

# 74F37

## Quad Two-Input NAND Buffer

### General Description

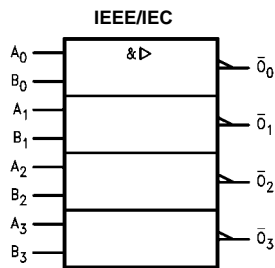
This device contains four independent gates, each of which performs the logic NAND function.

### Ordering Code:

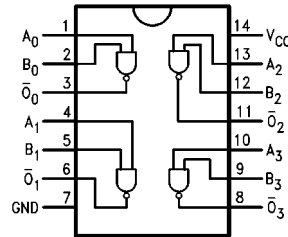
| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| 74F37SC      | M14A           | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow |
| 74F37SJ      | M14D           | 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide               |
| 74F37PC      | 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.

### Logic Symbol



### Connection Diagram



### Unit Loading/Fan Out

| Pin Names   | Description | U.L.<br>HIGH/LOW | Input $I_{IH}/I_{IL}$<br>Output $I_{OH}/I_{OL}$ |
|-------------|-------------|------------------|---|
| $A_n, B_n$  | Inputs      | 1.0/2.0          | 20 $\mu$ A/-1.2 mA                              |
| $\bar{O}_n$ | Outputs     | 600/106.6 (80)   | -12 mA/64 mA<br>(48 mA)                         |

### Function Table

| Inputs |   | Output    |
|--------|---|-----------|
| A      | B | $\bar{O}$ |
| L      | L | H         |
| L      | H | H         |
| H      | L | H         |
| H      | H | L         |

H = HIGH Voltage Level  
L = LOW Voltage Level

**Absolute Maximum Ratings** (Note 1)

|  |                                      |
|--|--------------------------------------|
| Storage Temperature  | -65°C to +150°C                      |
| Ambient Temperature under Bias   | -55°C to +125°C                      |
| Junction Temperature under Bias  | -55°C to +150°C                      |
| V <sub>CC</sub> Pin Potential to Ground Pin                            | -0.5V to +7.0V                       |
| Input Voltage (Note 2)   | -0.5V to +7.0V                       |
| Input Current (Note 2)   | -30 mA to +5.0 mA                    |
| Voltage Applied to Output<br>in HIGH State (with V <sub>CC</sub> = 0V) |                                      |
| Standard Output  | -0.5V to V <sub>CC</sub>             |
| 3-STATE Output   | -0.5V to +5.5V                       |
| Current Applied to Output<br>in LOW State (Max)                        | twice the rated I <sub>OL</sub> (mA) |

**Recommended Operating Conditions**

|                              |                |
|------------------------------|----------------|
| Free Air Ambient Temperature | 0°C to +70°C   |
| Supply Voltage               | +4.5V to +5.5V |

**Note 1:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Note 2:** Either voltage limit or current limit is sufficient to protect inputs.

