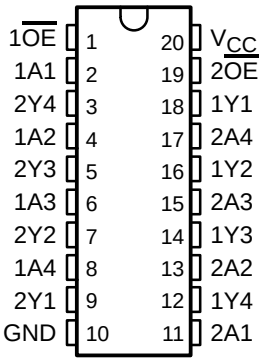
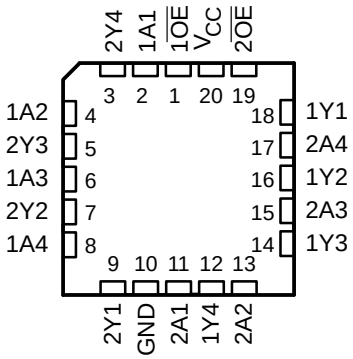
- **Open-Collector Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **Eliminates the Need for 3-State Overlap Protection**
- **pnp Inputs Reduce dc Loading**
- **Open-Collector Versions of ′ALS244 and ′AS244**
- **Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs**

**SN54AS760 . . . J PACKAGE**
**SN74ALS760, SN74AS760 . . . DW OR N PACKAGE**
**(TOP VIEW)**




**SN54AS760 . . . FK PACKAGE**
**(TOP VIEW)**

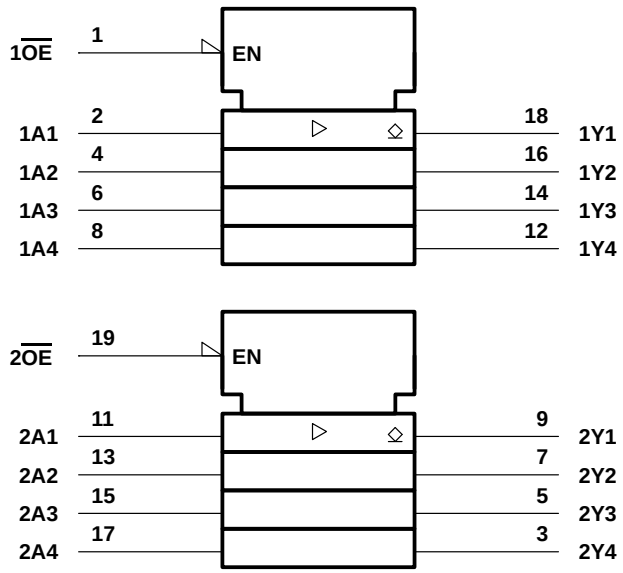



## description

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 by eliminating the need for 3-state overlap protection. With the ′AS756 and SN74AS757, these devices provide the choice of selected combinations of inverting outputs, symmetrical active-low output-enable ($\overline{OE}$) inputs, and complementary OE and $\overline{OE}$ inputs.

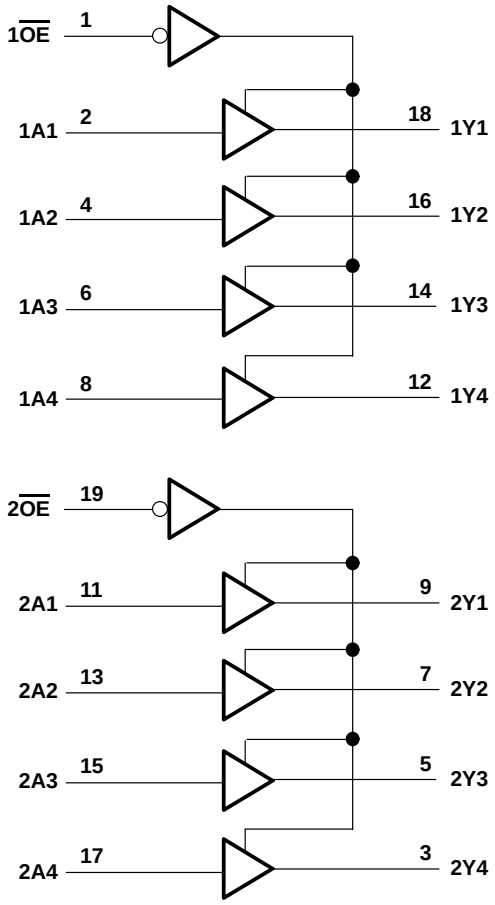
The SN54AS760 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS760 and SN74AS760 are characterized for operation from 0°C to 70°C.

