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April 1st, 2010
Renesas Electronics Corporation

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Not recommended
for new design

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HD74AC280

9-bit Parity Generator/Checker

REJ03D0266-0200Z
 (Previous ADE-205-387 (Z))
 Rev.2.00
 Jul.16.2004

Description

The HD74AC280 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.

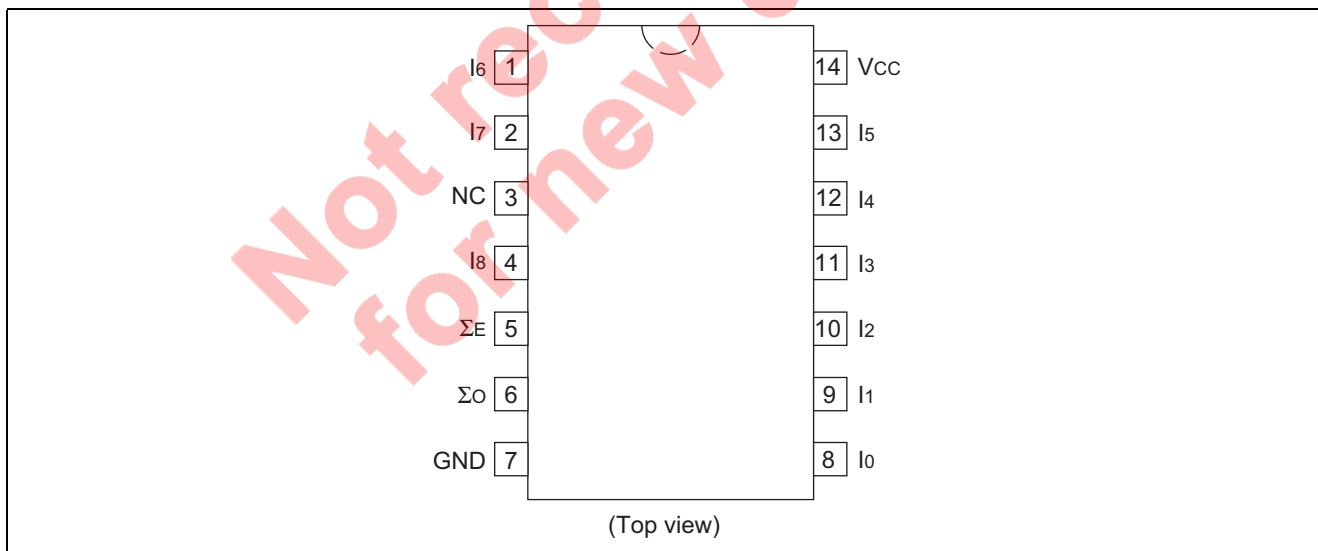
Features

- Outputs Source/Sink 24 mA
- Ordering Information

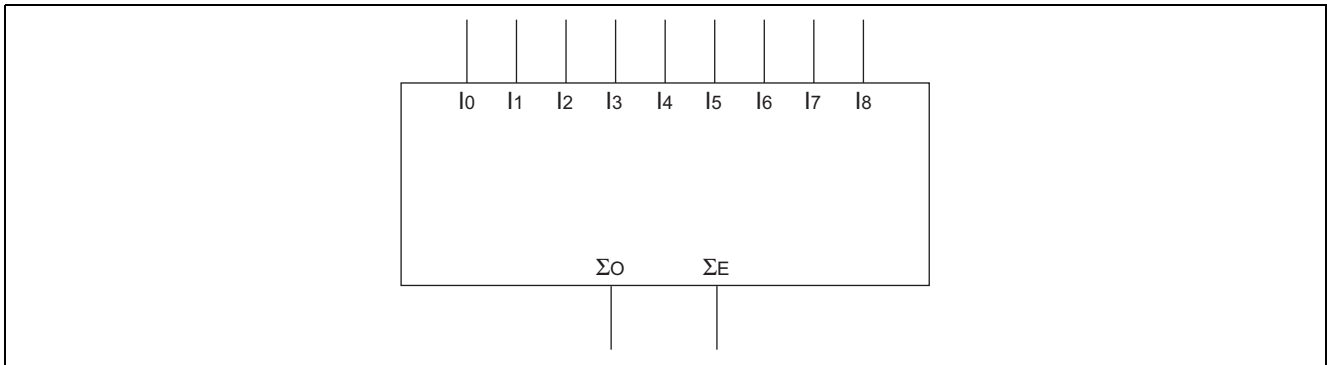
| Part Name | Package Type | Package Code | Package Abbreviation | Taping Abbreviation (Quantity) |
|---------------|--------------------|--------------|----------------------|--------------------------------|
| HD74AC280FPEL | SOP-14 pin (JEITA) | FP-14DAV | FP | EL (2,000 pcs/reel) |
| HD74AC280RPEL | SOP-14 pin (JEDEC) | FP-14DNV | RP | EL (2,500 pcs/reel) |

- Notes: 1. Please consult the sales office for the above package availability.
 2. The packages with lead-free pins are distinguished from the conventional products by adding V at the end of the package code.

