- State of the Art BiCMOS Design Significantly Reduces ICCZ
- Functionally Equivalent to SN54F623 and SN74F623
- ESD Protection Exceeds 2000 V per MIL-STD-833C Method 3015
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil
- Dependable Texas Instruments Quality and Reliability

description

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

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

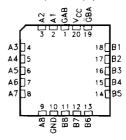
The enable inputs can be used to disable the device so that the buses are effectively isolated. The dual-enable configuration gives the octal bus transceivers the capability to store data by simultaneous activation of GBA and GAB. Each output reinforces its input in this transceiver configuration. When both enable inputs are activated 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 SN54BCT623 is characterized for operation over the full military temperature range of -55°C to 125°C. The SN74BCT623 is characterized for operation from 0°C to 70°C.

SN54BCT623 ... J PACKAGE SN74BCT623 ... DW OR N PACKAGE (TOP VIEW)

GAB[1	U ₂₀	□vcc
A1[2	19	Ğ₿A
A2[3	18]B1
A3[4	17]B2
A4[5	16]B3
A5[6	15	B4
A6[7	14	B5
A7[8	13	B6
A8[9	12	В7
GND	10	11	В8

SN54BCT623 ... FK PACKAGE (TOP VIEW)



FUNCTION TABLE

ENABLE	INPUTS	OPERATION				
ĞВА	GAB					
L	L L	B data to A bus				
н	н	A data to 8 bus				
н	L	Isolation				
L	н	B data to A bus				
L	н	A data to B bus				

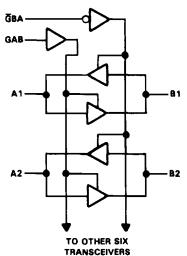
PRODUCTION DATA documents contain information current as of publication data. Products conform to specifications per the terms of Texas instruments standard warranty. Production processing does not necessarily include testing of all parameters.



logic symbol†

GBA (19) EN1 GAB (1) EN2 (18) ∇ 1 2 🗸 (17) B2 (16) B3 (14) 85 13) 12)

logic diagram (positive logic)



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

Supply voltage, VCC	. $-0.5V$ to $7V$
Input voltage (see Note 1): Control inputs	. -0.5 V to 7 V
I/O ports	-0.5 V to 5.5 V
Voltage applied to any output in the disabled or power-off state	
Voltage applied to any output in the high state	-0.5 V to VCC
Input clamp current	30 mA
Current into any output in the low state: SN54BCT623	96 mA
SN74BCT623	128 mA
Operating free-air temperature range: SN54BCT623	-55°C to 125°C
SN74BCT623	0°C to 70°C
Storage temperature range	-65°C to 150°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.



[†] This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

NOTE 1: The input negative-voltage rating may be exceeded if the input clamp current rating is observed.

recommended operating conditions

			8N54BCT623			SN74BCT623			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	01411
Vcc	Supply voltage	4.5	5	5.5	4.5	5	5.5	٧	
۷н	High-level input voltage		2			2			V
٧ĪL	Low-level input voltage				8.0			0.8	٧
ήK	Input clamp current				18			-18	mA
ЮН	High-level output current	Any A			-3			-3	mA
·Оп	IOH Ingli-level datpar carrent	Any B			-12			- 15	
loL	Low-level output current	Any A			20			24	mA
OL COM-10491 Output cuit will	cow-level output current	Any B			48			64	'''^
TA	Operating free-air temperature		-55		125	0		70	•c

