



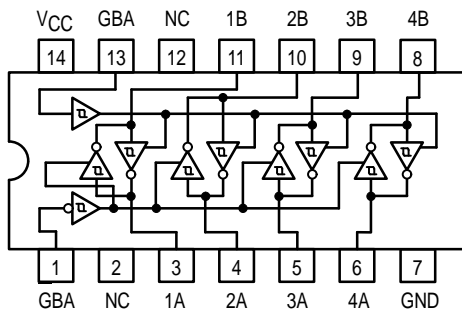
QUAD BUS TRANSCEIVER

The SN54/74LS242 and SN54/74LS243 are Quad Bus Transmitters/Receivers designed for 4-line asynchronous 2-way data communications between data buses.

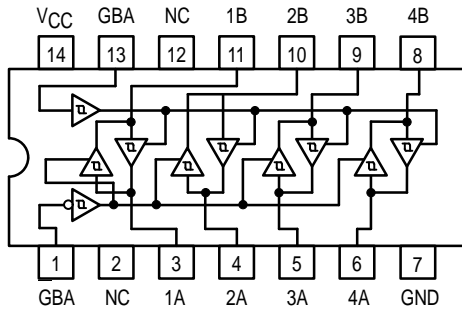
- Hysteresis at Inputs to Improve Noise Immunity
- 2-Way Asynchronous Data Bus Communication
- Input Clamp Diodes Limit High-Speed Termination Effects

LOGIC AND CONNECTION DIAGRAMS DIP (TOP VIEW)

SN54/74LS242



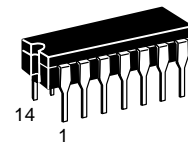
SN54/74LS243



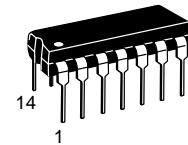
NOTE:
The Flatpak version has the same pinouts (Connection Diagram) as the Dual In-Line Package.

SN54/74LS242
SN54/74LS243

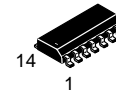
QUAD BUS TRANSCEIVER
LOW POWER SCHOTTKY



J SUFFIX
CERAMIC
CASE 632-08



N SUFFIX
PLASTIC
CASE 646-06



D SUFFIX
SOIC
CASE 751A-02

ORDERING INFORMATION

SN54LSXXXJ Ceramic
SN74LSXXXN Plastic
SN74LSXXXDW SOIC

TRUTH TABLES

SN54/74LS242

| INPUTS | | OUTPUT | INPUTS | | OUTPUT |
|--------|---|--------|--------|---|--------|
| GAB | D | | GAB | D | |
| L | L | H | L | X | (Z) |
| L | H | L | H | L | H |
| H | X | (Z) | H | H | L |

SN54/74LS243

| INPUTS | | OUTPUT | INPUTS | | OUTPUT |
|--------|---|--------|--------|---|--------|
| GAB | D | | GAB | D | |
| L | L | L | L | X | (Z) |
| L | H | H | H | L | H |
| H | X | (Z) | H | H | L |

H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = HIGH Impedance

SN54/74LS242 • SN54/74LS243

GUARANTEED OPERATING RANGES

| Symbol | Parameter | | Min | Typ | Max | Unit |
|-----------------|-------------------------------------|----------|-------------|------------|-------------|------|
| V _{CC} | Supply Voltage | 54 74 | 4.5 4.75 | 5.0 5.0 | 5.5 5.25 | V |
| T _A | Operating Ambient Temperature Range | 54 74 | -55 0 | 25 25 | 125 70 | °C |
| I _{OH} | Output Current — High | 54, 74 | | | -3.0 | mA |
| | | 54 74 | | | -12 -15 | mA |
| I _{OL} | Output Current — Low | 54 | | | 12 | mA |
| | | 74 | | | 24 | mA |

