

SN54BCT29863B, SN74BCT29863B 9-BIT BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SCBS015D – NOVEMBER 1988 – REVISED NOVEMBER 1993

- 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

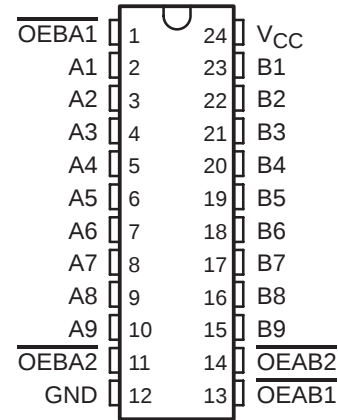
These 9-bit transceivers are designed for asynchronous communication between data buses. The control-function implementation allows for maximum flexibility in timing.

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.

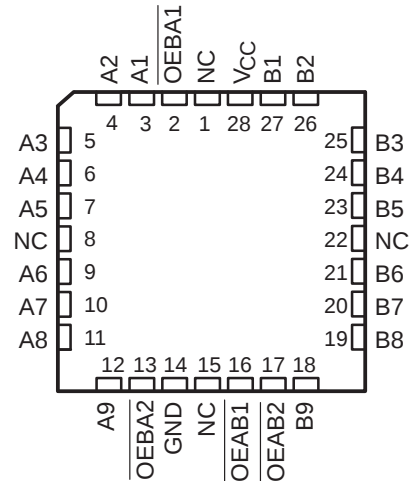
The outputs are in the high-impedance state during power-up and power-down conditions. The outputs remain in the high-impedance state while the device is powered down.

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	

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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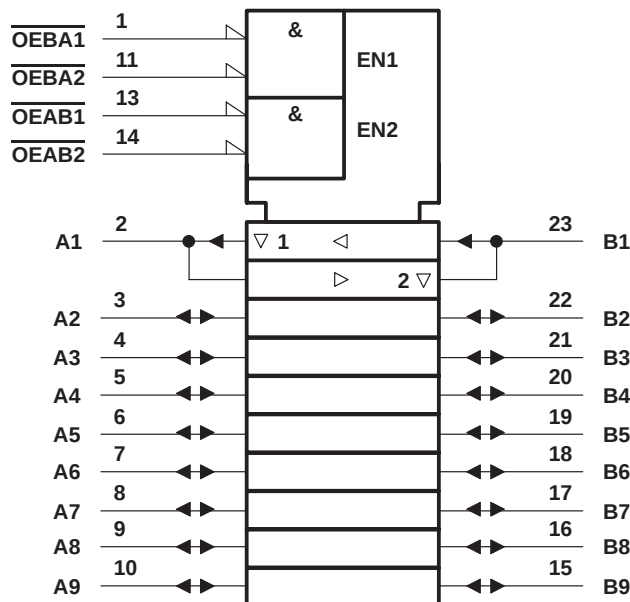
SN54BCT29863B, SN74BCT29863B

9-BIT BUS TRANSCEIVERS

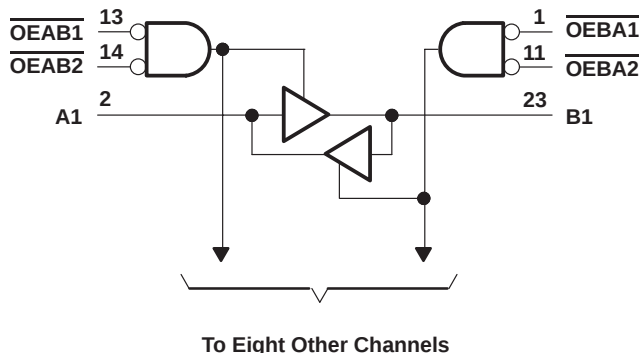
WITH 3-STATE OUTPUTS

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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.

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.



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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}		$V_{CC} = 4.5\text{ V}$,	$I_I = -18\text{ mA}$			-1.2			-1.2	V
V_{OH}		$V_{CC} = 4.5\text{ V}$	$I_{OH} = -15\text{ mA}$	2.4	3.3		2.4	3.3		V
			$I_{OH} = -24\text{ mA}$				2	3.1		
		$V_{CC} = 4.75\text{ V}$,	$I_{OH} = -3\text{ mA}$				2.7			
V_{OL}		$V_{CC} = 4.5\text{ V}$	$I_{OL} = 24\text{ mA}$	0.35	0.5					V
			$I_{OL} = 48\text{ mA}$				0.35	0.5		
I_I		$V_{CC} = 5.5\text{ V}$,	$V_I = 5.5\text{ V}$			0.1			0.1	mA
I_{IH}	Control inputs	$V_{CC} = 5.5\text{ V}$,	$V_I = 2.7\text{ V}$			20			20	μA
	A or B port‡					20			20	
I_{IL}	Control inputs	$V_{CC} = 5.5\text{ V}$,	$V_I = 0.5\text{ V}$			-0.2			-0.2	mA
	A or B port‡					-0.2			-0.2	
$I_{IO(off)}^{\S}$		$V_{CC} = 0$,	$V_O = 2.7\text{ V}$			0.1			0.1	mA
$I_{OS}^{\parallel}$		$V_{CC} = 5.5\text{ V}$,	$V_O = 0$	-75		-250	-75		-250	mA
I_{CC}		$V_{CC} = 5.5\text{ V}$	Outputs high	18	30		18	30		mA
			Outputs low	30	45		30	45		
			Outputs disabled	6.5	12		6.5	12		
C_i		$V_{CC} = 5\text{ V}$,	$V_I = 2.5\text{ V or }0.5\text{ V}$	6			6			pF
C_{io}		$V_{CC} = 5\text{ V}$,	$V_I = 2.5\text{ V or }0.5\text{ V}$	8			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.

