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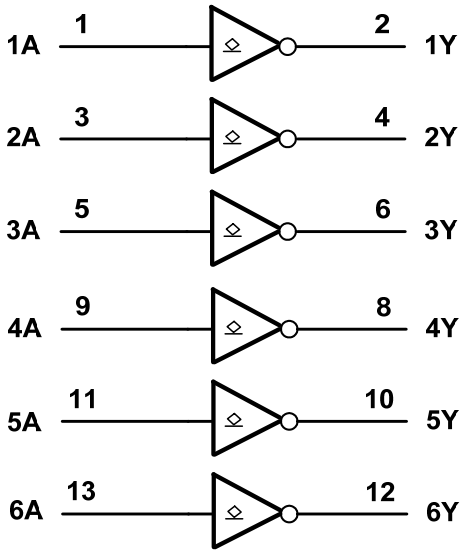
## Pin Descriptions

| Pin Number | Pin Name | Description |
|---|---|---|
| 1 | 1A | Data Input |
| 2 | 1Y | Data Output |
| 3 | 2A | Data Input |
| 4 | 2Y | Data Output |
| 5 | 3A | Data Input |
| 6 | 3Y | Data Output |
| 7 | GND | Ground |
| 8 | 4Y | Data Output |
| 9 | 4A | Data Input |
| 10 | 5Y | Data Output |
| 11 | 5A | Data Input |
| 12 | 6Y | Data Output |
| 13 | 6A | Data Input |
| 14 | Vcc | Supply Voltage |

## Logic Diagram




## Function Table

| Input | Output |
|---|---|
| **A** | **Y** |
| H | L |
| L | Z |

## Absolute Maximum Ratings (Note 4) (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Parameter | Rating | Unit |
|---|---|---|---|
| ESD HBM | Human Body Model ESD Protection | 2 | kV |
| ESD CDM | Charged Device Model ESD Protection | 1 | kV |
| ESD MM | Machine Model ESD Protection | 200 | V |
| $V_{CC}$ | Supply Voltage Range | -0.5 to +7.0 | V |
| $V_I$ | Input Voltage Range (Note 4) | -0.5 to +7.0 | V |
| $I_{IK}$ | Input Clamp Current $V_I$ < 0V | -20 | mA |
| $I_{OK}$ | Output Clamp Current $V_O$ < 0V | -50 | mA |
| $I_O$ | Continuous Output Current - 0.5V < $V_O$ Vcc +0.5V | - 25 | mA |
| $I_{CC}$ | Continuous Current Through Vcc | 50 | mA |
| $I_{GND}$ | Continuous Current Through GND | -50 | mA |
| $T_J$ | Operating Junction Temperature | -40 to +150 | °C |
| $T_{STG}$ | Storage Temperature | -65 to +150 | °C |
| $P_{TOT}$ | Total Power Dissipation | 500 | mW |

Note: 4. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

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## Recommended Operating Conditions (Note 5) (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | 2.0 | 5.5 | V |
| $V_I$ | Input Voltage | | 0 | 5.5 | V |
| $V_O$ | Output Voltage | | 0 | 5.5 | V |
| $I_{OL}$ | Low-Level Output Current | 2.0V | | 50 | µA |
| | | 2.3V to 2.7V | | 2 | mA |
| | | 3.0V to 3.6V | | 6 | mA |
| | | 4.5V to 5.5V | | 12 | mA |
| Δt/ΔV | Input Transition Rise or Fall Rate | 2.3V to 2.7V | | 200 | ns/V |
| | | 3.0V to 3.6V | | 100 | |
| | | 4.5V to 5.5V | | 20 | |
| $T_A$ | Operating Free-Air Temperature | | -40 | +125 | °C |

Note: 5. Unused inputs should be held at Vcc or Ground.