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

PARAMETER		TEST CONDITIONS		SI	154BCT62	23	SN74BCT623			UNIT
		123	MIN	TYP	MAX	MIN	TYP [†]	MAX	URII	
Vik		V _{CC} = 4.5 V,	I _I = −18 mA			~ 1.2			-1.2	V
	Any A	V _{CC} = 4.5 V	IOH = -1 mA	2.5	3.4		2.5	3.4		
	City C	4.5	IOH = -3 mA	2.4	3.3		2.4	3.3		
Vон	4		IOH = -3 mA	2.4	3.3		2.4	3.3		V
	Any B	$V_{CC} = 4.5 V$	IOH = −12 mA	2	3.2				_	
			IOH = -15 mA				2	3.1		
	Any A	V _{CC} = 4.5 V	IOL = 20 mA		0.3	0.5	-			
VOL	^"', ``	100	IOL = 24 mA					0.35	0.5	v
·OL	Any B	V _{CC} = 4.5 V	IOL = 48 mA		0.38	0.55				
	1, -		IOL = 64 mA					0.42	0.55	
I _I	A and B VC	$V_{CC} = 5.5 V$,	V _I = 5.5 V			1			1	mA
1	GAB and GBA	$V_{CC} = 5.5 V$	V _I = 5.5 V			0.1			0.1	
лн‡	A and B	$V_{CC} = 5.5 V$	$V_{\parallel} = 2.7 V$			70			70	μΑ
1111	GAB and GBA	$V_{CC} = 5.5 V$	V _I = 2.7 V			20			20	
կլ.‡	A and B	$V_{CC} = 5.5 V$	$V_I = 0.5 V$			0.65			~0.65	mA
'IL	GAB and GBA	$V_{CC} = 5.5 V_i$	V _f = 0.5 V			-0.6			-0.6	
los§	Any A	$V_{CC} = 5.5 V$	VO = 0	- 60		- 150	60		- 150	mA
.03	Any B	$V_{CC} = 5.5 V$	VO ≈ 0	-100		-225	100		- 225	
ІССН		V _{CC} ≈ 5.5 V,	See Note 2		33	53		33	53	mA
ICCL		V _{CC} = 5.5 V,	See Note 2		58	92		58	92	mA
ICCZ		V _{CC} = 5.5 V			6	11		6	11	mA
Cin	GAB and GBA	V _{CC} = 5 V,	V _j = 2.5 V or 0.5 V		5			5		ρF
Cio	Α		$V_{\parallel} = 2.5 \text{V or } 0.5 \text{V}$		9			_ 9		pF
Cio	В	V _{CC} = 5 V,	V ₁ = 2.5 V or 0.5 V		12			12		pF

[†] All typical values are at $V_{CC} = 5 \text{ V, T}_{A} = 25^{\circ}\text{C}$.



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

Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

NOTE 2: ICCH and ICCL are measured in the A-to-B mode.

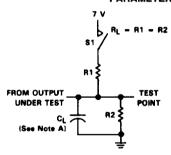
switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C _L R1 R2	C = 5 V, = 50 pF. = 500 Ω = 500 Ω A = 25°C	, ,		V _{CC} = 4.5 C _L = 5 R1 = 5 R2 = 5 T _A = MIN	i0 pF, i00 Ω, i00 Ω,		UNIT
				BCT623			BCT623	SN74B	N74BCT623	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
tPLH	Α	В	0.5	3.1	4.7	0.5	5.3	0.5	5.2	ns
tPHL_		[1.7	4.9	6.9	1.7	7.6	1.7	7.4	
tPLH	В	A	0.9	4.1	5.9	0.9	6.8	0.9	6.7	กร
[†] PHL		``	1.8	5.3	7.6	1.B	8.3	1.8	8	113
^t PZH	GBA	A	3.1	6.8	9.1	3.1	10.7	3.1	10.6	ns
tPZL.] ""	^	3.3	7.2	9.6	3.3	11.3	3.3	10.7	113
tPHZ	ĞВА	A	1.9	6.1	8.3	1.9	10.6	1.9	9.8	ns
tPLZ	GDA	^	1.1	4.6	7	1.1	8.1	1.1	7.8	113
tPZH	GAB	В	2	5	6.8	2	7.8	2	7.6	ns
tPZL	ا		2.7	6.2	8	2.7	9.3	2.7	8.9	115
tpHZ	GAB	В	1.1	4.6	6.5	1.1	8	1.1	7.7	ns
tPLZ	1		0.3	3.2	6.3	0.3	7.2	0.3	7.1	,,,,

[†] For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.



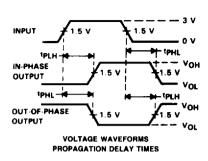
PARAMETER MEASUREMENT INFORMATION

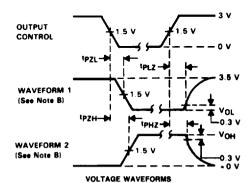


SWITCH POSITION TABLE

TEST	S1
tPLH	Open
tPHL.	Open
tPZH	Open
tPZL	Closed
tPHZ	Open
tPLZ	Closed

LOAD CIRCUIT





VOLTAGE WAVEFORMS

ENABLE AND DISABLE TIMES. THREE-STATE OUTPUTS

NOTES: A. CL includes probe and jig capacitance.

- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.

 Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_0 = 50 \Omega$, $t_f \leq$ 2.5 ns, $t_f \leq$ 2.5 ns.
- D. The outputs are measured one at a time with one input transition per measurement.

FIGURE 1. SWITCHING CHARACTERISTICS