Pin Arrangement



Logic Symbol



Pin Names

- I₀ – I₈ Data Inputs
- Σ_O Odd Parity Output
- Σ_E Even Parity Output

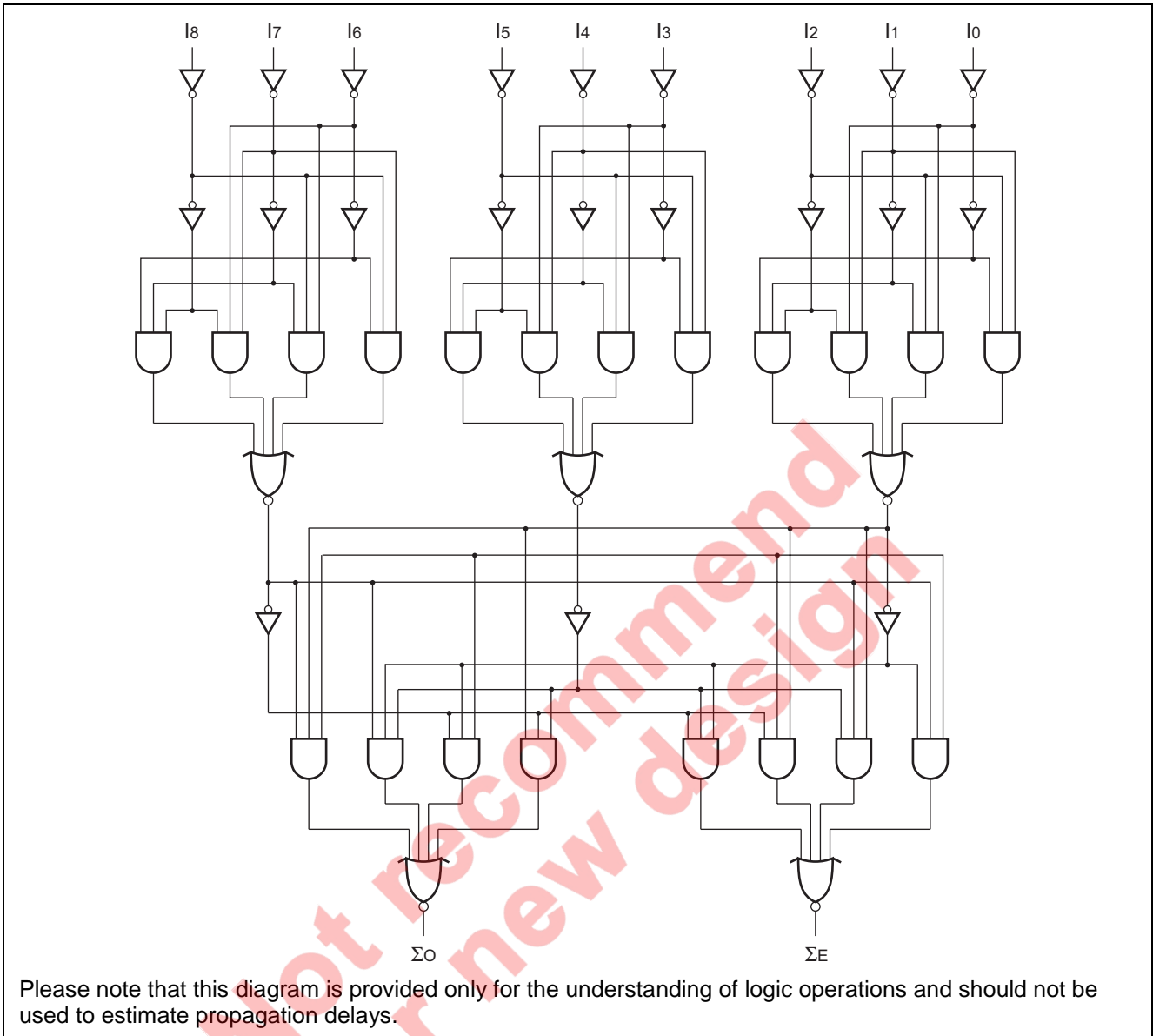
Truth Table

| Number of High Inputs I ₀ – I ₈ | Outputs | |
|---|---------|-------|
| | Σ Even | Σ Odd |
| 0, 2, 4, 6, 8 | H | L |
| 1, 3, 5, 7, 9 | L | H |

