

SN54ALS1244A, SN74ALS1244A OCTAL BUFFERS AND DRIVERS WITH 3-STATE OUTPUTS

SDAS186B – JULY 1990 – REVISED JANUARY 1995

- Low-Power Versions of 'ALS244 Series
- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- pnp Inputs Reduce dc Loading
- Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

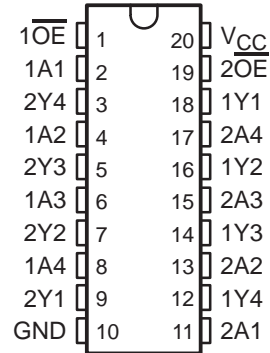
description

These octal buffers and 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.

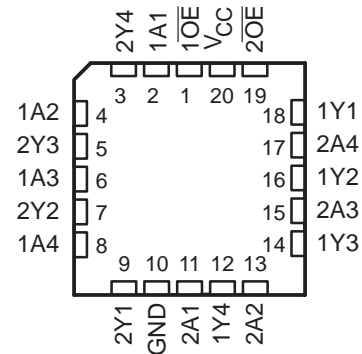
Taken together with the SN74ALS1240, these devices provide the choice of inverting and noninverting outputs.

The SN54ALS1244A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1244A is characterized for operation from 0°C to 70°C .

SN54ALS1244A . . . J PACKAGE
SN74ALS1244A . . . DW OR N PACKAGE
(TOP VIEW)



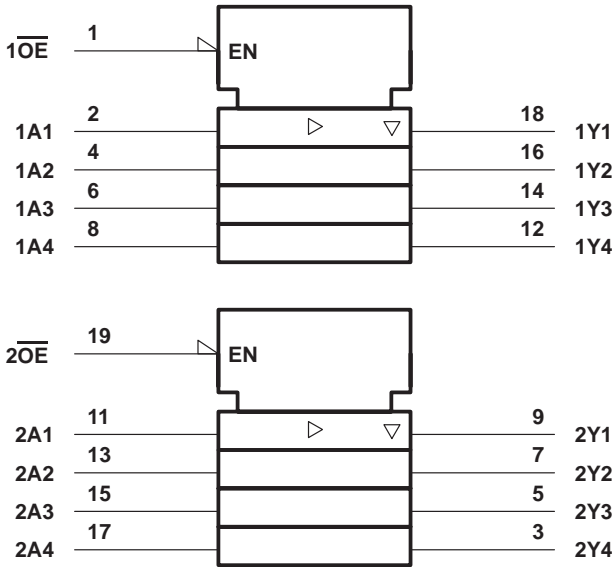
SN54ALS1244A . . . FK PACKAGE
(TOP VIEW)



SN54ALS1244A, SN74ALS1244A OCTAL BUFFERS AND DRIVERS WITH 3-STATE OUTPUTS

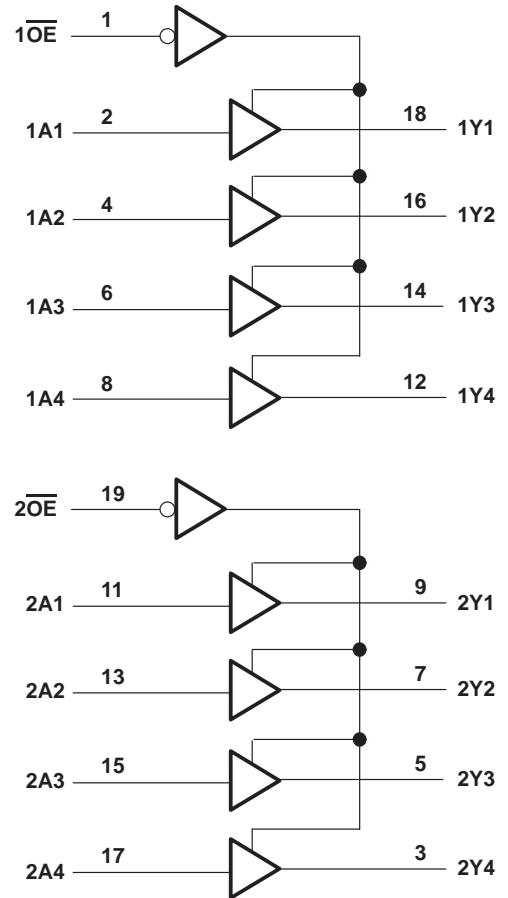
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logic symbol†



