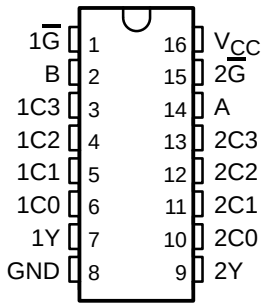
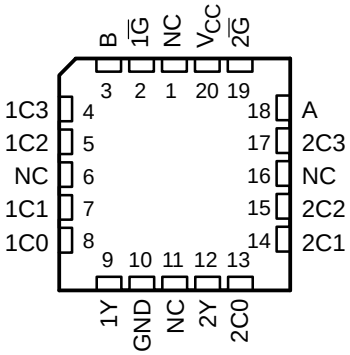
- **Inverting Versions of the ′ALS153**
- **Permit Multiplexing From n Lines to One Line**
- **Perform Parallel-to-Serial Conversion**
- **Strobe (Enable) Line Provided for Cascading (n Lines to n Lines)**
- **Typical Power Per Multiplexer Is 16 mW**
- **Package Options Include Plastic Small-Outline (D) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs**

**SN54ALS352 . . . J PACKAGE**
**SN74ALS352 . . . D OR N PACKAGE**
**(TOP VIEW)**




**SN54ALS352 . . . FK PACKAGE**
**(TOP VIEW)**




NC – No internal connection

## description

These data selectors/multiplexers contain inverters and drivers to supply fully complementary binary decoding data selection to the AND-OR-invert gates. Separate strobe ($\overline{G}$) inputs are provided for each of the two 4-line sections.

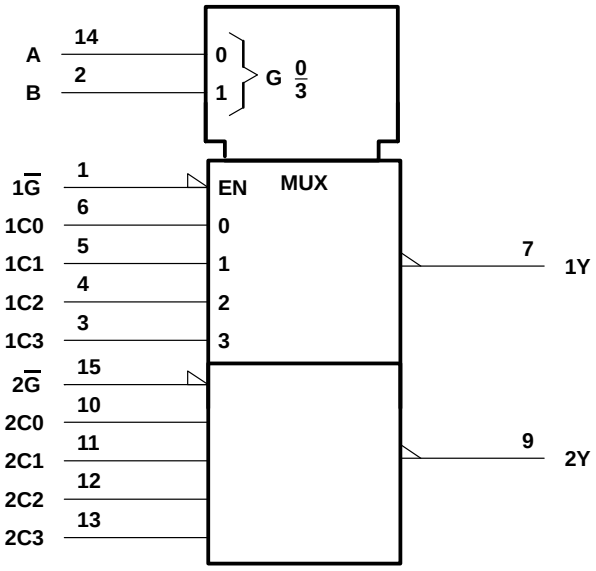
The SN54ALS352 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS352 is characterized for operation from 0°C to 70°C.

**FUNCTION TABLE**

| INPUTS | | | | | | STROBE $\overline{G}$ | OUTPUT Y |
|---|---|---|---|---|---|---|---|
| SELECT | | DATA | | | | | |
| B | A | C0 | C1 | C2 | C3 | | |
| X | X | X | X | X | X | H | H |
| L | L | L | X | X | X | L | H |
| L | L | H | X | X | X | L | L |
| L | H | X | L | X | X | L | H |
| L | H | X | H | X | X | L | L |
| H | L | X | X | L | X | L | H |
| H | L | X | X | H | X | L | L |
| H | H | X | X | X | L | L | H |
| H | H | X | X | X | H | L | L |

