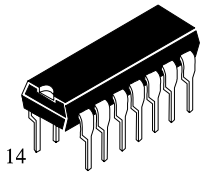
# Hex Inverter Buffers/Drivers with Open-Collector High-Voltage Outputs

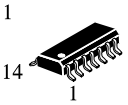
**IN7406**

The IN7406 monolithic TTL hex inverter buffers/drivers feature high-voltage open collector outputs for interfacing with high-level circuits (such as MOS) or for driving high-current loads (such as lamps or relays), and are also characterized for use as inverter buffers for driving TTL inputs.

- Minimum breakdown Voltages is 30 V
- Maximum sink Current is 40 mA
- Converts TTL Voltage Levels to MOS Levels
- Open-Collector Driver for Indicator Lamps and Relays
- Inputs Fully Compatible with MOST TTL Circuits.




N SUFFIX
PLASTIC

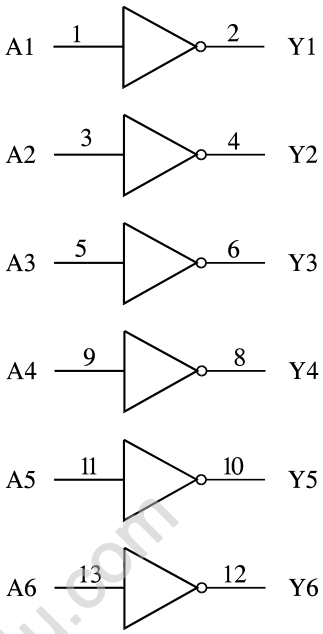



D SUFFIX
SOIC

**ORDERING INFORMATION**

IN7406N Plastic
IN7406D SOIC
$T_A$ = -10° to 70° C for all packages

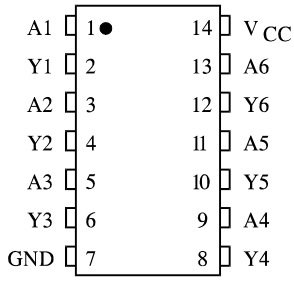
## LOGIC DIAGRAM




Y = $\bar{A}$

PIN 14 =$V_{CC}$
PIN 7 = GND

## PIN ASSIGNMENT




## FUNCTION TABLE

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

Z = High Impedance

## MAXIMUM RATINGS*

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | Supply Voltage | 7.0 | V |
| $V_{IN}$ | Input Voltage | 5.5 | V |
| $V_{OUT}$ | Output Voltage | 30 | V |
| Tstg | Storage Temperature Range | -65 to +150 | °C |

*Maximum Ratings are those values beyond which damage to the device may occur.
Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Max | Unit |
|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | 4.75 | 5.25 | V |
| $V_{IH}$ | High Level Input Voltage | 2.0 | | V |
| $V_{IL}$ | Low Level Input Voltage | | 0.8 | V |
| $U_{OH}$ | High Level Output Voltage | | 30 | V |
| $I_{OL}$ | Low Level Output Current | | 40 | mA |
| $T_A$ | Ambient Temperature Range | -10 | +70 | °C |

## DC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test Conditions | | Guaranteed Limit | | Unit |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| $V_{IK}$ | Input Clamp Voltage | $V_{CC}$ = 4.75V, $I_{IN}$ = -12 mA | | | -1.5 | V |
| $I_{OH}$ | High Level Output Current | $V_{CC}$ = 4.75V, $V_{OH}$ =30V | | | 0.25 | mA |
| $V_{OL}$ | Low Level Output Voltage | $V_{CC}$ = 4.75V, $I_{OL}$ = 16 mA | | | 0.4 | V |
| | | $V_{CC}$ = 4.75V, $I_{OL}$ = 40 mA | | | 0.7 | |
| $I_{IH}$ | High Level Input Current | $V_{CC}$ = 5.25V, $V_{IN}$ = 2.4 V | | | 0.04 | mA |
| $I_{IL}$ | Low Level Input Current | $V_{CC}$ = 5.25V, $V_{IN}$ = 0.4 V | | | -1.6 | mA |
| $I_{CC}$ | Supply Current | $V_{CC}$ = 5.25V | Outputs High | | 48 | mA |
| | | | Outputs Low | | 51 | |

## AC ELECTRICAL CHARACTERISTICS ($T = 25°C$, $V_{CC} = 5.0$ V, $C_L = 15$ pF, $R_L = 110\ \Omega$, Input $t_r = t_f = 10$ ns)

| Symbol | Parameter | Min | Max | Unit |
|---|---|---|---|---|
| $t_{PLH}$ | Propagation Delay Time, Low to High Level Output (from Input to Output) | | 18 | ns |
| $t_{PHL}$ | Propagation Delay Time, High to Low Level Output (from Input to Output) | | 28 | ns |

