

SN74BCT29864B 9-BIT BUS TRANSCEIVER WITH 3-STATE OUTPUTS

SCBS010A – NOVEMBER 1988 – REVISED NOVEMBER 1993

- BiCMOS Design Substantially Reduces Standby Current
- Functionally Equivalent to 'ALS29864 and AMD Am29864A
- Power-Up High-Impedance State
- ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015
- Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)

description

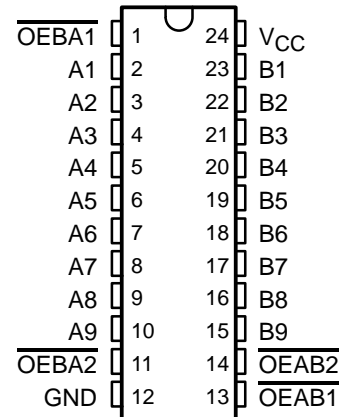
This 9-bit transceiver is designed for asynchronous communication between data buses. The control-function implementation allows for maximum flexibility in timing.

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 ($\overline{\text{OEBA}}$ and $\overline{\text{OEAB}}$) 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 SN74BCT29864B is characterized for operation from 0°C to 70°C.

DW OR NT PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS				OPERATION
$\overline{\text{OEAB1}}$	$\overline{\text{OEAB2}}$	$\overline{\text{OEBA1}}$	$\overline{\text{OEBA2}}$	
L	L	L	L	Latch A and B
L	L	H	X	$\overline{\text{A}}$ to B
L	L	X	H	$\overline{\text{B}}$ to A
H	X	L	L	$\overline{\text{B}}$ to A
X	H	L	L	$\overline{\text{B}}$ to A
H	X	H	X	Isolation
H	X	X	H	
X	H	X	H	
X	H	H	X	

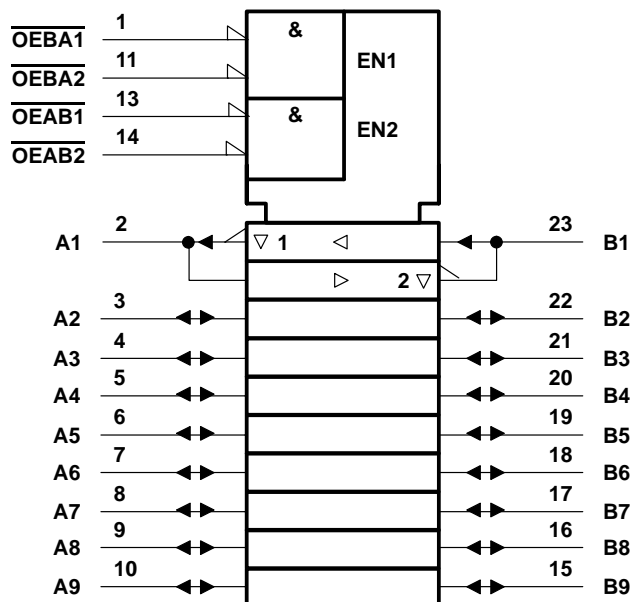
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WITH 3-STATE OUTPUTS

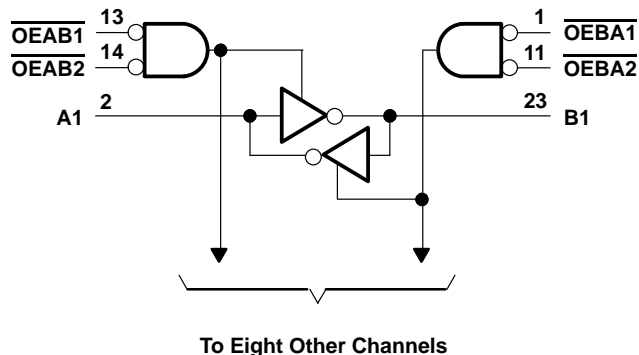
SCBS010A – NOVEMBER 1988 – REVISED NOVEMBER 1993

logic symbol†



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

logic diagram (positive logic)



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 (I/O ports) (see Note 1)	–0.5 V to 5.5 V
Input voltage range (excluding I/O ports) (see Note 1)	–0.5 V to 7 V
Voltage range 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 negative voltage rating may be exceeded if the input 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

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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 V, I _I = −18 mA				−1.2	V
V _{OH}		V _{CC} = 4.5 V	I _{OH} = −15 mA	2.4	3.3		V
			I _{OH} = −24 mA	2	3.1		
		V _{CC} = 4.75 V, I _{OH} = −3 mA	2.7				
V _{OL}		V _{CC} = 4.5 V	I _{OL} = 48 mA	0.35		0.5	V
I _I		V _{CC} = 5.5 V, V _I = 5.5 V			0.1		mA
I _{IH}	Control inputs	V _{CC} = 5.5 V, V _I = 2.7 V			20		μA
	A or B port‡		20				
I _{IL}	Control inputs	V _{CC} = 5.5 V, V _I = 2.7 V			−0.2		mA
	A or B port‡		−0.2				
I _{IO(off)} §		V _{CC} = 0, V _O = 2.7 V			0.1		mA
I _{OS} ¶		V _{CC} = 5.5 V, V _O = 0	−75		−250		mA
I _{CC}		V _{CC} = 5.5 V	Outputs high	18		30	mA
			Outputs low	30		45	
			Outputs disabled	6.5		12	
C _i		V _{CC} = 5 V, V _I = 0.5 V or 2.5 V	6				pF
C _{io}		V _{CC} = 5 V, V _I = 0.5 V or 2.5 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 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	3.5	5.3	1	6.1	ns
t_{PHL}			0.5	2.3	4.6	0.5	4.8	
t_{PZH}	\overline{OEAB} or \overline{OEBA}	A or B	2.3	5	7.2	2.3	8.4	ns
t_{PZL}			4.3	7.3	10.6	4.3	12.5	
t_{PHZ}	\overline{OEAB} or \overline{OEBA}	A or B	2.3	4.6	7.6	2.3	8.4	ns
t_{PLZ}			2	4	7	2	8.2	

^{\#} 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.

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