

SN74BCT29861B 10-BIT BUS TRANSCEIVER WITH 3-STATE OUTPUTS

SCBS009D – NOVEMBER 1988 – REVISED NOVEMBER 1993

- BiCMOS Design Substantially Reduces Standby Current
- Functionally Equivalent to SN74ALS29861 and AMD Am29861A
- Power-Up High-Impedance State
- Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)

description

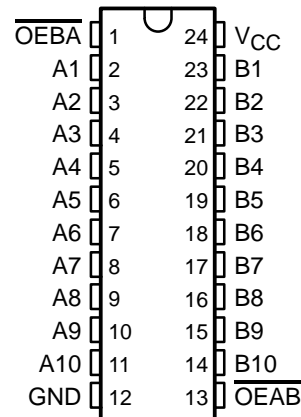
This 10-bit bus transceiver is designed for asynchronous communication between data buses. The control-function implementation allows for maximum flexibility in timing.

The device allows 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 (\overline{OEBA} and \overline{OEAB}) inputs.

The outputs are in the high-impedance state during power-up and power-down conditions. The outputs remain in the high-impedance state while the device is powered-down.

The SN74BCT29861B is characterized for operation from 0°C to 70°C.

DW OR NT PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS		OPERATION
\overline{OEAB}	\overline{OEBA}	
L	H	A to B
H	L	B to A
H	H	Isolation
L	L	Latch A and B (A = B)

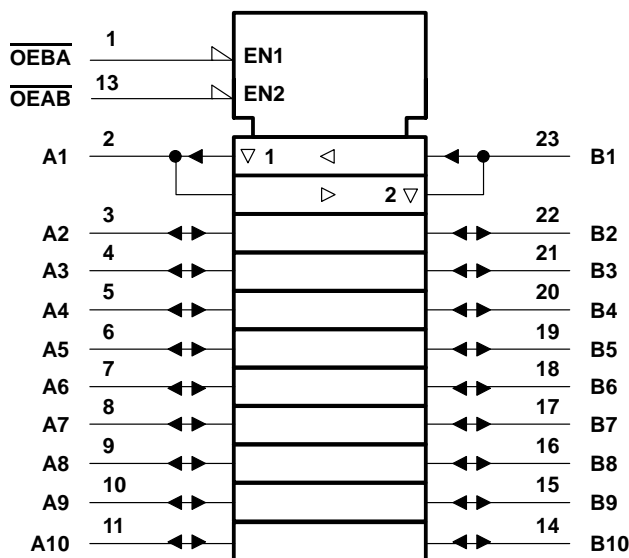
SN74BCT29861B

10-BIT BUS TRANSCEIVER

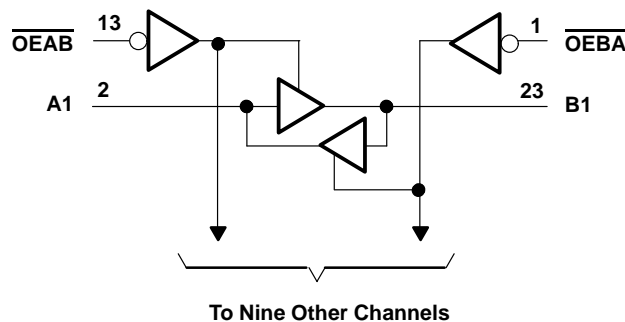
WITH 3-STATE OUTPUTS

SCBS009D – NOVEMBER 1988 – REVISED NOVEMBER 1993

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, V_{CC}	–0.5 V to 7 V
Input voltage (I/O ports) (see Note 1)	–0.5 V to 5.5 V
Input voltage (excluding I/O ports) (see Note 1)	–0.5 V to 7 V
Voltage applied to any output in the high state	–0.5 V to V_{CC}
Input clamp current	–30 mA
Current into any output in the low state	96 mA
Operating free-air temperature range	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 negative voltage rating may be exceeded if the input clamp current rating is observed.

recommended operating conditions

	MIN	NOM	MAX	UNIT
V_{CC} Supply voltage	4.5	5	5.5	V
V_{IH} High-level input voltage	2			V
V_{IL} Low-level input voltage			0.8	V
I_{IK} Input clamp current			–18	mA
I_{OH} High-level output current			–24	mA
I_{OL} Low-level output current			48	mA
T_A Operating free-air temperature	0		70	°C

SN74BCT29861B
10-BIT BUS TRANSCEIVER
WITH 3-STATE OUTPUTS

SCBS009D – NOVEMBER 1988 – REVISED NOVEMBER 1993

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

PARAMETER		TEST CONDITIONS	MIN	TYP [†]	MAX	UNIT
V_{IK}		$V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$			-1.2	V
V_{OH}		$V_{CC} = 4.5\text{ V}$ $I_{OH} = -15\text{ mA}$	2.4	3.3		V
		$I_{OH} = -24\text{ mA}$	2	3.1		
V_{OL}		$V_{CC} = 4.5\text{ V}$, $I_{OL} = 48\text{ mA}$		0.35	0.5	V
I_I		$V_{CC} = 5.5\text{ V}$, $V_I = 5.5\text{ V}$			0.1	mA
I_{IH}	Control inputs	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			20	μA
	A or B port [‡]				70	
I_{IL}	Control inputs	$V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$			-0.2	mA
	A or B port [‡]				-0.2	
$I_{O(off)}^{\S}$		$V_{CC} = 0$, $V_O = 2.7\text{ V}$			0.1	mA
I_{OS}^{\parallel}		$V_{CC} = 5.5\text{ V}$, $V_O = 0$	-75		-250	mA
I_{CC}		$V_{CC} = 5.5\text{ V}$	Outputs high		18	mA
			Outputs low		30	
			Outputs disabled		6.5	
C_i		$V_{CC} = 5\text{ V}$, $V_I = 0.5\text{ V or }2.5\text{ V}$		6		pF
C_o		$V_{CC} = 5\text{ V}$, $V_I = 0.5\text{ V or }2.5\text{ V}$		8		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.

^{\S} $I_{O(off)}$ = Power-off bus leakage current

^{\parallel} Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 5\text{ V}$, $C_L = 50\text{ pF}$, $R_1 = 500\ \Omega$, $R_2 = 500\ \Omega$, $T_A = 25^\circ\text{C}$			$V_{CC} = 4.5\text{ V to }5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_1 = 500\ \Omega$, $R_2 = 500\ \Omega$, $T_A = \text{MIN to MAX}^{\#}$		UNIT
			MIN	TYP	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1	3.2	4.6	1	5.1	ns
t_{PHL}			1	4.6	6.2	1	6.8	
t_{PZH}	\overline{OEAB} or \overline{OEBA}	A or B	2	5.2	6.8	2	8.1	ns
t_{PZL}			2	8.3	10.1	2	11.7	
t_{PHZ}	\overline{OEAB} or \overline{OEBA}	A or B	2	5.3	7.1	2	7.9	ns
t_{PLZ}			2	5	6.7	2	7.7	

^{\#} 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.

IMPORTANT NOTICE

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Certain applications using semiconductor products may involve potential risks of death, personal injury, or severe property or environmental damage ("Critical Applications").

TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used.