

DM74ALS1000A Quadruple 2-Input NAND Buffer

General Description

These devices contain four independent 2-input buffer/drivers, each of which performs the logic NAND function. The DM74ALS1000A is a buffer/driver version of the DM74ALS00A.

Features

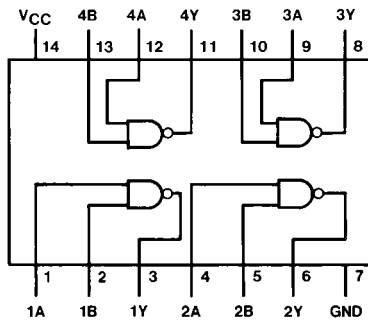
- Switching specifications at 50 pF
- Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Improved line receiving characteristics

Ordering Code:

| Order Number | Package Number | Package Description |
|---------------|----------------|---|
| DM74ALS1000AM | M14A | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow |
| DM74ALS1000AN | 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

$$Y = \overline{AB}$$

| Inputs | | Output |
|--------|---|--------|
| A | B | Y |
| L | L | H |
| L | H | H |
| H | L | H |
| H | H | L |

H = HIGH Logic Level
L = LOW Logic Level

Absolute Maximum Ratings(Note 1)

| | |
|--------------------------------------|-----------------|
| Supply Voltage | 7V |
| Input Voltage | 7V |
| Operating Free Air Temperature Range | 0°C to +70°C |
| Storage Temperature Range | -65°C to +150°C |
| Typical θ_{JA} | |
| N Package | 83.0°C/W |
| M Package | 114.0°C/W |

Note 1: 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 | 4.5 | 5 | 5.5 | V |
| V_{IH} | HIGH Level Input Voltage | 2 | | | V |
| V_{IL} | LOW Level Input Voltage | | | 0.8 | V |
| I_{OH} | HIGH Level Output Current | | | -2.6 | 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. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.

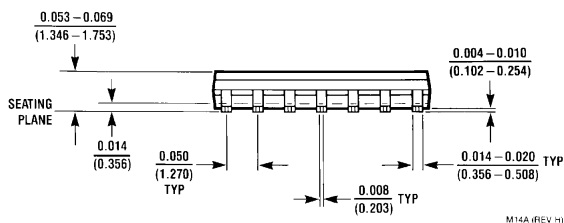
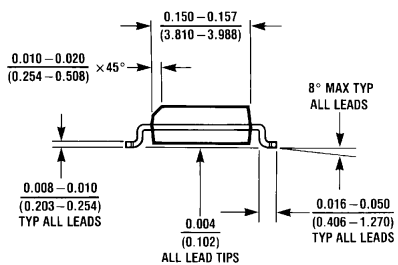
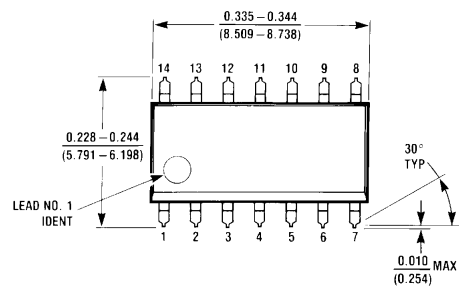
| Symbol | Parameter | Conditions | Min | Typ | Max | Units | |
|-----------|--|--|-----------------------|--------------|------|---------|---|
| V_{IK} | Input Clamp Voltage | $V_{CC} = 4.5V$, $I_I = -18 mA$ | | | -1.5 | V | |
| V_{OH} | HIGH Level Output Voltage | $V_{CC} = 4.5V$ $V_{IL} = V_{IL Max}$ | $I_{OH} = Max$ | 2.4 | 3.2 | V | |
| | | $V_{CC} = 4.5V$ to $5.5V$ | $I_{OH} = -400 \mu A$ | $V_{CC} - 2$ | | V | |
| V_{OL} | LOW Level Output Voltage | $V_{CC} = 4.5V$ | $I_{OL} = 12 mA$ | | 0.25 | 0.4 | V |
| | | $V_{IH} = 2V$ | $I_{OL} = 24 mA$ | | 0.35 | 0.5 | V |
| I_I | Input Current at Maximum Input Voltage | $V_{CC} = 5.5V$, $V_{IH} = 7V$ | | | 0.1 | mA | |
| I_{IH} | HIGH Level Input Current | $V_{CC} = 5.5V$, $V_{IH} = 2.7V$ | | | 20 | μA | |
| I_{IL} | LOW Level Input Current | $V_{CC} = 5.5V$, $V_{IL} = 0.4V$ | | | -0.1 | mA | |
| I_O | Output Drive Current | $V_{CC} = 5.5V$, $V_O = 2.25V$ | -30 | | -112 | mA | |
| I_{CCH} | Supply Current with Outputs HIGH | $V_{CC} = 5.5V$, $V_I = 0V$ | | 0.86 | 1.6 | mA | |
| I_{CCL} | Supply Current with Outputs LOW | $V_{CC} = 5.5V$, $V_I = 4.5V$ | | 4.8 | 7.8 | mA | |

Switching Characteristics

over recommended operating free air temperature range

| Symbol | Parameter | Conditions | Min | Max | Units |
|-----------|--|--|-----|-----|-------|
| t_{PLH} | Propagation Delay Time LOW-to-HIGH Level Output | $V_{CC} = 4.5V$ to $5.5V$ $R_L = 500\Omega$ | 2 | 8 | ns |
| | | $C_L = 50 pF$ | 2 | 7 | ns |
| t_{PHL} | Propagation Delay Time HIGH-to-LOW Level Output | | | | |

Physical Dimensions inches (millimeters) unless otherwise noted



**14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150 Narrow
Package Number M14A**

M14A (REV H)

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

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