- **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)**

SN54BCT240 . . . J OR W PACKAGE
SN74BCT240 . . . DB, DW OR N PACKAGE
(TOP VIEW)

```
        ___
1OE  [ 1    20 ] V_CC
1A1  [ 2    19 ] 2OE
2Y4  [ 3    18 ] 1Y1
1A2  [ 4    17 ] 2A4
2Y3  [ 5    16 ] 1Y2
1A3  [ 6    15 ] 2A3
2Y2  [ 7    14 ] 1Y3
1A4  [ 8    13 ] 2A2
2Y1  [ 9    12 ] 1Y4
GND  [ 10   11 ] 2A1
```

SN54BCT240 . . . FK PACKAGE
(TOP VIEW)

```
        2Y4 1A1 1OE V_CC 2OE
         3   2   1  20  19
1A2  [ 4              18 ] 1Y1
2Y3  [ 5              17 ] 2A4
1A3  [ 6              16 ] 1Y2
2Y2  [ 7              15 ] 2A3
1A4  [ 8              14 ] 1Y3
         9  10  11  12  13
        2Y1 GND 2A1 1Y4 2A2
```
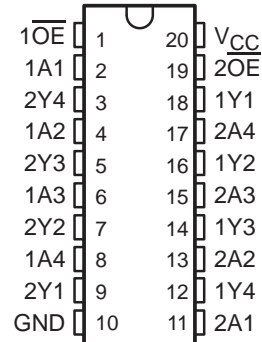
description

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 ′BCT241 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. These devices feature high fan-out and improved fan-in.
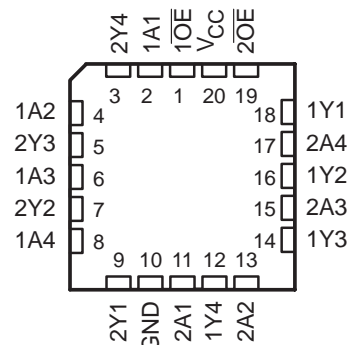
The ′BCT240 is organized as two 4-bit buffers/line drivers with separate output-enable ($\overline{OE}$) inputs. When $\overline{OE}$ is low, the device passes data from the A inputs to the Y outputs. When $\overline{OE}$ is high, the outputs are in the high-impedance state.

The SN54BCT240 is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74BCT240 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE
(each buffer)

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

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SN54BCT240, SN74BCT240
OCTAL BUFFERS/DRIVERS
WITH 3-STATE OUTPUTS

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logic symbol†

1$\overline{\text{OE}}$ — 1 — EN

1A1 — 2 — ▷ — ▽ — 18 — 1Y1
1A2 — 4 — 16 — 1Y2
1A3 — 6 — 14 — 1Y3
1A4 — 8 — 12 — 1Y4

2$\overline{\text{OE}}$ — 19 — EN

2A1 — 11 — ▷ — ▽ — 9 — 2Y1
2A2 — 13 — 7 — 2Y2
2A3 — 15 — 5 — 2Y3
2A4 — 17 — 3 — 2Y4
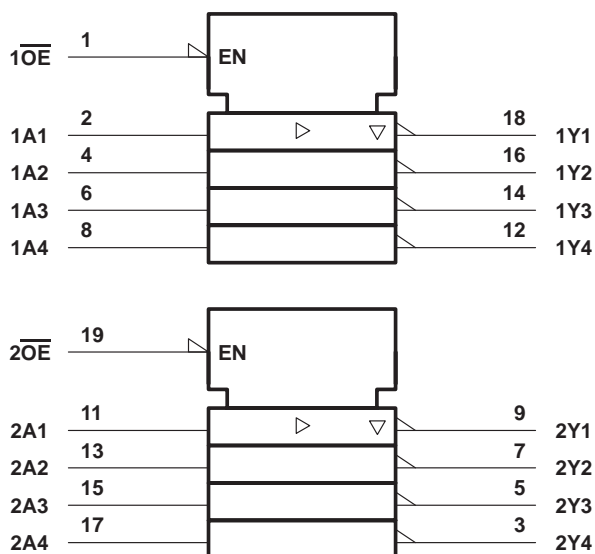
† This symbol is in accordance with ANSI/IEEE Std 91-1984
and IEC Publication 617-12.

logic diagram (positive logic)

1$\overline{\text{OE}}$ — 1

1A1 — 2 — 18 — 1Y1
1A2 — 4 — 16 — 1Y2
1A3 — 6 — 14 — 1Y3
1A4 — 8 — 12 — 1Y4

2$\overline{\text{OE}}$ — 19

2A1 — 11 — 9 — 2Y1
2A2 — 13 — 7 — 2Y2
2A3 — 15 — 5 — 2Y3
2A4 — 17 — 3 — 2Y4
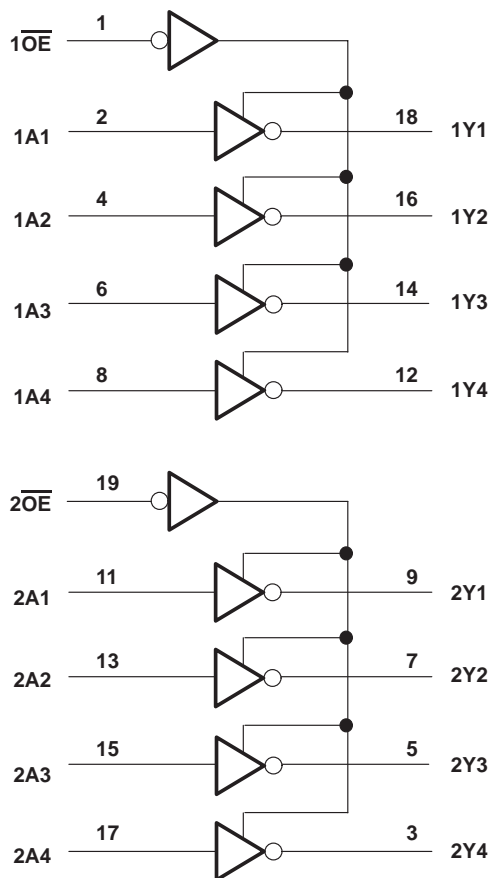
absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

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: SN54BCT240 . . . . 96 mA
SN74BCT240 . . . . 128 mA
Operating free-air temperature range: SN54BCT240 . . . . − 55°C to 125°C
SN74BCT240 . . . . 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.

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recommended operating conditions

		SN54BCT240			SN74BCT240			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		SN54BCT240			SN74BCT240			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}	$V_{CC} = 5.5$ V,	$V_I = 0.5$ V			−1			−1	mA
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		19	31		19	31	mA
I_{CCL}	$V_{CC} = 5.5$ V,	Outputs open		46	71		46	71	mA
I_{CCZ}	$V_{CC} = 5.5$ V,	Outputs open		6	9		6	9	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.
[‡] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

SN54BCT240, SN74BCT240
OCTAL BUFFERS/DRIVERS
WITH 3-STATE OUTPUTS
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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
			'BCT240			SN54BCT240		SN74BCT240		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A	Y	0.5	3.3	4.8	0.5	6.4	0.5	5.6	ns
t_{PHL}			0.4	1.8	3.5	0.4	4.5	0.4	4	
t_{PZH}	$\overline{OE}$	Y	1	6.4	7.9	1	9.2	1	8.8	ns
t_{PZL}			1	7.5	9.4	1	10.8	1	10.5	
t_{PHZ}	$\overline{OE}$	Y	1	6	6.8	1	8.5	1	8.1	ns
t_{PLZ}			1	6.7	8.1	1	10.6	1	9.5	

† 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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