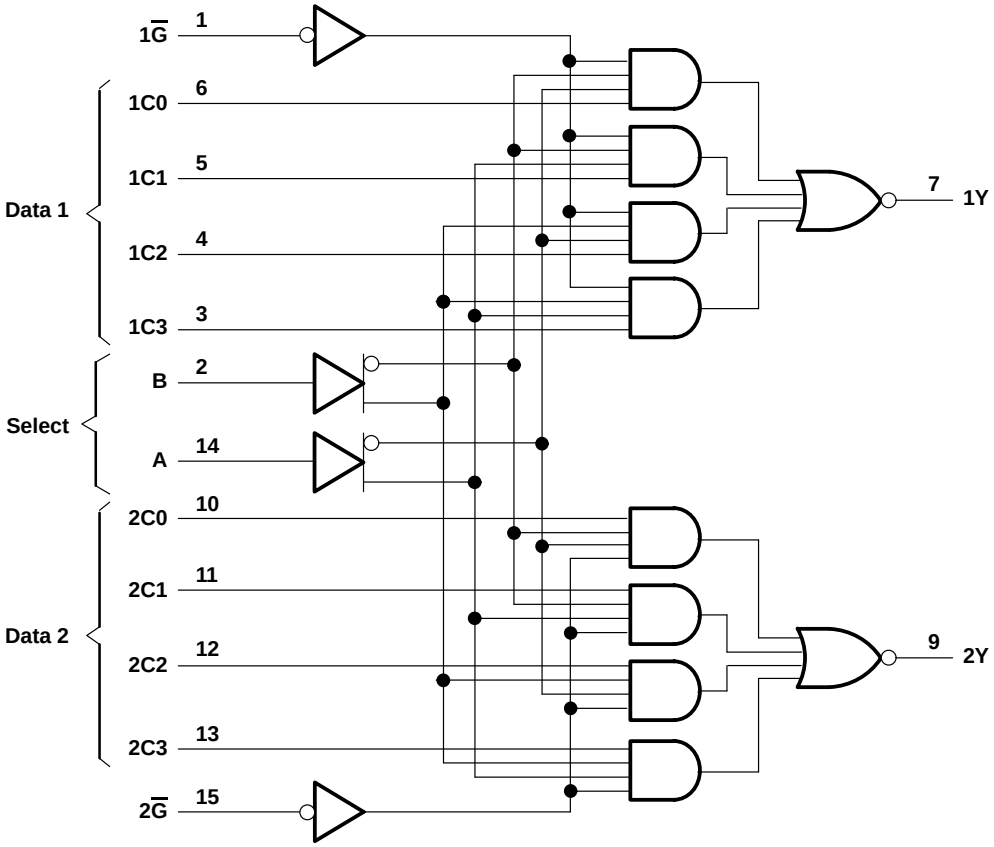
Select inputs A and B are common to both sections.

## logic symbol†




† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for the D, J, and N packages.

## logic diagram (positive logic)




Pin numbers shown are for the D, J, and N packages.

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

Supply voltage, $V_{CC}$ . . . . . 7 V
Input voltage, $V_I$ . . . . . 7 V
Operating free-air temperature range, $T_A$: SN54ALS352 . . . . . –55°C to 125°C
SN74ALS352 . . . . . 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

| | | SN54ALS352 | | | SN74ALS352 | | | 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 | | | –1 | | | –2.6 | mA |
| $I_{OL}$ | Low-level output current | | | 12 | | | 24 | 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 | | SN54ALS352 | | | SN74ALS352 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = 4.5 V, | $I_I$ = –18 mA | | | –1.5 | | | –1.5 | V |
| $V_{OH}$ | $V_{CC}$ = 4.5 V to 5.5 V, | $I_{OH}$ = –0.4 mA | $V_{CC}$ –2 | | | $V_{CC}$ –2 | | | V |
| | $V_{CC}$ = 4.5 V | $I_{OH}$ = –1 mA | 2.4 | 3.3 | | | | | |
| | | $I_{OH}$ = –2.6 mA | | | | 2.4 | 3.2 | | |
| $V_{OL}$ | $V_{CC}$ = 4.5 V | $I_{OL}$ = 12 mA | | 0.25 | 0.4 | | 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 | | | 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, | $V_I$ = 0.4 V | | | –0.1 | | | –0.1 | mA |
| $I_O$§ | $V_{CC}$ = 5.5 V, | $V_O$ = 2.25 V | –20 | | –112 | –30 | | –112 | mA |
| $I_{CC}$ | $V_{CC}$ = 5.5 V, | See Note 1 | | 6.5 | 10 | | 6.5 | 10 | mA |