† 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, V_{CC} | 7 V |
| Input voltage, V_I | 7 V |
| Voltage applied to a disabled 3-state output | 5.5 V |
| Operating free-air temperature range, T_A : SN54ALS1244A | -55°C to 125°C |
| SN74ALS1244A | 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.

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recommended operating conditions

| | | SN54ALS1244A | | | SN74ALS1244A | | | 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 | | | 0.7 | | | 0.8 | V |
| I_{OH} | High-level output current | | | -12 | | | -15 | mA |
| I_{OL} | Low-level output current | | | 8 | | | 16 | 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 | SN54ALS1244A | | | SN74ALS1244A | | | UNIT |
|-----------|---|--------------------------|------|------|--------------|------|------|------|
| | | MIN | TYP† | MAX | MIN | TYP† | MAX | |
| V_{IK} | $V_{CC} = 4.5\text{ V}$, $I_I = -18\text{ mA}$ | | | -1.5 | | | -1.5 | V |
| V_{OH} | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $I_{OH} = -0.4\text{ mA}$ | $V_{CC} - 2$ | | | $V_{CC} - 2$ | | | V |
| | $V_{CC} = 4.5\text{ V}$ | $I_{OH} = -3\text{ mA}$ | 2.4 | 3.2 | 2.4 | 3.2 | | |
| | | $I_{OH} = -12\text{ mA}$ | 2 | | | | | |
| | | $I_{OH} = -15\text{ mA}$ | | | 2 | | | |
| V_{OL} | $V_{CC} = 4.5\text{ V}$ | $I_{OL} = 8\text{ mA}$ | 0.25 | 0.4 | 0.25 | 0.4 | V | |
| | | $I_{OL} = 16\text{ mA}$ | | | 0.35 | 0.5 | | |
| I_{OZH} | $V_{CC} = 5.5\text{ V}$, $V_O = 2.7\text{ V}$ | | | 20 | | | 20 | μA |
| I_{OZL} | $V_{CC} = 5.5\text{ V}$, $V_O = 0.4\text{ V}$ | | | -20 | | | -20 | μA |
| I_I | $V_{CC} = 5.5\text{ V}$, $V_I = 7\text{ V}$ | | | 0.1 | | | 0.1 | mA |
| I_{IH} | $V_{CC} = 5.5\text{ V}$, $V_I = 2.7\text{ V}$ | | | 20 | | | 20 | μA |
| I_{IL} | $V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$ | | | -0.1 | | | -0.1 | mA |
| $I_{O‡}$ | $V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$ | -20 | | -112 | -30 | | -112 | mA |
| I_{CC} | $V_{CC} = 5.5\text{ V}$ | Outputs high | 6 | 15 | 6 | 11 | mA | |
| | | Outputs low | 10 | 20 | 10 | 17 | | |
| | | Outputs disabled | 11 | 25 | 11 | 20 | | |

