

# SN64BCT244 OCTAL BUFFER/DRIVER WITH 3-STATE OUTPUTS

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- State-of-the-Art BiCMOS Design Significantly Reduces  $I_{CCZ}$
- 3-State Outputs Drive Bus Lines or Buffer-Memory Address Registers
- P-N-P Inputs Reduce DC Loading
- High-Impedance State During Power Up and Power Down
- Package Options Include Plastic Small-Outline (DW) Packages and Standard Plastic 300-mil DIPs (N)

## description

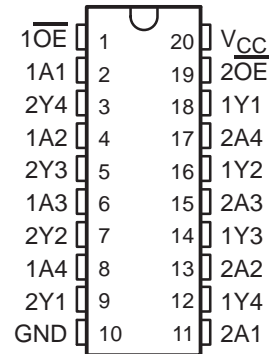
This octal buffer and line driver is designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Taken together with the SN64BCT240 and SN64BCT241, these devices provide the choice of selected combinations of inverting and noninverting outputs, symmetrical active-low output-enable ( $\overline{OE}$ ) inputs, and complementary OE and  $\overline{OE}$  inputs.

The SN64BCT244 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 outputs are in a high-impedance state during power up and power down while the supply voltage is less than approximately 3 V.

The SN64BCT244 is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

DW OR N PACKAGE  
(TOP VIEW)



FUNCTION TABLE  
(each buffer)

| INPUTS          |   | OUTPUT<br>Y |
|-----------------|---|-------------|
| $\overline{OE}$ | A |             |
| L               | H | H           |
| L               | L | L           |
| H               | X | Z           |

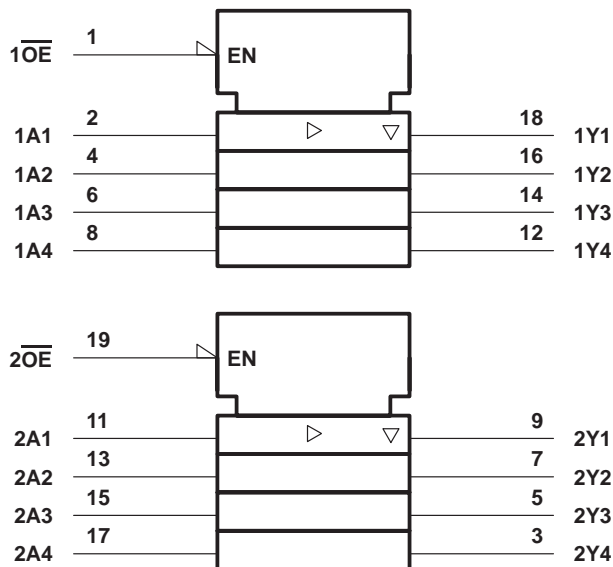
# SN64BCT244

## OCTAL BUFFER/DRIVER

### WITH 3-STATE OUTPUTS

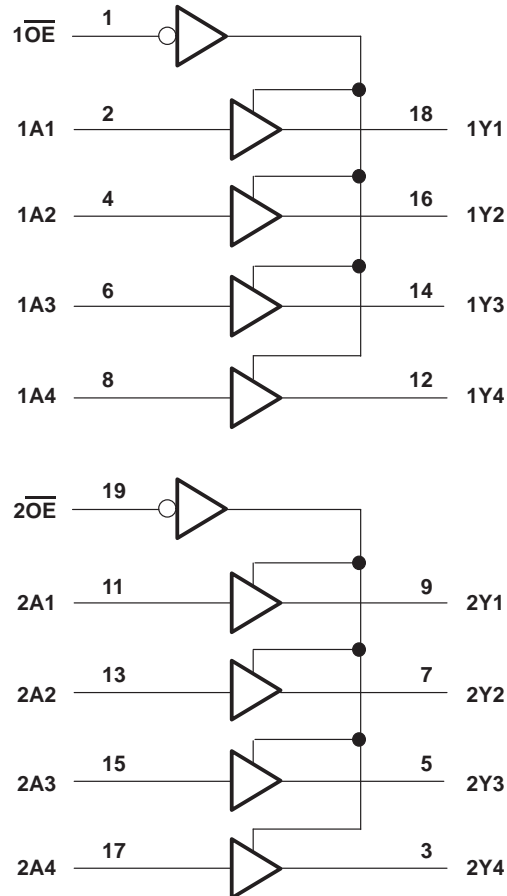
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#### logic symbol†



† 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, $I_O$                               | 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.

# SN64BCT244

## OCTAL BUFFER/DRIVER

### WITH 3-STATE OUTPUTS

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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 |
|------------------|------------------------------------|--|------|------|------|------|
| $V_{IK}$         | $V_{CC} = 4.5$ 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, $\overline{OE}$ 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                                    |      |      | 50   | μA   |
| $I_{OZL}$        | $V_{CC} = 5.5$ V,                  | $V_O = 0.5$ V                                    |      |      | -50  | μA   |
| $I_{OS}^\dagger$ | $V_{CC} = 5.5$ V,                  | $V_O = 0$  | -100 |      | -225 | mA   |
| $I_{CCH}$        | $V_{CC} = 5.5$ V,                  | Output open                                      |      | 23   | 40   | mA   |
| $I_{CCL}$        | $V_{CC} = 5.5$ V,                  | Output open                                      |      | 53   | 80   | mA   |
| $I_{CCZ}$        | $V_{CC} = 5.5$ V,                  | Output open                                      |      | 4    | 10   | mA   |

† 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.

#### switching characteristics (see Note 2)

| PARAMETER | FROM (INPUT)    | TO (OUTPUT) | $V_{CC} = 5$ V,<br>$C_L = 50$ pF,<br>$R_1 = 500 \Omega$ ,<br>$R_2 = 500 \Omega$ ,<br>$T_A = 25^\circ\text{C}$ |     |     | $V_{CC} = 4.5$ V to 5.5 V,<br>$C_L = 50$ pF,<br>$R_1 = 500 \Omega$ ,<br>$R_2 = 500 \Omega$ ,<br>$T_A = \text{MIN to MAX}^\S$ |     | UNIT |
|-----------|-----------------|-------------|---|-----|-----|--|-----|------|
|           |                 |             | MIN   | TYP | MAX | MIN  | MAX |      |
| $t_{PLH}$ | A               | Y           | 1.2   | 2.5 | 4.4 | 0.9  | 5.3 | ns   |
| $t_{PHL}$ |                 |             | 1.7   | 3.2 | 5   | 1.4  | 6   |      |
| $t_{PZH}$ | $\overline{OE}$ | Y           | 2   | 5.7 | 7.8 | 2  | 9   | ns   |
| $t_{PZL}$ |                 |             | 2   | 5.9 | 8.1 | 2  | 9.4 |      |
| $t_{PHZ}$ | $\overline{OE}$ | Y           | 2   | 5.4 | 6.7 | 2  | 8   | ns   |
| $t_{PLZ}$ |                 |             | 2   | 6.1 | 7.6 | 2  | 9.8 |      |

§ 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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