

**Rochester Electronics  
Manufactured Components**

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

**Quality Overview**

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
  - Class Q Military
  - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
  - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

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The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

# SN54LS242, SN54LS243, SN74LS242, SN74LS243 QUADRUPLE BUS TRANSCEIVERS

APRIL 1985—REVISED MARCH 1988

- Two-Way Asynchronous Communication Between Data Buses
- PNP Inputs Reduce D-C Loading
- Hysteresis (Typically 400 mV) at Inputs Improves Noise Margin

## description

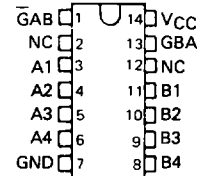
These four-data-line transceivers are designed for asynchronous two-way communications between data buses. The SN74LS' can be used to drive terminated lines down to 133 ohms.

The SN54' family is characterized for operation over the full military temperature range of  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN74' family is characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

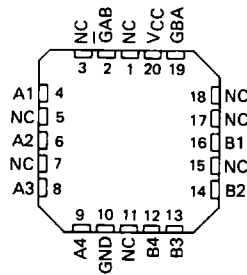
FUNCTION TABLE (EACH TRANSCEIVER)

| INPUTS                  |     | 'LS242                                                | 'LS243                                     |
|-------------------------|-----|-------------------------------------------------------|--------------------------------------------|
| $\overline{\text{GAB}}$ | GBA |                                                       |                                            |
| L                       | L   | $\overline{\text{A}}$ to B                            | A to B                                     |
| H                       | H   | $\overline{\text{B}}$ to A                            | B to A                                     |
| H                       | L   | Isolation                                             | Isolation                                  |
| L                       | H   | Latch A and B<br>( $\text{A} = \overline{\text{B}}$ ) | Latch A and B<br>( $\text{A} = \text{B}$ ) |

SN54LS242, SN54LS243 . . . J OR W PACKAGE  
SN74LS242, SN74LS243 . . . D OR N PACKAGE  
(TOP VIEW)



SN54LS242, SN54LS243 . . . FK PACKAGE  
(TOP VIEW)

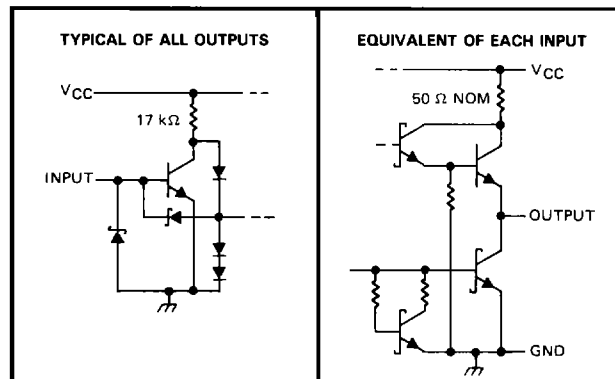


NC—No internal connection

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TTL Devices

## schematics of inputs and outputs



PRODUCTION DATA documents contain information 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.

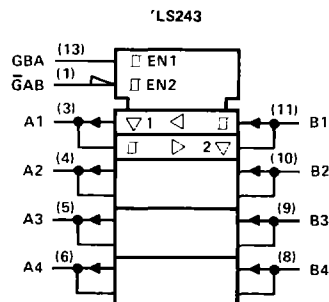
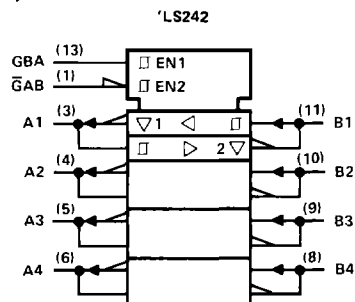
TEXAS  
INSTRUMENTS

