

## 74F27

### Triple 3-Input NOR Gate

#### General Description

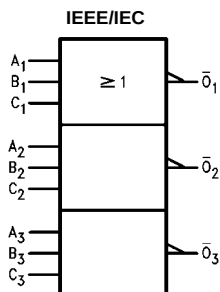
This device contains three independent gates, each of which performs the logic NOR function.

#### Ordering Code:

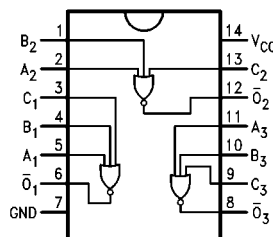
| Order Number | Package Number | Package Description                                                         |
|--------------|----------------|-----------------------------------------------------------------------------|
| 74F27SC      | M14A           | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow |
| 74F27SJ      | M14D           | 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide               |
| 74F27PC      | 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 $I_{OH}/I_{OL}$ |
|-----------------|--------------|------------------|-------------------------------------------------|
| $A_n, B_n, C_n$ | Data Inputs  | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| $\bar{O}_n$     | Data Outputs | 50/33.3          | -1 mA/20 mA                                     |

#### Function Table

| Inputs |       |       | Output      |
|--------|-------|-------|-------------|
| $A_n$  | $B_n$ | $C_n$ | $\bar{O}_n$ |
| L      | L     | L     | H           |
| X      | X     | H     | L           |
| X      | H     | X     | L           |
| H      | X     | X     | L           |

H = HIGH Voltage Level  
L = LOW Voltage Level  
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.

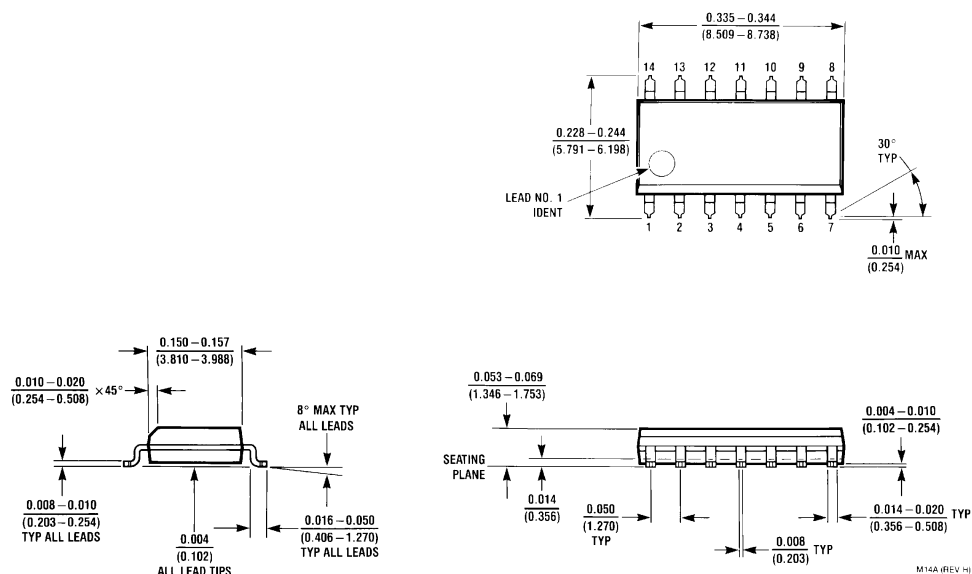
**Note 2:** Either voltage limit or current limit is sufficient to protect inputs.

**DC Electrical Characteristics**

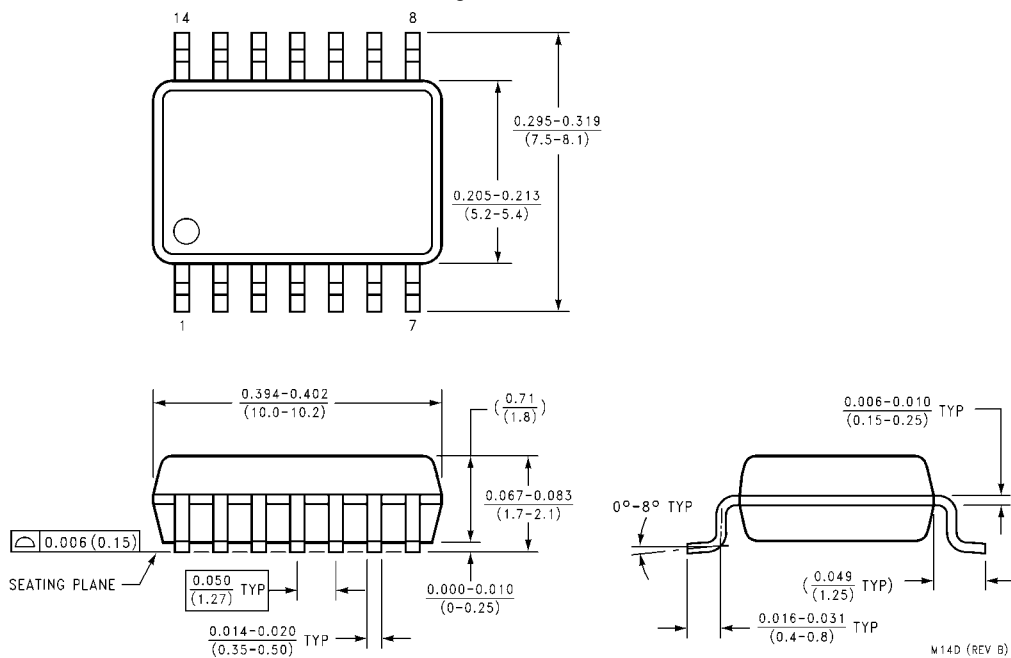
| Symbol           | Parameter                         | Min                                       | Typ        | Max  | Units | V <sub>CC</sub> | Conditions                                           |
|------------------|-----------------------------------|-------------------------------------------|------------|------|-------|-----------------|------------------------------------------------------|
| 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>5% V <sub>CC</sub> | 2.5<br>2.7 |      | V     | Min             | I <sub>OH</sub> = −1 mA<br>I <sub>OH</sub> = −1 mA   |
| V <sub>OL</sub>  | Output LOW Voltage                | 10% V <sub>CC</sub>                       |            | 0.5  | V     | Min             | I <sub>OL</sub> = 20 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                 |                                           |            | −0.6 | mA    | Max             | V <sub>IN</sub> = 0.5V                               |
| I <sub>OS</sub>  | Output Short-Circuit Current      | −60                                       |            | −150 | mA    | Max             | V <sub>OUT</sub> = 0V                                |
| I <sub>CCH</sub> | Power Supply Current              |                                           | 4.0        | 5.5  | mA    | Max             | V <sub>O</sub> = HIGH                                |
| I <sub>CCL</sub> | Power Supply Current              |                                           | 8.7        | 12.0 | 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>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                                                                         | 3.8 | 6.0 | 1.5                                                                                | 6.5 | ns    |
| t <sub>PHL</sub> |                   | 1.0                                                                         | 2.6 | 4.0 | 1.0                                                                                | 4.5 |       |

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


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



**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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