

## 74F827 • 74F828 10-Bit Buffers/Line Drivers

### General Description

The 74F827 and 74F828 10-bit bus buffers provide high performance bus interface buffering for wide data/address paths or buses carrying parity. The 10-bit buffers have NOR output enables for maximum control flexibility.

The 74F828 is an inverting version of the 74F827.

### Features

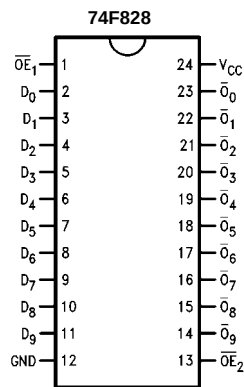
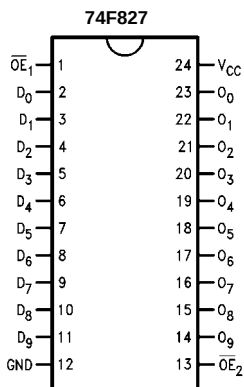
- 3-STATE output
- 74F828 is inverting

### Ordering Code:

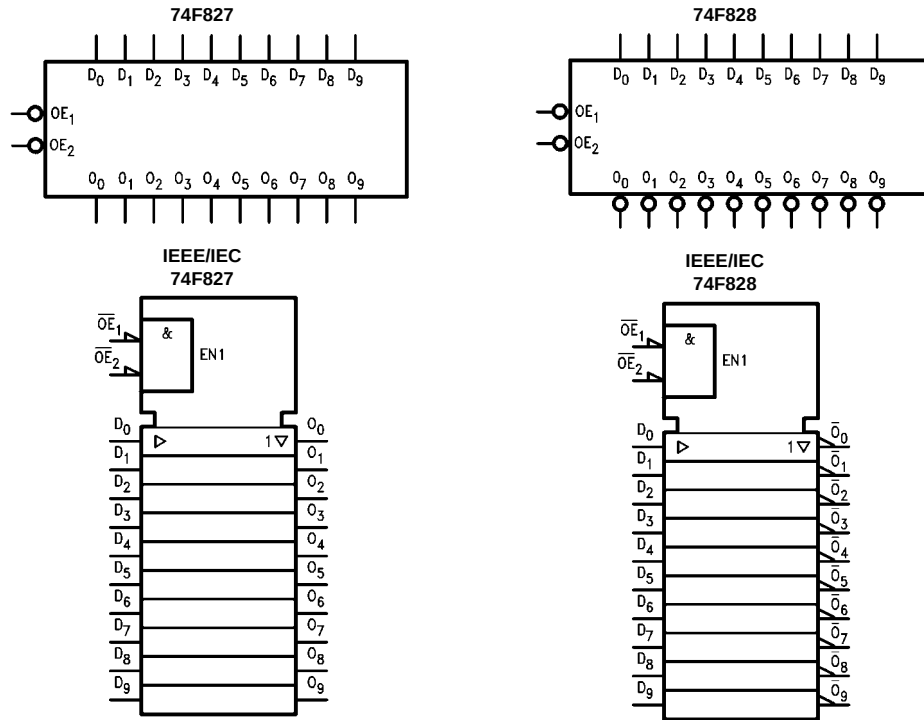
| Order Number | Package Number | Package Description                                                       |
|--------------|----------------|---------------------------------------------------------------------------|
| 74F827SC     | M24B           | 24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| 74F827SPC    | N24C           | 24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-100, 0.300 Wide     |
| 74F828SC     | M24B           | 24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| 74F828SPC    | N24C           | 24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-100, 0.300 Wide     |

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

### Connection Diagrams



## Logic Symbols



## Unit Loading/Fan Out

| Pin Names                          | Description           | U.L.<br>HIGH/LOW | Input $I_{IH}/I_{IL}$<br>Output $I_{OH}/I_{OL}$ |
|------------------------------------|-----------------------|------------------|-------------------------------------------------|
| $\overline{OE}_1, \overline{OE}_2$ | Output Enable Input   | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| $D_0-D_7$                          | Data Inputs           | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| $O_0-O_7$                          | Data Outputs, 3-STATE | 600/106.6 (80)   | -12 mA/64 mA (48 mA)                            |

