# M74LS280P

## 9-BIT ODD/EVEN PARITY GENERATOR/CHECKER

## DESCRIPTION

The M74LS280P is a semiconductor integrated circuit containing a 9-bit parity generator/checker function.

## FEATURES

- Easy expansion of bits with cascade connection
- Wide operating temperature range ($T_a$=−20~+75°C)

## APPLICATION

General purpose, for use in industrial and consumer equipment.

## FUNCTIONAL DESCRIPTION

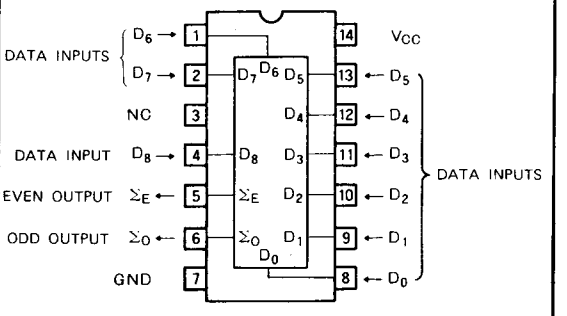
This device is provided with both a 9-bit parity generator and checker functions. For use as a parity generator, parity outputs in even output $\Sigma_E$ and odd output $\Sigma_O$ are obtained in accordance with the function table, depending on whether the number of high-level data in the inputs is even or odd when 9-bit data are applied to data inputs $D_0$~$D_8$.

For use as a parity checker, one of the 9-bit data inputs is used for the even or odd parity designation and the remaining 8 bits are used as the data.

## FUNCTION TABLE

| Number of high-level data in input data. | $\Sigma_E$ | $\Sigma_O$ |
|---|---|---|
| Even number | H | L |
| Odd number | L | H |

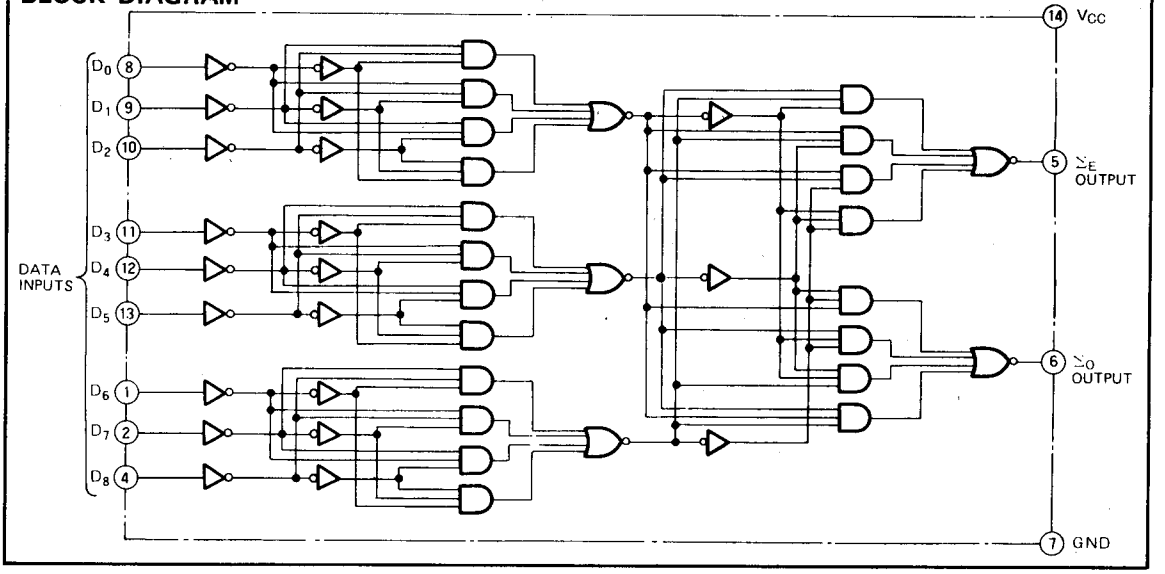
## PIN CONFIGURATION (TOP VIEW)




NC : NO CONNECTION

**Outline 14P4**

## BLOCK DIAGRAM



## 9-BIT ODD/EVEN PARITY GENERATOR/CHECKER

### ABSOLUTE MAXIMUM RATINGS (Ta = −20 ~ +75℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Limits | Unit |
|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | | −0.5 ~ +7 | V |
| $V_I$ | Input voltage | | −0.5 ~ +15 | V |
| $V_O$ | Output voltage | High-level state | −0.5 ~ $V_{CC}$ | V |
| $T_{opr}$ | Operating free-air ambient temperature range | | −20 ~ +75 | ℃ |
| $T_{stg}$ | Storage temperature range | | −65 ~ +150 | ℃ |

