

# 74F125 Quad Buffer (3-STATE)

## Features

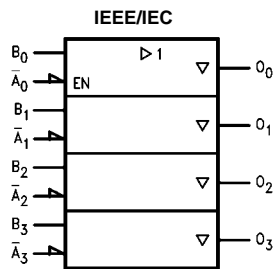
- High impedance base inputs for reduced loading

## Ordering Code:

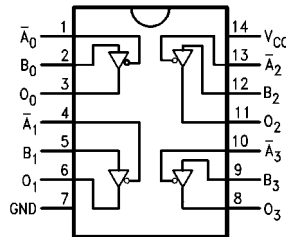
| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| 74F125SC     | M14A           | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow |
| 74F125SJ     | M14D           | 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide               |
| 74F125PC     | 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 $I_H/I_L$<br>Output $I_{OH}/I_{OL}$ |
|------------------|-------------|------------------|---|
| $\bar{A}_n, B_n$ | Inputs      | 1.0/0.033        | 20 $\mu$ A/-20 $\mu$ A                    |
| $O_n$            | Outputs     | 600/106.6 (80)   | -12 mA/64 mA (48 mA)                      |

## Function Table

| Inputs      |       | Output |
|-------------|-------|--------|
| $\bar{A}_n$ | $B_n$ | O      |
| L           | L     | L      |
| L           | H     | H      |
| H           | X     | Z      |

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

**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><br>5% V <sub>CC</sub> | 2.4<br>2.0<br>2.7<br>2.0 |       | V     | Min             | I <sub>OH</sub> = -3 mA<br>I <sub>OH</sub> = -12 mA<br>I <sub>OH</sub> = -3 mA<br>I <sub>OH</sub> = -15 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                |  |                          | 20    | μA    | Max             | V <sub>IN</sub> = 2.7V   |
| I <sub>BVI</sub> | Input HIGH Current Breakdown Test |  |                          | 100   | μA    | 0.0V            | V <sub>IN</sub> = 7.0V   |
| I <sub>IL</sub>  | Input LOW Current                 |  |                          | -20.0 | μA    | Max             | V <sub>IN</sub> = 0.5V   |
| I <sub>OZH</sub> | Output Leakage Current            |  |                          | 50    | μA    | Max             | V <sub>OUT</sub> = 2.7V  |
| I <sub>OZL</sub> | Output Leakage Current            |  |                          | -50   | μA    | Max             | V <sub>OUT</sub> = 0.5V  |
| I <sub>OS</sub>  | Output Short-Circuit Current      | -100   |                          | -225  | mA    | Max             | V <sub>OUT</sub> = 0V  |
| I <sub>CEX</sub> | Output HIGH Leakage Current       |  |                          | 250   | μA    | Max             | V <sub>OUT</sub> = V <sub>CC</sub>   |
| I <sub>ZZ</sub>  | Buss Drainage Test                |  |                          | 500   | μA    | 0.0V            | V <sub>OUT</sub> = 5.25V   |
| I <sub>CCH</sub> | Power Supply Current              |  | 18.5                     | 24.0  | mA    | Max             | V <sub>O</sub> = HIGH  |
| I <sub>CCL</sub> | Power Supply Current              |  | 31.7                     | 40.0  | mA    | Max             | V <sub>O</sub> = LOW   |
| I <sub>CCZ</sub> | Power Supply Current              |  | 27.6                     | 35.0  | mA    | Max             | V <sub>O</sub> = HIGH Z  |

**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>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |     | Units |
|------------------|---------------------|---|-----|-----|--|-----|-------|
|                  |                     | Min   | Typ | Max | Min  | Max |       |
| t <sub>PLH</sub> | Propagation Delay   | 2.0   | 4.0 | 6.0 | 2.0  | 6.5 | ns    |
| t <sub>PHL</sub> |                     | 3.0   | 4.6 | 7.5 | 3.0  | 8.0 |       |
| t <sub>PZH</sub> | Output Enable Time  | 3.5   | 4.7 | 7.5 | 3.0  | 8.5 | ns    |
| t <sub>PZL</sub> |                     | 3.5   | 5.3 | 8.0 | 3.5  | 9.0 |       |
| t <sub>PHZ</sub> | Output Disable Time | 1.5   | 3.9 | 5.5 | 1.5  | 6.0 | ns    |
| t <sub>PLZ</sub> |                     | 1.5   | 4.0 | 6.0 | 1.5  | 6.5 |       |

