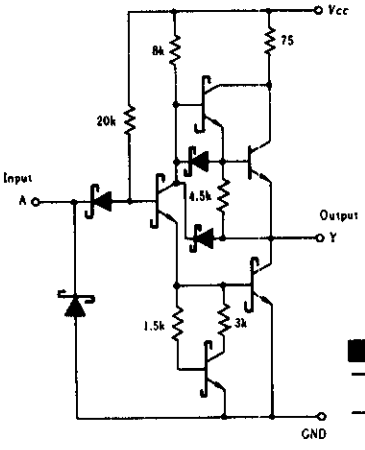
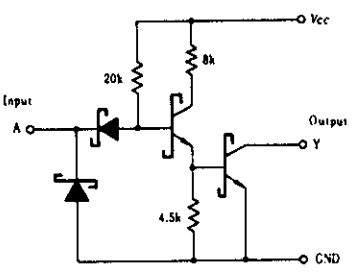
# HD74LS04/HD74LS05 ●Hex Inverters ●Hex Inverters (with Open Collector Outputs)

## ■CIRCUIT SCHEMATIC(1/6)

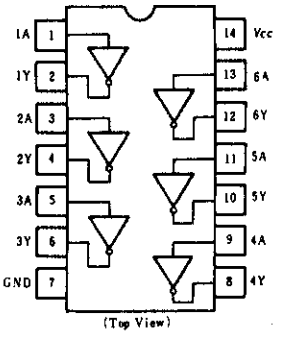
HD74LS04




HD74LS05




## ■PIN ARRANGEMENT




## ■HD74LS05 RECOMMENDED OPERATING CONDITIONS

| Item | Symbol | min | typ | max | Unit |
|---|---|---|---|---|---|
| High level output voltage | $V_{OH}$ | – | – | 5.5 | V |
| Low level output current | $I_{OL}$ | – | – | 8 | mA |

## ■ELECTRICAL CHARACTERISTICS ($Ta=-20\sim+75°C$)

| Item | Symbol | Test Conditions | | HD74LS04 | | | HD74LS05 | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | min | typ* | max | min | typ* | max | |
| Input voltage | $V_{IH}$ | | | 2.0 | – | – | 2.0 | – | – | V |
| | $V_{IL}$ | | | – | – | 0.8 | – | – | 0.8 | V |
| Output voltage | $V_{OH}$ | $V_{CC}=4.75V$, $V_{IL}=0.8V$, $I_{OH}=-400\mu A$ | | 2.7 | – | – | – | – | – | V |
| | $V_{OL}$ | $V_{CC}=4.75V$, $V_{IH}=2V$ | $I_{OL}=8mA$ | – | – | 0.5 | – | – | 0.5 | V |
| | | | $I_{OL}=4mA$ | – | – | 0.4 | – | – | 0.4 | |
| Output current | $I_{OH}$ | $V_{CC}=4.75V$, $V_{IL}=0.8V$, $V_{OH}=5.5V$ | | – | – | – | – | – | 100 | $\mu A$ |
| Input current | $I_{IH}$ | $V_{CC}=5.25V$, $V_I=2.7V$ | | – | – | 20 | – | – | 20 | $\mu A$ |
| | $I_{IL}$ | $V_{CC}=5.25V$, $V_I=0.4V$ | | – | – | −0.4 | – | – | −0.4 | mA |
| | $I_I$ | $V_{CC}=5.25V$, $V_I=7V$ | | – | – | 0.1 | – | – | 0.1 | mA |
| Short-circuit output current | $I_{OS}$ | $V_{CC}=5.25V$ | | −20 | – | −100 | – | – | – | mA |
| Supply current | $I_{CCH}$ | $V_{CC}=5.25V$ | | – | 1.2 | 2.4 | – | 1.2 | 2.4 | mA |
| | $I_{CCL}$ | | | – | 3.6 | 6.6 | – | 3.6 | 6.6 | |
| Input clamp voltage | $V_{IK}$ | $V_{CC}=4.75V$, $I_{IN}=-18mA$ | | – | – | −1.5 | – | – | −1.5 | V |

