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20 🛛 V_{CC}

18 B1

17 B2

15 B4

14 **П** B5

13 🛛 B6

12 🛛 B7

OEBA

17 B2

15 B4

14

B1 18 Ē

B3 16

B5

20 0E/

10 11 12 13

GND B8 B7 B7 B6

20 19

11 B8

SN54BCT620A ... FK PACKAGE

(TOP VIEW)

16 ПВЗ

19 OEBA

SN54BCT620A . . . J OR W PACKAGE

SN74BCT620A ... DW OR N PACKAGE

(TOP VIEW)

1

2

3

7

10

2 1

OEAB

A1 [

A2 []

A3 [4

A4 [5

A6 🛛

А7 П 8 A8 🛛 9

GND L

A3 A4 П 5

A5 ∐ 6

A6 Π7

A7 Π 8

9

A5 🛛 6

- State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}
- P-N-P Inputs Reduce DC Loading
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK) and Flatpacks (W), and Plastic and Ceramic 300-mil DIPs (J, N)

description

The 'BCT620A bus transceiver is designed for asynchronous communication between data buses. The control function implementation allows for maximum flexibility in timing. The 'BCT620A provides inverted data at its outputs.

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 output-enable (OEAB and OEBA) inputs.

The output-enable inputs can be used to disable the device so that the buses are effectively isolated. The dual-enable configuration gives the transceivers the capability of storing data by simultaneously enabling OEAB and OEBA. When both OEAB and OEBA 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. In this way, each output reinforces its input in this configuration.

The SN54BCT620A is characterized for operation over the full military temperature range of -55°C to 125°C. The SN74BCT620A is characterized for operation from 0°C to 70°C.

INP	UTS	
OEBA	OEAB	OPERATION
L	L	B data to A bus
L	Н	B data to A bus, A data to B bus
н	L	Isolation
н	Н	A data to B bus

FUNCTION TABLE

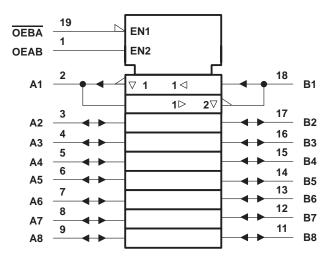
	OEAB	OEBA
E	L	L

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.

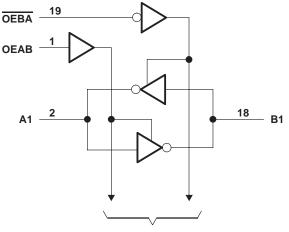


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logic symbol[†]



logic diagram (positive logic)



To Seven Other Channels

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

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

Supply voltage range, V _{CC}		– 0.5 V to 7 V
Input voltage range: Control inputs (see	Note 1)	$\dots \dots \dots \dots \dots \dots - 0.5$ V to 7 V
I/O ports (see Note	1)	\ldots — 0.5 V to 5.5 V
Voltage range applied to any output in th	e disabled or power-off state, VO	\ldots — 0.5 V to 5.5 V
Voltage range applied to any output in th	ne high state, V _O	$\dots \dots \dots \dots \dots - 0.5$ V to V _{CC}
Input clamp current, IIK		–30 mA
Current into any output in the low state:	SN54BCT620A	96 mA
:	SN74BCT620A	128 mA
Operating free-air temperature range:	SN54BCT620A	– 55°C to 125°C
:	SN74BCT620A	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.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

recommended operating conditions

			54BCT62	20A	SN74BCT620A					
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT	
VCC	Supply voltage		4.5	5	5.5	4.5	5	5.5	V	
VIH	High-level input voltage	2			2			V		
VIL	Low-level input voltage			0.8			0.8	V		
IIK	Input clamp current			-18			-18	mA		
		A port			-3			-3		
ЮН	High-level output current	B port			-12			-15	mA	
		A port			20			24		
IOL	Low-level output current	B port			48			64	mA	
TA	Operating free-air temperature	-55		125	0		70	°C		



