

HD74LS14

Hex Schmitt Trigger Inverters

REJ03D0399-0400

Rev.4.00

Apr 07, 2009

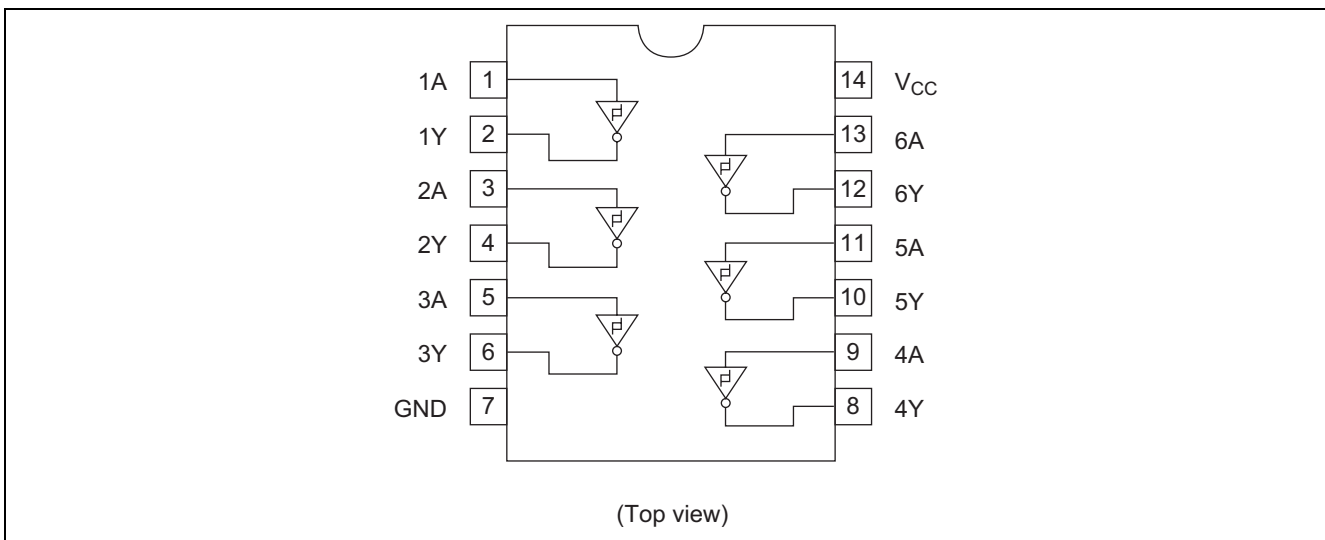
Features

- Ordering Information

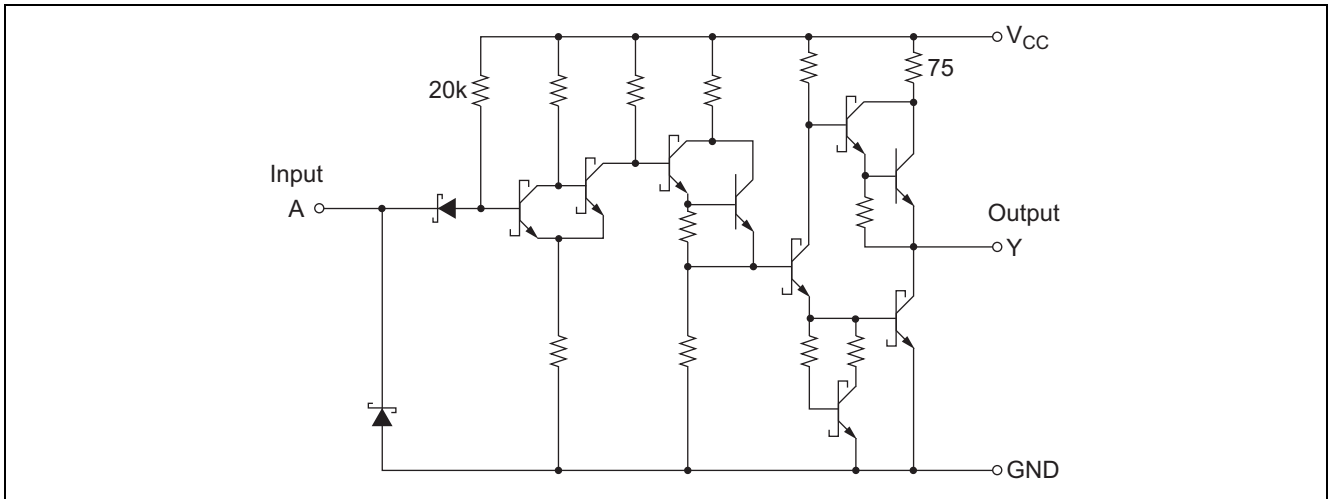
| Part Name | Package Type | Package Code (Previous Code) | Package Abbreviation | Taping Abbreviation (Quantity) |
|--------------|--------------------|------------------------------|----------------------|--------------------------------|
| HD74LS14P | DILP-14 pin | PRDP0014AB-B (DP-14AV) | P | — |
| HD74LS14FPEL | SOP-14 pin (JEITA) | PRSP0014DF-B (FP-14DAV) | FP | EL (2,000 pcs/reel) |
| HD74LS14RPEL | SOP-14 pin (JEDEC) | PRSP0014DE-A (FP-14DNV) | RP | EL (2,500 pcs/reel) |

Note: Please consult the sales office for the above package availability.

Pin Arrangement



Circuit Schematic (1/6)



Absolute Maximum Ratings

| Item | Symbol | Ratings | Unit |
|---------------------|-----------|-------------|------|
| Input voltage | V_{IN} | 7 | V |
| Supply voltage | V_{CC} | 7 | V |
| Power dissipation | P_T | 400 | mW |
| Storage temperature | T_{stg} | -65 to +150 | °C |

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------|-----------|------|------|------|---------|
| Supply voltage | V_{CC} | 4.75 | 5.00 | 5.25 | V |
| Output current | I_{OH} | — | — | -400 | μA |
| | I_{OL} | — | — | 8 | mA |
| Operating temperature | T_{opr} | -20 | 25 | 75 | °C |

Electrical Characteristics

