

DM74LS243

Quadruple Bus Transceiver

General Description

This four data line transceiver is designed for asynchronous two-way communications between data buses. It can be used to drive terminated lines down to 133Ω.

Features

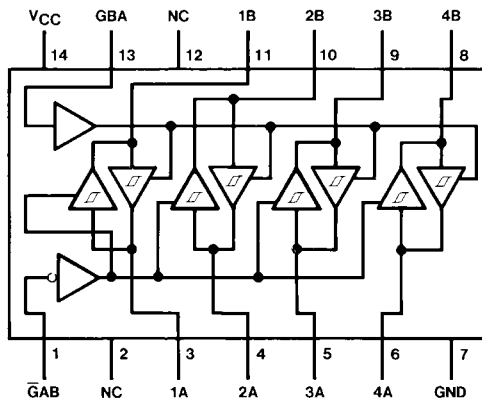
- Two-way asynchronous communication between data buses
- PNP inputs reduce DC loading on bus line
- Hysteresis at data inputs improves noise margin

Ordering Code:

| Order Number | Package Number | Package Description |
|--------------|----------------|---|
| DM74LS243M | M14A | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow |
| DM74LS243N | N14A | 14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Function Table

| Control Inputs | | Data Port Status | |
|----------------|-----|------------------|----------|
| G AB | GBA | A | B |
| H | H | O | I |
| L | H | (Note 1) | (Note 1) |
| H | L | ISOLATED | |
| L | L | I | O |

I = Input
O = Output
H = HIGH Logic Level
L = LOW Logic Level

Note 1: Possibly destructive oscillation may occur if the transceivers are enabled in both directions at once.

Absolute Maximum Ratings(Note 2)

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | |
| Any G | 7V |
| A or B | 5.5V |
| Operating Free Air Temperature Range | 0°C to +70°C |
| Storage Temperature Range | –65°C to +150°C |

Note 2: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

| Symbol | Parameter | Min | Nom | Max | Units |
|-----------------|--------------------------------|------|-----|------|-------|
| V _{CC} | Supply Voltage | 4.75 | 5 | 5.25 | V |
| V _{IH} | HIGH Level Input Voltage | 2 | | | V |
| V _{IL} | LOW Level Input Voltage | | | 0.8 | V |
| I _{OH} | HIGH Level Output Current | | | –15 | mA |
| I _{OL} | LOW Level Output Current | | | 24 | mA |
| T _A | Free Air Operating Temperature | 0 | | 70 | °C |

Electrical Characteristics

over recommended operating free air temperature range (unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ (Note 3) | Max | Units |
|------------------|---|--|--|-----------------|----------------|-------|
| V _I | Input Clamp Voltage | V _{CC} = Min, I _I = –18 mA | | | –1.5 | V |
| HYS | Hysteresis (V _{T+} – V _{T–}) (Data Inputs Only) | V _{CC} = Min | 0.2 | 0.4 | | V |
| V _{OH} | HIGH Level Output Voltage | V _{CC} = Min, V _{IH} = Min V _{IL} = Max, I _{OH} = –1 mA | 2.7 | | | V |
| | | V _{CC} = Min, V _{IH} = Min V _{IL} = Max, I _{OH} = –3 mA | 2.4 | 3.4 | | |
| | | V _{CC} = Min, V _{IH} = Min V _{IL} = 0.5V, I _{OH} = Max | 2 | | | |
| V _{OL} | LOW Level Output Voltage | V _{CC} = Min V _{IL} = Max V _{IH} = Min | I _{OL} = 12 mA I _{OL} = Max | | 0.4 0.5 | V |
| I _{OZH} | Off-State Output Current, HIGH Level Voltage Applied | V _{CC} = Max V _{IL} = Max | V _O = 2.7V | | 40 | μA |
| I _{OZL} | Off-State Output Current, LOW Level Voltage Applied | V _{IH} = Min | V _O = 0.4V | | –200 | μA |
| I _I | Input Current at Maximum Input Voltage | V _{CC} = Max | V _I = 5.5V V _I = 7V | A or B Any G | 0.1 0.1 | mA |
| I _{IH} | HIGH Level Input Current | V _{CC} = Max, V _I = 2.7V | | | 20 | μA |
| I _{IL} | LOW Level Input Current | V _{CC} = Max, V _I = 0.4V | | | –0.2 | mA |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 4) | –40 | | –225 | mA |
| I _{CC} | Supply Current | V _{CC} = Max | Outputs HIGH Outputs LOW Outputs Disabled | 22 29 32 | 38 50 54 | mA |
| | | | | | | |
| | | | | | | |

Note 3: All typicals are at V_{CC} = 5V, T_A = 25°C.