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2-697

# SN54LS242, SN54LS243, SN74LS242, SN74LS243 QUADRUPLE BUS TRANSCEIVERS

## logic symbols†

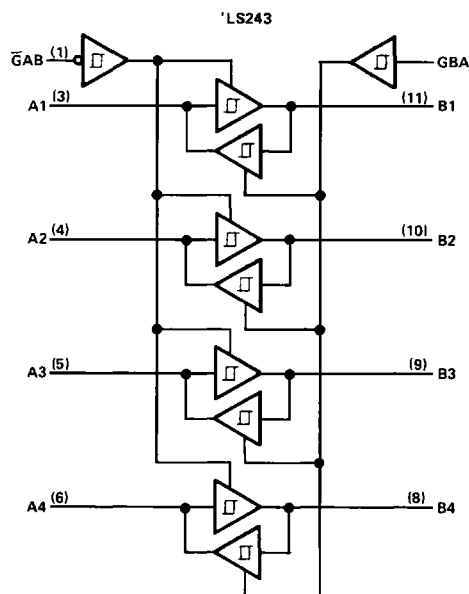
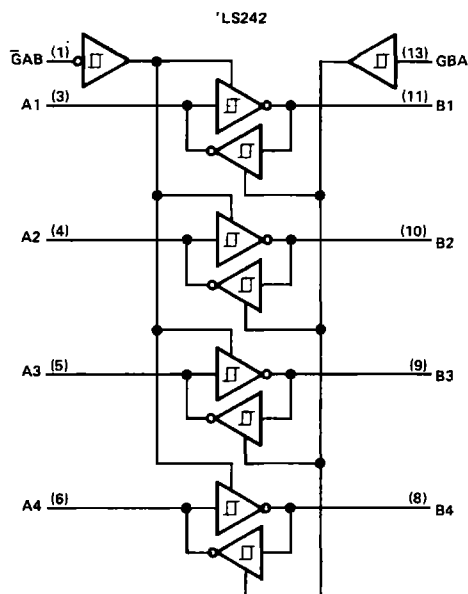


†These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.

## 2

## TTL Devices

## logic diagrams (positive logic)



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

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

|                                       |                |
|---------------------------------------|----------------|
| Supply voltage, $V_{CC}$ (see Note 1) | 7 V            |
| Input voltage                         | 7 V            |
| Off-state output voltage              | 5.5 V          |
| Operating free-air temperature range: |                |
| SN54LS'                               | –55°C to 125°C |
| SN74LS'                               | 0°C to 70°C    |
| Storage temperature range             | –65°C to 150°C |

