

## 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

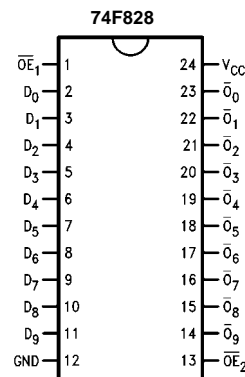
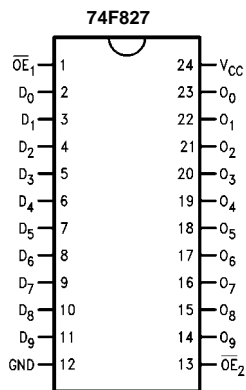
- 3-STATE output
- 74F828 is inverting

### Ordering Code:

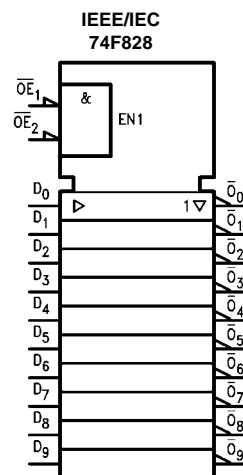
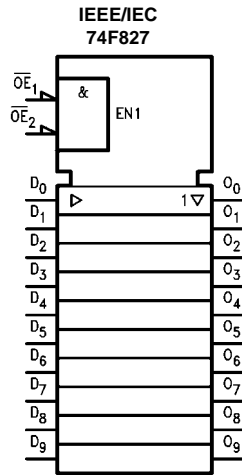
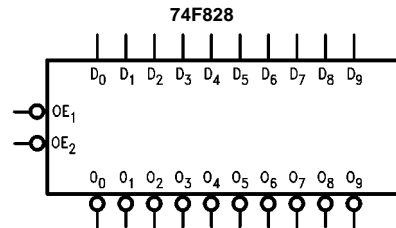
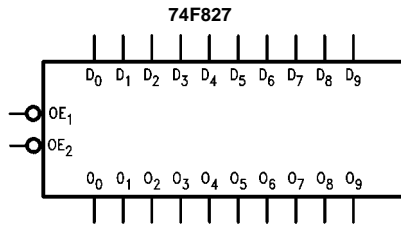
| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| 74F827SC     | M24B           | 24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide |
| 74F827SPC    | N24C           | 24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-100, 0.300 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 <sub>0</sub> -D <sub>7</sub>     | Data Inputs           | 1.0/1.0          | 20 $\mu$ A/-0.6 mA                              |
| O <sub>0</sub> -O <sub>7</sub>     | Data Outputs, 3-STATE | 600/106.6 (80)   | -12 mA/64 mA (48 mA)                            |

### Functional Description

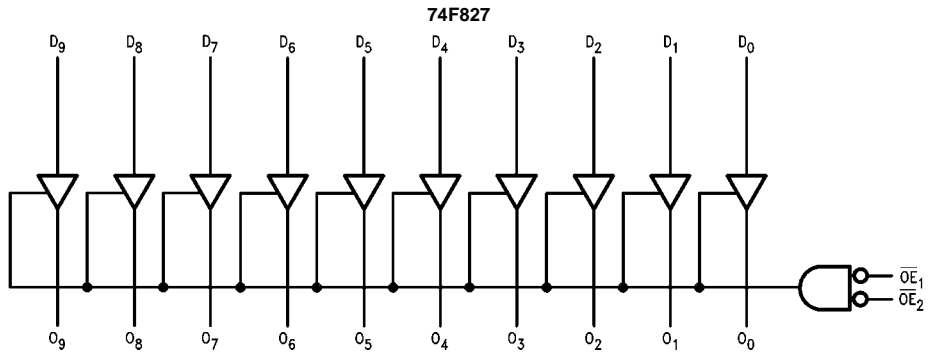
The 74F827 and 74F828 are line drivers designed to be employed as memory address drivers, clock drivers and bus-oriented transmitters/receivers which provide improved PC board density. The devices have 3-STATE outputs controlled by the Output Enable ( $\overline{OE}$ ) pins. The outputs can sink 64 mA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

### Function Table

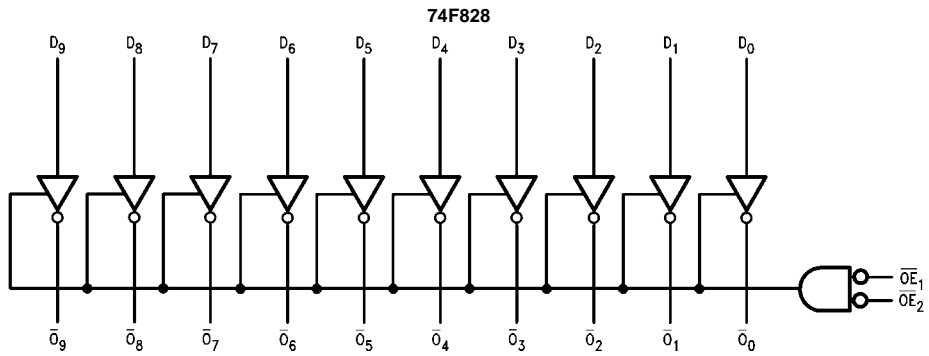
| $\overline{OE}$ | D <sub>n</sub> | Outputs |        | Function    |
|-----------------|----------------|---------|--------|-------------|
|                 |                | 74F827  | 74F828 |             |
| L               | H              | H       | L      | Transparent |
| L               | L              | 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.