(Ta = -20 to +75 °C)

| Item | Symbol | min. | typ.* | max. | Unit | Condition |
|------------------------------|---------------------|------|-------|------|---------------|--|
| Input threshold voltage | V_{T^+} | 1.4 | 1.6 | 1.9 | V | $V_{CC} = 5\text{ V}$ |
| | V_{T^-} | 0.5 | 0.7 | 1.0 | V | $V_{CC} = 5\text{ V}$ |
| Hysteresis | $V_{T^+} - V_{T^-}$ | 0.4 | 0.9 | — | V | $V_{CC} = 5\text{ V}$ |
| Output voltage | V_{OH} | 2.7 | — | — | V | $V_{CC} = 4.75\text{ V}$, $V_I = 0.5\text{ V}$, $I_{OH} = -400\text{ }\mu\text{A}$ |
| | V_{OL} | — | — | 0.5 | V | $V_{CC} = 4.75\text{ V}$, $V_I = 1.9\text{ V}$ |
| | | — | — | 0.4 | | |
| Input threshold current | I_{T^+} | — | -0.14 | — | mA | $V_{CC} = 5\text{ V}$, $V_I = V_{T^+}$ |
| | I_{T^-} | — | -0.18 | — | mA | $V_{CC} = 5\text{ V}$, $V_I = V_{T^-}$ |
| Input current | I_{IH} | — | — | 20 | μA | $V_{CC} = 5.25\text{ V}$, $V_I = 2.7\text{ V}$ |
| | I_{IL} | — | — | -0.4 | mA | $V_{CC} = 5.25\text{ V}$, $V_I = 0.4\text{ V}$ |
| | I_I | — | — | 0.1 | mA | $V_{CC} = 5.25\text{ V}$, $V_I = 7\text{ V}$ |
| Short-circuit output current | I_{OS} | -20 | — | -100 | mA | $V_{CC} = 5.25\text{ V}$ |
| Supply current | I_{CCH} | — | 8.6 | 16 | mA | $V_{CC} = 5.25\text{ V}$ |
| | I_{CCL} | — | 12 | 21 | mA | $V_{CC} = 5.25\text{ V}$ |
| Input clamp voltage | V_{IK} | — | — | -1.5 | V | $V_{CC} = 4.75\text{ V}$, $I_{IN} = -18\text{ mA}$ |

