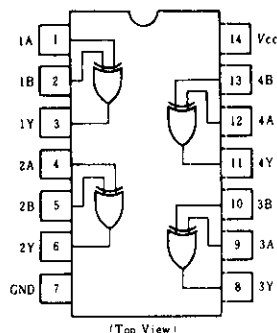


# HD74LS86 • Quadruple 2-input Exclusive-OR Gates

## ■ PIN ARRANGEMENT



## ■ FUNCTION TABLE

| Inputs |   | Output |
|--------|---|--------|
| A      | B | Y      |
| L      | L | L      |
| L      | H | H      |
| H      | L | H      |
| H      | H | L      |

H; high level, L; low level

## ■ ELECTRICAL CHARACTERISTICS ( $T_a = -20 \sim +75^\circ\text{C}$ )

| Item                         | Symbol   | Test Conditions                                                                                      | min | typ* | max  | Unit          |
|------------------------------|----------|------------------------------------------------------------------------------------------------------|-----|------|------|---------------|
| Input voltage                | $V_{IH}$ |                                                                                                      | 2.0 | —    | —    | V             |
|                              | $V_{IL}$ |                                                                                                      | —   | —    | 0.8  | V             |
| Output voltage               | $V_{OH}$ | $V_{CC} = 4.75\text{V}$ , $V_{IH} = 2\text{V}$ , $V_{IL} = 0.8\text{V}$ , $I_{OH} = -400\mu\text{A}$ | 2.7 | —    | —    | V             |
|                              | $V_{OL}$ | $V_{OL} = 4.75\text{V}$ , $V_{IH} = 2\text{V}$ , $V_{IL} = 0.8\text{V}$                              |     |      | 0.4  | V             |
|                              |          |                                                                                                      |     |      | 0.5  |               |
|                              |          | $I_{OL} = 4\text{mA}$                                                                                | —   | —    | —    |               |
| Input current                | $I_I$    | $V_{CC} = 5.25\text{V}$ , $V_I = 7\text{V}$                                                          | —   | —    | 0.2  | mA            |
|                              | $I_{IH}$ | $V_{CC} = 5.25\text{V}$ , $V_I = 2.7\text{V}$                                                        | —   | —    | 40   | $\mu\text{A}$ |
|                              | $I_{IL}$ | $V_{CC} = 5.25\text{V}$ , $V_I = 0.4\text{V}$                                                        | —   | —    | -0.8 | mA            |
| Short-circuit output current | $I_{OS}$ | $V_{CC} = 5.25\text{V}$                                                                              | -20 | —    | -100 | mA            |
| Supply current **            | $I_{CC}$ | $V_{CC} = 5.25\text{V}$                                                                              | —   | 6.1  | 10   | mA            |
| Input clamp voltage          | $V_{IK}$ | $V_{CC} = 4.75\text{V}$ , $I_{IN} = -18\text{mA}$                                                    | —   | —    | -1.5 | V             |

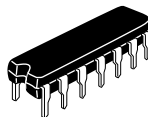
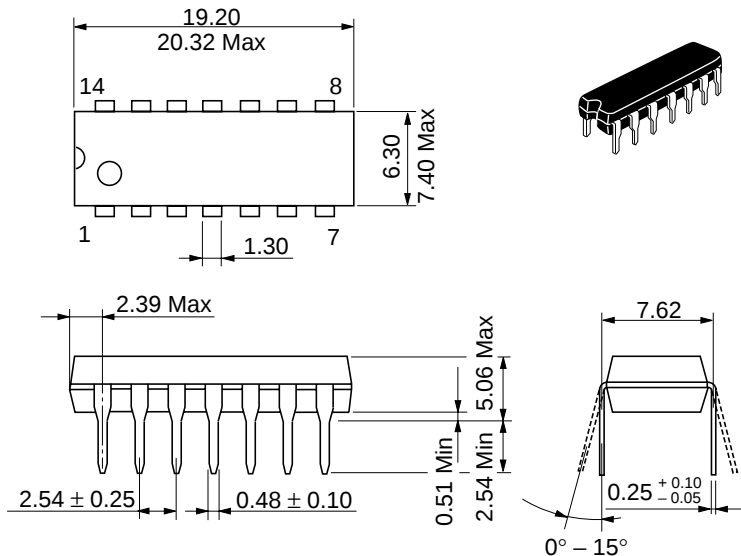
\*  $V_{CC} = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$

\*\*  $I_{CC}$  is measured with all outputs open and all inputs grounded.

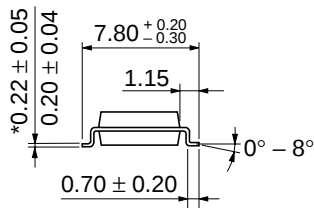
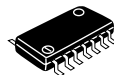
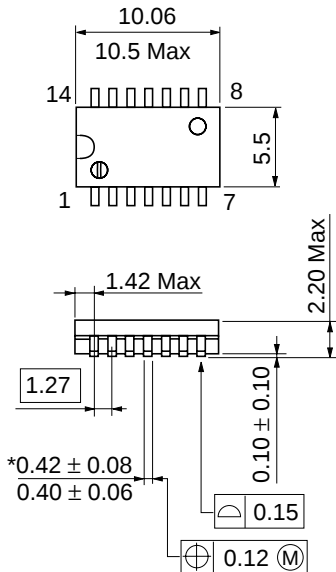
## ■ SWITCHING CHARACTERISTICS ( $V_{CC} = 5\text{V}$ , $T_a = 25^\circ\text{C}$ )

| Item                   | Symbol    | Inputs | Test Conditions                              |                   | min | typ | max | Unit |
|------------------------|-----------|--------|----------------------------------------------|-------------------|-----|-----|-----|------|
| Propagation delay time | $t_{PLH}$ | A or B | $C_L=15\text{pF}$ ,<br>$R_L=2\text{k}\Omega$ | Other inputs=0V   | —   | 12  | 23  | ns   |
|                        | $t_{PHL}$ |        |                                              |                   | —   | 10  | 17  | ns   |
|                        | $t_{PLH}$ | A or B |                                              | Other inputs=4.5V | —   | 20  | 30  | ns   |
|                        | $t_{PHL}$ |        |                                              |                   | —   | 13  | 22  | ns   |

Note) Refer to Test Circuit and Waveform of the Common Item

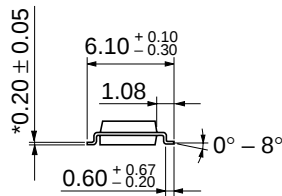
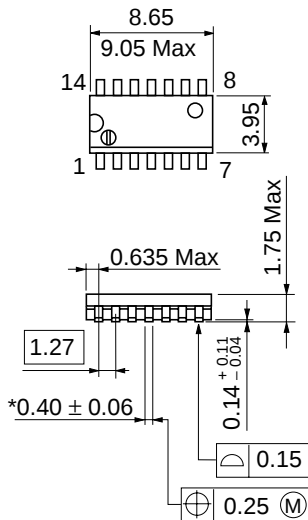


|                          |          |
|--------------------------|----------|
| Hitachi Code             | DP-14    |
| JEDEC                    | Conforms |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.97 g   |



|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-14DA  |
| JEDEC                    | —        |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.23 g   |

\*Dimension including the plating thickness  
Base material dimension



|                          |          |
|--------------------------|----------|
| Hitachi Code             | FP-14DN  |
| JEDEC                    | Conforms |
| EIAJ                     | Conforms |
| Weight (reference value) | 0.13 g   |

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