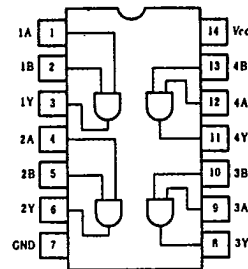


**HD74ALS09** • Quadruple 2-Input Positive AND Gates  
(with open collector outputs)

T-43-15

## ■ PIN ARRANGEMENT



(Top View)

■ 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      | $V_{OL}$  | $V_{CC}=4.5\text{V}, V_{IL}=0.8\text{V}, I_{OL}=4\text{mA}$  | —   | —    | 0.4  | V             |
|                     |           | $V_{CC}=4.75\text{V}, V_{IL}=0.8\text{V}, I_{OL}=8\text{mA}$ | —   | —    | 0.5  |               |
| Output current      | $I_{OH}$  | $V_{CC}=4.5\text{V}, V_{IL}=2\text{V}, V_{OH}=5.5\text{V}$   | —   | —    | 100  | $\mu\text{A}$ |
| Input current       | $I_{IH}$  | $V_{CC}=5.5\text{V}, V_I=2.7\text{V}$                        | —   | —    | 20   | $\mu\text{A}$ |
|                     | $I_I$     | $V_{CC}=5.5\text{V}, V_I=7\text{V}$                          | —   | —    | 0.1  | mA            |
|                     | $I_{IL}$  | $V_{CC}=5.5\text{V}, V_I=0.4\text{V}$                        | —   | —    | -0.2 | mA            |
| Supply current      | $I_{CCH}$ | $V_{CC}=5.5\text{V}, V_I=4.5\text{V}$                        | —   | 1.35 | 2.40 | mA            |
|                     | $I_{CCL}$ | $V_{CC}=5.5\text{V}, V_I=0\text{V}$                          | —   | 2.2  | 4.0  | mA            |
| Input clamp voltage | $V_{IK}$  | $V_{CC}=4.5\text{V}, I_{IN}=-18\text{mA}$                    | —   | —    | -1.5 | V             |

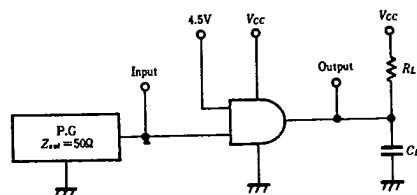
\*  $V_{CC}=5\text{V}, T_a=25^\circ\text{C}$ 

## ■ SWITCHING CHARACTERISTICS

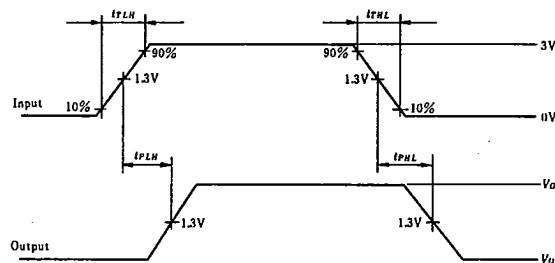
| Item                   | Symbol    | Test Conditions                                                                                  | min | typ | max | Unit |
|------------------------|-----------|--------------------------------------------------------------------------------------------------|-----|-----|-----|------|
| Propagation delay time | $t_{PLH}$ | $V_{CC}=5\text{V}, T_a=25^\circ\text{C}, R_L=2\text{k}\Omega, C_L=15\text{pF}$                   | —   | 20  | —   | ns   |
|                        | $t_{PHL}$ |                                                                                                  | —   | 10  | —   |      |
|                        | $t_{PLH}$ | $V_{CC}=5 \pm 0.5\text{V}, T_a=-20 \sim +75^\circ\text{C}, R_L=2\text{k}\Omega, C_L=50\text{pF}$ | 20  | —   | 54  |      |
|                        | $t_{PHL}$ |                                                                                                  | 7   | —   | 18  |      |

## ■ TESTING METHOD

Test Circuit

Note:  $C_L$  includes probe and jig capacitance.

Waveform

Input pulse:  $t_{TLH} \leq 6\text{ns}, t_{THL} \leq 6\text{ns}, \text{PRR} = 1\text{MHz}, \text{duty cycle } 50\%$