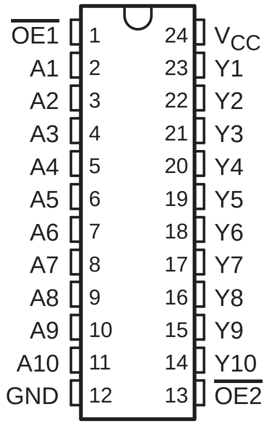
SN64BCT29828B
10-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS

SCBS478 − MAY 1993 − REVISED NOVEMBER 1993

- **State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **High-Impedance State During Power Up and Power Down**
- **3-State Outputs Drive Bus Lines or Buffer-Memory Address Registers**
- **P-N-P Inputs Reduce DC Loading**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (NT)**

DW OR NT PACKAGE
(TOP VIEW)



description

This 10-bit buffer/driver provides high-performance bus interface for wide data paths or buses carrying parity.

The 3-state control gate is a 2-input AND gate with active-low inputs so that if either output-enable ($\overline{\text{OE1}}$ or $\overline{\text{OE2}}$) input is high, all ten outputs are in the high-impedance state. The outputs are also 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.

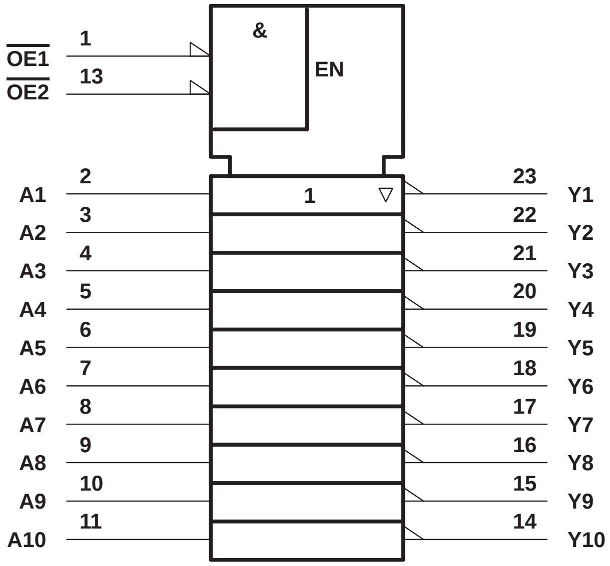
The SN64BCT29828B is characterized for operation from −40°C to 85°C and 0°C to 70°C.

FUNCTION TABLE

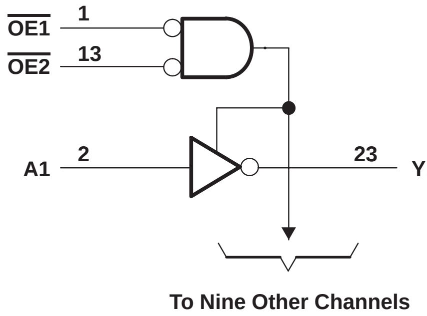
INPUTS			OUTPUT
$\overline{\text{OE1}}$	$\overline{\text{OE2}}$	A	Y
L	L	L	H
L	L	H	L
H	X	X	Z
X	H	X	Z

TEXAS INSTRUMENTS

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, V_I (see Note 1) . . . . −0.5 V to 7 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 5.5 V
Input clamp current, I_{IK} ($V_I < 0$) . . . . −30 mA
Current into any output in the low state, I_O . . . . 96 mA
Operating free-air temperature range . . . . −40°C to 85°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 negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions (see Note 2)

		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	−40		85	°C

NOTE 2: Unused or floating inputs must be held high or low.

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		0.42	0.5	V
I_{OZ}	V_{CC} = 0 to 2.3 V (power up)	V_O = 2.7 V or 0.5 V, $\overline{OE}$ at 0.8 V			±50	μA
	V_{CC} = 1.8 V to 0 (power down)				±50	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2.7 V			20	μA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.5 V			−20	μA
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20	μA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.5 V			−0.2	mA
I_{OS}‡	V_{CC} = 5.5 V,	V_O = 0	−75		−250	mA
I_{CCL}	V_{CC} = 5.5 V,	Outputs open		28	40	mA
I_{CCH}	V_{CC} = 5.5 V,	Outputs open		15	25	mA
I_{CCZ}	V_{CC} = 5.5 V,	Outputs open		3.5	6	mA
C_i	V_{CC} = 5 V,	V_I = 2.5 V to 0.5 V		4.5		pF
C_o	V_{CC} = 5 V,	V_O = 2.5 V to 0.5 V		7		pF

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

switching characteristics over recommended range of supply voltage, C_L = 50 pF (unless otherwise noted) (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, T_A = 25°C			T_A = −40°C to 85°C		T_A = 0°C to 70°C		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	1	3.3	5.2	1	6.3	1	5.9	ns
t_{PHL}			1	5.1	4.2	1	4.9	1	4.5	
t_{PZH}	$\overline{OE}$	Y	2	5.3	7.7	2	9.2	2	8.6	ns
t_{PZL}			2	8.5	10.2	2	12.7	2	11.9	
t_{PHZ}	$\overline{OE}$	Y	2	5.4	7.6	2	9.4	2	8.7	ns
t_{PLZ}			2	5.1	6.8	2	9	2	8.1	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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