## Functional Description

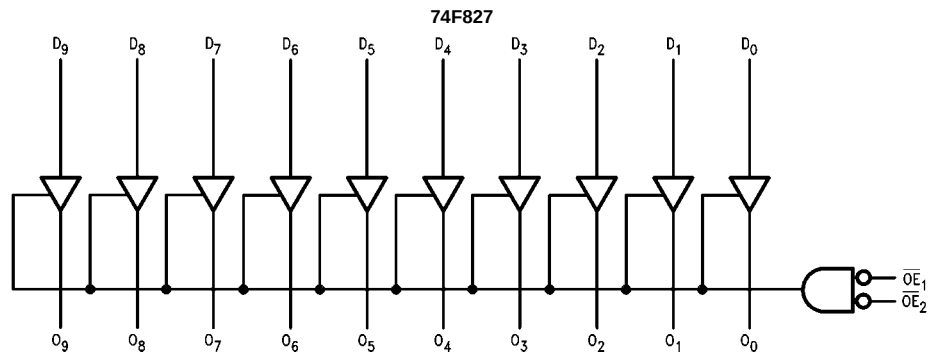
The 74F827 and 74F828 are line drivers designed to be employed as memory address drivers, clock drivers and bus-oriented transmitters/receivers which provide improved PC board density. The devices have 3-STATE outputs controlled by the Output Enable ( $\overline{OE}$ ) pins. The outputs can sink 64 mA and source 15 mA. Input clamp diodes limit high-speed termination effects.

## Function Table

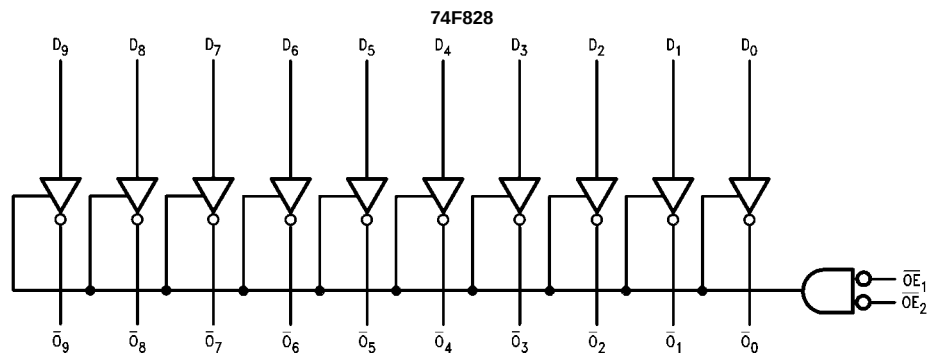
| Inputs          |       | Outputs |        | Function    |
|-----------------|-------|---------|--------|-------------|
| $\overline{OE}$ | $D_n$ | $O_n$   |        |             |
|                 |       | 74F827  | 74F828 |             |
| L               | H     | H       | L      | Transparent |
| L               | L     | L       | H      | Transparent |
| H               | X     | Z       | Z      | High Z      |

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

## Logic Diagrams



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.



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**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.