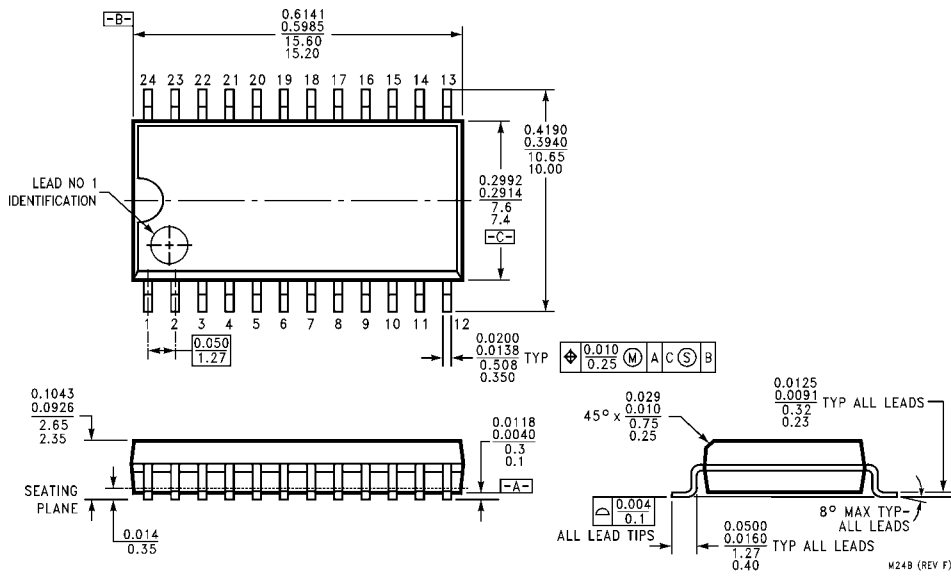
**DC Electrical Characteristics**

| 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

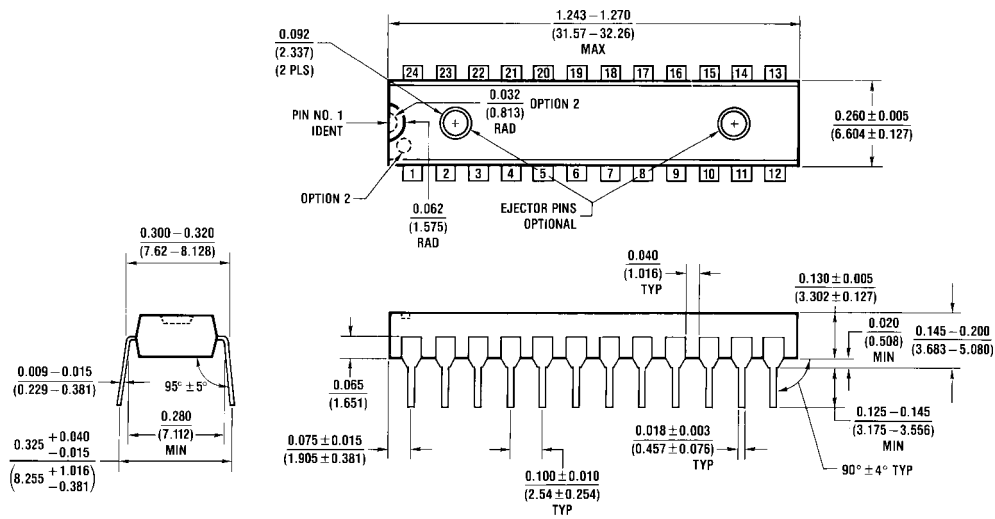
| Symbol    | Parameter                | $T_A = +25^\circ\text{C}$<br>$V_{CC} = +5.0\text{V}$<br>$C_L = 50\text{ pF}$ |     |      | $T_A = -55^\circ\text{C to } +125^\circ\text{C}$<br>$V_{CC} = +5.0\text{V}$<br>$C_L = 50\text{ pF}$ |      | $T_A = 0^\circ\text{C to } +70^\circ\text{C}$<br>$V_{CC} = +5.0\text{V}$<br>$C_L = 50\text{ pF}$ |      | Units |
|-----------|--------------------------|--|-----|------|---|------|--|------|-------|
|           |                          | Min  | Typ | Max  | Min   | Max  | Min  | Max  |       |
| $t_{PLH}$ | Propagation Delay        | 1.0  | 3.0 | 5.5  | 1.0   | 7.5  | 1.0  | 6.5  | ns    |
| $t_{PHL}$ | Data to Output (74F827)  | 1.5  | 3.3 | 5.5  | 1.5   | 7.0  | 1.5  | 6.0  |       |
| $t_{PLH}$ | Propagation Delay        | 1.0  | 3.0 | 5.0  |   |      | 1.0  | 5.5  | ns    |
| $t_{PHL}$ | Data to Output (74F828)  | 1.0  | 2.0 | 4.0  |   |      | 1.0  | 4.0  |       |
| $t_{PZH}$ | Output Enable Time       | 3.0  | 5.7 | 9.0  | 2.5   | 10.0 | 2.5  | 9.5  | ns    |
| $t_{PZL}$ | $\overline{OE}$ to $O_n$ | 3.5  | 6.8 | 11.5 | 3.0   | 12.5 | 3.0  | 12.0 |       |
| $t_{PHZ}$ | Output Disable Time      | 1.5  | 3.3 | 8.0  | 1.5   | 9.0  | 1.5  | 8.5  | ns    |
| $t_{PLZ}$ | $\overline{OE}$ to $O_n$ | 1.0  | 3.5 | 8.0  | 1.0   | 9.0  | 1.0  | 8.5  |       |

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



**24-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide  
Package Number M24B**

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



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

N24C (REV F)

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