- **BiCMOS Design Substantially Reduces I_{CCZ}**
- **Functionally Equivalent to ′ALS29863 and AMD Am29863A**
- **Power-Up High-Impedance State**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015**
- **Package Options Include Plastic Small-Outline Packages (DW), Ceramic Chip Carriers (FK) and Flatpacks (W), and Standard Plastic and Ceramic 300-mil DIPs (JT, NT)**

description

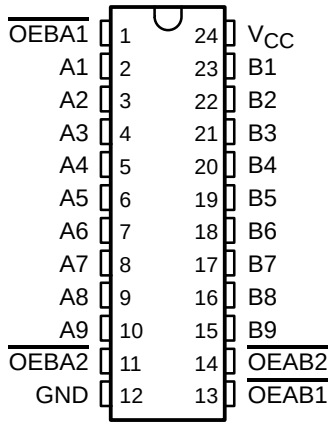
These 9-bit transceivers are designed for asynchronous communication between data buses. The control-function implementation allows for maximum flexibility in timing.

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 output-enable ($\overline{OEBA}$ and $\overline{OEAB}$) inputs.

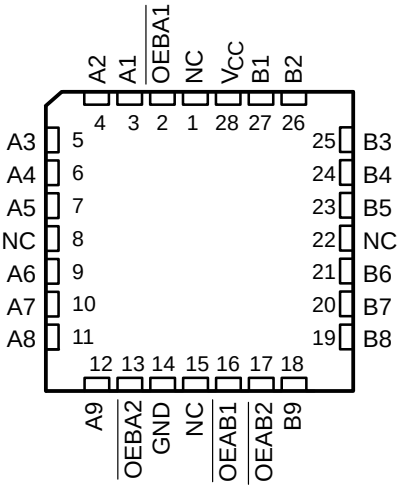
The outputs are in the high-impedance state during power-up and power-down conditions. The outputs remain in the high-impedance state while the device is powered down.

The SN54BCT29863B is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74BCT29863B is characterized for operation from 0°C to 70°C.

SN54BCT29863B . . . JT OR W PACKAGE
SN74BCT29863B . . . DW OR NT PACKAGE
(TOP VIEW)



SN54BCT29863B . . . FK PACKAGE
(TOP VIEW)

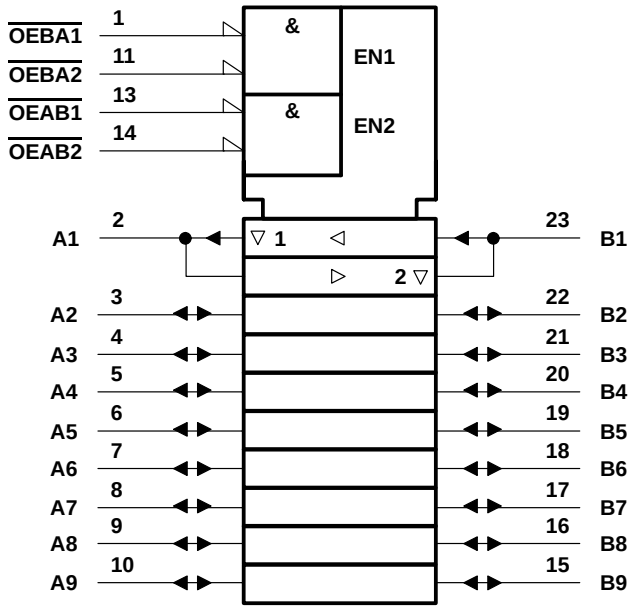


NC – No internal connection

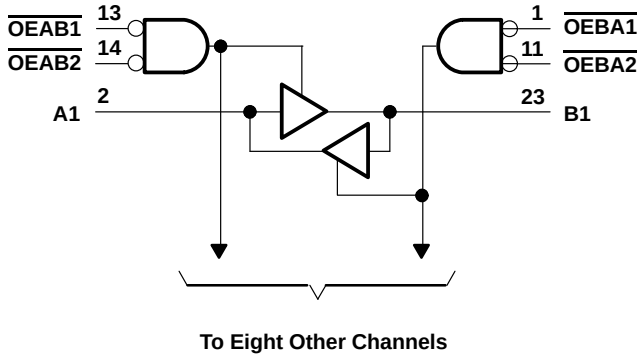
FUNCTION TABLE

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

logic symbol†



logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the DW, JT, NT, and W packages.

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: SN54BCT29863B	48 mA
SN74BCT29863B	96 mA
Operating free-air temperature range: SN54BCT29863B	–55°C to 125°C
SN74BCT29863B	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 input voltage ratings may be exceeded if the input current rating is observed.

recommended operating conditions

		SN54BCT29863B			SN74BCT29863B			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			−15			−24	mA
I_{OL}	Low-level output current			24			48	mA
T_A	Operating free-air temperature	−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS		SN54BCT29863B			SN74BCT29863B			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}		V_{CC} = 4.5 V	I_{OH} = −15 mA	2.4	3.3		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} = 24 mA		0.35	0.5				V
			I_{OL} = 48 mA					0.35	0.5	
I_I		V_{CC} = 5.5 V,	V_I = 5.5 V			0.1			0.1	mA
I_{IH}	Control inputs	V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	µA
	A or B port‡					20			20	
I_{IL}	Control inputs	V_{CC} = 5.5 V,	V_I = 0.5 V			−0.2			−0.2	mA
	A or B port‡					−0.2			−0.2	
$I_{IO(off)}$§		V_{CC} = 0,	V_O = 2.7 V			0.1			0.1	mA
I_{OS}¶		V_{CC} = 5.5 V,	V_O = 0	−75		−250	−75		−250	mA
I_{CC}		V_{CC} = 5.5 V	Outputs high		18	30		18	30	mA
			Outputs low		30	45		30	45	
			Outputs disabled		6.5	12		6.5	12	
C_i		V_{CC} = 5 V,	V_I = 2.5 V or 0.5 V		6			6		pF
C_{io}		V_{CC} = 5 V,	V_I = 2.5 V or 0.5 V		8			8		pF

† 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.
§ $I_{IO(off)}$ = Power-off bus-leakage current
¶ 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 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			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
			'BCT29863B			SN54BCT29863B		SN74BCT29863B		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1	3	4.5	1	5.4	1	5	ns
t_{PHL}			2	4.8	6.8	2	7.9	2	7.5	
t_{PZH}	$\overline{OEAB}$ or $\overline{OEBA}$	A or B	2	5.1	7	2	9.2	2	8.4	ns
t_{PZL}			4.5	8.4	10.8	4.5	13.6	4.5	12.6	
t_{PHZ}	$\overline{OEAB}$ or $\overline{OEBA}$	A or B	2	5	7.2	2	9.6	2	8.8	ns
t_{PLZ}			1.7	4.7	6.7	1.7	9.1	1.7	8.1	

† 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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