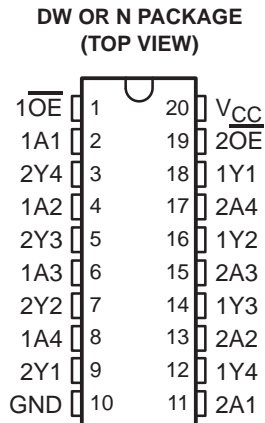


SN74ALS2240 OCTAL BUFFER AND LINE DRIVER/MOS DRIVER WITH 3-STATE OUTPUTS

SDAS268A – DECEMBER 1994 – REVISED NOVEMBER 1997

- Bidirectional Quadruple-Bus Transceivers for Driving MOS Devices
- I/O Ports Have 25-Ω Series Resistors, So No External Resistors Are Required
- Package Options Include Plastic Small-Outline (DW) Package and Standard Plastic (N) 300-mil DIPs



description

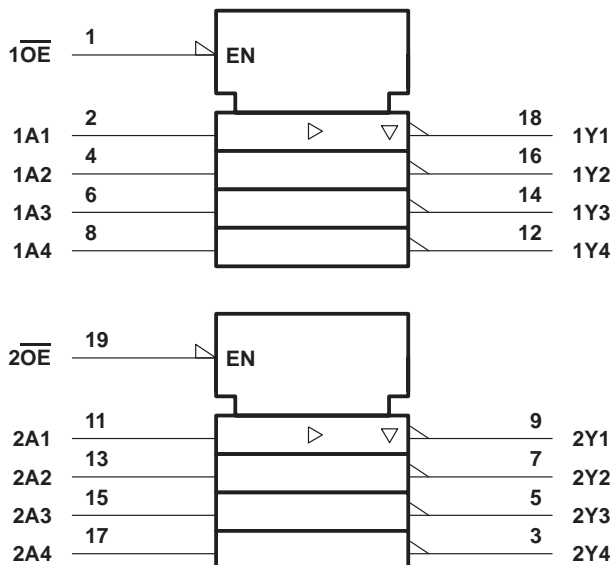
This octal buffer and line driver/MOS driver is designed to drive the capacitive inputs of MOS devices and to improve the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. This device features high fan-out and improved fan-in.

The SN74ALS2240 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 |

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.



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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.

**TEXAS
INSTRUMENTS**

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SN74ALS2240

OCTAL BUFFER AND LINE DRIVER/MOS 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 |
| T_A | Operating free-air temperature | 0 | | 70 | °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} | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $I_{OH} = -0.4\text{ mA}$ | $V_{CC}-2$ | | | V |
| V_{OL} | $V_{CC} = 4.5\text{ V}$ | $I_{OL} = 1\text{ mA}$ | 0.15 | 0.5 | V |
| | | $I_{OL} = 12\text{ mA}$ | 0.35 | 0.8 | |
| I_{OZH} | $V_{CC} = 5.5\text{ V}$, $V_O = 2.7\text{ V}$ | | | 20 | μA |
| I_{OZL} | $V_{CC} = 5.5\text{ V}$, $V_O = 0.4\text{ V}$ | | | -20 | μA |
| 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} | $V_{CC} = 5.5\text{ V}$, $V_I = 0.4\text{ V}$ | | | -0.1 | mA |
| $I_{O‡}$ | $V_{CC} = 5.5\text{ V}$, $V_O = 2.25\text{ V}$ | -30 | | -112 | mA |
| I_{OH} | $V_{CC} = 4.5\text{ V}$, | | | -15 | mA |
| I_{OL} | $V_{CC} = 4.5\text{ V}$, | | | 15 | mA |
| I_{CC} | $V_{CC} = 5.5\text{ V}$ | Outputs high | 6 | 11 | mA |
| | | Outputs low | 13 | 23 | |
| | | Outputs disabled | 12 | 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} .

switching characteristics (see Figure 1)