**DC Electrical Characteristics**

| Symbol           | Parameter                         | Min  | Typ               | Max  | Units | V <sub>CC</sub> | Conditions   |
|------------------|-----------------------------------|--|-------------------|------|-------|-----------------|--|
| V <sub>IH</sub>  | Input HIGH Voltage                | 2.0  |                   |      | V     |                 | Recognized as a HIGH Signal  |
| V <sub>IL</sub>  | Input LOW Voltage                 |  |                   | 0.8  | V     |                 | Recognized as a LOW Signal   |
| V <sub>CD</sub>  | Input Clamp Diode Voltage         |  |                   | -1.2 | V     | Min             | I <sub>IN</sub> = -18 mA   |
| V <sub>OH</sub>  | Output HIGH Voltage               | 10% V <sub>CC</sub><br>10% V <sub>CC</sub><br>5% V <sub>CC</sub> | 2.4<br>2.0<br>2.7 |      | V     | Min             | I <sub>OH</sub> = -3 mA<br>I <sub>OH</sub> = -15 mA<br>I <sub>OH</sub> = -3 mA |
| V <sub>OL</sub>  | Output LOW Voltage                | 10% V <sub>CC</sub>  |                   | 0.55 | V     | Min             | I <sub>OL</sub> = 64 mA  |
| I <sub>IH</sub>  | Input HIGH Current                |  |                   | 5.0  | μA    | Max             | V <sub>IN</sub> = 2.7V   |
| I <sub>BVI</sub> | Input HIGH Current Breakdown Test |  |                   | 7.0  | μA    | Max             | V <sub>IN</sub> = 7.0V   |
| I <sub>CEX</sub> | Output HIGH Leakage Current       |  |                   | 50   | μA    | Max             | V <sub>OUT</sub> = V <sub>CC</sub>   |
| V <sub>ID</sub>  | Input Leakage Test                | 4.75   |                   |      | V     | 0.0             | I <sub>ID</sub> = 1.9 μA<br>All Other Pins Grounded                            |
| I <sub>OD</sub>  | Output Leakage Circuit Current    |  |                   | 3.75 | μA    | 0.0             | V <sub>IOD</sub> = 150 mV<br>All Other Pins Grounded                           |
| I <sub>IL</sub>  | Input LOW Current                 |  |                   | -1.2 | mA    | Max             | V <sub>IN</sub> = 0.5V   |
| I <sub>OS</sub>  | Output Short-Circuit Current      | -100   |                   | -225 | mA    | Max             | V <sub>OUT</sub> = 0V  |
| I <sub>CCH</sub> | Power Supply Current              |  | 3.7               | 6.0  | mA    | Max             | V <sub>O</sub> = HIGH  |
| I <sub>CCL</sub> | Power Supply Current              |  | 28.0              | 33.0 | mA    | Max             | V <sub>O</sub> = LOW   |

**AC Electrical Characteristics**

| Symbol           | Parameter                                      | T <sub>A</sub> = +25°C<br>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |     |     | T <sub>A</sub> = 0°C to +70°C<br>C <sub>L</sub> = 50 pF |     | Units |
|------------------|--|---|-----|-----|---|-----|-------|
|                  |  | Min   | Typ | Max | Min   | Max |       |
| t <sub>PLH</sub> | Propagation Delay                              | 2.0   | 3.2 | 5.5 | 1.5   | 6.5 | ns    |
| t <sub>PHL</sub> | A <sub>n</sub> , B <sub>n</sub> to $\bar{O}_n$ | 1.5   | 2.4 | 4.5 | 1.0   | 5.0 |       |

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



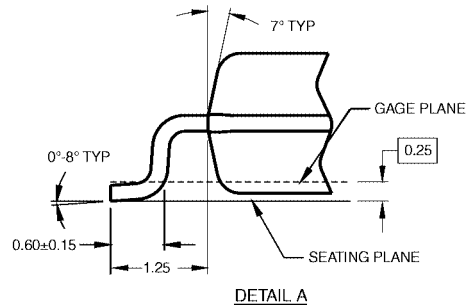
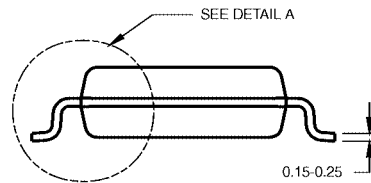
**14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow  
Package Number M14A**

M14A (REV. 1)

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



DIMENSIONS ARE IN MILLIMETERS

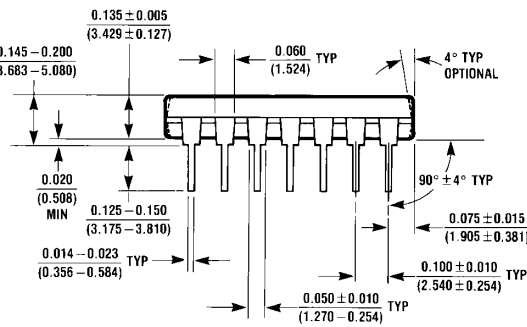


- NOTES:
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
  - B. DIMENSIONS ARE IN MILLIMETERS.
  - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M14DRevB1

**14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide  
Package Number M14D**

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



N14A (REV F)

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

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