H : High Voltage Level
 L : Low Voltage Level

Not recommend
for new design

Logic Diagram



Absolute Maximum Ratings

| Item | Symbol | Ratings | Unit | Condition |
|--|-------------------|----------------------|-------------|---------------------|
| Supply voltage | V_{CC} | -0.5 to 7 | V | |
| DC input diode current | I_{IK} | -20 | mA | $V_I = -0.5V$ |
| | | 20 | mA | $V_I = V_{CC}+0.5V$ |
| DC input voltage | V_I | -0.5 to $V_{CC}+0.5$ | V | |
| DC output diode current | I_{OK} | -50 | mA | $V_O = -0.5V$ |
| | | 50 | mA | $V_O = V_{CC}+0.5V$ |
| DC output voltage | V_O | -0.5 to $V_{CC}+0.5$ | V | |
| DC output source or sink current | I_O | ± 50 | mA | |
| DC V_{CC} or ground current per output pin | I_{CC}, I_{GND} | ± 50 | mA | |
| Storage temperature | T_{stg} | -65 to +150 | $^{\circ}C$ | |

Recommended Operating Conditions

| Item | Symbol | Ratings | Unit | Condition |
|---|------------|---------------|------|------------------|
| Supply voltage | V_{CC} | 2 to 6 | V | |
| Input and output voltage | V_I, V_O | 0 to V_{CC} | V | |
| Operating temperature | T_a | -40 to +85 | °C | |
| Input rise and fall time (except Schmitt inputs) V_{IN} 30% to 70% V_{CC} | t_r, t_f | 8 | ns/V | $V_{CC} = 3.0V$ |
| | | | | $V_{CC} = 4.5 V$ |
| | | | | $V_{CC} = 5.5 V$ |

DC Characteristics

| Item | Symbol | V_{CC} (V) | $T_a = 25^\circ C$ | | | $T_a = -40$ to $+85^\circ C$ | | Unit | Condition | | | | |
|--------------------------|-----------|--------------|--------------------|-------|-----------|------------------------------|-----------|-----------------------------|--|--|---------------------------------------|--|--|
| | | | min. | typ. | max. | min. | max. | | | | | | |
| Input Voltage | V_{IH} | 3.0 | 2.1 | 1.5 | — | 2.1 | — | V | $V_{OUT} = 0.1 V$ or $V_{CC} - 0.1 V$ | | | | |
| | | 4.5 | 3.15 | 2.25 | — | 3.15 | — | | | | | | |
| | | 5.5 | 3.85 | 2.75 | — | 3.85 | — | | | | | | |
| | V_{IL} | 3.0 | — | 1.50 | 0.9 | — | 0.9 | | | | $V_{OUT} = 0.1 V$ or $V_{CC} - 0.1 V$ | | |
| | | 4.5 | — | 2.25 | 1.35 | — | 1.35 | | | | | | |
| | | 5.5 | — | 2.75 | 1.65 | — | 1.65 | | | | | | |
| Output voltage | V_{OH} | 3.0 | 2.9 | 2.99 | — | 2.9 | — | V | $V_{IN} = V_{IL}$ or V_{IH} $I_{OUT} = -50 \mu A$ | | | | |
| | | 4.5 | 4.4 | 4.49 | — | 4.4 | — | | | | | | |
| | | 5.5 | 5.4 | 5.49 | — | 5.4 | — | | | | | | |
| | | V_{OL} | 3.0 | 2.58 | — | — | 2.48 | | | | — | $V_{IN} = V_{IL}$ or V_{IH} $I_{OH} = -12 mA$ $I_{OH} = -24 mA$ $I_{OH} = -24 mA$ | |
| | | | 4.5 | 3.94 | — | — | 3.80 | | | | — | | |
| | | | 5.5 | 4.94 | — | — | 4.80 | | | | — | | |
| | V_{OL} | 3.0 | — | 0.002 | 0.1 | — | 0.1 | | $V_{IN} = V_{IL}$ or V_{IH} $I_{OUT} = 50 \mu A$ | | | | |
| | | 4.5 | — | 0.001 | 0.1 | — | 0.1 | | | | | | |
| | | 5.5 | — | 0.001 | 0.1 | — | 0.1 | | | | | | |
| | | V_{OL} | 3.0 | — | — | 0.32 | — | | | | 0.37 | $V_{IN} = V_{IL}$ or V_{IH} $I_{OL} = 12 mA$ $I_{OL} = 24 mA$ $I_{OL} = 24 mA$ | |
| | | | 4.5 | — | — | 0.32 | — | | | | 0.37 | | |
| | | | 5.5 | — | — | 0.32 | — | | | | 0.37 | | |
| Input leakage current | I_{IN} | 5.5 | — | — | ± 0.1 | — | ± 1.0 | $V_{IN} = V_{CC}$ or GND | | | | | |
| Dynamic output current* | I_{OLD} | 5.5 | — | — | — | 86 | — | $V_{OLD} = 1.1 V$ | | | | | |
| | I_{OHD} | 5.5 | — | — | — | -75 | — | $V_{OHD} = 3.85 V$ | | | | | |
| Quiescent supply current | I_{CC} | 5.5 | — | — | 8.0 | — | 80 | $V_{IN} = V_{CC}$ or ground | | | | | |

