

TC74HC280AP, TC74HC280AF

9 - BIT PARITY GENERATOR / CHECKER

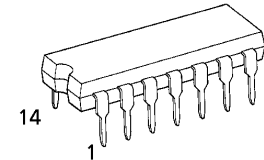
The TC74HC280A is a high speed CMOS 9 - BIT PARITY GENERATOR fabricated with silicon gate C²MOS technology. It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation. The TC74HC280A is composed of nine data inputs A thru I and odd/even parity outputs Σ ODD and Σ EVEN. The odd parity output is high when an odd number of data inputs are high. The even parity output is high when an even number of data inputs are high. The word-length capability is easily expanded by cascading. All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES :

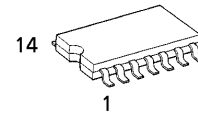
- High Speed..... $t_{pd} = 22ns$ (typ.) at $V_{CC} = 5V$
- Low Power Dissipation..... $I_{CC} = 4\mu A$ (Max.) at $T_a = 25^\circ C$
- High Noise Immunity..... $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (Min.)
- Output Drive Capability 10 LSTTL Loads
- Symmetrical Output Impedance... $|I_{OH}| = I_{OL} = 4mA$ (Min.)
- Balanced Propagation Delays..... $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range... V_{CC} (opr.) = 2V ~ 6V
- Pin and Function Compatible with 74LS280

TRUTH TABLE

| Number of inputs A through I that are High | Outputs | |
|---|---------------|--------------|
| | Σ EVEN | Σ ODD |
| 0, 2, 4, 6, 8 | H | L |
| 1, 3, 5, 7, 9 | L | H |

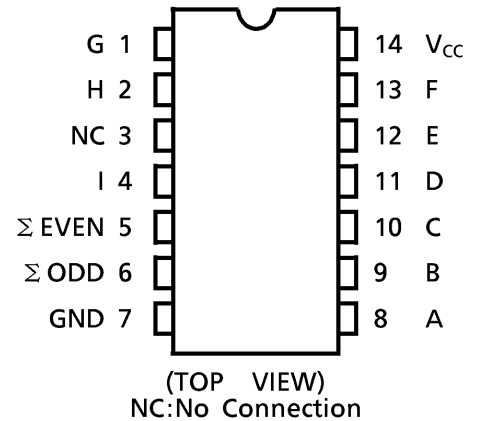


P (DIP14-P-300-2.54)
Weight : 0.96g (Typ.)

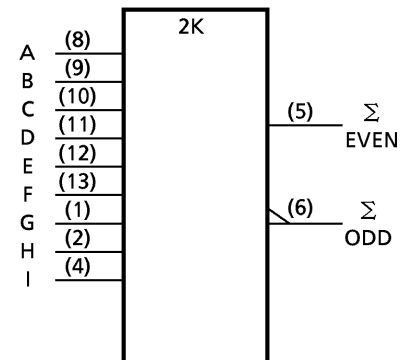


F (SOP14-P-300-1.27)
Weight : 0.18g (Typ.)

PIN ASSIGNMENT



IEC LOGIC SYMBOL



ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | VALUE | UNIT |
|-----------------------------|-----------|------------------------|------|
| Supply Voltage Range | V_{CC} | -0.5~7 | V |
| DC Input Voltage | V_{IN} | -0.5~ $V_{CC} + 0.5$ | V |
| DC Output Voltage | V_{OUT} | -0.5~ $V_{CC} + 0.5$ | V |
| Input Diode Current | I_{IK} | ± 20 | mA |
| Output Diode Current | I_{OK} | ± 20 | mA |
| DC Output Current | I_{OUT} | ± 25 | mA |
| DC V_{CC} /Ground Current | I_{CC} | ± 50 | mA |
| Power Dissipation | P_D | 500 (DIP)* / 180 (SOP) | mW |
| Storage Temperature | T_{stg} | -65~150 | °C |

*500mW in the range of $T_a = -40^{\circ}\text{C} \sim 65^{\circ}\text{C}$. From $T_a = 65^{\circ}\text{C}$ to 85°C a derating factor of $-10\text{mW}/^{\circ}\text{C}$ shall be applied until 300mW.

RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | VALUE | UNIT |
|--------------------------|------------|--|------|
| Supply Voltage | V_{CC} | 2~6 | V |
| Input Voltage | V_{IN} | 0~ V_{CC} | V |
| Output Voltage | V_{OUT} | 0~ V_{CC} | V |
| Operating Temperature | T_{opr} | -40~85 | °C |
| Input Rise and Fall Time | t_r, t_f | 0~ 1000 ($V_{CC} = 2.0\text{V}$) 0~ 500 ($V_{CC} = 4.5\text{V}$) 0~ 400 ($V_{CC} = 6.0\text{V}$) | ns |

DC ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | TEST CONDITION | V_{CC} (V) | $T_a = 25^{\circ}\text{C}$ | | | $T_a = -40 \sim 85^{\circ}\text{C}$ | | UNIT | |
|-----------------------------|----------|--|---------------------------|----------------------------|------|-------|-------------------------------------|-------|---------------|---|
| | | | | MIN. | TYP. | MAX. | MIN. | MAX. | | |
| High - Level Input Voltage | V_{IH} | | 2.0 | 1.50 | — | — | 1.50 | — | V | |
| | | | 4.5 | 3.15 | — | — | 3.15 | — | | |
| | | | 6.0 | 4.20 | — | — | 4.20 | — | | |
| Low - Level Input Voltage | V_{IL} | | 2.0 | — | — | 0.50 | — | 0.50 | V | |
| | | | 4.5 | — | — | 1.35 | — | 1.35 | | |
| | | | 6.0 | — | — | 1.80 | — | 1.80 | | |
| High - Level Output Voltage | V_{OH} | $V_{IN} = V_{IH}$ or V_{IL} | $I_{OH} = -20\mu\text{A}$ | 2.0 | 1.9 | 2.0 | — | 1.9 | — | V |
| | | | | 4.5 | 4.4 | 4.5 | — | 4.4 | — | |
| | | 6.0 | 5.9 | 6.0 | — | 5.9 | — | | | |
| | | $I_{OH} = -4\text{ mA}$ $I_{OH} = -5.2\text{ mA}$ | 4.5 | 4.18 | 4.31 | — | 4.13 | — | | |
| 6.0 | 5.68 | | 5.80 | — | 5.63 | — | | | | |
| Low - Level Output Voltage | V_{OL} | $V_{IN} = V_{IH}$ or V_{IL} | $I_{OL} = 20\mu\text{A}$ | 2.0 | — | 0.0 | 0.1 | — | 0.1 | V |
| | | | | 4.5 | — | 0.0 | 0.1 | — | 0.1 | |
| | | 6.0 | — | 0.0 | 0.1 | — | 0.1 | | | |
| | | $I_{OL} = 4\text{ mA}$ $I_{OL} = 5.2\text{ mA}$ | 4.5 | — | 0.17 | 0.26 | — | 0.33 | | |
| 6.0 | — | | 0.18 | 0.26 | — | 0.33 | | | | |
| Input Leakage Current | I_{IN} | $V_{IN} = V_{CC}$ or GND | 6.0 | — | — | ± 0.1 | — | ± 1.0 | μA | |
| Quiescent Supply Current | I_{CC} | $V_{IN} = V_{CC}$ or GND | 6.0 | — | — | 4.0 | — | 40.0 | | |

AC ELECTRICAL CHARACTERISTICS ($C_L = 15\text{pF}$, $V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$, Input $t_r = t_f = 6\text{ns}$)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|------------------------|------------------------|----------------|------|------|------|------|
| Output Transition Time | t_{TLH} t_{THL} | | — | 4 | 8 | ns |
| Propagation Delay Time | t_{PLH} t_{PHL} | | — | 22 | 35 | |

AC ELECTRICAL CHARACTERISTICS ($C_L = 50\text{pF}$, Input $t_r = t_f = 6\text{ns}$)

