceivers are designed to drive the capacitive input characteristics of MOS devices and allow asynchronous two-way communication between data buses. The control function implementation allows for maximum flexibility in timing.

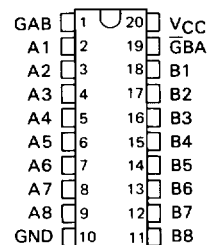
These devices allow data transmission from A bus to the B bus or from the B bus to the A bus depending upon the logic levels at the enable inputs ( $\bar{G}BA$  and  $GAB$ ).

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

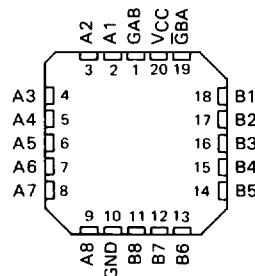
The dual-enable configuration gives the 'AS2620 or 'AS2623 the capability to store data by simultaneous enabling of  $\bar{G}BA$  and  $GAB$ . Each output reinforces its input in this transceiver configuration. Thus, when both control inputs are enabled and all other data sources to the two sets of bus 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 'AS2623 or complementary for the 'AS2620.

The SN54AS2620 and SN54AS2623 are characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74AS2620 and SN74AS2623 are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

SN54AS' . . . J PACKAGE  
SN74AS' . . . N PACKAGE  
(TOP VIEW)



SN54AS' . . . FH PACKAGE  
SN74AS' . . . FN PACKAGE  
(TOP VIEW)



FUNCTION TABLE

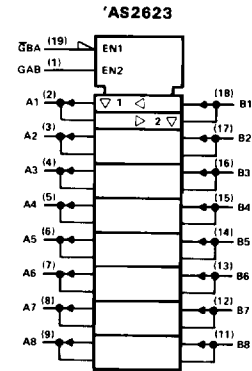
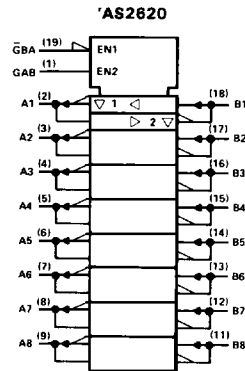
ENABLE INPUTS		OPERATION	
$\bar{G}BA$	$GAB$	'AS2620	'AS2623
L	L	$\bar{B}$ data to A bus	B data to A bus
H	H	$\bar{A}$ data to B bus	A data to B bus
H	L	Isolation	Isolation
L	H	$\bar{B}$ data to A bus, $\bar{A}$ data to B bus	B data to A bus, A data to B bus

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ALS AND AS CIRCUITS

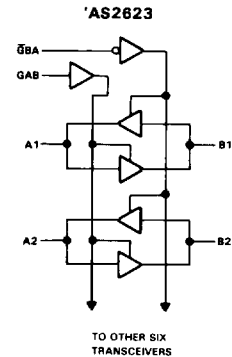
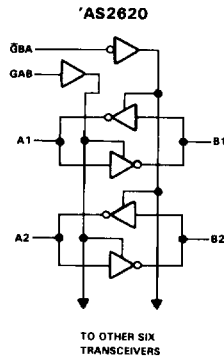
**TYPES SN54AS2620, SN54AS2623, SN74AS2620, SN74AS2623**  
**OCTAL BUS TRANSCEIVERS/MOS DRIVER**

**logic symbols**



Pin numbers shown are for J and N packages.