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Parameter | Test Conditions | $V_{CC}$ | $T_A$ = -40°C to +85°C | | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min | Max | |
| $V_{IH}$ | High-Level Input Voltage | | 2.0V | 1.5 | | 1.5 | | V |
| | | | 2.3V to 2.7V | $V_{CC}$ X 0.7 | | $V_{CC}$ X 0.7 | | |
| | | | 3.0V to 3.6V | $V_{CC}$ X 0.7 | | $V_{CC}$ X 0.7 | | |
| | | | 4.5V to 5.5V | $V_{CC}$ X 0.7 | | $V_{CC}$ X 0.7 | | |
| $V_{IL}$ | Low-Level Input Voltage | | 2.0V | | 0.5 | | 0.5 | V |
| | | | 2.3V to 2.7V | | $V_{CC}$ X 0.3 | | $V_{CC}$ X 0.3 | |
| | | | 3.0V to 3.6V | | $V_{CC}$ X 0.3 | | $V_{CC}$ X 0.3 | |
| | | | 4.5V to 5.5V | | $V_{CC}$ X 0.3 | | $V_{CC}$ X 0.3 | |
| $V_{OL}$ | Low-Level Output Voltage | $I_{OL}$ = 50µA | 2.0V to 5.5V | | 0.1 | | 0.1 | V |
| | | $I_{OL}$ = 2mA | 2.3V | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 6mA | 3.0V | | 0.44 | | 0.44 | |
| | | $I_{OL}$ = 12mA | 4.5V | | 0.55 | | 0.55 | |
| $I_{OFF}$ | Power Down Leakage Current | $V_I$ or $V_O$ = 0 to 5.5V | 0V | | 5 | | 5 | µA |
| $I_I$ | Input Current | $V_I$ =GND or 5.5V | 0 to 5.5V | | ±1 | | ±1 | µA |
| $I_{CC}$ | Supply Current | $V_I$ = GND or $V_{CC}$ $I_O$=0 | 5.5V | | 20 | | 20 | µA |

NEW PRODUCT

## Switching Characteristics

$V_{CC}$ = 2.5V ± 0.2V

| Symbol | Parameter | Test Conditions | $T_A$ = +25°C | | | -40°C to +85 °C | | -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{PLZ}$ | Propagation Delay $A_N$ to $Y_N$ | Figure 1 $C_L$ = 15pF | — | 3.6 | 10.4 | 1 | 13 | 1 | 13 | ns |
| $t_{PZL}$ | | | — | 5.8 | 12.2 | 1 | 15 | 1 | 15 | |
| $t_{PLZ}$ | | Figure 1 $C_L$ = 50pF | — | 6.1 | 15.2 | 1 | 18 | 1 | 18 | ns |
| $t_{PZL}$ | | | — | 8.1 | 16.6 | 1 | 19.5 | 1 | 19.5 | |

$V_{CC}$ =3.3V ± 0.3V

| Symbol | Parameter | Test Conditions | $T_A$ = +25°C | | | -40°C to +85 °C | | -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{PLZ}$ | Propagation Delay $A_N$ to $Y_N$ | Figure 1 $C_L$ = 15pF | — | 2.9 | 7.1 | 1 | 8.5 | 1 | 8.5 | ns |
| $t_{PZL}$ | | | — | 4 | 7.1 | 1 | 8.5 | 1 | 8.5 | |
| $t_{PLZ}$ | | Figure 1 $C_L$ = 50pF | — | 4.7 | 10.6 | 1 | 12 | 1 | 12 | ns |
| $t_{PZL}$ | | | — | 5.8 | 10.6 | 1 | 12 | 1 | 12 | |

$V_{CC}$ =5.0V ± 0.5V

| Symbol | Parameter | Test Conditions | $T_A$ = +25°C | | | -40°C to +85 °C | | -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{PLZ}$ | Propagation Delay $A_N$ to $Y_N$ | Figure 1 $C_L$ = 15pF | — | 2.2 | 5.5 | 1 | 6.5 | 1 | 6.5 | ns |
| $t_{PZL}$ | | | — | 2.9 | 5.5 | 1 | 6.5 | 1 | 6.5 | |
| $t_{PLZ}$ | | Figure 1 $C_L$ = 50pF | — | 3.4 | 7.5 | 1 | 8.5 | 1 | 8.5 | ns |
| $t_{PZL}$ | | | — | 4.2 | 7.5 | 1 | 8.5 | 1 | 8.5 | |