### 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
Off-state output voltage . . . . . 7 V
Operating free-air temperature range, $T_A$: SN74ALS760 . . . . . 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.

### recommended operating conditions

| | | SN74ALS760 | | | UNIT |
|---|---|---|---|---|---|
| | | MIN | NOM | MAX | |
| $V_{CC}$ | 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 |
| $V_{OH}$ | High-level output voltage | | | 5.5 | V |
| $I_{OL}$ | Low-level output current | | | 24 | mA |
| $T_A$ | Operating free-air temperature | 0 | | 70 | °C |

## electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SN74ALS760 | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP† | MAX | |
| $V_{IK}$ | $V_{CC}$ = 4.5 V, | $I_I$ = –18 mA | | | –1.5 | V |
| $I_{OH}$ | $V_{CC}$ = 4.5 V, | $V_{OH}$ = 5.5 V | | | 0.1 | mA |
| $I_{OL}$ | $V_{CC}$ = 4.5 V | $I_{OL}$ = 12 mA | | 0.25 | 0.4 | V |
| | | $I_{OL}$ = 24 mA | | 0.35 | 0.5 | |
| $I_I$ | $V_{CC}$ = 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, | $V_I$ = 0.4 V | | | –0.1 | mA |
| $I_{CC}$ | $V_{CC}$ = 5.5 V | Outputs high | | 9 | 15 | mA |
| | | Outputs low | | 15 | 19 | |

† All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.

## switching characteristics (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, $R_L$ = 500 Ω, $T_A$ = MIN to MAX‡ | | UNIT |
|---|---|---|---|---|---|
| | | | SN74ALS760 | | |
| | | | MIN | MAX | |
| $t_{PLH}$ | A | Y | 5 | 15 | ns |
| $t_{PHL}$ | | | 5 | 12 | |
| $t_{PLH}$ | $\overline{OE}$ | Y | 5 | 16 | ns |
| $t_{PHL}$ | | | 5 | 13 | |

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

## absolute maximum ratings over operating free-air temperature range (unless otherwise noted) §

Supply voltage, $V_{CC}$ . . . . . 7 V
Input voltage, $V_I$ . . . . . 7 V
Off-state output voltage . . . . . 7 V
Operating free-air temperature range, $T_A$: SN54AS760 . . . . . –55°C to 125°C
SN74AS760 . . . . . 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.

## recommended operating conditions

| | | SN54AS760 | | | SN74AS760 | | | 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 |
| $V_{OH}$ | High-level output voltage | | | 5.5 | | | 5.5 | V |
| $I_{OL}$ | 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 | | SN54AS760 | | | SN74AS760 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP† | MAX | MIN | TYP† | MAX | |
| $V_{IK}$ | | $V_{CC}$ = 4.5 V, | $I_I$ = –18 mA | | | –1.2 | | | –1.2 | V |
| $I_{OH}$ | | $V_{CC}$ = 4.5 V, | $V_{OH}$ = 5.5 V | | | 0.1 | | | 0.1 | mA |
| $V_{OL}$ | | $V_{CC}$ = 4.5 V | $I_{OL}$ = 48 mA | | | 0.55 | | | | V |
| | | | $I_{OL}$ = 64 mA | | | | | | 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 |
| $I_{IL}$ | $\overline{OE}$ | $V_{CC}$ = 5.5 V, | $V_I$ = 0.4 V | | | –0.5 | | | –0.5 | mA |
| | A | | | | | –1 | | | –1 | |
| $I_{CC}$ | | $V_{CC}$ = 5.5 V | Outputs high | | 20 | 32 | | 20 | 32 | mA |
| | | | Outputs low | | 60 | 94 | | 60 | 94 | |

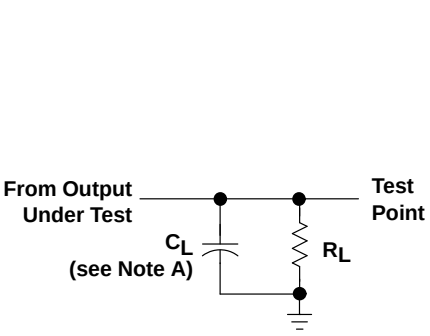
† All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.