§ $I_{IO(off)}$ = 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.



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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}	$\overline{\text{OEAB}}$ or $\overline{\text{OEBA}}$	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}	$\overline{\text{OEAB}}$ or $\overline{\text{OEBA}}$	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.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN74BCT29863BDW	Active	Production	SOIC (DW) 24	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	BCT29863B
SN74BCT29863BDW.A	Active	Production	SOIC (DW) 24	25 TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	BCT29863B

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts 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.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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TUBE

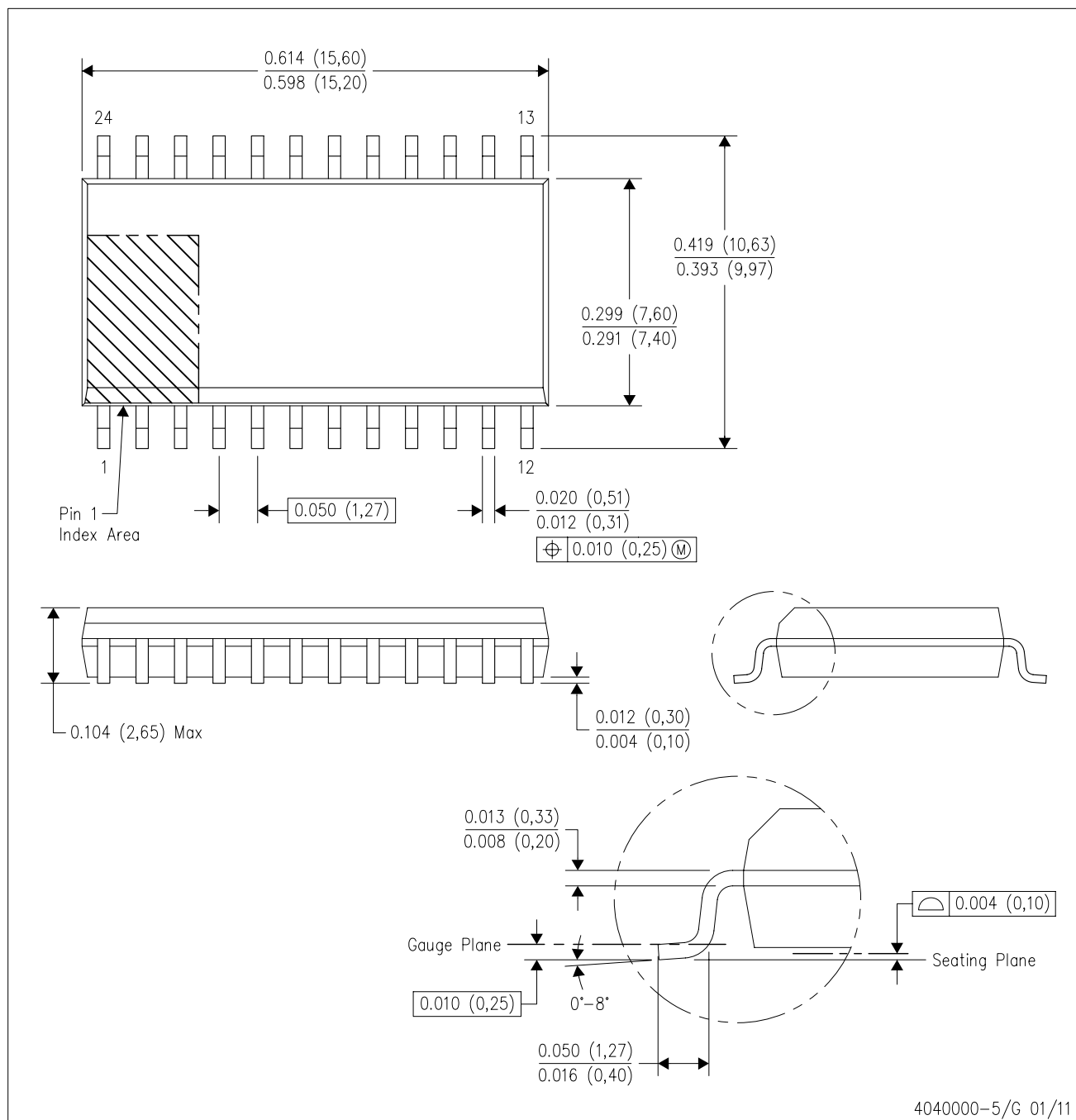


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
SN74BCT29863BDW	DW	SOIC	24	25	506.98	12.7	4826	6.6
SN74BCT29863BDW.A	DW	SOIC	24	25	506.98	12.7	4826	6.6

DW (R-PDSO-G24)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - Falls within JEDEC MS-013 variation AD.

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