**logic diagrams (positive logic)**



**2 ALS AND AS CIRCUITS**

## TYPES SN54AS2620, SN54AS2623, SN74AS2620, SN74AS2623 OCTAL BUS TRANSCEIVERS/MOS DRIVER

### 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: SN54AS2620, SN54AS2623 .....	-55 °C to 125 °C
SN74AS2620, SN74AS2623 .....	0 °C to 70 °C
Storage temperature range .....	-65 °C to 150 °C

### recommended operating conditions

		SN54AS2620 SN54AS2623			SN74AS2620 SN74AS2623			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
$T_A$	Operating free-air temperature	-55			125			°C

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

PARAMETER	TEST CONDITIONS	SN54AS2620 SN54AS2623		SN74AS2620 SN74AS2623		UNIT		
		MIN	TYP†	MAX	MIN		TYP†	MAX
$V_{IK}$	$V_{CC} = 4.5$ V, $I_I = -18$ mA			-1.2		V		
$V_{OH}$	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -2$ mA	$V_{CC}-2$		$V_{CC}-2$		V		
$V_{OL}$	$V_{CC} = 4.5$ V, $I_{OL} = 1$ mA	0.15	0.4	0.15	0.4	V		
	$V_{CC} = 4.5$ V, $I_{OL} = 12$ mA	0.35	0.7	0.35	0.7			
$I_I$	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	$V_{CC} = 5.5$ V, $V_I = 2.7$ V		20		µA		
	A or B ports‡			50				
$I_{IL}$	Control inputs	$V_{CC} = 5.5$ V, $V_I = 0.4$ V		-0.5		mA		
	A or B ports‡			-0.5				
$I_O^§$	$V_{CC} = 5.5$ V, $V_O = 2.25$ V	-30	-112	-30	-112	mA		
$I_{OH}$	$V_{CC} = 4.5$ V, $V_O = 2$ V	-35		-35		mA		
$I_{OL}$	$V_{CC} = 4.5$ V, $V_O = 2$ V	35		35		mA		
$I_{CC}$	'AS2620	$V_{CC} = 5.5$ V	Outputs high	62	100	62	100	mA
			Outputs low	74	121	74	121	
			Outputs disabled	48	77	48	77	
	'AS2623	$V_{CC} = 5.5$ V	Outputs high	57	93	57	93	
			Outputs low	116	189	116	189	
			Outputs disabled	72	116	72	116	

† 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

**TYPES SN54AS2620, SN54AS2623, SN74AS2620, SN74AS2623**  
**OCTAL BUS TRANSCEIVERS/MOS DRIVER**

**AS2620 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
			SN54AS2620		SN74AS2620		
			MIN	MAX	MIN	MAX	
$t_{PLH}$	A	B	1	9.5	1	8	ns
$t_{PHL}$			1	7.5	1	6.5	
$t_{PLH}$	B	A	1	9.5	1	8	ns
$t_{PHL}$			1	7.5	1	6.5	
$t_{PZH}$	$\bar{G}BA$	A	1	11	1	10	ns
$t_{PZL}$			1	12	1	11	
$t_{PHZ}$	$\bar{G}BA$	A	1	7.5	1	6	ns
$t_{PLZ}$			1	15	1	12	
$t_{PZH}$	GAB	B	1	9	1	8	ns
$t_{PZL}$			1	9	1	8	
$t_{PHZ}$	GAB	B	1	12	1	11	ns
$t_{PLZ}$			1	12	1	11	

**AS2623 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
			SN54AS2623		SN74AS2623		
			MIN	MAX	MIN	MAX	
$t_{PLH}$	A	B	1	9.5	1	8.5	ns
$t_{PHL}$			1	8.5	1	7.5	
$t_{PLH}$	B	A	1	10	1	9	ns
$t_{PHL}$			1	9	1	7.5	
$t_{PZH}$	$\bar{G}BA$	A	1	12.5	1	11	ns
$t_{PZL}$			1	12	1	11	
$t_{PHZ}$	$\bar{G}BA$	A	1	8.5	1	7.5	ns
$t_{PLZ}$			1	13	1	12	
$t_{PZH}$	GAB	B	1	13	1	12	ns
$t_{PZL}$			1	13.5	1	12	
$t_{PHZ}$	GAB	B	1	7.5	1	7	ns
$t_{PLZ}$			1	14.5	1	12.5	

NOTE 1: For load circuit and voltage waveforms, see page 1-12.

**2 ALS AND AS CIRCUITS**