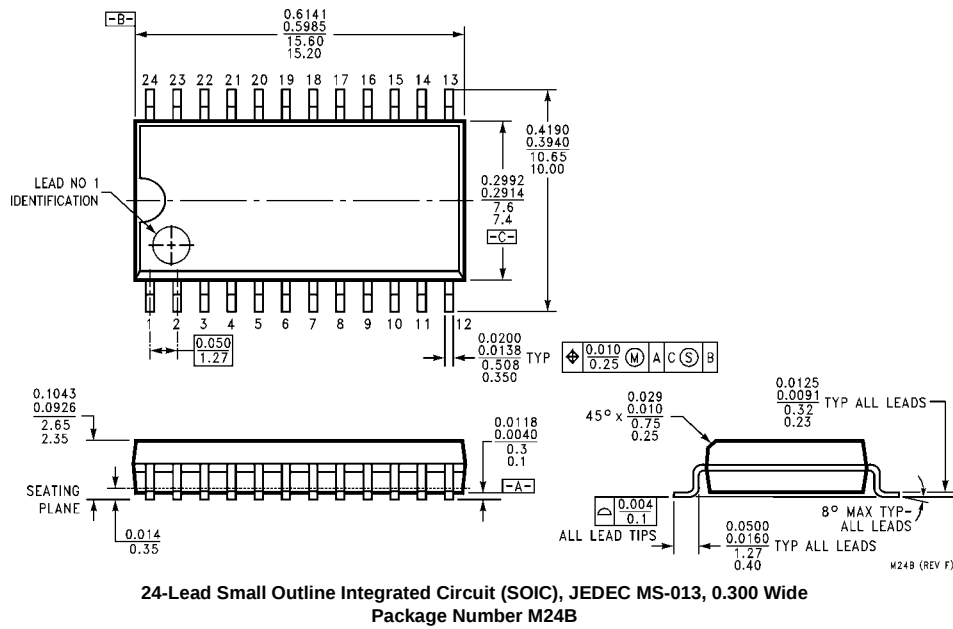
**DC Electrical Characteristics**

| 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                 |                                                                  |                   | –0.6 | mA    | 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>ZZ</sub>  | Bus Drainage Test                 |                                                                  |                   | 500  | μA    | 0.0V            | V <sub>OUT</sub> = 5.25V                                                       |
| I <sub>CCH</sub> | Power Supply Current (74F827)     |                                                                  | 30                | 45   | mA    | Max             | V <sub>O</sub> = HIGH                                                          |
| I <sub>CCL</sub> | Power Supply Current (74F827)     |                                                                  | 60                | 90   | mA    | Max             | V <sub>O</sub> = LOW                                                           |
| I <sub>CCZ</sub> | Power Supply Current (74F827)     |                                                                  | 40                | 60   | mA    | Max             | V <sub>O</sub> = HIGH Z                                                        |
| I <sub>CCH</sub> | Power Supply Current (74F828)     |                                                                  | 14                | 20   | mA    | Max             | V <sub>O</sub> = HIGH                                                          |
| I <sub>CCL</sub> | Power Supply Current (74F828)     |                                                                  | 56                | 85   | mA    | Max             | V <sub>O</sub> = LOW                                                           |
| I <sub>CCZ</sub> | Power Supply Current (74F828)     |                                                                  | 35                | 50   | mA    | Max             | V <sub>O</sub> = HIGH Z                                                        |

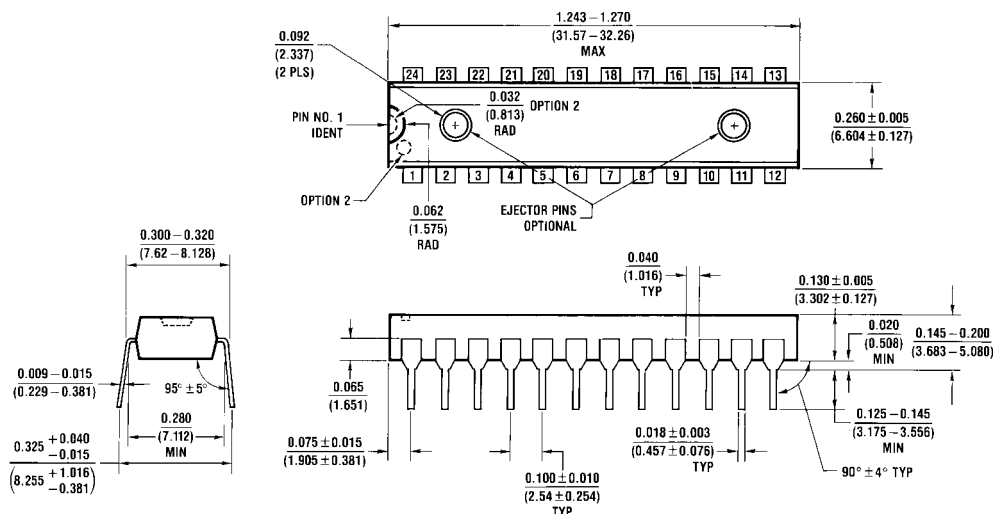
## AC Electrical Characteristics

| 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> = -55°C to +125°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  | Min                                                                                | Max  |       |
| t <sub>PLH</sub> | Propagation Delay                        | 1.0                                                                         | 3.0 | 5.5  | 1.0                                                                                   | 7.5  | 1.0                                                                                | 6.5  | ns    |
| t <sub>PHL</sub> | Data to Output (74F827)                  | 1.5                                                                         | 3.3 | 5.5  | 1.5                                                                                   | 7.0  | 1.5                                                                                | 6.0  |       |
| t <sub>PLH</sub> | Propagation Delay                        | 1.0                                                                         | 3.0 | 5.0  |                                                                                       |      | 1.0                                                                                | 5.5  | ns    |
| t <sub>PHL</sub> | Data to Output (74F828)                  | 1.0                                                                         | 2.0 | 4.0  |                                                                                       |      | 1.0                                                                                | 4.0  |       |
| t <sub>PZH</sub> | Output Enable Time                       | 3.0                                                                         | 5.7 | 9.0  | 2.5                                                                                   | 10.0 | 2.5                                                                                | 9.5  | ns    |
| t <sub>PZL</sub> | $\overline{\text{OE}}$ to O <sub>n</sub> | 3.5                                                                         | 6.8 | 11.5 | 3.0                                                                                   | 12.5 | 3.0                                                                                | 12.0 |       |
| t <sub>PHZ</sub> | Output Disable Time                      | 1.5                                                                         | 3.3 | 8.0  | 1.5                                                                                   | 9.0  | 1.5                                                                                | 8.5  | ns    |
| t <sub>PLZ</sub> | $\overline{\text{OE}}$ to O <sub>n</sub> | 1.0                                                                         | 3.5 | 8.0  | 1.0                                                                                   | 9.0  | 1.0                                                                                | 8.5  |       |

# Physical Dimensions inches (millimeters) unless otherwise noted



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



N24C (REV F)

24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-100, 0.300 Wide  
Package Number N24C

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