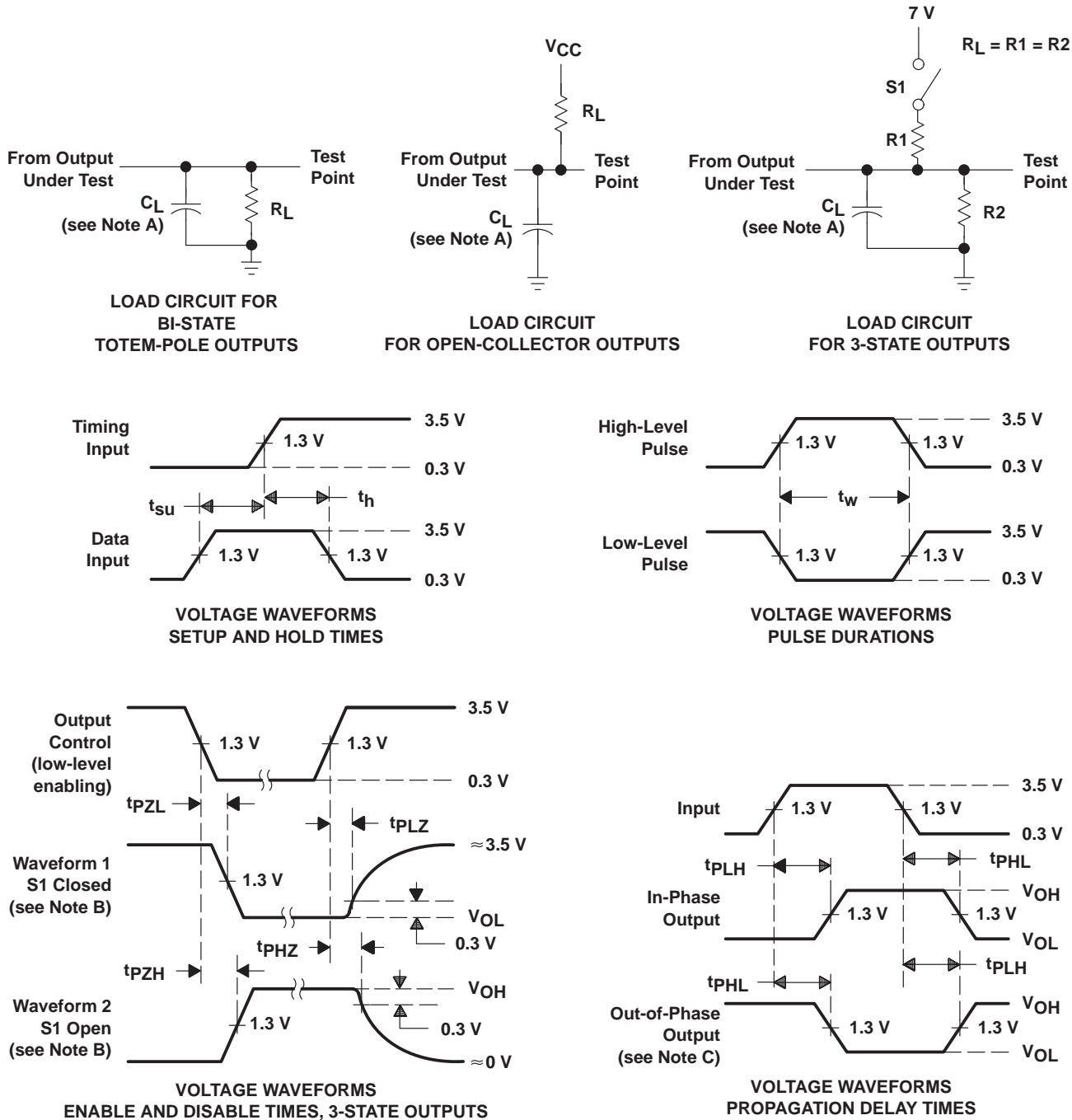
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, $C_L = 50\text{ pF}$, $R_1 = 500\ \Omega$, $R_2 = 500\ \Omega$, $T_A = \text{MIN to MAX}^\S$ | | UNIT |
|-----------|-----------------|-------------|--|-----|------|
| | | | MIN | MAX | |
| t_{PLH} | A | Y | 2 | 10 | ns |
| t_{PHL} | | | 2 | 10 | |
| t_{PZH} | \overline{OE} | Y | 5 | 17 | ns |
| t_{PZL} | \overline{OE} | Y | 7 | 20 | ns |
| t_{PHZ} | \overline{OE} | Y | 2 | 10 | ns |
| t_{PLZ} | \overline{OE} | Y | 4 | 15 | ns |

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

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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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