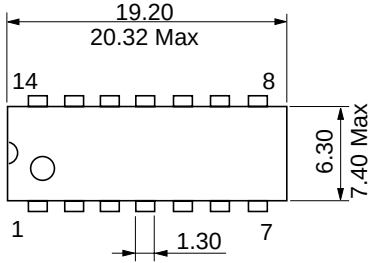
* $V_{CC}$=5V, $Ta$=25°C

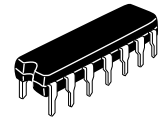
## ■SWITCHING CHARACTERISTICS ($V_{CC}=5V$, $Ta=25°C$)

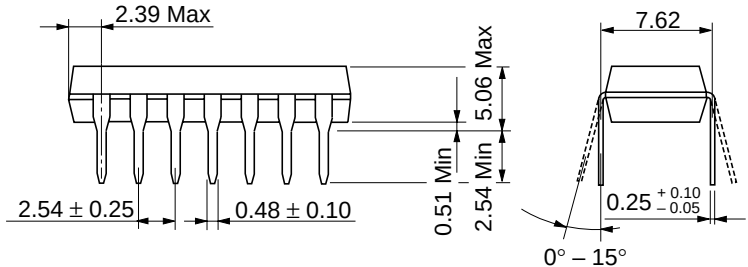
| Item | Symbol | Test Conditions | HD74LS04 | | | HD74LS05 | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | min | typ | max | min | typ | max | |
| Propagation delay time | $t_{PLH}$ | $C_L=15pF$, $R_L=2k\Omega$ | – | 9 | 15 | – | 17 | 32 | ns |
| | $t_{PHL}$ | | – | 10 | 15 | – | 15 | 28 | |

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

Unit: mm

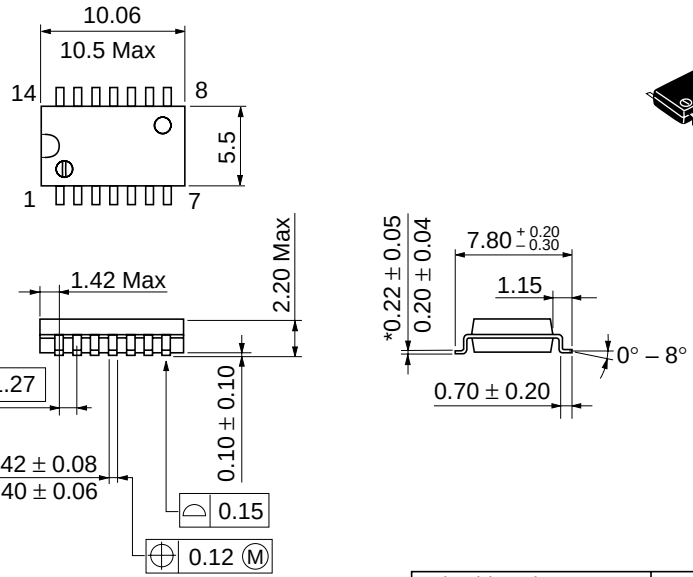


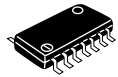






| | |
|---|---|
| Hitachi Code | DP-14 |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 0.97 g |

Unit: mm

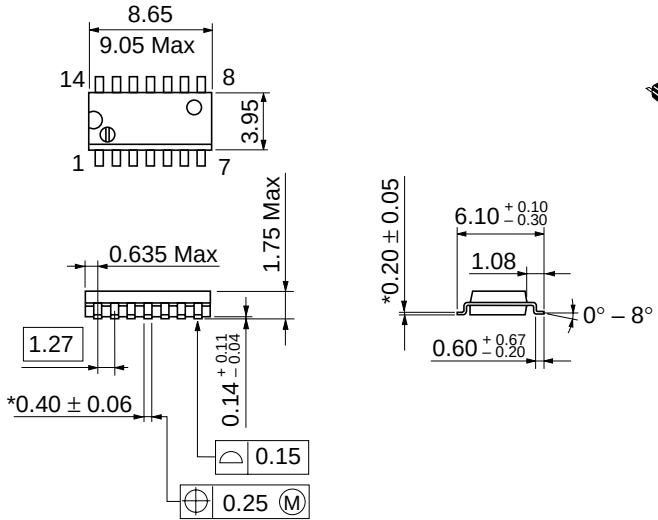


| | |
|---|---|
| Hitachi Code | FP-14DA |
| JEDEC | — |
| EIAJ | Conforms |
| Weight (reference value) | 0.23 g |

*Dimension including the plating thickness
Base material dimension

Unit: mm




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

*Pd plating

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