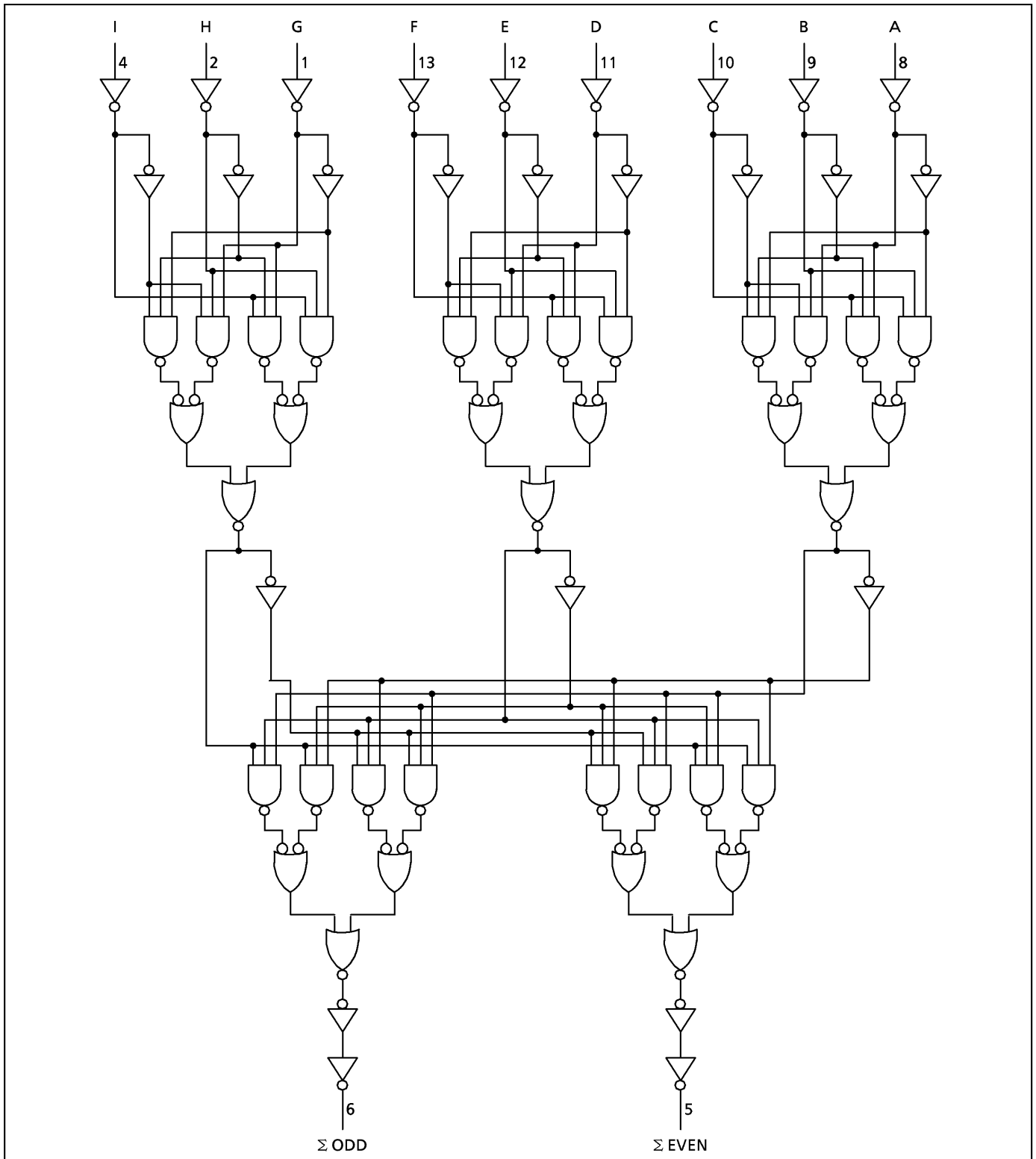
| PARAMETER | SYMBOL | TEST CONDITION | $T_a = 25^\circ\text{C}$ | | | $T_a = -40\text{--}85^\circ\text{C}$ | | UNIT | |
|-------------------------------|------------------------|----------------|--------------------------|------|------|--------------------------------------|------|------|------|
| | | | $V_{CC}(\text{V})$ | MIN. | TYP. | MAX. | MIN. | | MAX. |
| Output Transition Time | t_{TLH} t_{THL} | | 2.0 | — | 30 | 75 | — | 95 | ns |
| | | | 4.5 | — | 8 | 15 | — | 19 | |
| | | | 6.0 | — | 7 | 13 | — | 16 | |
| Propagation Delay Time | t_{PLH} t_{PHL} | | 2.0 | — | 80 | 200 | — | 250 | ns |
| | | | 4.5 | — | 26 | 40 | — | 50 | |
| | | | 6.0 | — | 22 | 34 | — | 43 | |
| Input Capacitance | C_{IN} | | — | 5 | 10 | — | 10 | pF | |
| Power Dissipation Capacitance | $C_{PD} (1)$ | | — | 61 | — | — | — | | |