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

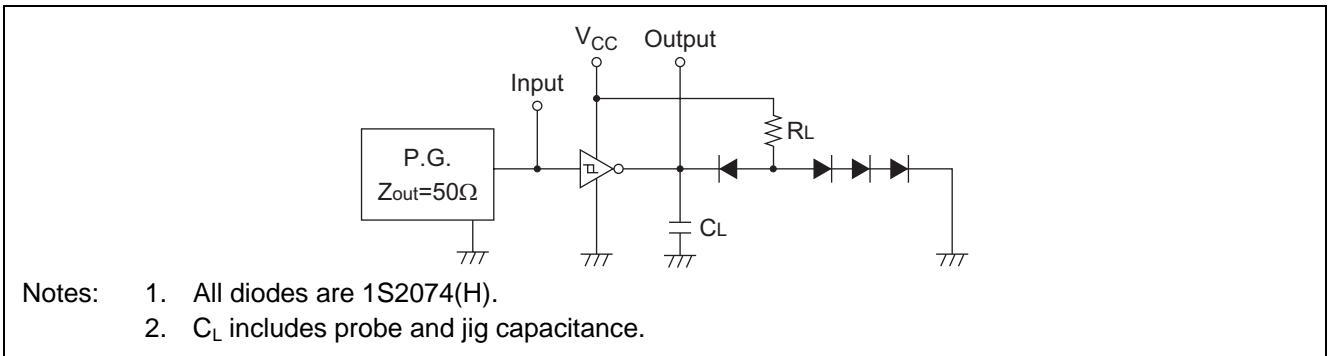
Switching Characteristics

(V_{CC} = 5 V, T_a = 25°C)

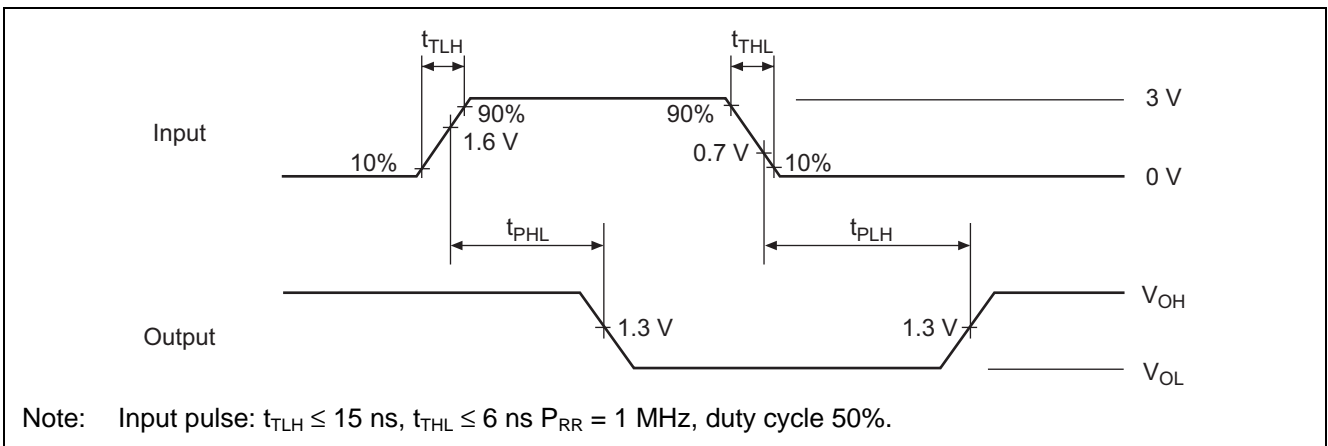
| Item | Symbol | min. | typ. | max. | Unit | Condition |
|------------------------|-----------|------|------|------|------|---|
| Propagation delay time | t_{PLH} | — | 15 | 22 | ns | $C_L = 15\text{ pF}$, $R_L = 2\text{ k}\Omega$ |
| | t_{PHL} | — | 15 | 22 | ns | |

