

Quad 2-input AND gate

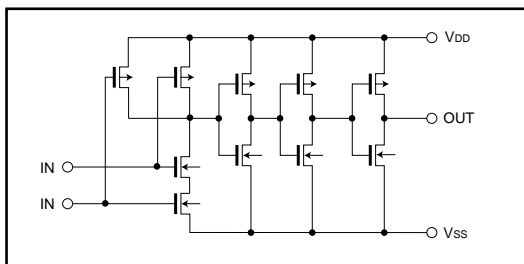
BU4081B / BU4081BF / BU4081BFV

The BU4081B, BU4081BF, and BU4081BFV are dual-input positive-logic AND gates with four circuits mounted on a single chip. An inverter-type buffer is added to the gate output, improving input / output transmission speed, and an increased load capacitance suppresses fluctuation in transmission time to a minimum.

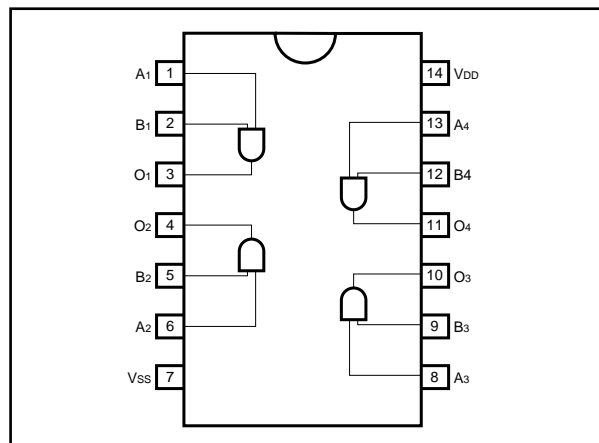
●Features

- 1) Low power dissipation.
- 2) Wide range of operating power supply voltages.
- 3) High input impedance.
- 4) High fan-out.
- 5) Direct drive of 2 L-TTL inputs and 1 LS-TTL input.

●Logic circuit diagram



●Block diagram



● Absolute maximum ratings ($T_a = 25^\circ\text{C}, V_{SS} = 0\text{V}$)

| Parameter | Symbol | Limits | Unit |
|-----------------------|-----------|-----------------------------------|------------------|
| Power supply voltage | V_{DD} | $-0.3 \sim +18$ | V |
| Power dissipation | P_d | 1000 (DIP), 450 (SOP), 350 (SSOP) | mW |
| Operating temperature | T_{opr} | $-40 \sim +85$ | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | $-55 \sim +150$ | $^\circ\text{C}$ |
| Input voltage | V_{IN} | $-0.3 \sim V_{DD} + 0.3$ | V |
| I / O pin current | $I_{I/O}$ | ± 10 | mA |

● Electrical characteristics (unless otherwise noted, $V_{SS} = 0\text{V}, T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | V_{DD} (V) | Conditions | Measurement circuit |
|----------------------------|----------|-------|------|------|---------------|--------------|-------------------------|---------------------|
| | | | | | | | | |
| Input high level voltage | V_{IH} | 3.5 | — | — | V | 5 | — | Fig.1 |
| | | 7.0 | — | — | | 10 | | |
| | | 11.0 | — | — | | 15 | | |
| Input low level voltage | V_{IL} | — | — | 1.5 | V | 5 | — | Fig.1 |
| | | — | — | 3.0 | | 10 | | |
| | | — | — | 4.0 | | 15 | | |
| Input high level current | I_{IH} | — | — | 0.3 | μA | 15 | $V_{IH} = 15\text{V}$ | Fig.1 |
| Input low level current | I_{IL} | — | — | -0.3 | μA | 15 | $V_{IL} = 0\text{V}$ | Fig.1 |
| Output high level voltage | V_{OH} | 4.95 | — | — | V | 5 | $I_o = 0\text{mA}$ | Fig.1 |
| | | 9.95 | — | — | | 10 | | |
| | | 14.95 | — | — | | 15 | | |
| Output low level voltage | V_{OL} | — | — | 0.05 | V | 5 | $I_o = 0\text{mA}$ | Fig.1 |
| | | — | — | 0.05 | | 10 | | |
| | | — | — | 0.05 | | 15 | | |
| Output high level current | I_{OH} | -0.16 | — | — | mA | 5 | $V_{OH} = 4.6\text{V}$ | Fig.1 |
| | | -0.4 | — | — | | 10 | $V_{OH} = 9.5\text{V}$ | |
| | | -1.2 | — | — | | 15 | $V_{OH} = 13.5\text{V}$ | |
| Output low level current | I_{OL} | 0.44 | — | — | mA | 5 | $V_{OL} = 0.4\text{V}$ | Fig.1 |
| | | 1.1 | — | — | | 10 | $V_{OL} = 0.5\text{V}$ | |
| | | 3.0 | — | — | | 15 | $V_{OL} = 1.5\text{V}$ | |
| Static current dissipation | I_{DD} | — | — | 1 | μA | 5 | $V_I = V_{DD}$ or GND | — |
| | | — | — | 2 | | 10 | | |
| | | — | — | 4 | | 15 | | |

