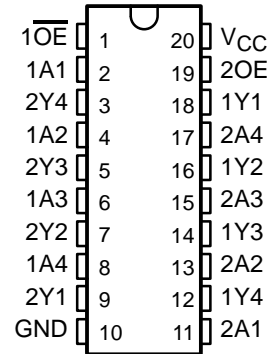


SN64BCT241 OCTAL BUFFER/DRIVER WITH 3-STATE OUTPUTS

SCBS046B – FEBRUARY 1990 – REVISED APRIL 1994

- State-of-the-Art BiCMOS Design Substantially Reduces Standby Current
- 3-State Outputs Drive Bus Lines or Buffer-Memory Address Registers
- ESD Protection Exceeds 2000 V Per MIL-STD-883C Method 3015
- High-Impedance State During Power Up and Power Down
- Package Options Include Small-Outline Packages (DW) and Standard Plastic 300-mil DIPs (N)

DW OR N PACKAGE
(TOP VIEW)



description

This octal 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. Taken together with the SN64BCT240 and SN64BCT244, these devices provide the choice of selected combinations of inverting and noninverting outputs, symmetrical active-low output-enable (\overline{OE}) inputs, and complementary OE and \overline{OE} inputs.

The SN64BCT241 is characterized for operation from -40°C to 85°C and 0°C to 70°C .

FUNCTION TABLES

INPUTS		OUTPUT
$\overline{1OE}$	1A	1Y
L	H	H
L	L	L
H	X	Z

INPUTS		OUTPUT
2OE	2A	2Y
H	H	H
H	L	L
L	X	Z

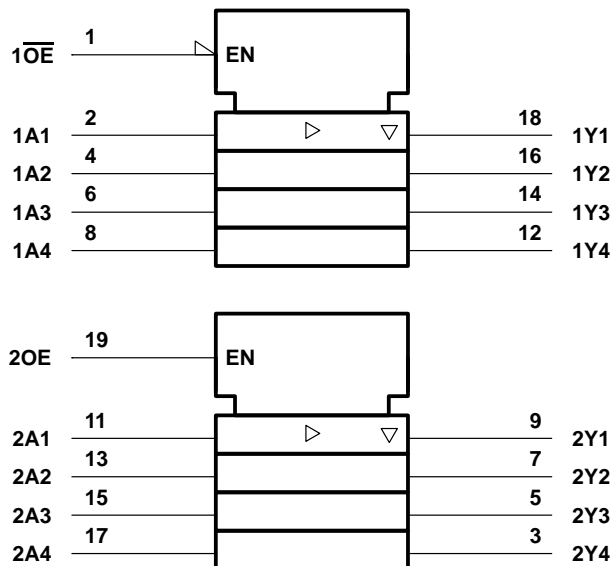
SN64BCT241

OCTAL BUFFER/DRIVER

WITH 3-STATE OUTPUTS

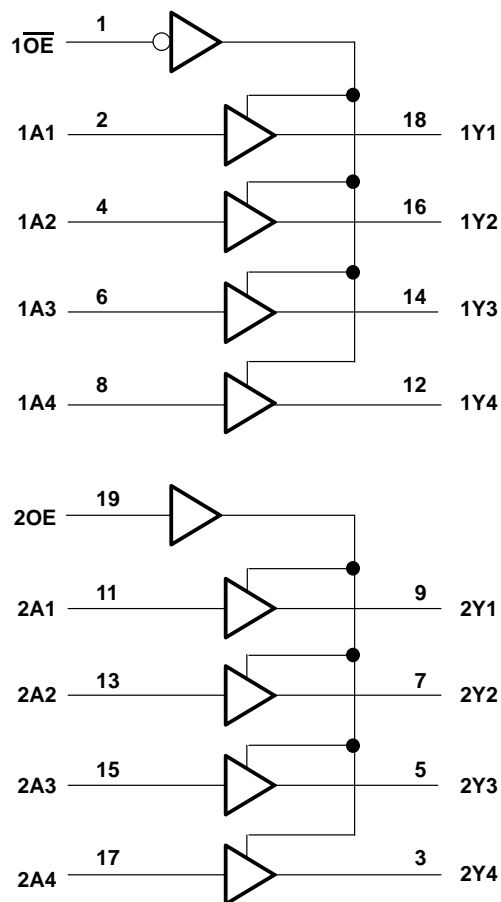
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logic symbol†



† 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}
Current into any output in the low state	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.

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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			-15	mA
I_{OL}	Low-level output current			64	mA
T_A	Operating free-air temperature	-40		85	°C

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

PARAMETER	TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IK}	$V_{CC} = 4.5\text{ V}$,	$I_I = -18\text{ mA}$			-1.2	V
V_{OH}	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -3\text{ mA}$	2.4	3.3		V
		$I_{OH} = -15\text{ mA}$	2	3.1		
	$V_{CC} = 4.75\text{ V}$,	$I_{OH} = -3\text{ mA}$	2.7			
V_{OL}	$V_{CC} = 4.5\text{ V}$,	$I_{OH} = 64\text{ mA}$		0.42	0.55	V
I_{OZH}	$V_{CC} = 5.5\text{ V}$,	$V_O = 2.7\text{ V}$			50	μA
I_{OZL}	$V_{CC} = 5.5\text{ V}$,	$V_O = 0.5\text{ V}$			-50	μA
I_{OZ}	$V_{CC} = 0\text{ to }2.3\text{ V}$ (power up)	$V_O = 2.7\text{ V or }0.5\text{ V}$, \overline{OE} at 0.8 V			± 50	μA
	$V_{CC} = 1.8\text{ V to }0$ (power down)				± 50	
I_I	$V_{CC} = 5.5\text{ V}$,	$V_I = 7\text{ V}$			0.1	mA
I_{IH}	$V_{CC} = 5.5\text{ V}$,	$V_I = 2.7\text{ V}$			20	μA
I_{IL}	$V_{CC} = 5.5\text{ V}$,	$V_I = 2.5\text{ V}$	OE or \overline{OE}		-1	mA
			Any A		-1.6	
$I_{OS}‡$	$V_{CC} = 5.5\text{ V}$,	$V_O = 0$	-100		-225	mA
I_{CCL}	$V_{CC} = 5.5\text{ V}$,	Output open		23	43	mA
I_{CCH}	$V_{CC} = 5.5\text{ V}$,	Output open		53	85	mA
I_{CCZ}	$V_{CC} = 5.5\text{ V}$,	Output open		4	10	mA
C_i	$V_{CC} = 5\text{ V}$,	$V_I = 2.5\text{ V or }0.5\text{ V}$		6		pF
C_o	$V_{CC} = 5\text{ V}$,	$V_O = 2.5\text{ V or }0.5\text{ V}$		11		pF

† All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

‡ Not more than one output should be tested at a time, and the duration of the test 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				UNIT
					T _A = −40°C to 85°C		T _A = 0°C to 70°C		
			MIN	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A	Y	0.5	4.5	0.5	5.2	0.5	4.9	ns
t _{PHL}			1	5.4	1	6.3	1	5.9	
t _{PZH}	OE or $\overline{\text{OE}}$	Y	1	7.8	1	9.1	1	8.7	ns
t _{PZL}			1	8.6	1	10	1	9.4	
t _{PHZ}	OE or $\overline{\text{OE}}$	Y	1	6.8	1	8.4	1	8.1	ns
t _{PLZ}			1	8.1	1	11	1	9.9	

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

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