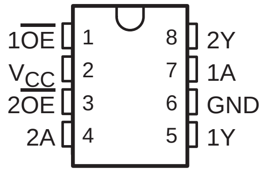
SN64BCT306
DUAL BUFFER/DRIVER
WITH 3-STATE OUTPUTS

SCBS048B – MARCH 1990 – 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 True Outputs Drive Bus Lines or Buffer-Memory Address Registers**
- **P-N-P Inputs Reduce DC Loading**
- **Package Options Include Plastic Small-Outline (D) Packages and Standard Plastic 300-mil DIPs (P)**

D OR P PACKAGE
(TOP VIEW)



description

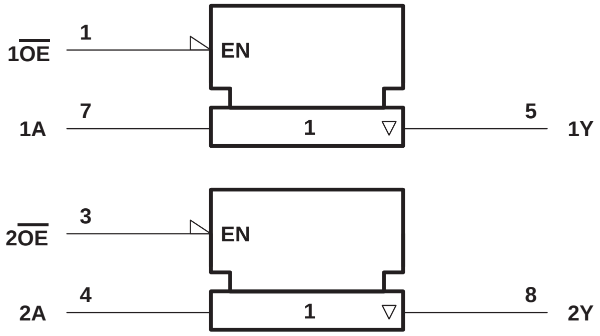
This dual buffer and line driver is designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters.

The SN64BCT306 is characterized for operation from –40°C to 85°C and 0°C to 70°C.

FUNCTION TABLE
(each buffer)

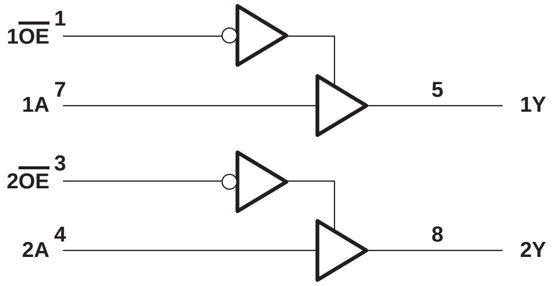
INPUTS		OUTPUT
$\overline{\text{OE}}$	A	Y
H	X	Z
L	L	L
L	H	H

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, 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 V_{CC}
Input clamp current, I_{IK} ($V_I < 0$)	–30 mA
Current into any output in the low state, I_O	128 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 negative-voltage rating may be exceeded if the input clamp-current rating is 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			–15	mA
I_{OL}	Low-level output current			64	mA
$\Delta t/\Delta V_{CC}$	Power-up ramp rate	2			µs/V
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} = –3 mA	2.4	3.3		V
		I_{OH} = –15 mA	2	3.1		
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 64 mA		0.42	0.55	V
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			–1	mA
I_{OZ}	V_{CC} = 0 to 2.3 V (power up)	V_O = 2.7 V or 0.5 V, $\overline{OE}$ = 0.8 V			±50	µA
	V_{CC} = 1.8 to 0 V (power down)				±50	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2.7 V			50	µA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.5 V			–50	µA
I_{OS}§	V_{CC} = 5.5 V,	V_O = 0	–100		–225	mA
I_{CCL}	V_{CC} = 5.5 V,	Outputs open		53	80	mA
I_{CCH}	V_{CC} = 5.5 V,	Outputs open		23	40	mA
I_{CCZ}	V_{CC} = 5.5 V,	Outputs open		4	10	mA

‡ 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	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	1.2	4.4	0.9	5.3	0.7	5	ns
t_{PHL}			1.7	5	1.4	6	1.4	5.5	
t_{PZH}	1$\overline{OE}$ or 2$\overline{OE}$	Y	2	7.8	2	9	2	8.7	ns
t_{PZL}			2	8.1	2	9.4	2	8.9	
t_{PHZ}	1$\overline{OE}$ or 2$\overline{OE}$	Y	2	6.7	2	8	2	7.7	ns
t_{PLZ}			2	7.6	2	9.8	2	8.9	

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

PACKAGE OPTION ADDENDUM

PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SN64BCT306D	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI
SN64BCT306DR	OBSOLETE	SOIC	D	0		TBD	Call TI	Call TI
SN64BCT306P	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI

[1] The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

[2] Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

[3] MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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