

## 74F280 9-Bit Parity Generator/Checker

### General Description

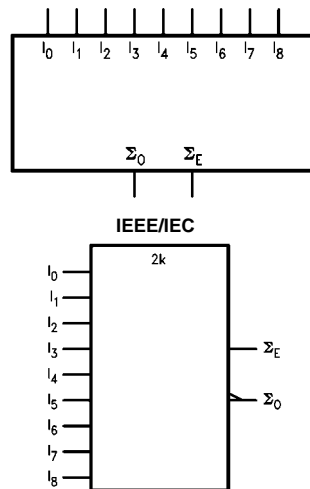
The F280 is a high-speed parity generator/checker that accepts nine bits of input data and detects whether an even or an odd number of these inputs is HIGH. If an even number of inputs is HIGH, the Sum Even output is HIGH. If an odd number is HIGH, the Sum Even output is LOW. The Sum Odd output is the complement of the Sum Even output.

### Ordering Code:

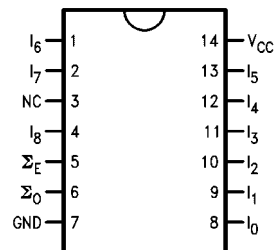
| Order Number | Package Number | Package Description   |
|--------------|----------------|---|
| 74F280SC     | M14A           | 14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150 Narrow |
| 74F280SJ     | M14D           | 14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide               |
| 74F280PC     | 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 Symbols



### Connection Diagram



## Unit Loading/Fan Out

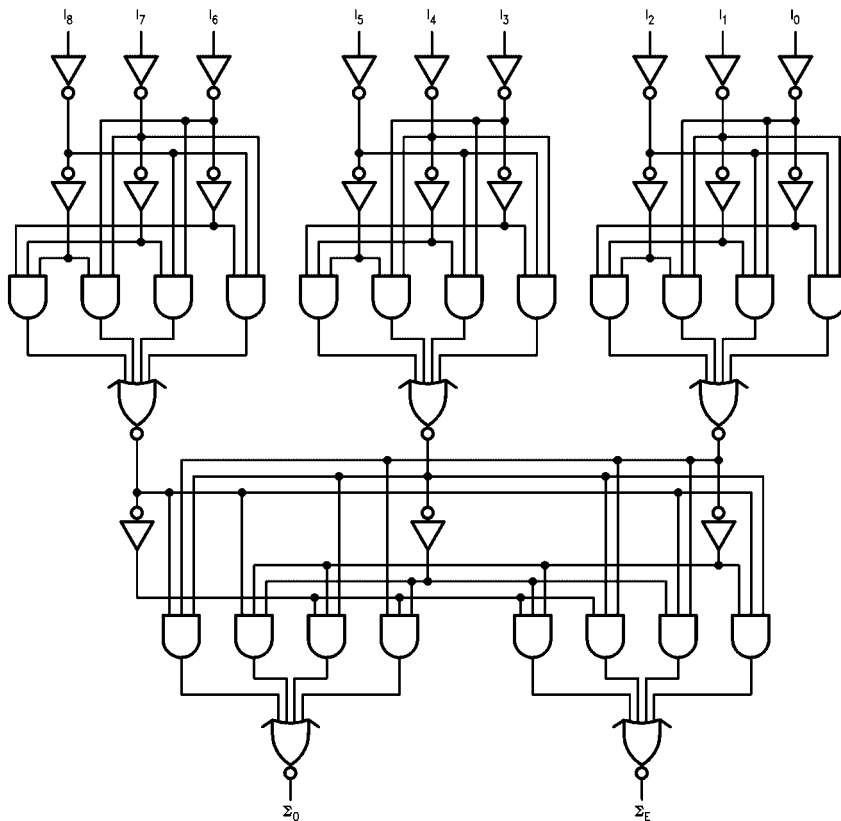
| Pin Names  | Description        | U.L.     |   |
|------------|--------------------|----------|---|
|            |                    | HIGH/LOW | Input $I_{IH}/I_{IL}$<br>Output $I_{OH}/I_{OL}$ |
| $I_0-I_8$  | Data Inputs        | 1.0/1.0  | 20 $\mu$ A/-0.6 mA                              |
| $\Sigma_O$ | Odd Parity Output  | 50/33.3  | -1 mA/20 mA                                     |
| $\Sigma_E$ | Even Parity Output | 50/33.3  | -1 mA/20 mA                                     |