## Operating Characteristics

$T_A$ = +25°C

| Parameter | | Test Conditions | $V_{CC}$ | Typ | Unit |
|---|---|---|---|---|---|
| $C_{pd}$ | Power Dissipation Capacitance per Gate | f = 10MHz $C_L$ = 50pF | 3.3V | 2.5 | pF |
| | | | 5.0V | 3.0 | |

## Noise Characteristics

$V_{CC}$ = 3V, $C_L$ = 50pF $T_A$ = +25°C

| Symbol | Parameter | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $V_{OL(p)}$ | Quiet output, maximum dynamic $V_{OL}$ | — | 0.2 | 0.8 | V |
| $V_{OL(V)}$ | Quiet output, minimum dynamic $V_{OL}$ | — | -0.1 | -0.8 | V |
| $V_{OH(V)}$ | Quiet output, minimum dynamic $V_{OH}$ | — | 3.1 | — | V |
| $V_{IH(D)}$ | High Level dynamic input voltage | 2.31 | — | — | V |
| $V_{IL(D)}$ | Low Level dynamic input voltage | — | — | 0.99 | V |

## Package Characteristics

| Symbol | Parameter | Test Conditions | $V_{CC}$ | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $C_i$ | Input Capacitance | $V_i$ = $V_{CC}$ – or GND | 2.0V to 5.5V | — | 3.3 | 10 | pF |

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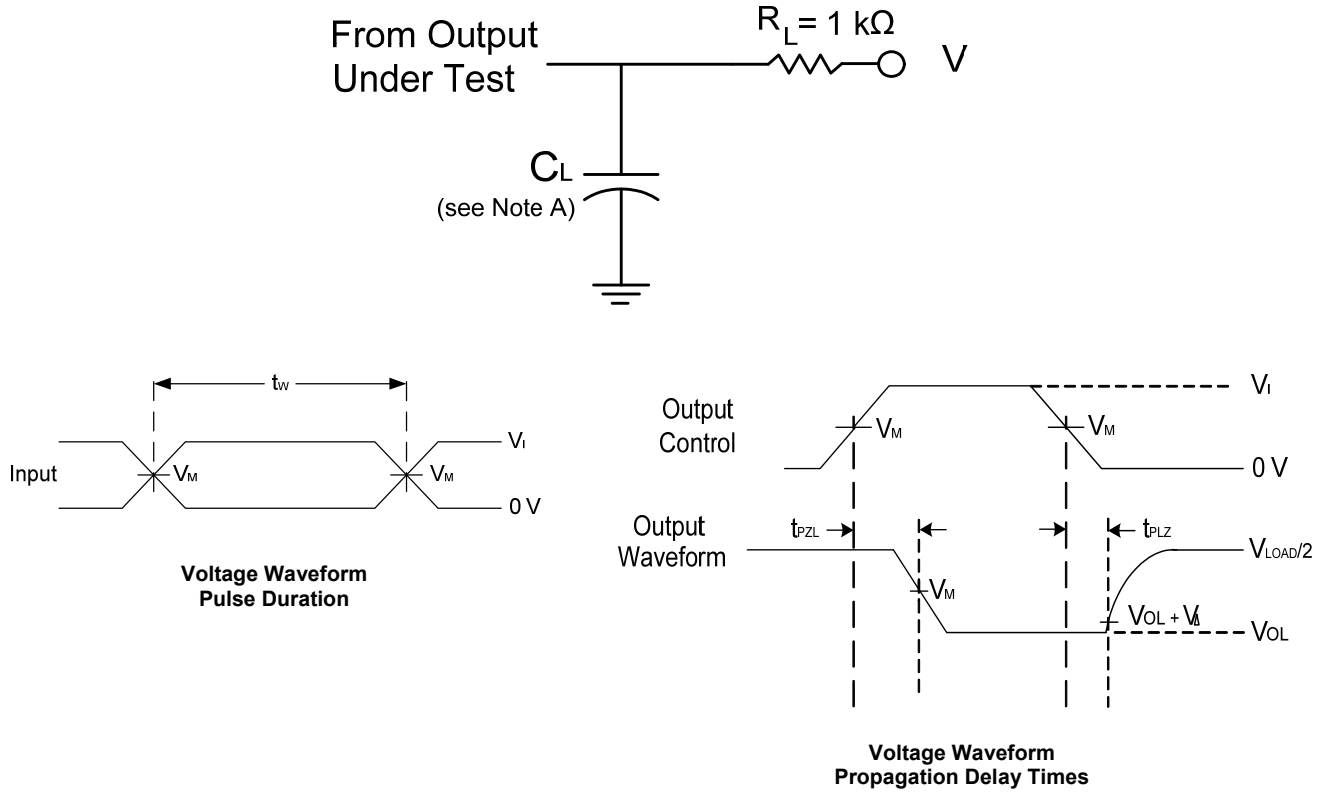
## Parameter Measurement Information