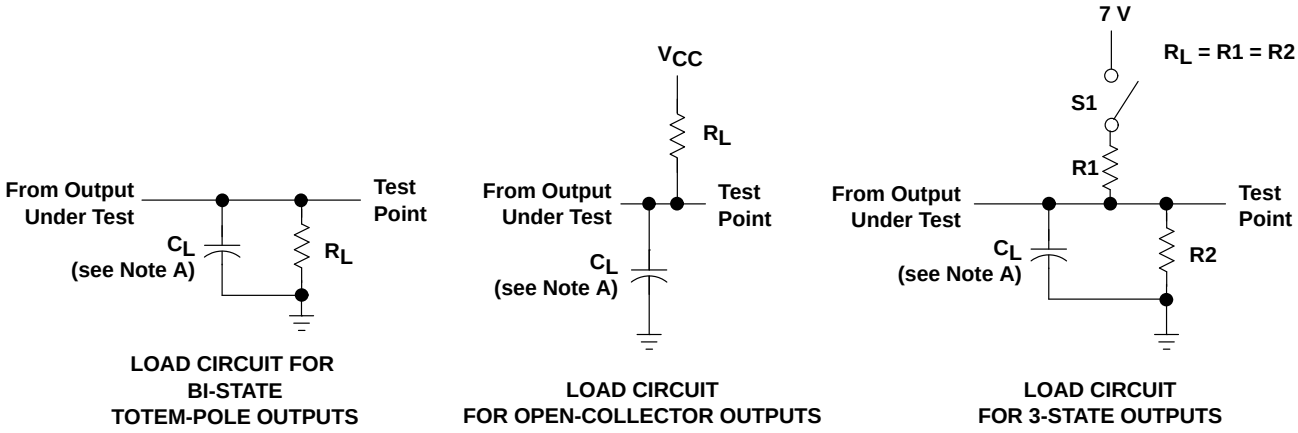
‡ All typical values are at $V_{CC}$ = 5 V, $T_A$ = 25°C.
§ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, $I_{OS}$.
NOTE 1: ICC is measured with data and select inputs at 4.5 V and $\overline{G}$ inputs grounded.

## 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 |
|---|---|---|---|---|---|---|---|
| | | | SN54ALS352 | | SN74ALS352 | | |
| | | | MIN | MAX | MIN | MAX | |
| $t_{PLH}$ | A or B | Y | 5 | 32 | 5 | 24 | ns |
| $t_{PHL}$ | | | 5 | 24 | 5 | 21 | |
| $t_{PLH}$ | Data (any C) | Y | 3 | 24 | 3 | 18 | ns |
| $t_{PHL}$ | | | 2 | 15 | 2 | 13 | |
| $t_{PLH}$ | $\overline{G}$ | Y | 4 | 26 | 4 | 18 | ns |
| $t_{PHL}$ | | | 4 | 24 | 4 | 20 | |

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

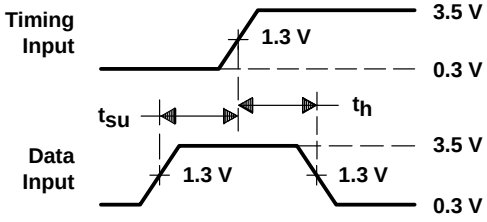
## PARAMETER MEASUREMENT INFORMATION
## SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



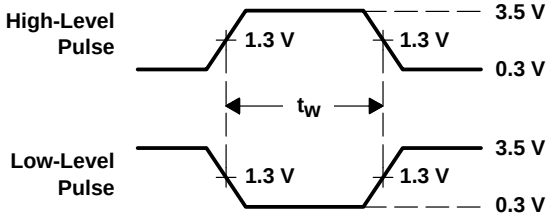

LOAD CIRCUIT FOR BI-STATE TOTEM-POLE OUTPUTS

LOAD CIRCUIT FOR OPEN-COLLECTOR OUTPUTS

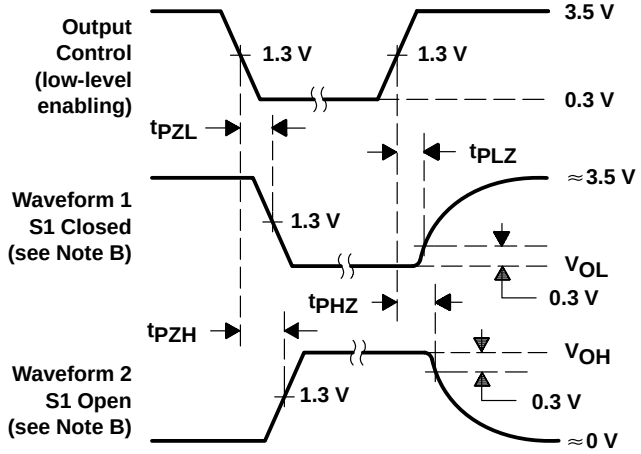
LOAD CIRCUIT FOR 3-STATE OUTPUTS



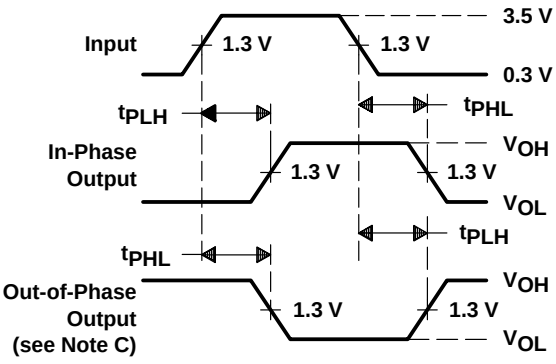

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES




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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