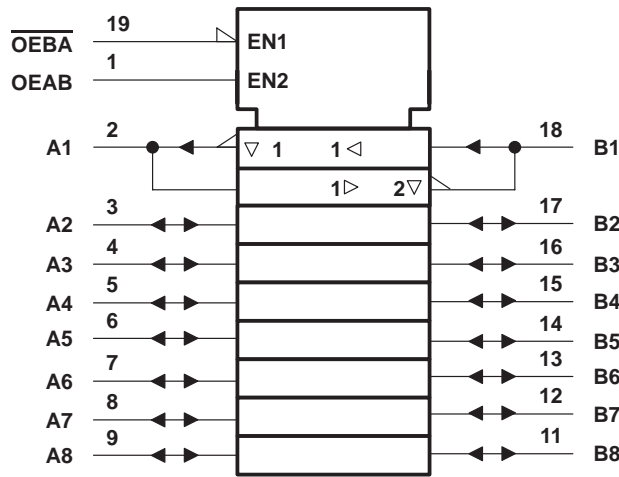




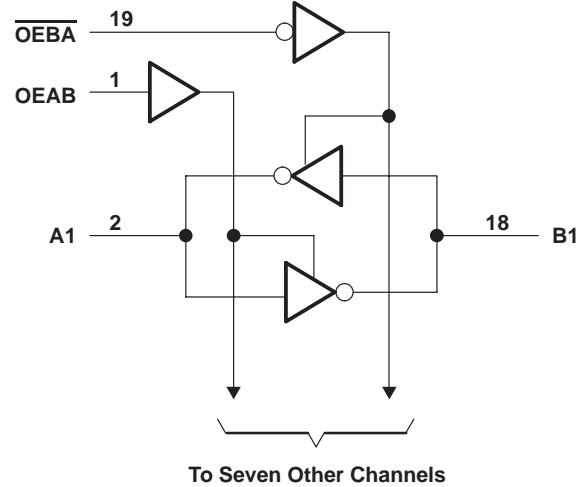
# SN54BCT620A, SN74BCT620A OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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## logic symbol†



## logic diagram (positive logic)



† 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) .....	– 0.5 V to 7 V
I/O ports (see Note 1) .....	– 0.5 V to 5.5 V
Voltage range applied to any output in the disabled or power-off state, $V_O$ .....	– 0.5 V to 5.5 V
Voltage range applied to any output in the high state, $V_O$ .....	– 0.5 V to $V_{CC}$
Input clamp current, $I_{IK}$ .....	–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

		SN54BCT620A			SN74BCT620A			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
$I_{IK}$	Input clamp current			–18			–18	mA
$I_{OH}$	High-level output current	A port		–3			–3	mA
		B port		–12			–15	
$I_{OL}$	Low-level output current	A port		20			24	mA
		B port		48			64	
$T_A$	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		SN54BCT620A		SN74BCT620A		UNIT
				MIN	TYP†	MAX	MIN	
$V_{IK}$		$V_{CC} = 4.5\text{ V}$ ,	$I_I = -18\text{ mA}$	-1.2		-1.2		V
$V_{OH}$	A port	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -1\text{ mA}$	2.5	3.4	2.5	3.4	V
			$I_{OH} = -3\text{ mA}$	2.4	3.3	2.4	3.3	
	B port	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -3\text{ mA}$	2.4	3.3	2.4	3.3	
			$I_{OH} = -12\text{ mA}$	2	3.2			
			$I_{OH} = -15\text{ mA}$			2	3.1	
$V_{OL}$	A port	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 20\text{ mA}$	0.3	0.5			V
			$I_{OL} = 24\text{ mA}$			0.35	0.5	
	B port	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 48\text{ mA}$	0.38	0.55			
			$I_{OL} = 64\text{ mA}$			0.42	0.55	
$I_I$	A or B port	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 5.5\text{ V}$	1		1		mA
	OEAB or OEBA			0.1		0.1		
$I_{IH}^\ddagger$	A or B port	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 2.7\text{ V}$	70		70		$\mu\text{A}$
	OEAB or OEBA			20		20		
$I_{IL}^\ddagger$	A or B port	$V_{CC} = 5.5\text{ V}$ ,	$V_I = 0.5\text{ V}$	-0.65		-0.65		mA
	OEAB or OEBA			-0.6		-0.6		
$I_{OS}^\S$	A port	$V_{CC} = 5.5\text{ V}$ ,	$V_O = 0$	-60	-150	-60	-150	mA
	B port			-100	-225	-100	-225	
$I_{CCL}$	A to B	$V_{CC} = 5.5\text{ V}$		53	84	53	84	mA
$I_{CCH}$	A to B	$V_{CC} = 5.5\text{ V}$		23	37	23	37	mA
$I_{CCZ}$		$V_{CC} = 5.5\text{ V}$		4	10	4	10	mA
$C_i$	OEAB or OEBA	$V_{CC} = 5\text{ V}$ ,	$V_I = 2.5\text{ V}$ or $0.5\text{ V}$	5		5		pF
$C_{io}$	A to B	$V_{CC} = 5\text{ V}$ ,	$V_O = 2.5\text{ V}$ or $0.5\text{ V}$	9		9		pF
	B to A			12		12		