Notes: A. Includes test lead and test apparatus capacitance.
B. All pulses are supplied at pulse repetition rate ≤ 10 MHz
D. For the open drain device $t_{PLZ}$ and $t_{PZL}$ are the same as $t_{PD}$
E. $t_{PZL}$ is measured at $V_M$.
D. $t_{PLZ}$ is measured at $V_{OL}$ +$V_\Delta$ where $V_\Delta$ = 0.3V

**Figure 1 Load Circuit and Voltage Waveforms**

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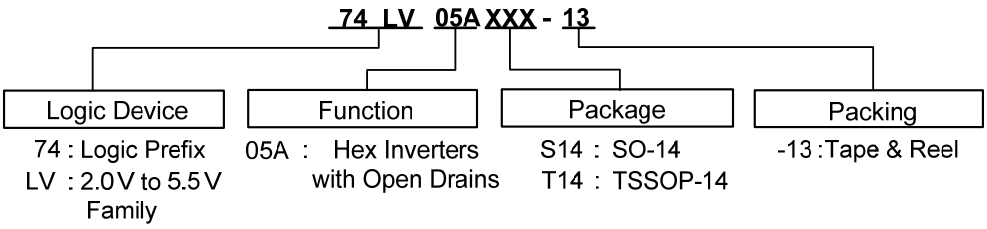
## Ordering Information

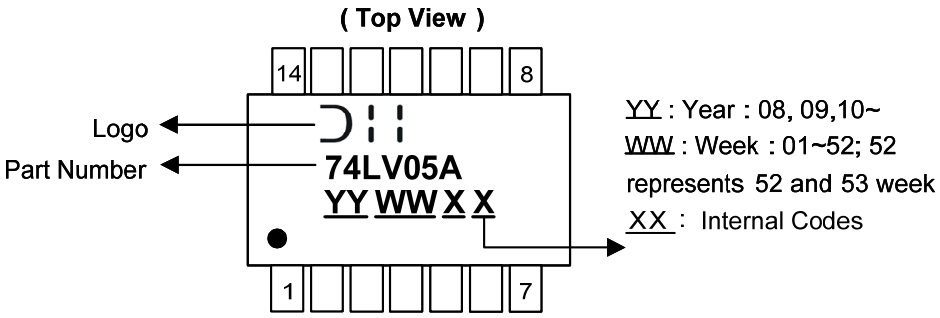



| Part Number | Package Code | Packaging (Note 6) | 13" Tape and Reel | |
|---|---|---|---|---|
| | | | Quantity | Part Number Suffix |
| 74LV05AS14-13 | S14 | SO-14 | 2500/Tape & Reel | -13 |
| 74LV05AT14-13 | T14 | TSSOP-14 | 2500/Tape & Reel | -13 |

Notes: 6. The taping orientation and tape details can be found at http://www.diodes.com/datasheets/ap02007.pdf

## Marking Information

**(1) SO14, TSSOP14**




| Part Number | Package |
|---|---|
| 74LV05AS14 | SO-14 |
| 74LV05AT14 | TSSOP-14 |