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

‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

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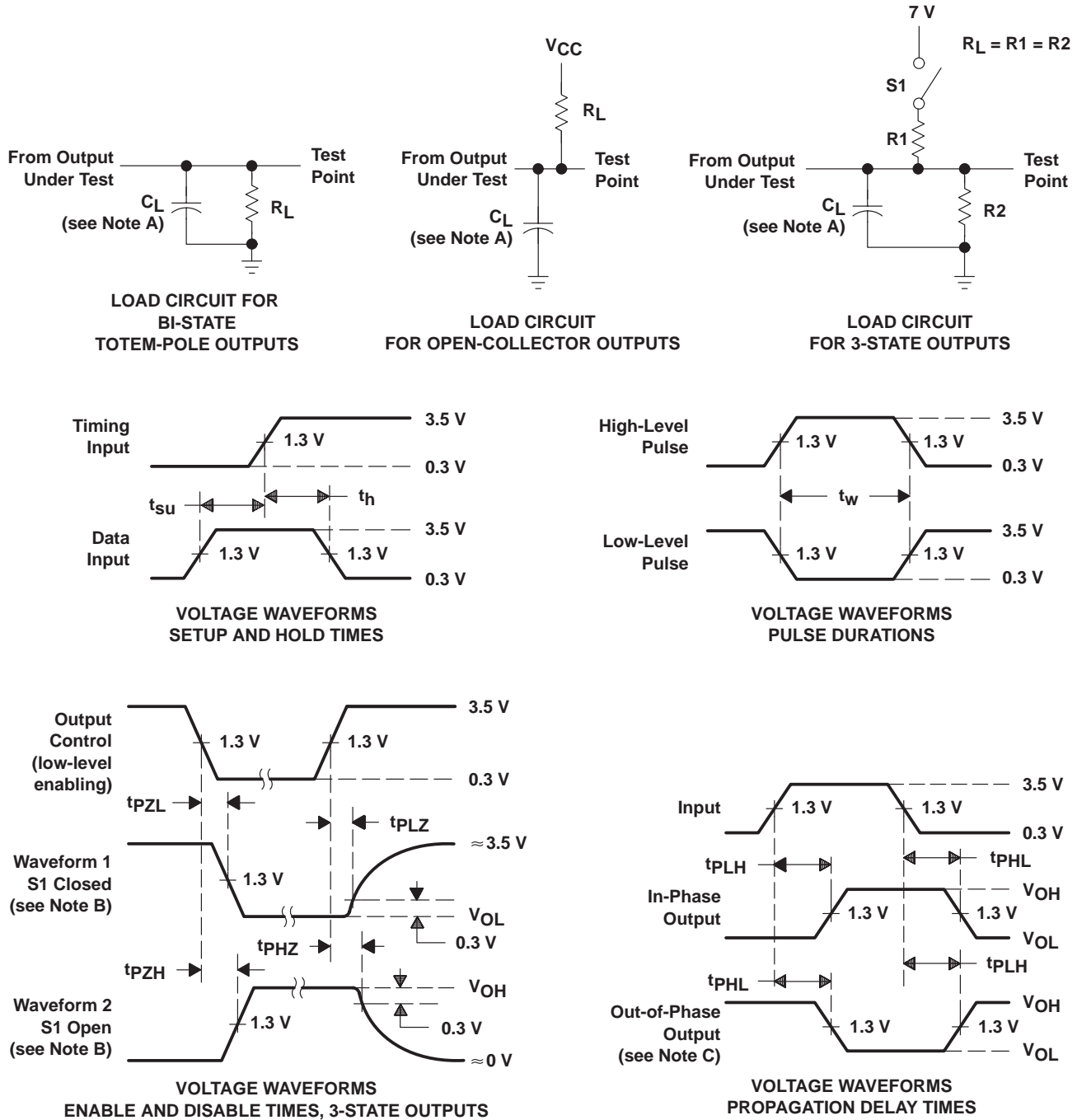
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switching characteristics (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX† | | | | UNIT |
|------------------|-----------------|----------------|--|-----|--------------|-----|------|
| | | | SN54ALS1244A | | SN74ALS1244A | | |
| | | | MIN | MAX | MIN | MAX | |
| t _{PLH} | A | Y | 3 | 21 | 3 | 14 | ns |
| t _{PHL} | | | 3 | 16 | 3 | 14 | |
| t _{PZH} | \overline{OE} | Y | 6 | 28 | 6 | 22 | ns |
| t _{PZL} | | | 6 | 26 | 6 | 22 | |
| t _{PHZ} | \overline{OE} | Y | 2 | 15 | 2 | 13 | ns |
| t _{PLZ} | | | 3 | 25 | 3 | 16 | |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

PARAMETER MEASUREMENT INFORMATION
 SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 C. When measuring propagation delay items of 3-state outputs, switch S1 is open.
 D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
 E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

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