## Truth Table

| Number of<br>HIGH Inputs<br>$I_0-I_8$ | Outputs       |              |
|---------------------------------------|---------------|--------------|
|                                       | $\Sigma$ Even | $\Sigma$ Odd |
| 0, 2, 4, 6, 8                         | H             | L            |
| 1, 3, 5, 7, 9                         | L             | H            |

H = HIGH Voltage Level  
L = LOW Voltage Level

## Logic Diagram



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

**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) |
| ESD Last Passing Voltage (Min)   | 4000V                                |

**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.

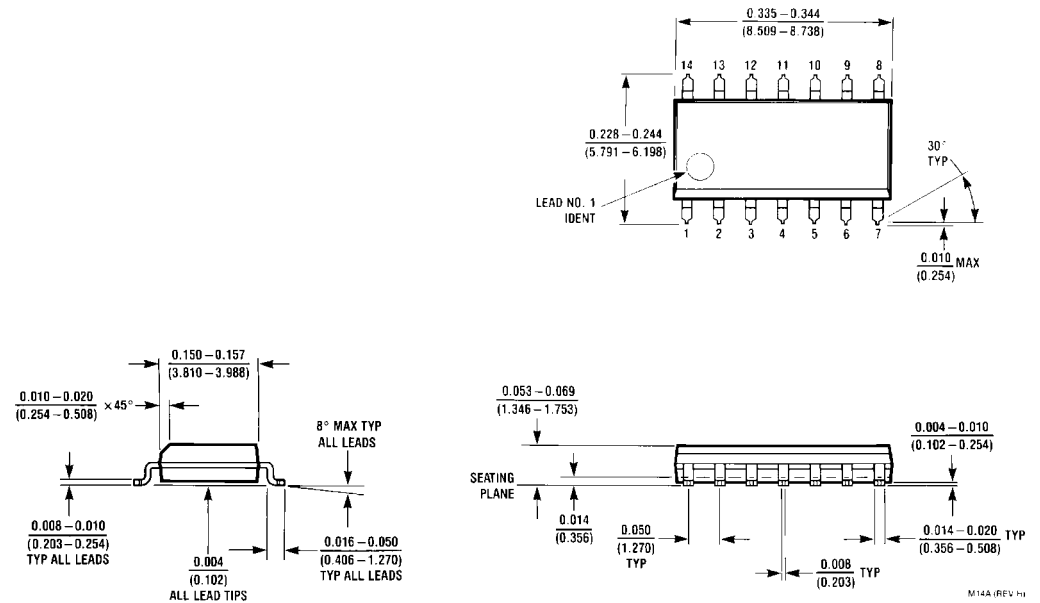
**DC Electrical Characteristics**

| 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> | 2.5 |      | V     | Min             | I <sub>OH</sub> = -1 mA                              |
|                  |                                   | 5% V <sub>CC</sub>  | 2.7 |      |       |                 | 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              |                     | 25  | 38   | mA    | Max             | V <sub>O</sub> = HIGH                                |

