



HD74AC08

Quad 2-Input AND Gate

REJ03D0242-0200Z
 (Previous ADE-205-358 (Z))
 Rev.2.00
 Jul.16.2004

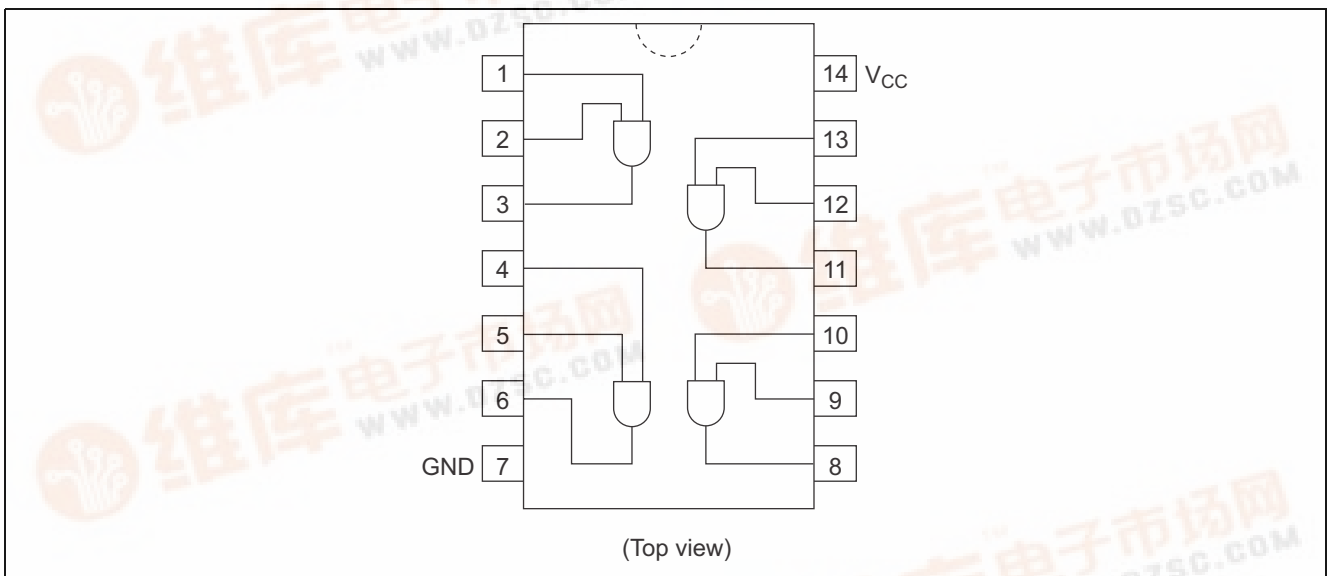
Features

- Outputs Source/Sink 24 mA
- Ordering Information

| Part Name | Package Type | Package Code | Package Abbreviation | Taping Abbreviation (Quantity) |
|--------------|--------------------|--------------|----------------------|--------------------------------|
| HD74AC08P | DIP-14 pin | DP-14, -14AV | P | — |
| HD74AC08FPEL | SOP-14 pin (JEITA) | FP-14DAV | FP | EL (2,000 pcs/reel) |
| HD74AC08RPEL | SOP-14 pin (JEDEC) | FP-14DNV | RP | EL (2,500 pcs/reel) |
| HD74AC08TELL | TSSOP-14 pin | TTP-14DV | T | ELL (2,000 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



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 | Tstg | -65 to +150 | °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 | Ta | -40 to +85 | °C | |
| Input rise and fall time (except Schmitt inputs) V_{IN} 30% to 70% V_{CC} | tr, tf | 8 | ns/V | $V_{CC} = 3.0V$ |
| | | | | $V_{CC} = 4.5V$ |
| | | | | $V_{CC} = 5.5V$ |