Note (1) C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

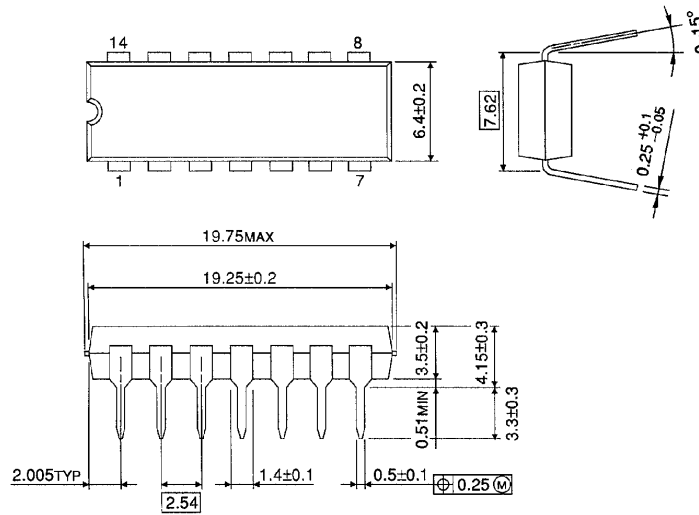
$$I_{CC}(\text{opr}) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}$$

SYSTEM DIAGRAM



DIP 14PIN PACKAGE DIMENSIONS (DIP14-P-300-2.54)

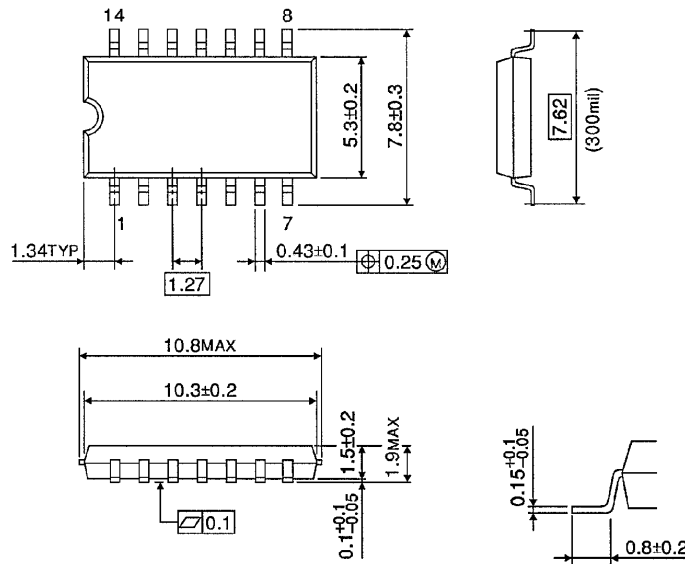
Unit in mm



Weight : 0.96g (Typ.)

SOP 14PIN (200mil BODY) PACKAGE DIMENSIONS (SOP14-P-300-1.27)

Unit in mm



Weight : 0.18g (Typ.)

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