*Maximum test duration 2.0 ms, one output loaded at a time.

AC Characteristics

| Item | Symbol | V_{CC} (V)*1 | $T_a = +25^\circ C$ $C_L = 50 pF$ | | | $T_a = -40^\circ C$ to $+85^\circ C$ $C_L = 50 pF$ | | Unit |
|-------------------|-----------|----------------|--------------------------------------|------|------|---|------|------|
| | | | Min | Typ | Max | Min | Max | |
| Propagation delay | t_{PLH} | 3.3 | 1.0 | 14.5 | 17.0 | 1.0 | 18.5 | ns |
| | | 5.0 | 1.0 | 11.0 | 13.0 | 1.0 | 14.5 | |
| Propagation delay | t_{PHL} | 3.3 | 1.0 | 14.5 | 17.0 | 1.0 | 18.5 | ns |
| | | 5.0 | 1.0 | 11.0 | 13.0 | 1.0 | 14.5 | |

Note: 1. Voltage Range 3.3 is 3.3 V \pm 0.3 V
Voltage Range 5.0 is 5.0 V \pm 0.5 V

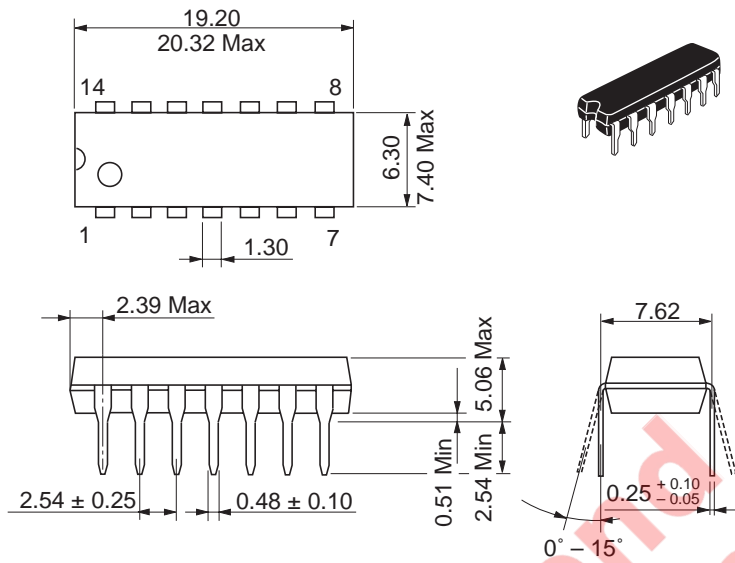
Capacitance

| Item | Symbol | Typ | Unit | Condition |
|-------------------------------|----------|------|------|--------------------------|
| Input capacitance | C_{IN} | 4.5 | pF | $V_{CC} = 5.5 \text{ V}$ |
| Power dissipation capacitance | C_{PD} | 60.0 | pF | $V_{CC} = 5.0 \text{ V}$ |