### RECOMMENDED OPERATING CONDITIONS (Ta = −20 ~ +75℃, unless otherwise noted)

| Symbol | Parameter | | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| $V_{CC}$ | Supply voltage | | 4.75 | 5 | 5.25 | V |
| $I_{OH}$ | High-level output current | $V_{OH} \geqq 2.7V$ | 0 | | −400 | μA |
| $I_{OL}$ | Low-level output current | $V_{OL} \leqq 0.4V$ | 0 | | 4 | mA |
| | | $V_{OL} \leqq 0.5V$ | 0 | | 8 | mA |

### ELECTRICAL CHARACTERISTICS (Ta = −20 ~ +75℃, unless otherwise noted)

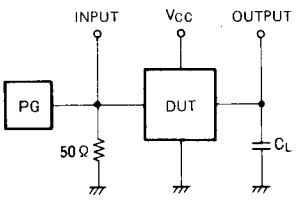
| Symbol | Parameter | Test conditions | | Limits | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min | Typ * | Max | |
| $V_{IH}$ | High-level input voltage | | | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | | | 0.8 | V |
| $V_{IC}$ | Input clamp voltage | $V_{CC}$=4.75V, $I_{IC}$=−18mA | | | | −1.5 | V |
| $V_{OH}$ | High-level output voltage | $V_{CC}$=4.75V, $V_I$=0.8V<br>$V_I$=2V, $I_{OH}$=−400μA | | 2.7 | 3.4 | | V |
| $V_{OL}$ | Low-level output | $V_{CC}$=4.75V | $I_{OL}$=4mA | | 0.25 | 0.4 | V |
| | | $V_I$=0.8V, $V_I$=2V | $I_{OL}$=8mA | | 0.35 | 0.5 | V |
| $I_{IH}$ | High-level input current | $V_{CC}$=5.25V, $V_I$=2.7V | | | | 20 | μA |
| | | $V_{CC}$=5.25V, $V_I$=10V | | | | 0.1 | mA |
| $I_{IL}$ | Low-level input current | $V_{CC}$=5.25V, $V_I$=0.4V | | | | −0.4 | mA |
| $I_{OS}$ | Short-circuit output current (Note 1) | $V_{CC}$=5.25V, $V_O$=0V | | −20 | | −100 | mA |
| $I_{CC}$ | Supply current | $V_{CC}$=5.25V (Note 2) | | | 16 | 27 | mA |

* : All typical values are at $V_{CC}$=5V, Ta=25°C.
Note 1: All measurements should be done quickly.
Note 2: $I_{CC}$ is measured with all inputs at 0V.

### SWITCHING CHARACTERISTICS ($V_{CC}$=5V, Ta=25℃, unless otherwise noted)

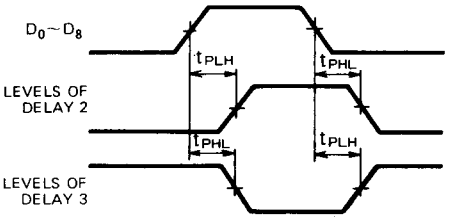
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| $t_{PLH}$ | Low-to-high-level, high-to-low-level output propagation time, from inputs $D_0 \sim D_8$ to output $\Sigma_E$ | $C_L$=15pF (Note 3) | | 22 | 50 | ns |
| $t_{PHL}$ | | | | 17 | 45 | ns |
| $t_{PLH}$ | Low-to-high-level, high-to-low-level output propagation time, from inputs $D_0 \sim D_8$ to output $\Sigma_O$ | | | 16 | 35 | ns |
| $t_{PHL}$ | | | | 17 | 50 | ns |

Note 3: Measurement circuit



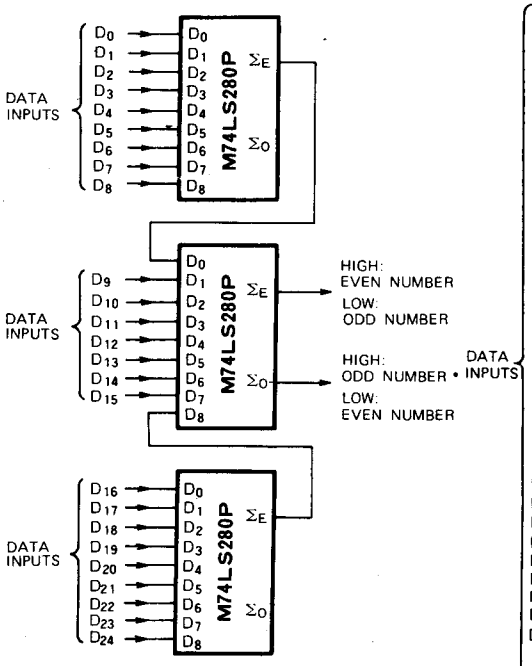

(1) The pulse generator (PG) has the following characteristics:
PRR=1MHz, $t_r$=6ns, $t_f$=6ns, $t_w$=500ns, $V_P$=3$V_{P-P}$, $Z_O$=50Ω.
(2) $C_L$ includes probe and jig capacitance