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

| Symbol | Parameter | | Limits | | | Unit | Test Conditions |
|----------------------------------|--|------------------------------------|--------|-------|------|------|--|
| | | | Min | Typ | Max | | |
| V _{IH} | Input HIGH Voltage | | 2.0 | | | V | Guaranteed Input HIGH Voltage for All Inputs |
| V _{IL} | Input LOW Voltage | 54 | | | 0.7 | V | Guaranteed Input LOW Voltage for All Inputs |
| | | 74 | | | 0.8 | | |
| V _{T+} -V _{T-} | Hysteresis | | 0.2 | 0.4 | | V | V _{CC} = MIN |
| V _{IK} | Input Clamp Diode Voltage | | | -0.65 | -1.5 | V | V _{CC} = MIN, I _{IN} = -18 mA |
| V _{OH} | Output HIGH Voltage | 54, 74 | 2.4 | 3.4 | | V | V _{CC} = MIN, I _{OH} = -3.0 mA |
| | | 54, 74 | 2.0 | | | V | V _{CC} = MIN, I _{OH} = MAX |
| V _{OL} | Output LOW Voltage | 54, 74 | | 0.25 | 0.4 | V | I _{OL} = 12 mA |
| | | 74 | | 0.35 | 0.5 | V | I _{OL} = 24 mA |
| I _{OZH} | Output Off Current HIGH | | | | 40 | μA | V _{CC} = MAX, V _{OUT} = 2.7 V |
| I _{OZL} | Output Off Current LOW | | | | -200 | μA | V _{CC} = MAX, V _{OUT} = 0.4 V |
| I _{IH} | Input HIGH Current | D, E ₁ , E ₂ | | | 20 | μA | V _{CC} = MAX, V _{IN} = 2.7 V |
| | | E ₁ , E ₂ | | | 0.1 | mA | V _{CC} = MAX, V _{IN} = 7.0 V |
| | | D Input | | | 0.1 | mA | V _{CC} = MAX, V _{IN} = 5.5 V |
| I _{IL} | Input LOW Current | | | | -0.2 | mA | V _{CC} = MAX, V _{IN} = 0.4 V |
| I _{OS} | Output Short Circuit Current (Note 1) | | -40 | | -225 | mA | V _{CC} = MAX |
| I _{CC} | Power Supply Current Total, Output HIGH | | | | 38 | mA | V _{CC} = MAX |
| | | | | | 50 | | |
| | Total at HIGH Z | LS242 | | | 50 | | |
| | | LS243 | | | 54 | | |

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

SN54/74LS242 • SN54/74LS243

AC CHARACTERISTICS ($T_A = 25^\circ\text{C}$, $V_{CC} = 5.0\text{ V}$)

| Symbol | Parameter | Limits | | | | | | Unit | Test Conditions |
|------------------------|-------------------------------------|--------|-----------|----------|-------|----------|----------|------|--|
| | | LS242 | | | LS243 | | | | |
| | | Min | Typ | Max | Min | Typ | Max | | |
| t_{PLH} t_{PHL} | Propagation Delay, Data to Output | | 9.0 12 | 14 18 | | 12 12 | 18 18 | ns | $C_L = 45\text{ pF}$, $R_L = 667\ \Omega$ |
| t_{PZH} | Output Enable Time to HIGH Level | | 15 | 23 | | 15 | 23 | ns | |
| t_{PZL} | Output Enable Time to LOW Level | | 20 | 30 | | 20 | 30 | ns | |
| t_{PLZ} | Output Disable Time from LOW Level | | 15 | 25 | | 15 | 25 | ns | $C_L = 5.0\text{ pF}$, $R_L = 667\ \Omega$ |
| t_{PHZ} | Output Disable Time from HIGH Level | | 10 | 18 | | 10 | 18 | ns | |

AC WAVEFORMS

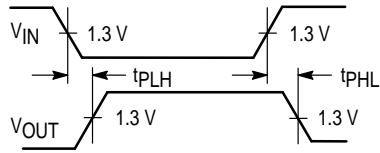


Figure 1

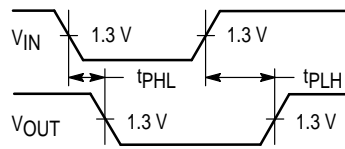


Figure 2

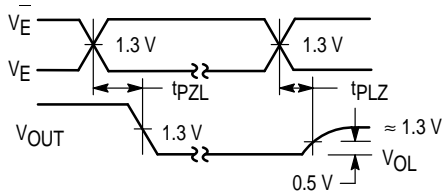


Figure 3

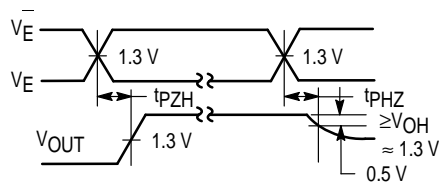
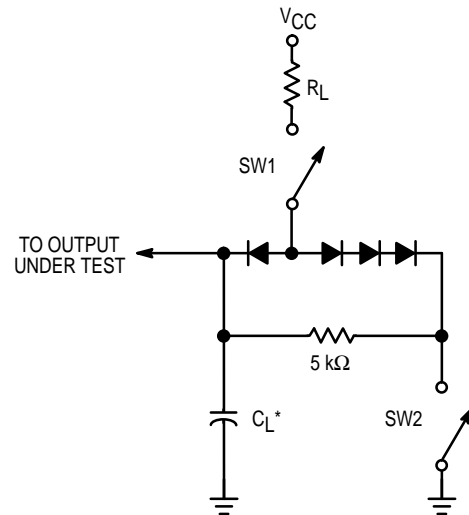


Figure 4



SWITCH POSITIONS

| SYMBOL | SW1 | SW2 |
|-----------|--------|--------|
| t_{PZH} | Open | Closed |
| t_{PZL} | Closed | Open |
| t_{PLZ} | Closed | Closed |
| t_{PHZ} | Closed | Closed |

Figure 5