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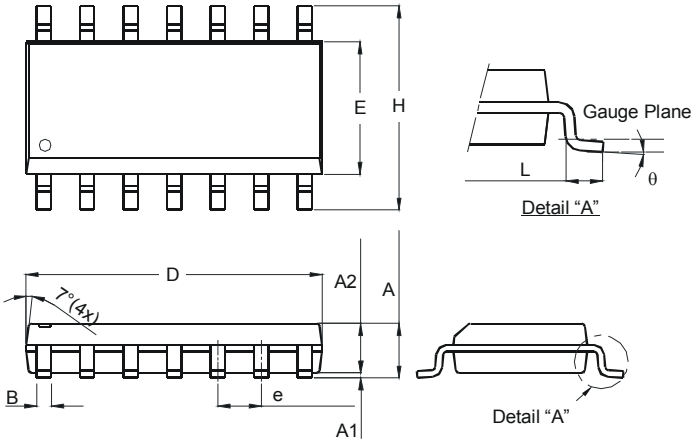
## Package Outline Dimensions (All dimensions in mm.)

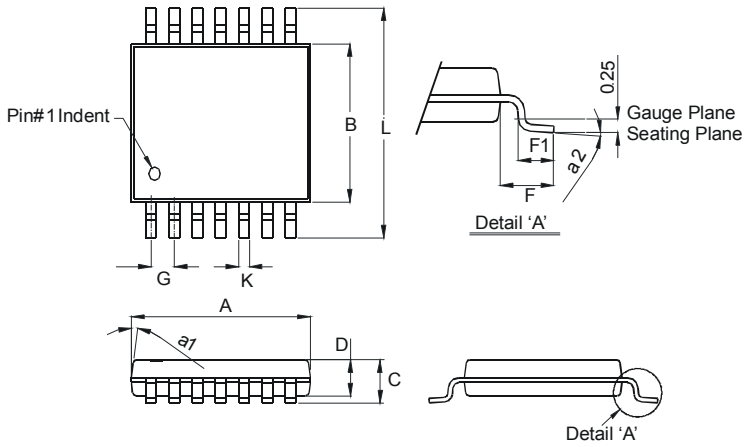
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

**Package Type: SO-14**




| SO-14 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 1.47 | 1.73 |
| **A1** | 0.10 | 0.25 |
| **A2** | 1.45 Typ | |
| **B** | 0.33 | 0.51 |
| **D** | 8.53 | 8.74 |
| **E** | 3.80 | 3.99 |
| **e** | 1.27 Typ | |
| **H** | 5.80 | 6.20 |
| **L** | 0.38 | 1.27 |
| **θ** | 0° | 8° |
| **All Dimensions in mm** | | |

**Package Type: TSSOP-14**




| TSSOP-14 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **a1** | 7° (4X) | |
| **a2** | 0° | 8° |
| **A** | 4.9 | 5.10 |
| **B** | 4.30 | 4.50 |
| **C** | — | 1.2 |
| **D** | 0.8 | 1.05 |
| **F** | 1.00 Typ | |
| **F1** | 0.45 | 0.75 |
| **G** | 0.65 Typ | |
| **K** | 0.19 | 0.30 |
| **L** | 6.40 Typ | |
| **All Dimensions in mm** | | |

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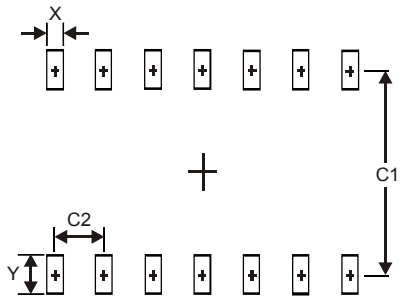
## Suggested Pad Layout

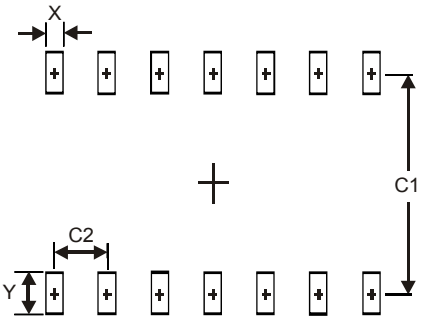
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

**Package Type: SO-14**




| Dimensions | Value (in mm) |
|---|---|
| X | 0.60 |
| Y | 1.50 |
| C1 | 5.4 |
| C2 | 1.27 |

**Package Type: TSSOP-14**




| Dimensions | Value (in mm) |
|---|---|
| X | 0.45 |
| Y | 1.45 |
| C1 | 5.9 |
| C2 | 0.65 |

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