## switching characteristics (see Figure 1)

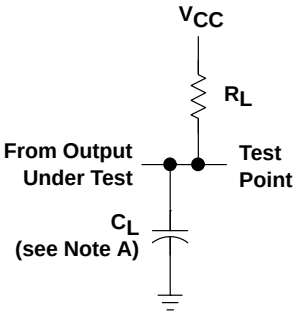
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $V_{CC}$ = 4.5 V to 5.5 V, $C_L$ = 50 pF, $R_L$ = 500 Ω, $T_A$ = MIN to MAX‡ | | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | SN54AS760 | | SN74AS760 | | |
| | | | MIN | MAX | MIN | MAX | |
| $t_{PLH}$ | A | Y | 3 | 19.5 | 3 | 18.5 | ns |
| $t_{PHL}$ | | | 1 | 7 | 1 | 6 | |
| $t_{PLH}$ | $\overline{OE}$ | Y | 3 | 19.5 | 3 | 18.5 | ns |
| $t_{PHL}$ | | | 1 | 8 | 1 | 7 | |

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

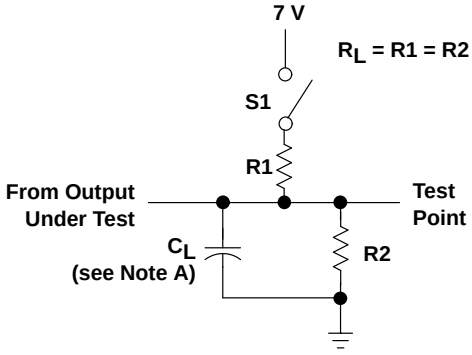
## PARAMETER MEASUREMENT INFORMATION
## SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



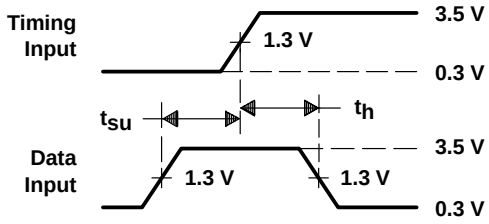

LOAD CIRCUIT FOR
BI-STATE
TOTEM-POLE OUTPUTS



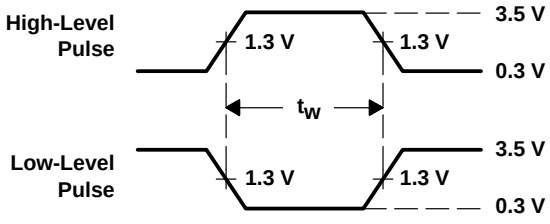

LOAD CIRCUIT
FOR OPEN-COLLECTOR OUTPUTS



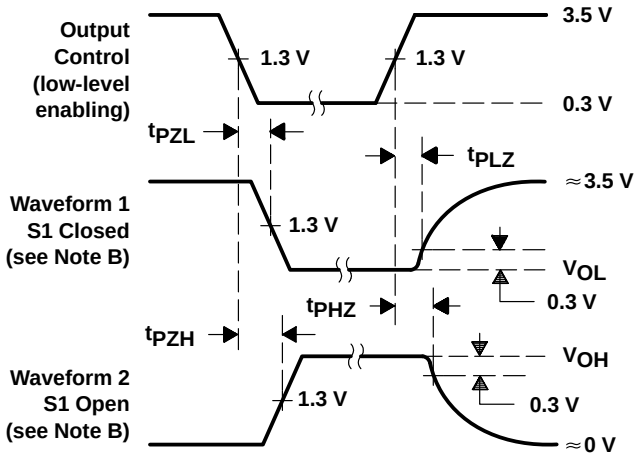

LOAD CIRCUIT
FOR 3-STATE OUTPUTS



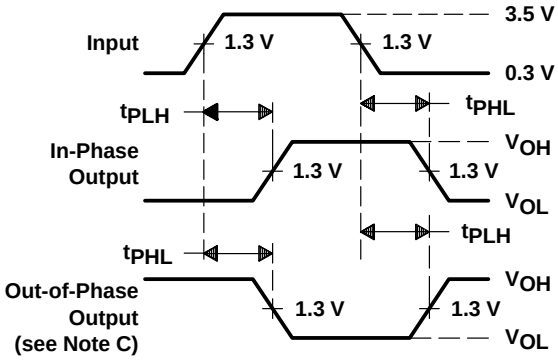

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES




VOLTAGE WAVEFORMS
PULSE DURATIONS




VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS




VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

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 ≤ 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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