Not recommend
for new design

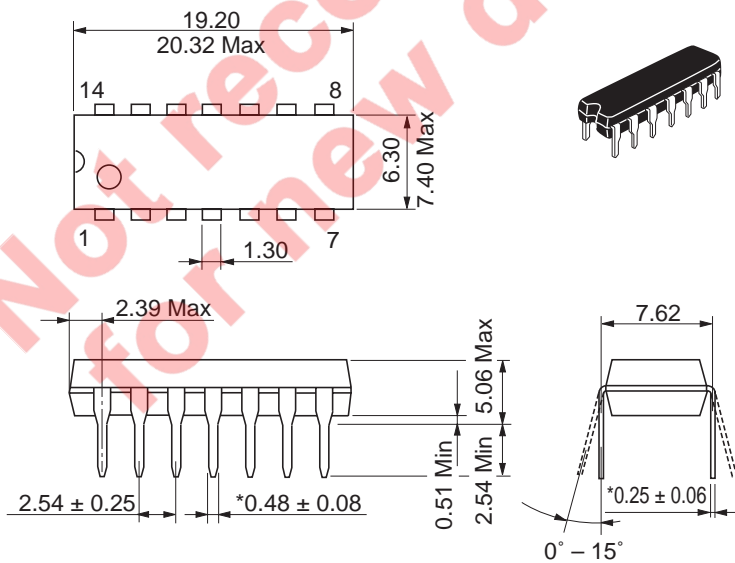
Package Dimensions

As of January, 2003
Unit: mm



| | |
|------------------------|----------|
| Package Code | DP-14 |
| JEDEC | Conforms |
| JEITA | Conforms |
| Mass (reference value) | 0.97 g |

Unit: mm

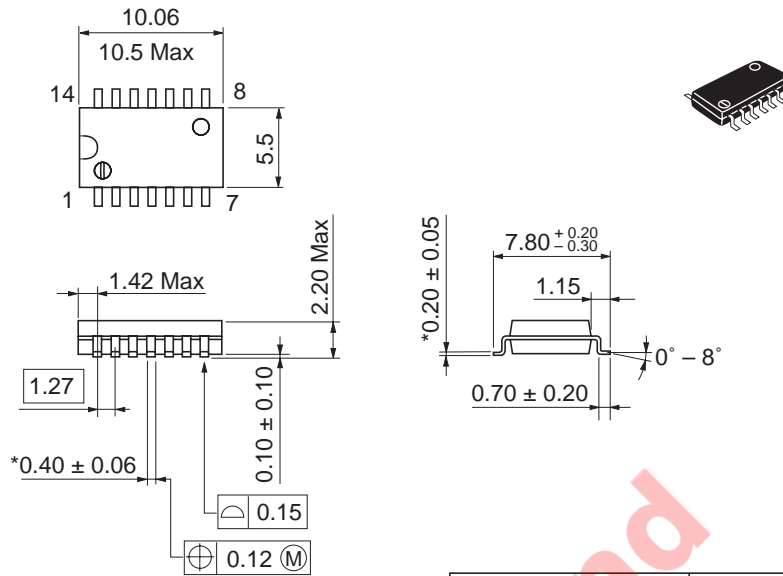


*Ni/Pd/AU Plating

| | |
|------------------------|----------|
| Package Code | DP-14AV |
| JEDEC | Conforms |
| JEITA | Conforms |
| Mass (reference value) | 0.97 g |

As of January, 2003

Unit: mm

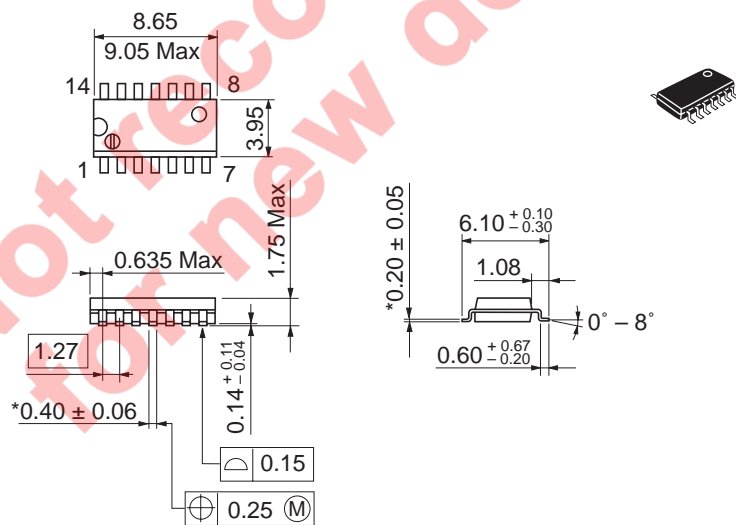


*Ni/Pd/Au plating

| | |
|------------------------|----------|
| Package Code | FP-14DAV |
| JEDEC | — |
| JEITA | Conforms |
| Mass (reference value) | 0.23 g |

As of January, 2003

Unit: mm



*Ni/Pd/Au plating

| | |
|------------------------|----------|
| Package Code | FP-14DNV |
| JEDEC | Conforms |
| JEITA | Conforms |
| Mass (reference value) | 0.13 g |

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