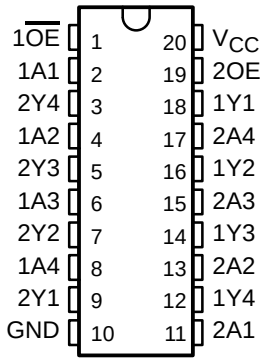
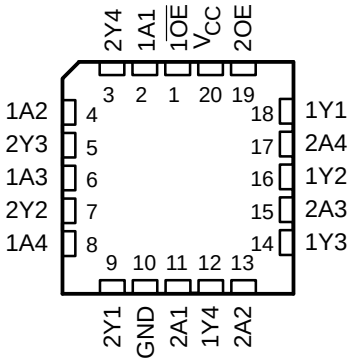
- **State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015**
- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **Package Options Include Plastic Small-Outline (DW) and Shrink Small-Outline (DB) Packages, Ceramic Chip Carriers (FK) and Flatpacks (W), and Standard Plastic and Ceramic 300-mil DIPs (J, N)**

SN54BCT241 . . . J OR W PACKAGE
SN74BCT241 . . . DB, DW OR N PACKAGE
(TOP VIEW)



SN54BCT241 . . . FK PACKAGE
(TOP VIEW)



description

These octal buffers and line drivers are 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 ′BCT240 and ′BCT244, these devices provide the choice of selected combinations of inverting and noninverting outputs, symmetrical $\overline{OE}$ (active-low output-enable) inputs, and complementary OE and $\overline{OE}$ inputs.

The SN54BCT241 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74BCT241 is characterized for operation from 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

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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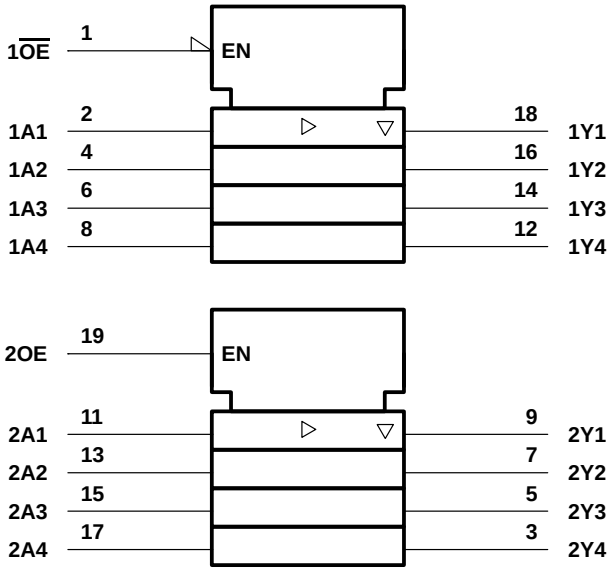
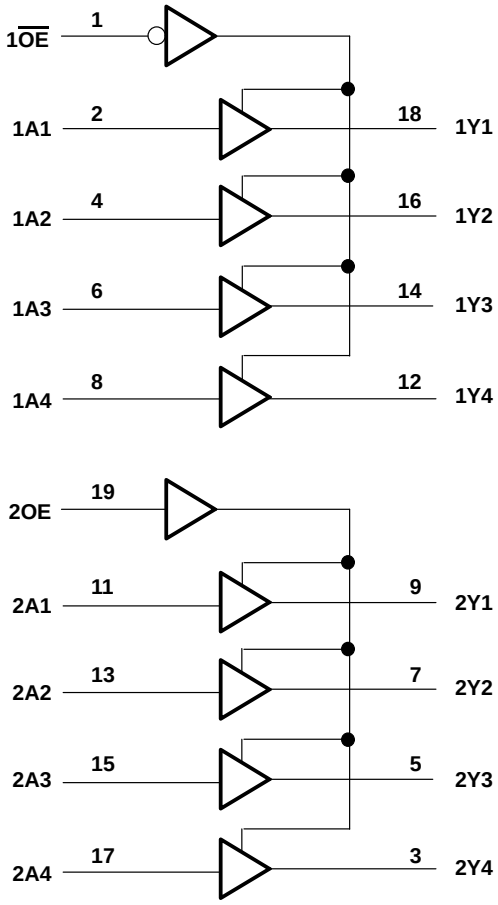
logic symbol†



† 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} . . . . . –30 mA
Current into any output in the low state: SN54BCT241 . . . . . 96 mA
SN74BCT241 . . . . . 128 mA
Operating free-air temperature range: SN54BCT241 . . . . . – 55°C to 125°C
SN74BCT241 . . . . . 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 input and output voltage ratings may be exceeded if the input and output current ratings are observed.

recommended operating conditions

		SN54BCT241			SN74BCT241			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			–12			–15	mA
I_{OL}	Low-level output current			48			64	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		SN54BCT241			SN74BCT241			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} = –3 mA	2.4	3.3		2.4	3.3		V
			I_{OH} = –12 mA	2	3.2					
			I_{OH} = –15 mA				2	3.1		
V_{OL}		V_{CC} = 4.5 V	I_{OL} = 48 mA		0.38	0.55				V
			I_{OL} = 64 mA					0.42	0.55	
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	µA
I_{IL}	$1\overline{OE}$ or 2OE	V_{CC} = 5.5 V,	V_I = 0.5 V			–1			–1	mA
	Any A input					–1.6			–1.6	
I_{OZH}		V_{CC} = 5.5 V,	V_O = 2.7 V			50			50	µA
I_{OZL}		V_{CC} = 5.5 V,	V_O = 0.5 V			–50			–50	µA
I_{OS}‡		V_{CC} = 5.5 V,	V_O = 0	–100		–225	–100		–225	mA
I_{CCH}		V_{CC} = 5.5 V,	Outputs open		23	43		23	43	mA
I_{CCL}		V_{CC} = 5.5 V,	Outputs open		53	85		53	85	mA
I_{CCZ}		V_{CC} = 5.5 V,	Outputs open		4	10		4	10	mA
C_i		V_{CC} = 5 V,	V_I = 2.5 V or 0.5 V		6			6		pF
C_o		V_{CC} = 5 V,	V_O = 2.5 V or 0.5 V		11			11		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 (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
			′BCT241			SN54BCT241		SN74BCT241		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	0.5	2.5	4.5	0.5	5.2	0.5	4.9	ns
t_{PHL}			1	3	5.4	1	6.3	1	5.9	
t_{PZH}	$\overline{OE}$ or OE	Y	1	5.7	7.8	1	9.1	1	8.7	ns
t_{PZL}			1	5.2	8.6	1	10	1	9.4	
t_{PHZ}	$\overline{OE}$ or OE	Y	1	5.8	6.8	1	8.4	1	8.1	ns
t_{PLZ}			1	7	8.1	1	11	1	9.9	

† 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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