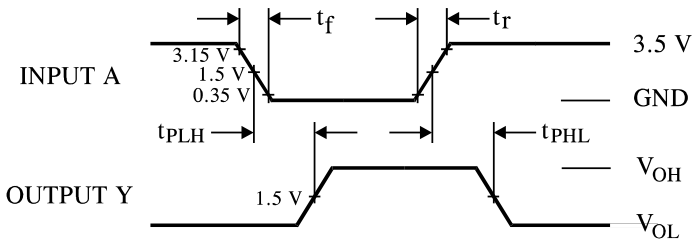
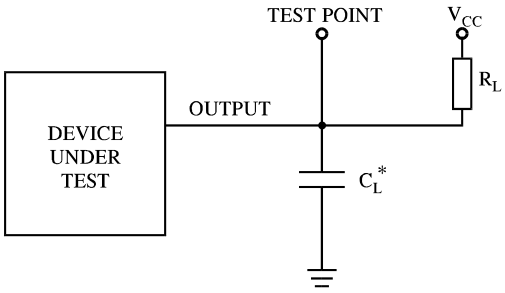


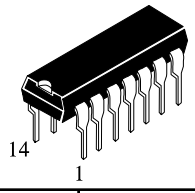

**Figure 1. Switching Waveforms**

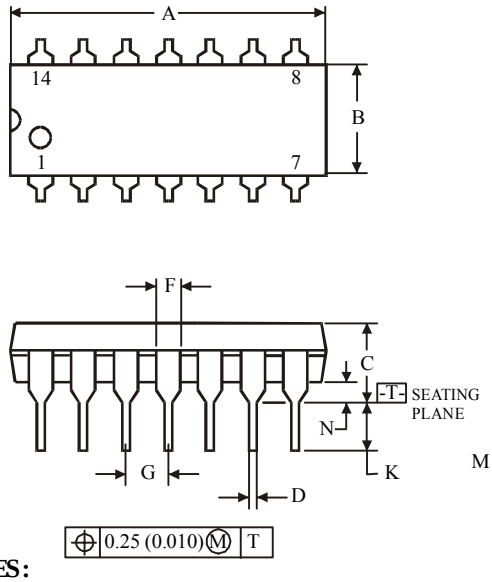



* Includes all probe and jig capacitance

**Figure 2. Test Circuit**

## N SUFFIX PLASTIC DIP
## (MS - 001AA)



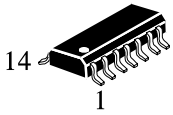



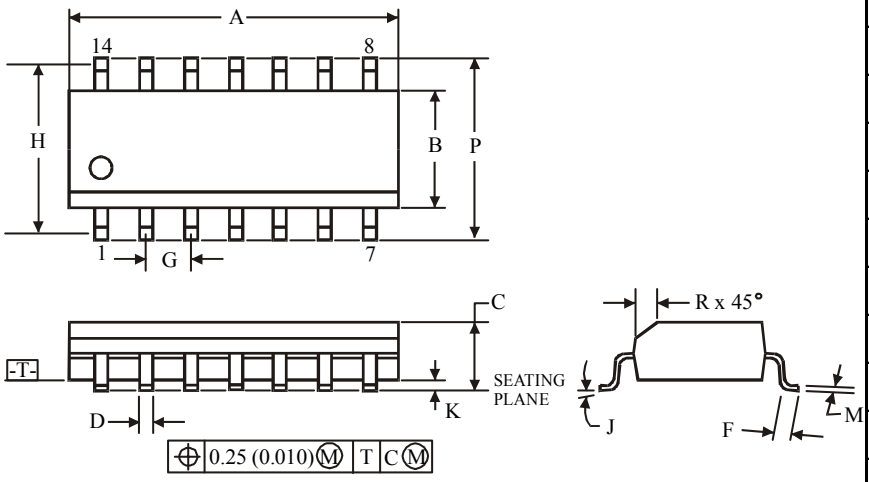

| | Dimension, mm | |
|---|---|---|
| **Symbol** | **MIN** | **MAX** |
| **A** | 18.67 | 19.69 |
| **B** | 6.1 | 7.11 |
| **C** | | 5.33 |
| **D** | 0.36 | 0.56 |
| **F** | 1.14 | 1.78 |
| **G** | 2.54 | |
| **H** | 7.62 | |
| **J** | 0° | 10° |
| **K** | 2.92 | 3.81 |
| **L** | 7.62 | 8.26 |
| **M** | 0.2 | 0.36 |
| **N** | 0.38 | |

**NOTES:**

1. Dimensions “A”, “B” do not include mold flash or protrusions.
   Maximum mold flash or protrusions 0.25 mm (0.010) per side.

## D SUFFIX SOIC
## (MS - 012AB)




| | Dimension, mm | |
|---|---|---|
| **Symbol** | **MIN** | **MAX** |
| **A** | 8.55 | 8.75 |
| **B** | 3.8 | 4 |
| **C** | 1.35 | 1.75 |
| **D** | 0.33 | 0.51 |
| **F** | 0.4 | 1.27 |
| **G** | 1.27 | |
| **H** | 5.27 | |
| **J** | 0° | 8° |
| **K** | 0.1 | 0.25 |
| **M** | 0.19 | 0.25 |
| **P** | 5.8 | 6.2 |
| **R** | 0.25 | 0.5 |

**NOTES:**

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side
   for A; for B – 0.25 mm (0.010) per side.