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

PARAMETER		TEST CONDITIONS			54BCT62	20A	SN	74BCT62	20A	
					TYP†	MAX	MIN	TYP†	MAX	UNIT
		V _{CC} = 4.5 V,	lı = –18 mA			-1.2			-1.2	V
			I _{OH} = -1 mA	2.5	3.4		2.5	3.4		
	A port	V _{CC} = 4.5 V	$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3		
Vон			$I_{OH} = -3 \text{ mA}$	2.4	3.3		2.4	3.3		V
	B port	V _{CC} = 4.5 V	I _{OH} = -12 mA	2	3.2					
			I _{OH} = -15 mA				2	3.1		
	A port	V _{CC} = 4.5 V	I _{OL} = 20 mA		0.3	0.5				
Va	A port	VCC = 4.5 V	I _{OL} = 24 mA					0.35	0.5	V
V _{OL}	VOL B port	V _{CC} = 4.5 V	I _{OL} = 48 mA		0.38	0.55				V
			I _{OL} = 64 mA					0.42	0.55	
L	A or B port					1			1	mA
lj	OEAB or OEBA	V _{CC} = 5.5 V,	V _I = 5.5 V			0.1			0.1	
. +	A or B port		<u>)</u> (, 07)(70			70	A
IIH‡	OEAB or OEBA	V _{CC} = 5.5 V,	V _I = 2.7 V			20			20	μA
†	A or B port					-0.65			-0.65	mA
IIL‡	OEAB or OEBA	V _{CC} = 5.5 V,	V _I = 0.5 V			-0.6			-0.6	mA
	A port		N O	-60		-150	-60		-150	A
los§	B port	V _{CC} = 5.5 V,	V _O = 0	-100		-225	-100		-225	mA
ICCL	A to B	V _{CC} = 5.5 V			53	84		53	84	mA
ICCH	A to B	V _{CC} = 5.5 V			23	37		23	37	mA
ICCZ		V _{CC} = 5.5 V			4	10		4	10	mA
Ci	OEAB or OEBA	V _{CC} = 5 V,	$V_{I} = 2.5 \text{ V or } 0.5 \text{ V}$		5			5		pF
<u> </u>	A to B		V _O = 2.5 V or 0.5 V		9			9		pF
Cio	B to A	V _{CC} = 5 V,	vO = 2.3 v 01 0.5 v		12			12		

[†] 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.

§ Not more than one output should be tested at a time, and the duration of the test should not exceed one second.



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switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C _L R1 R2	CC = 5 V = 50 pl = 500 9 2 = 500 9 4 = 25°C	F, Ω, Ω,	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T _A = MIN to MAX [†]				UNIT
			′B	CT620A	ι	SN54BC	T620A	SN74BC	T620A	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
^t PLH	^	р	0.6	3.4	5.2	0.6	6.2	0.6	5.8	
^t PHL	A	В	0.1	1.9	3.4	0.1	3.7	0.1	3.6	ns
^t PLH	6	•	0.9	4.1	6	0.9	7.2	0.9	6.9	
^t PHL	В	А	0.1	2	3.7	0.1	4	0.1	3.9	ns
^t PZH	OEBA	•	3.5	7.2	9.2	3.5	10.9	3.5	10.6	
^t PZL	OEBA	A	3.7	7.6	9.9	3.7	11.5	3.7	11.1	ns
^t PHZ	OEBA		3.1	5.3	8.6	3.1	10.8	3.1	10	
^t PLZ	OEBA	A	1.3	4.4	6.9	1.3	8.3	1.3	7.8	ns
^t PZH	0540	P	2	5.3	6.7	2	7.9	2	7.4	
^t PZL	OEAB	В	2.9	6.1	8.1	2.9	9.2	2.9	9	ns
^t PHZ	OEAB	В	2.1	5.2	7	2.1	8.5 2.1 8		8.1	
^t PLZ	UEAB	0	0.1	3.7	5.3	0.1	6	0.1	5.9	ns

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

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.





PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
5962-9075001M2A	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 9075001M2A SNJ54BCT 620AFK	Samples
5962-9075001MRA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	Samples
5962-9075001MRA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	Samples
SNJ54BCT620AFK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 9075001M2A SNJ54BCT 620AFK	Samples
SNJ54BCT620AFK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 9075001M2A SNJ54BCT 620AFK	Samples
SNJ54BCT620AJ	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	Samples
SNJ54BCT620AJ	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	Samples

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ RoHS: TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.



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PACKAGE OPTION ADDENDUM

Green: TI defines "Green" to mean the content of Chlorine (CI) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

⁽⁴⁾ There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	Τ (μm)	B (mm)
5962-9075001M2A	FK	LCCC	20	1	506.98	12.06	2030	NA
SNJ54BCT620AFK	FK	LCCC	20	1	506.98	12.06	2030	NA

J (R-GDIP-T**) 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



NOTES: A. All linear dimensions are in inches (millimeters).

- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

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