Testing Method

Test Circuit

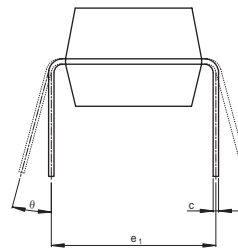
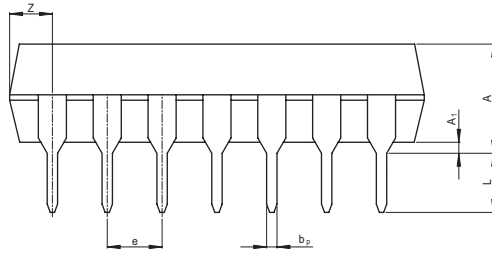
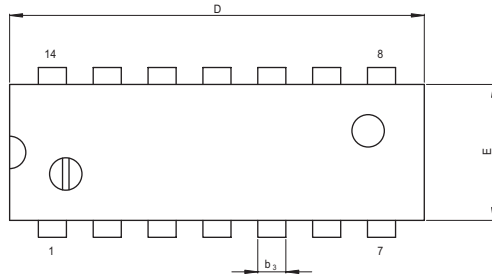


Waveform



Package Dimensions

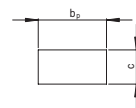
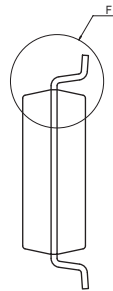
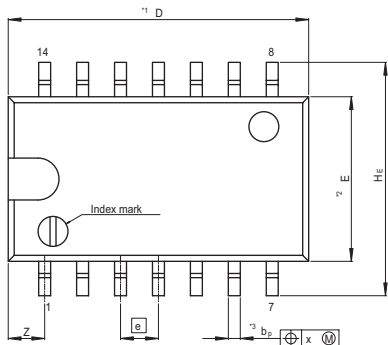
| | | | |
|-----------------------|--------------|---------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-DIP14-6.3x19.2-2.54 | PRDP0014AB-B | DP-14AV | 0.97g |



(Ni/Pd/Au plating)

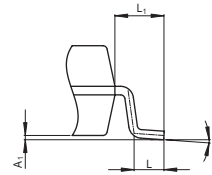
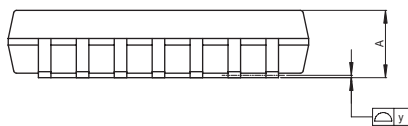
| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|------|-------|
| | Min | Nom | Max |
| e ₁ | — | 7.62 | — |
| D | — | 19.2 | 20.32 |
| E | — | 6.3 | 7.4 |
| A | — | — | 5.06 |
| A ₁ | 0.51 | — | — |
| b _p | 0.40 | 0.48 | 0.56 |
| b ₃ | — | 1.30 | — |
| c | 0.19 | 0.25 | 0.31 |
| θ | 0° | — | 15° |
| e | 2.29 | 2.54 | 2.79 |
| Z | — | — | 2.39 |
| L | 2.54 | — | — |

| | | | |
|------------------------|--------------|---------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-SOP14-5.5x10.06-1.27 | PRSP0014DF-B | FP-14DAV | 0.23g |



Terminal cross section (Ni/Pd/Au plating)

NOTE)
 1. DIMENSIONS**1 (Nom)**AND**2* DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION**3*DOES NOT INCLUDE TRIM OFFSET.

