

74F38 Quad Two-Input NAND Buffer (Open Collector)

General Description

This device contains four independent gates, each of which performs the logic NAND function. The open-collector out-

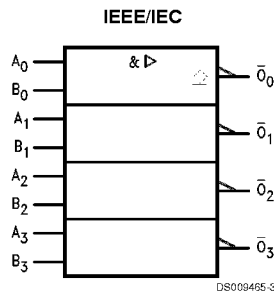
puts require external pull-up resistors for proper logical operation.

Ordering Code:

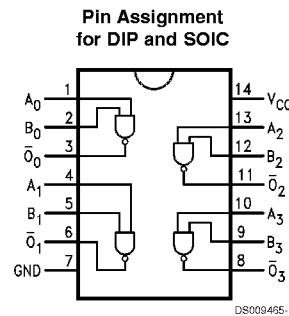
| Commercial | Package Number | Package Description |
|------------------|----------------|---|
| 74F38PC | N14E | 14-Lead (0.300" Wide) Molded Dual-In-Line |
| 74F38SC (Note 1) | M14A | 14-Lead (0.150" Wide) Molded Small Outline, JEDEC |
| 74F38SJ (Note 1) | M14D | 14-Lead (0.300" Wide) Molded Small Outline, EIAJ |

Note 1: Devices also available in 13" reel. Use suffix = SCX and SJX.

Logic Symbol



Connection Diagram



Unit Loading/Fan Out

| Pin Names | Description | U.L. HIGH/LOW | Input I_{IH}/I_{IL} Output I_{OH}/I_{OL} |
|-------------|-------------|-------------------------|---|
| A_n, B_n | Inputs | 1.0/2.0 | 20 μ A/-1.2 mA |
| \bar{O}_n | Outputs | OC (Note 2) /106.6 (80) | OC (Note 2) /64 mA (48 mA) |

Note 2: OC = Open Collector

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 3)

| | |
|---|--------------------------|
| Storage Temperature | -65°C to +150°C |
| Ambient Temperature under Bias | -55°C to +125°C |
| Junction Temperature under Bias | -55°C to +175°C |
| Plastic | -55°C to +150°C |
| V _{CC} Pin Potential to Ground Pin | -0.5V to +7.0V |
| Input Voltage (Note 4) | -0.5V to +7.0V |
| Input Current (Note 4) | -30 mA to +5.0 mA |
| Voltage Applied to Output in HIGH State (with V _{CC} = 0V) | |
| Standard Output | -0.5V to V _{CC} |
| 3-STATE Output | -0.5V to +5.5V |
| Current Applied to Output | |

in LOW State (Max)

twice the rated I_{OL} (mA)

Recommended Operating Conditions

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

Note 3: 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 4: Either voltage limit or current limit is sufficient to protect inputs.

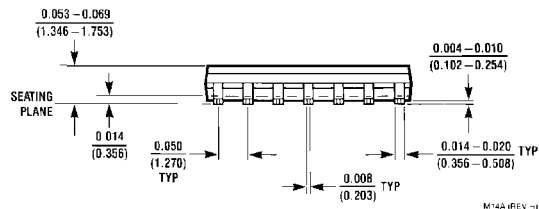
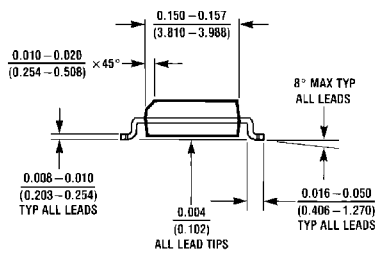
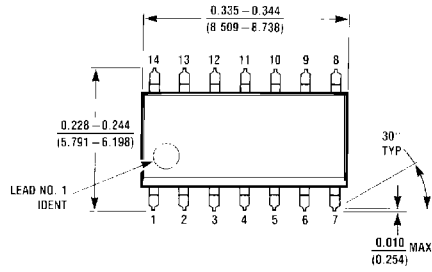
DC Electrical Characteristics

| Symbol | Parameter | 74F | | | Units | V _{CC} | Conditions |
|------------------|---|------|------|------|-------|-----------------|--|
| | | Min | Typ | Max | | | |
| V _{IH} | Input HIGH Voltage | 2.0 | | | V | | Recognized as a HIGH Signal |
| V _{IL} | Input LOW Voltage | | | 0.8 | V | | Recognized as a LOW Signal |
| V _{CD} | Input Clamp Diode Voltage | | | -1.2 | V | Min | I _{IN} = -18 mA |
| V _{OL} | Output LOW Voltage | | | 0.55 | V | Min | I _{OL} = 64 mA |
| I _{IH} | Input HIGH Current | | | 5.0 | μA | Max | V _{IN} = 2.7V |
| I _{BVI} | Input HIGH Current Breakdown Test | | | 7.0 | μA | Max | V _{IN} = 7.0V |
| V _{ID} | Input Leakage Test | 4.75 | | | V | 0.0 | I _{ID} = 1.9 μA All Other Pins Grounded |
| I _{OD} | Output Leakage Circuit Current | | | 3.75 | μA | 0.0 | V _{IOD} = 150 mV All Other Pins Grounded |
| I _{IL} | Input LOW Current | | | -1.2 | mA | Max | V _{IN} = 0.5V |
| I _{OHC} | Open Collector, Output OFF Leakage Test | | | 250 | μA | Min | V _{OUT} = V _{CC} |
| I _{CCH} | Power Supply Current | | 2.1 | 7.0 | mA | Max | V _O = HIGH |
| I _{CCL} | Power Supply Current | | 26.0 | 30.0 | mA | Max | V _O = LOW |