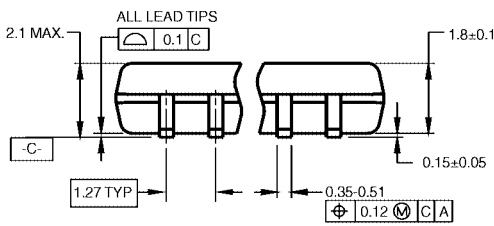
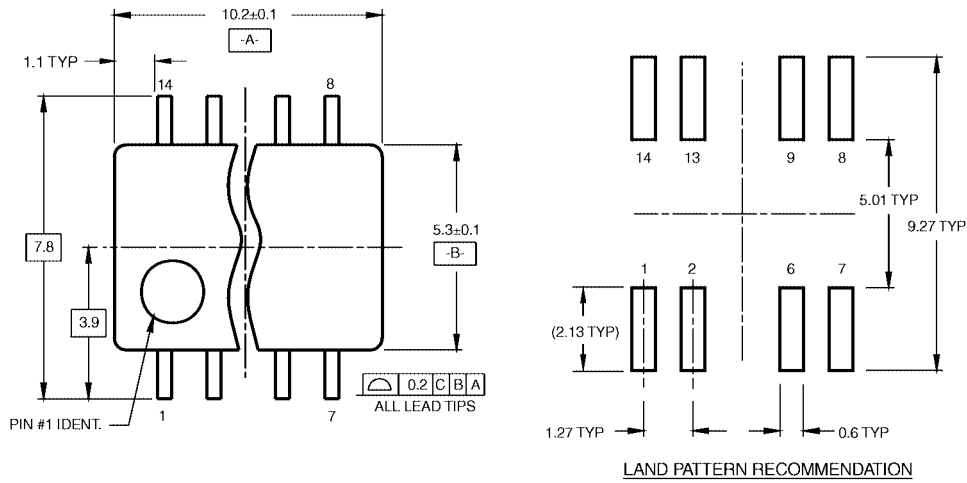
**Physical Dimensions** inches (millimeters) unless otherwise noted



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

M14A (REV. 1)

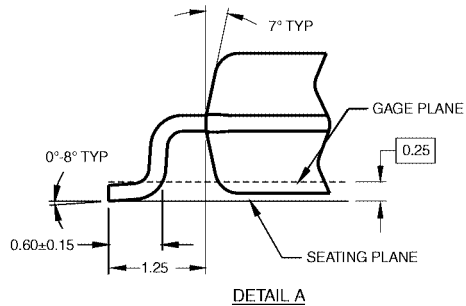
**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



DIMENSIONS ARE IN MILLIMETERS

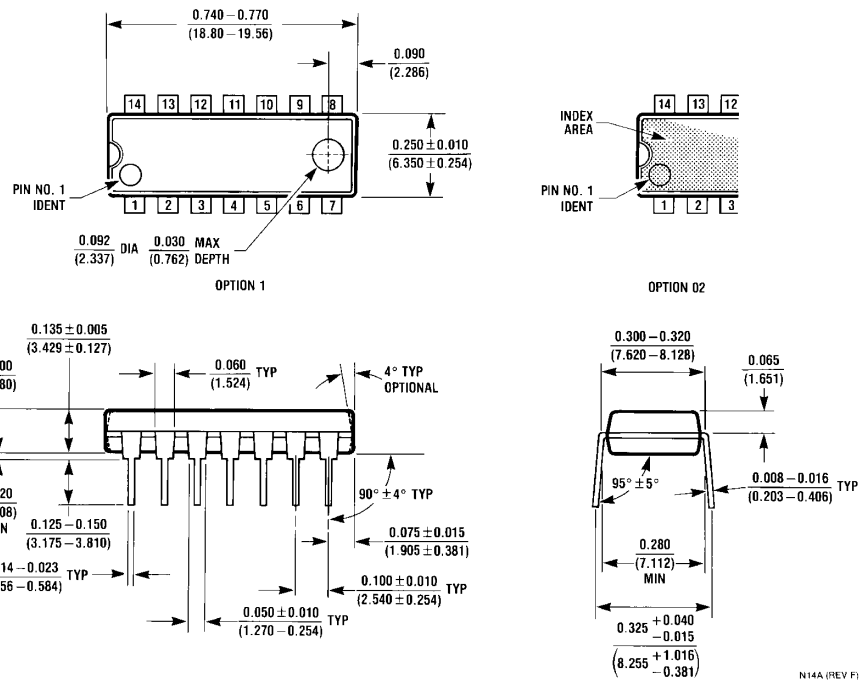
- NOTES:  
 A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.  
 B. DIMENSIONS ARE IN MILLIMETERS.  
 C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

M14DRevB1



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

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



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

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