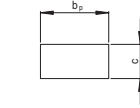
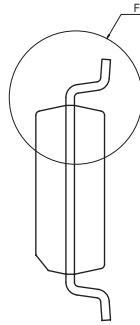
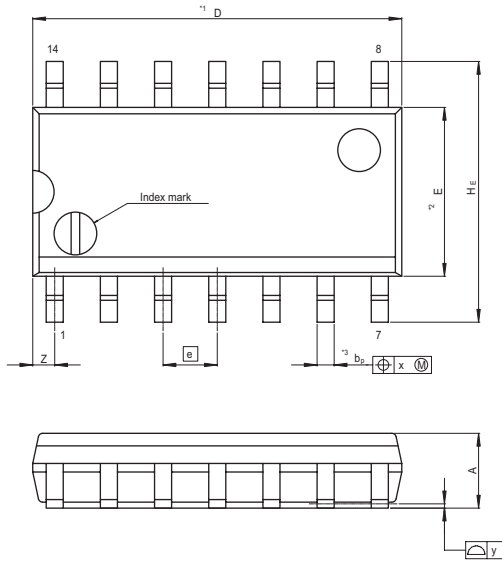


Detail F

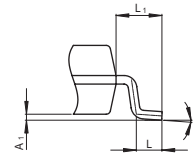
| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|-------|------|
| | Min | Nom | Max |
| D | — | 10.06 | 10.5 |
| E | — | 5.50 | — |
| A ₂ | — | — | — |
| A ₁ | 0.00 | 0.10 | 0.20 |
| A | — | — | 2.20 |
| b _p | 0.34 | 0.40 | 0.46 |
| b ₁ | — | — | — |
| c | 0.15 | 0.20 | 0.25 |
| c ₁ | — | — | — |
| θ | 0° | — | 8° |
| H _E | 7.50 | 7.80 | 8.00 |
| ⓪ | — | 1.27 | — |
| x | — | — | 0.12 |
| y | — | — | 0.15 |
| Z | — | — | 1.42 |
| L | 0.50 | 0.70 | 0.90 |
| L ₁ | — | 1.15 | — |

HD74LS14

| | | | |
|------------------------|--------------|---------------|------------|
| JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
| P-SOP14-3.95x8.65-1.27 | PRSP0014DE-A | FP-14DNV | 0.13g |



Terminal cross section
(Ni/Pd/Au plating)



Detail F

NOTE
1. DIMENSIONS**1 (Nom)*AND**2*
DO NOT INCLUDE MOLD FLASH.
2. DIMENSION**3*DOES NOT
INCLUDE TRIM OFFSET.

| Reference Symbol | Dimension in Millimeters | | |
|------------------|--------------------------|------|-------|
| | Min | Nom | Max |
| D | — | 8.65 | 9.05 |
| E | — | 3.95 | — |
| A ₂ | — | — | — |
| A ₁ | 0.10 | 0.14 | 0.25 |
| A | — | — | 1.75 |
| b _p | 0.34 | 0.40 | 0.46 |
| d ₁ | — | — | — |
| c | 0.15 | 0.20 | 0.25 |
| c ₁ | — | — | — |
| θ | 0° | — | 8° |
| HE | 5.80 | 6.10 | 6.20 |
| ⓐ | — | 1.27 | — |
| x | — | — | 0.25 |
| y | — | — | 0.15 |
| Z | — | — | 0.635 |
| L | 0.40 | 0.60 | 1.27 |
| L ₁ | — | 1.08 | — |