DC Characteristics

| Item | Sym- bol | Vcc (V) | Ta = 25°C | | | Ta = -40 to +85°C | | Unit | Condition | | | |
|--------------------------|-------------|------------|-----------|-------|-----------|----------------------|-----------|---------|--|--|--|--|
| | | | min. | typ. | max. | min. | max. | | | | | |
| Input Voltage | V_{IH} | 3.0 | 2.1 | 1.5 | — | 2.1 | — | V | $V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$ | | | |
| | | 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 | | $V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$ | | | |
| | | 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 | — | | | | | |
| | | 3.0 | 2.58 | — | — | 2.48 | — | | | | $V_{IN} = V_{IL}$ or V_{IH} $I_{OH} = -12 \text{ mA}$ $I_{OH} = -24 \text{ mA}$ $I_{OH} = -24 \text{ mA}$ | |
| | | 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 | | | | | |
| | | 3.0 | — | — | 0.32 | — | 0.37 | | | | $V_{IN} = V_{IL}$ or V_{IH} $I_{OL} = 12 \text{ mA}$ $I_{OL} = 24 \text{ mA}$ $I_{OL} = 24 \text{ mA}$ | |
| | | 4.5 | — | — | 0.32 | — | 0.37 | | | | | |
| | | 5.5 | — | — | 0.32 | — | 0.37 | | | | | |
| Input leakage current | I_{IN} | 5.5 | — | — | ± 0.1 | — | ± 1.0 | μA | $V_{IN} = V_{CC}$ or GND | | | |
| Dynamic output current* | I_{OLD} | 5.5 | — | — | — | 86 | — | mA | $V_{OLD} = 1.1V$ | | | |
| | I_{OHD} | 5.5 | — | — | — | -75 | — | mA | $V_{OHD} = 3.85V$ | | | |
| Quiescent supply current | I_{CC} | 5.5 | — | — | 4.0 | — | 40 | μA | $V_{IN} = V_{CC}$ or ground | | | |

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

AC Characteristics

| Item | Symbol | V _{CC} (V)*1 | Ta = +25°C C _L = 50 pF | | | Ta = -40°C to +85°C C _L = 50 pF | | Unit |
|-------------------|------------------|-----------------------|--------------------------------------|-----|-----|---|------|------|
| | | | Min | Typ | Max | Min | Max | |
| Propagation delay | t _{PLH} | 3.3 | 1.0 | 7.5 | 9.5 | 1.0 | 10.0 | ns |
| | | 5.0 | 1.0 | 5.5 | 7.5 | 1.0 | 8.5 | |
| Propagation delay | t _{PHL} | 3.3 | 1.0 | 7.0 | 8.5 | 1.0 | 9.0 | ns |
| | | 5.0 | 1.0 | 5.5 | 7.0 | 1.0 | 7.5 | |

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

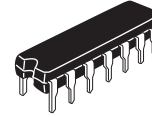
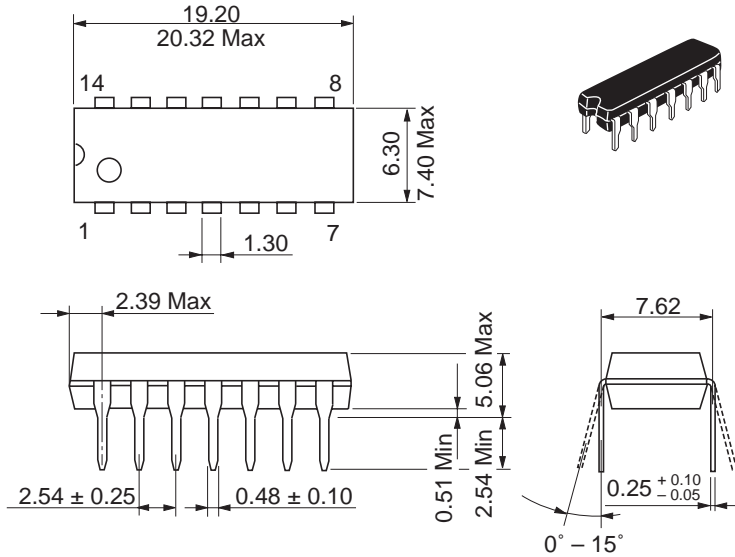
Capacitance

| Item | Symbol | Typ | Unit | Condition |
|-------------------------------|-----------------|------|------|-------------------------|
| Input capacitance | C _{IN} | 4.5 | pF | V _{CC} = 5.5 V |
| Power dissipation capacitance | C _{PD} | 20.0 | pF | V _{CC} = 5.0 V |