† 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 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)	V <sub>CC</sub> = 5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = 25°C			V <sub>CC</sub> = 4.5 V to 5.5 V, C <sub>L</sub> = 50 pF, R <sub>1</sub> = 500 Ω, R <sub>2</sub> = 500 Ω, T <sub>A</sub> = MIN to MAX†				UNIT
			BCT620A			SN54BCT620A		SN74BCT620A		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A	B	0.6	3.4	5.2	0.6	6.2	0.6	5.8	ns
t <sub>PHL</sub>			0.1	1.9	3.4	0.1	3.7	0.1	3.6	
t <sub>PLH</sub>	B	A	0.9	4.1	6	0.9	7.2	0.9	6.9	ns
t <sub>PHL</sub>			0.1	2	3.7	0.1	4	0.1	3.9	
t <sub>PZH</sub>	$\overline{\text{OEBA}}$	A	3.5	7.2	9.2	3.5	10.9	3.5	10.6	ns
t <sub>PZL</sub>			3.7	7.6	9.9	3.7	11.5	3.7	11.1	
t <sub>PHZ</sub>	$\overline{\text{OEBA}}$	A	3.1	5.3	8.6	3.1	10.8	3.1	10	ns
t <sub>PLZ</sub>			1.3	4.4	6.9	1.3	8.3	1.3	7.8	
t <sub>PZH</sub>	OEAB	B	2	5.3	6.7	2	7.9	2	7.4	ns
t <sub>PZL</sub>			2.9	6.1	8.1	2.9	9.2	2.9	9	
t <sub>PHZ</sub>	OEAB	B	2.1	5.2	7	2.1	8.5	2.1	8.1	ns
t <sub>PLZ</sub>			0.1	3.7	5.3	0.1	6	0.1	5.9	

† 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	<a href="#">Samples</a>
5962-9075001MRA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	<a href="#">Samples</a>
5962-9075001MRA	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	<a href="#">Samples</a>
SNJ54BCT620AFK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 9075001M2A SNJ54BCT 620AFK	<a href="#">Samples</a>
SNJ54BCT620AFK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962- 9075001M2A SNJ54BCT 620AFK	<a href="#">Samples</a>
SNJ54BCT620AJ	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	<a href="#">Samples</a>
SNJ54BCT620AJ	ACTIVE	CDIP	J	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9075001MR A SNJ54BCT620AJ	<a href="#">Samples</a>

(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.

**OBSELETE:** 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.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of  $\leq 1000$ ppm threshold. Antimony trioxide based flame retardants must also meet the  $\leq 1000$ ppm 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)	T (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





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