**AC Electrical Characteristics**

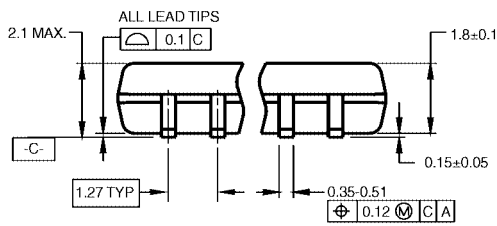
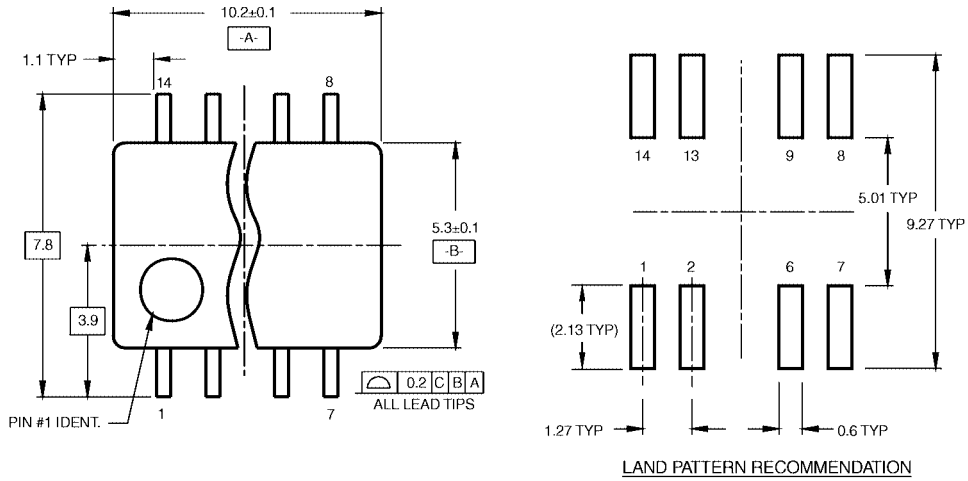
| Symbol           | Parameter                        | T <sub>A</sub> = +25°C<br>V <sub>CC</sub> = +5.0V<br>C <sub>L</sub> = 50 pF |      |      | T <sub>A</sub> = -55°C to +125°C<br>V <sub>CC</sub> = 5.0V<br>C <sub>L</sub> = 50 pF |      | T <sub>A</sub> = 0°C to +70°C<br>V <sub>CC</sub> = 5.0V<br>C <sub>L</sub> = 50 pF |      | Units |
|------------------|----------------------------------|---|------|------|--|------|---|------|-------|
|                  |                                  | Min   | Typ  | Max  | Min  | Max  | Min   | Max  |       |
| t <sub>PLH</sub> | Propagation Delay                | 6.5   | 10.0 | 15.0 | 6.5  | 20.0 | 6.5   | 16.0 | ns    |
| t <sub>PHL</sub> | I <sub>n</sub> to Σ <sub>E</sub> | 6.5   | 11.0 | 16.0 | 6.5  | 21.0 | 6.5   | 17.0 |       |
| t <sub>PLH</sub> | Propagation Delay                | 6.0   | 10.0 | 15.0 | 5.0  | 20.0 | 6.0   | 16.0 | ns    |
| t <sub>PHL</sub> | I <sub>n</sub> to Σ <sub>O</sub> | 6.5   | 11.0 | 16.0 | 6.5  | 21.0 | 6.5   | 17.0 |       |

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



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

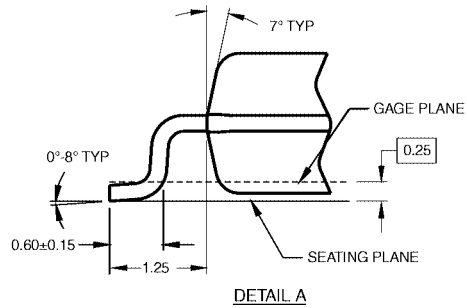
**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



DIMENSIONS ARE IN MILLIMETERS

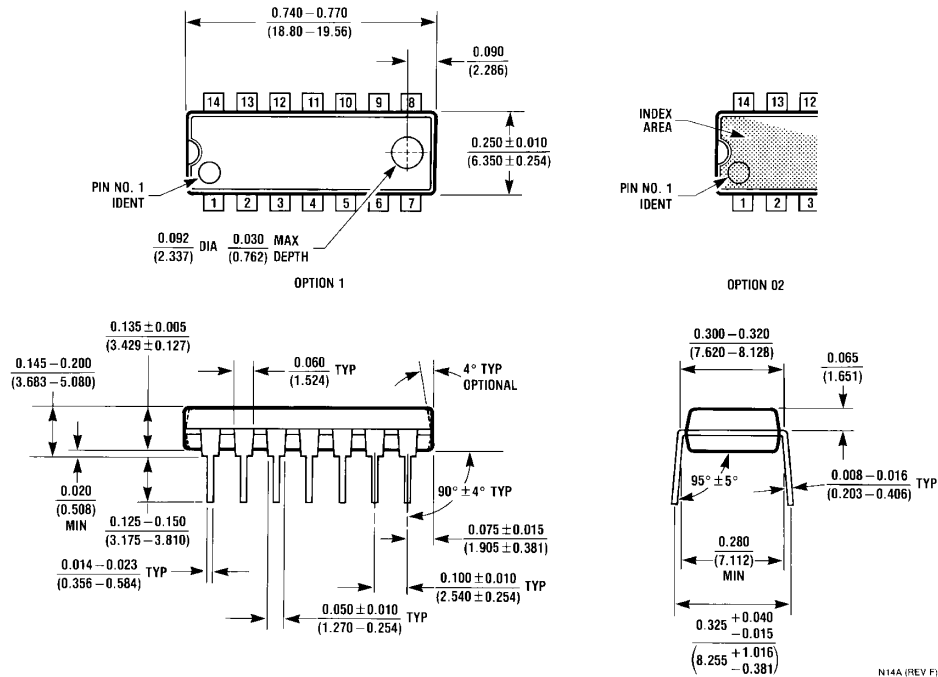
- NOTES:
- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
  - B. DIMENSIONS ARE IN MILLIMETERS.
  - C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

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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