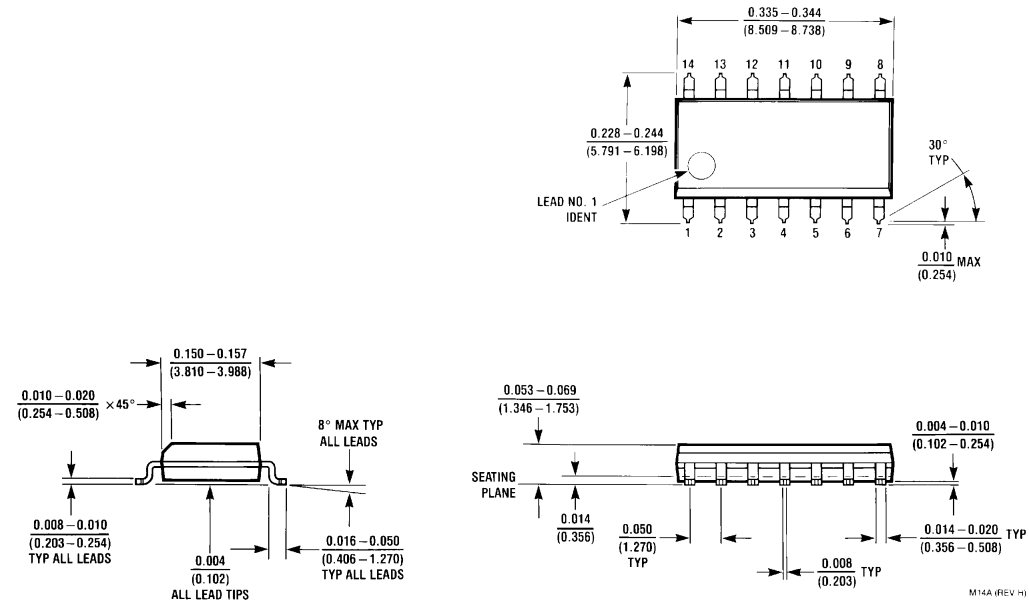
Note 4: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

at $V_{CC} = 5V$, $T_A = 25^\circ C$

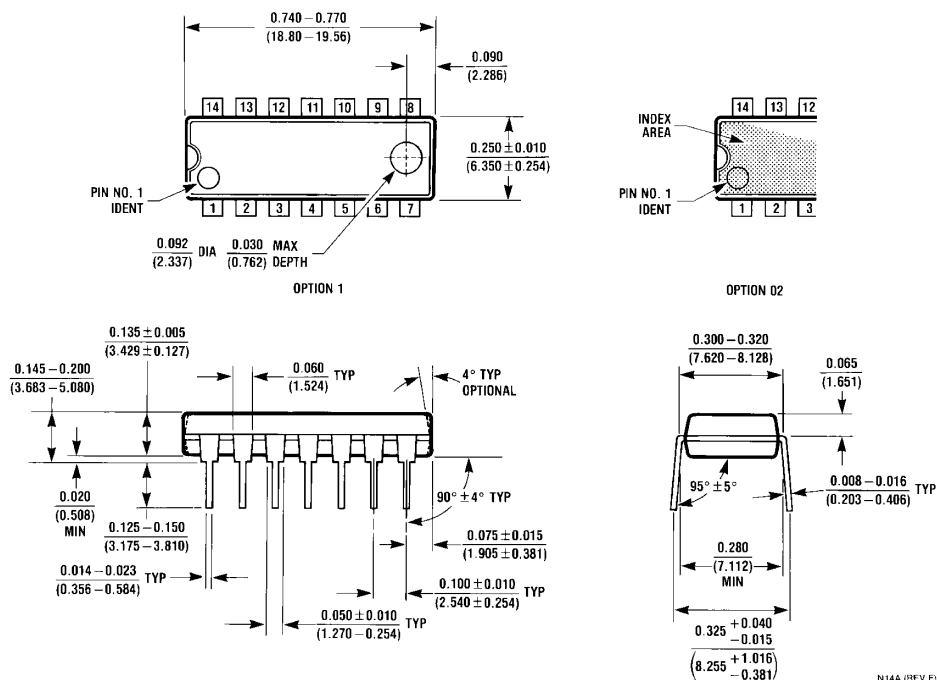
| Symbol | Parameter | Conditions | Min | Max | Units |
|-----------|--|---|-----|-----|-------|
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | $C_L = 45 \text{ pF}$ $R_L = 667\Omega$ | | 18 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | $C_L = 45 \text{ pF}$ $R_L = 667\Omega$ | | 18 | ns |
| t_{PZL} | Output Enable Time to LOW Level | $C_L = 45 \text{ pF}$ $R_L = 667\Omega$ | | 30 | ns |
| t_{PZH} | Output Enable Time to HIGH Level | $C_L = 45 \text{ pF}$ $R_L = 667\Omega$ | | 23 | ns |
| t_{PLZ} | Output Disable Time from LOW Level | $C_L = 5 \text{ pF}$ $R_L = 667\Omega$ | | 25 | ns |
| t_{PHZ} | Output Disable Time from HIGH Level | $C_L = 5 \text{ pF}$ $R_L = 667\Omega$ | | 18 | ns |
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | $C_L = 150 \text{ pF}$ $R_L = 667\Omega$ | | 21 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | $C_L = 150 \text{ pF}$ $R_L = 667\Omega$ | | 22 | ns |
| t_{PZL} | Output Enable Time to LOW Level | $C_L = 150 \text{ pF}$ $R_L = 667\Omega$ | | 33 | ns |
| t_{PZH} | Output Enable Time to HIGH Level | $C_L = 150 \text{ pF}$ $R_L = 667\Omega$ | | 26 | ns |

Physical Dimensions inches (millimeters) unless otherwise noted



**14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow
Package Number M14A**

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
Package Number N14A

N14A (REV F)

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

www.fairchildsemi.com