NOTE 1. Voltage values are with respect to network ground terminal

# SN54LS242, SN54LS243, SN74LS242, SN74LS243 QUADRUPLE BUS TRANSCEIVERS

## recommended operating conditions

|                                       | SN54LS' |     |     | SN74LS' |     |      | UNIT |
|---------------------------------------|---------|-----|-----|---------|-----|------|------|
|                                       | MIN     | NOM | MAX | MIN     | NOM | MAX  |      |
| $V_{CC}$ Supply voltage, (see Note 1) | 4.5     | 5   | 5.5 | 4.75    | 5   | 5.25 | 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     |         |     | 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†                                                                                |                       | SN54LS' |      |      | SN74LS' |      |      | UNIT |
|----------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------|-----------------------|---------|------|------|---------|------|------|------|
|                                  |                                |                                                                                                 |                       | MIN     | TYP‡ | MAX  | MIN     | TYP‡ | MAX  |      |
| $V_{IK}$ A or B                  |                                | $V_{CC} = \text{MIN.}$ $I_I = -18 \text{ mA}$                                                   |                       |         |      | -1.5 |         |      | -1.5 | V    |
| Hysteresis ( $V_{T+} - V_{T-}$ ) |                                | $V_{CC} = \text{MIN.}$                                                                          |                       | 0.2     | 0.4  |      | 0.2     | 0.4  |      | V    |
| $V_{OH}$                         |                                | $V_{CC} = \text{MIN.}$ $V_{IH} = 2 \text{ V.}$ $V_{IL} = \text{MAX.}$ $I_{OH} = -3 \text{ mA}$  |                       | 2.4     | 3.1  |      | 2.4     | 3.1  |      | V    |
|                                  |                                | $V_{CC} = \text{MIN.}$ $V_{IH} = 2 \text{ V.}$ $V_{IL} = 0.5 \text{ V.}$ $I_{OH} = \text{MAX.}$ |                       | 2       |      |      | 2       |      |      | V    |
| $V_{OL}$                         |                                | $V_{CC} = \text{MIN.}$ $V_{IH} = 2 \text{ V.}$ $I_{OL} = 12 \text{ mA}$                         |                       | 0.25    | 0.4  |      | 0.25    | 0.4  |      | V    |
|                                  |                                | $V_{IL} = \text{MAX.}$ $I_{OL} = 24 \text{ mA}$                                                 |                       |         |      |      | 0.35    | 0.5  |      | V    |
| $I_{OZH}$                        |                                | $V_{CC} = \text{MAX.}$ $V_{IH} = 2 \text{ V.}$ $V_O = 2.7 \text{ V}$                            |                       |         |      | 40   |         |      | 40   | µA   |
| $I_{OZL}$                        |                                | $V_{IL} = \text{MAX.}$ $V_O = 0.4 \text{ V}$                                                    |                       |         |      | -200 |         |      | -200 | µA   |
| $I_I$                            | A or B                         | $V_{CC} = \text{MAX.}$                                                                          | $V_I = 5.5 \text{ V}$ |         |      | 0.1  |         |      | 0.1  | mA   |
|                                  | $\overline{\text{GAB}}$ or GBA |                                                                                                 | $V_I = 7 \text{ V}$   |         |      | 0.1  |         |      | 0.1  | mA   |
| $I_{IH}$                         |                                | $V_{CC} = \text{MAX.}$ $V_I = 2.7 \text{ V}$                                                    |                       |         |      | 20   |         |      | 20   | µA   |
| $I_{IL}$                         | A inputs                       | $V_{CC} = \text{MAX.}$ $V_I = 0.4 \text{ V.}$ $\overline{\text{GAB}}$ and GBA at 0 V            |                       |         |      | -0.2 |         |      | -0.2 | mA   |
|                                  | B inputs                       | $V_{CC} = \text{MAX.}$ $V_I = 0.4 \text{ V.}$ $\overline{\text{GAB}}$ and GBA at 4.5 V          |                       |         |      | -0.2 |         |      | -0.2 | mA   |
|                                  | $\overline{\text{GAB}}$ or GBA | $V_{CC} = \text{MAX.}$ $V_I = 0.4 \text{ V}$                                                    |                       |         |      | -0.2 |         |      | -0.2 | mA   |
| $I_{OS}$                         |                                | $V_{CC} = \text{MAX.}$                                                                          |                       | -40     |      | -225 | -40     |      | -225 | mA   |
| $I_{CC}$                         | Outputs high                   | $V_{CC} = \text{MAX.}$ Outputs open,                                                            | 'LS242, 'LS243        |         |      | 22   |         |      | 22   | 38   |
|                                  | Outputs low                    |                                                                                                 | 'LS242, 'LS243        |         |      | 29   |         |      | 29   | 50   |
|                                  | All outputs disabled           | See Note 2                                                                                      | 'LS242                |         |      | 29   |         |      | 29   | 50   |
|                                  |                                |                                                                                                 | 'LS243                |         |      | 32   |         |      | 32   | 54   |

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

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

§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.

NOTE 2  $I_{CC}$  is measured with transceivers enabled in one direction only, or with all transceivers disabled

## switching characteristics, $V_{CC} = 5 \text{ V}$ , $T_A = 25^\circ\text{C}$

| PARAMETER | TEST CONDITIONS                                          |  | 'LS242 |     |     | 'LS243 |     |     | UNIT |
|-----------|----------------------------------------------------------|--|--------|-----|-----|--------|-----|-----|------|
|           |                                                          |  | MIN    | TYP | MAX | MIN    | TYP | MAX |      |
| $t_{PLH}$ | $R_L = 667 \Omega$ $C_L = 45 \text{ pF.}$<br>See Note 3  |  |        | 9   | 14  |        | 12  | 18  | ns   |
| $t_{PHL}$ |                                                          |  |        | 12  | 18  |        | 12  | 18  | ns   |
| $t_{PZL}$ |                                                          |  |        | 20  | 30  |        | 20  | 30  | ns   |
| $t_{PZH}$ | $R_L = 667 \Omega$ , $C_L = 5 \text{ pF.}$<br>See Note 3 |  |        | 15  | 23  |        | 15  | 23  | ns   |
| $t_{PLZ}$ |                                                          |  |        | 10  | 20  |        | 10  | 20  | ns   |
| $t_{PHZ}$ |                                                          |  |        | 15  | 25  |        | 15  | 25  | ns   |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