Package Dimensions

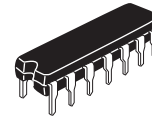
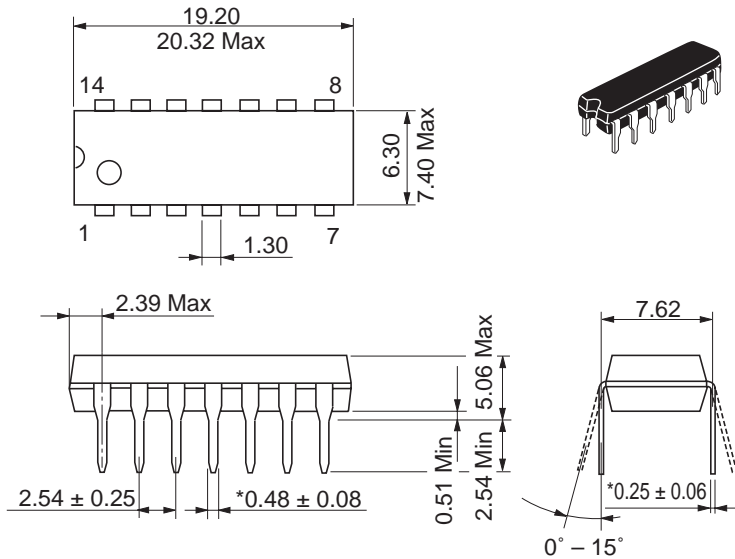
As of January, 2003

Unit: mm



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

Unit: mm

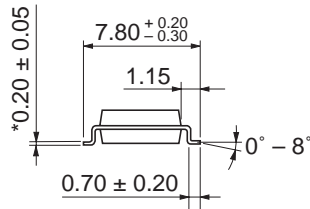
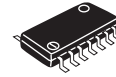
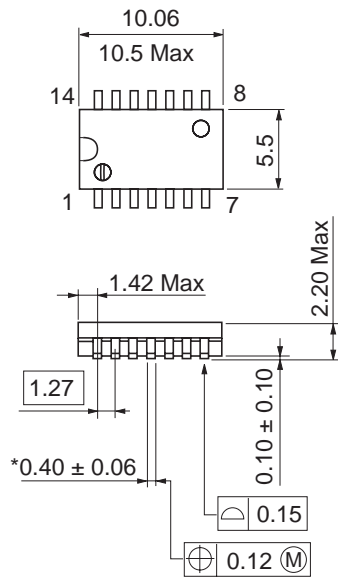


*Ni/Pd/AU Plating

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

HD74AC08

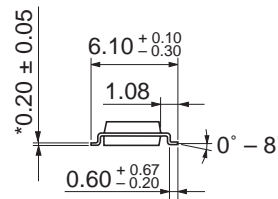
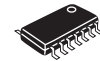
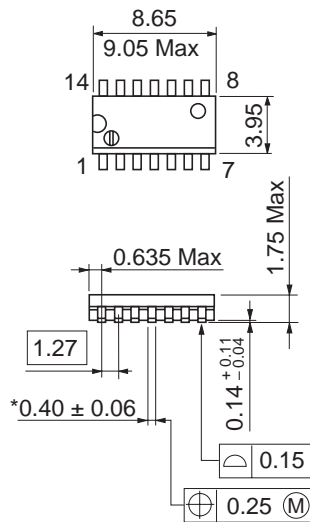
As of January, 2003
Unit: mm



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

*Ni/Pd/Au plating

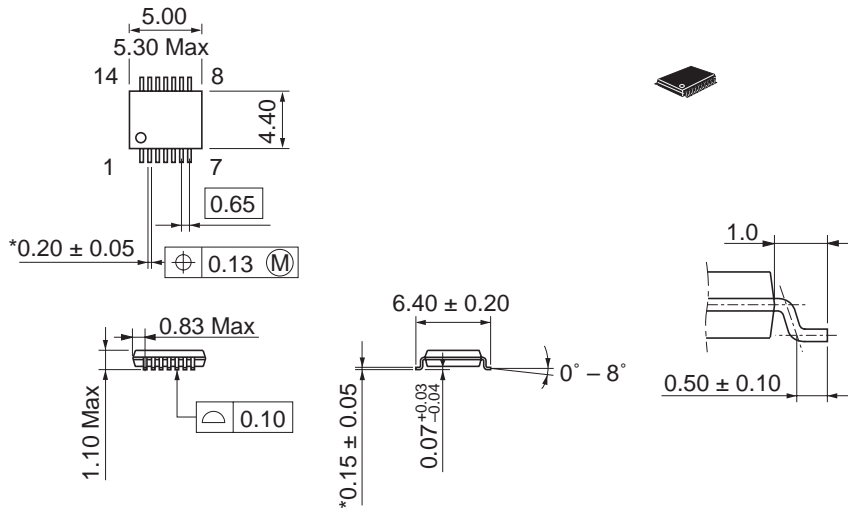
As of January, 2003
Unit: mm



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

*Ni/Pd/Au plating

As of January, 2003
Unit: mm



*Ni/Pd/Au plating

| | |
|------------------------|----------|
| Package Code | TTP-14DV |
| JEDEC | — |
| JEITA | — |
| Mass (reference value) | 0.05 g |

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