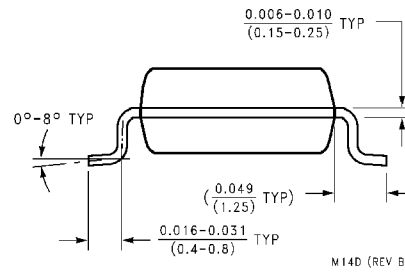
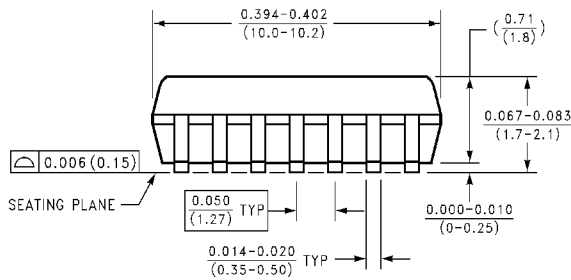
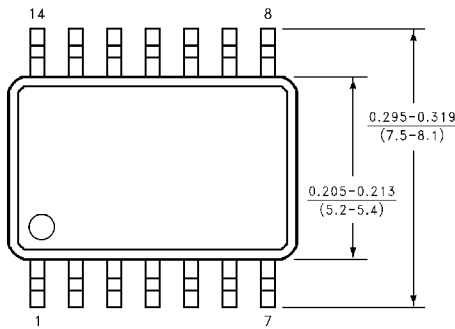
AC Electrical Characteristics

| Symbol | Parameter | 74F | | | 74F | | Units | Fig. No. |
|------------------|---|---|-----|------|--|------|-------|----------|
| | | T _A = +25°C V _{CC} = +5.0V C _L = 50 pF | | | T _A , V _{CC} = Com C _L = 50 pF | | | |
| | | Min | Typ | Max | Min | Max | | |
| t _{PLH} | Propagation Delay | 6.5 | 9.7 | 12.5 | 6.5 | 13.0 | ns | |
| t _{PHL} | A _n , B _n to \overline{O}_n | 1.5 | 2.1 | 5.0 | 1.5 | 5.5 | | |

Physical Dimensions inches (millimeters) unless otherwise noted

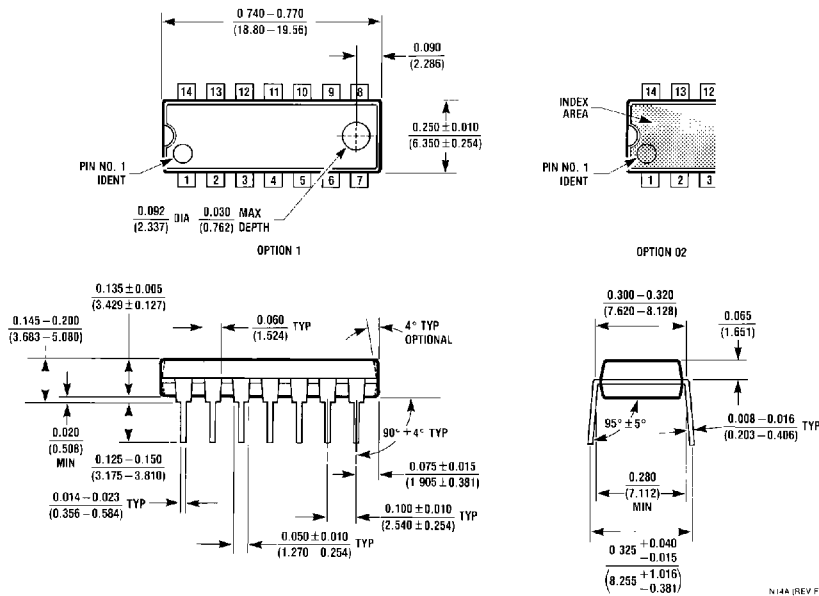


**14-Lead (0.150" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M14A**



**14-Lead (0.300" Wide) Molded Small Outline Package, EIAJ (SJ)
Package Number M14D**

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



**14-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
Package Number N14A**

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