## TIMING DIAGRAM (Reference level = 1.3V)

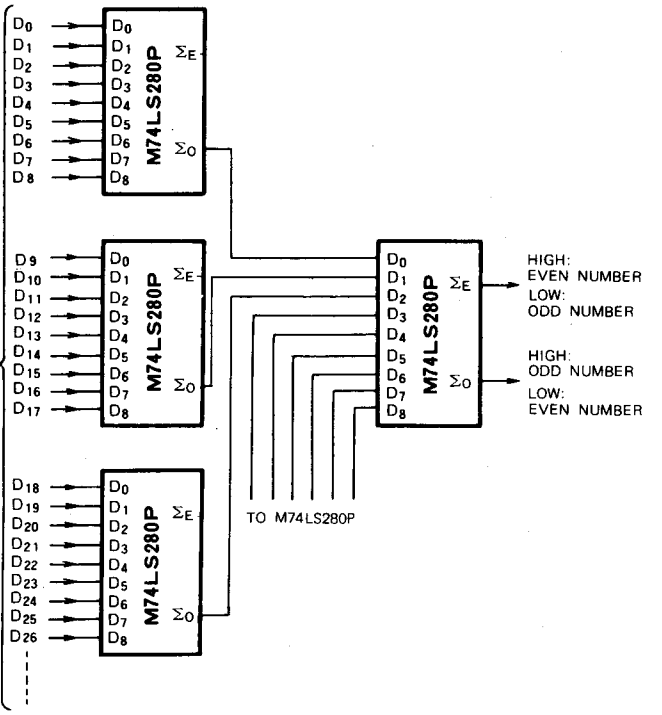



## APPLICATIONS EXAMPLES

### (1) 25-line parity generator/checker

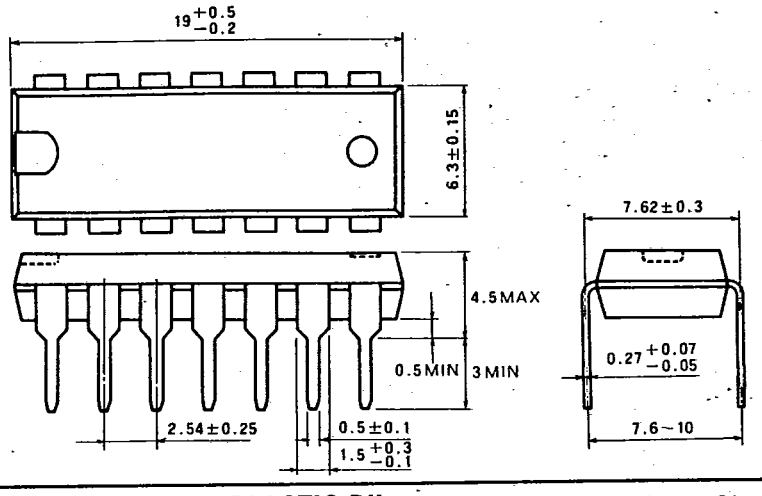



### (2) 81-line parity generator/checker



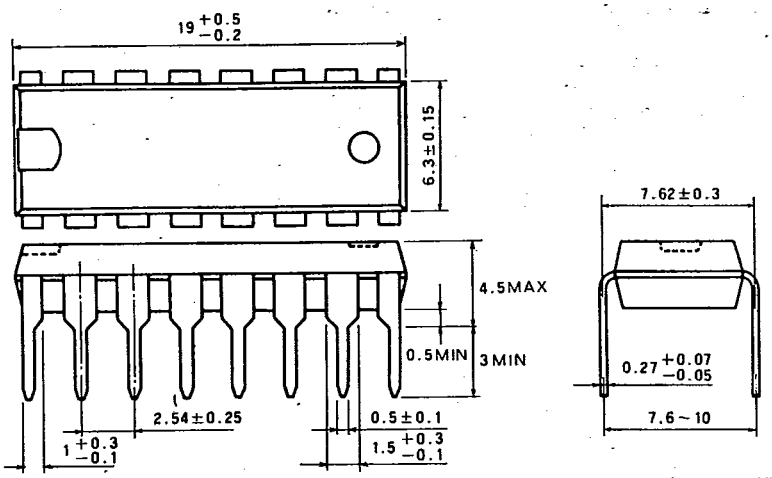
## TYPE 14P4 14-PIN MOLDED PLASTIC DIL

Dimension in mm




## TYPE 16P4 16-PIN MOLDED PLASTIC DIL

Dimension in mm




## TYPE 20P4 20-PIN MOLDED PLASTIC DIL

Dimension in mm