Switching characteristics (unless otherwise noted, $V_{SS} = 0V$, $T_a = 25^\circ C$, $C_L = 50pF$)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | V _{DD} (V) | Conditions | Measurement circuit |
|-----------------------------------|------------------|------|------|------|------|---------------------|------------|---------------------|
| | | | | | | 5 | | |
| Output rise time | t _{RLH} | — | 180 | — | ns | 5 | — | Fig.2 |
| | | — | 90 | — | | 10 | | |
| | | — | 65 | — | | 15 | | |
| Output fall time | t _{rHL} | — | 100 | — | ns | 5 | — | Fig.2 |
| | | — | 50 | — | | 10 | | |
| | | — | 40 | — | | 15 | | |
| “L” to “H” Propagation delay time | t _{PLH} | — | 160 | — | ns | 5 | — | Fig.2 |
| | | — | 65 | — | | 10 | | |
| | | — | 50 | — | | 15 | | |
| “H” to “L” Propagation delay time | t _{PHL} | — | 160 | — | ns | 5 | — | Fig.2 |
| | | — | 65 | — | | 10 | | |
| | | — | 50 | — | | 15 | | |
| Input capacitance | C _{IN} | — | 5 | — | pF | — | — | — |

● Measurement circuits

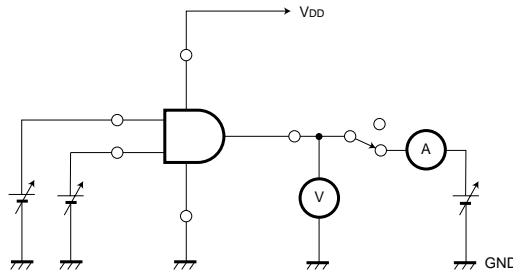


Fig. 1 DC characteristics

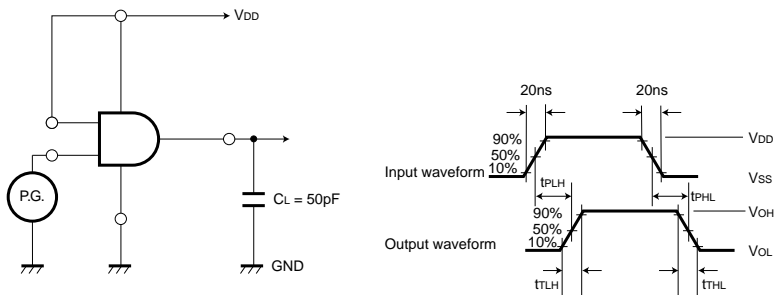


Fig. 2 Switching characteristics

●Electrical characteristic curve

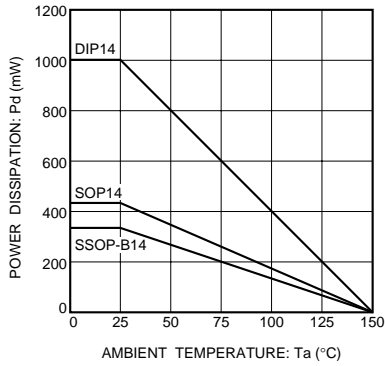


Fig. 3 Power dissipation vs. Ta

●External dimensions (Units: mm)

