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# Quad 2-input AND gate

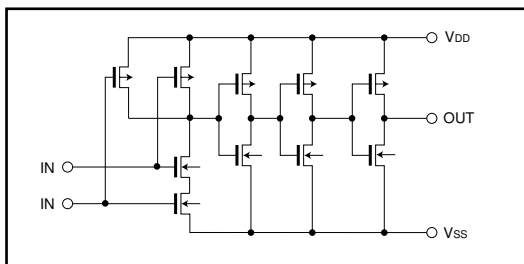
## BU4081B / BU4081BF / BU4081BFV

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.

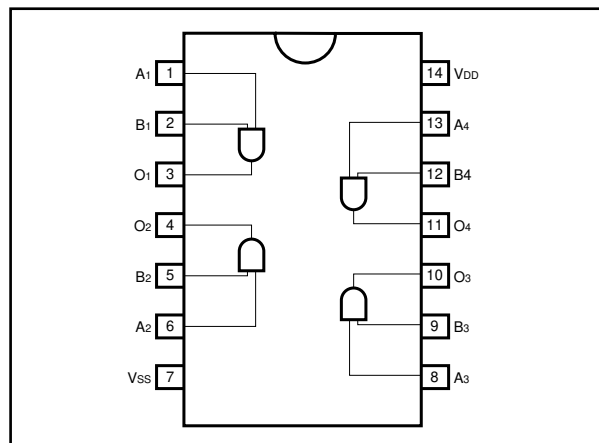
●Features

- 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	$I_{I/O}$	$\pm 10$	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	$\mu\text{A}$	15	$V_{IH} = 15\text{V}$	Fig.1
Input low level current	$I_{IL}$	—	—	$-0.3$	$\mu\text{A}$	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	$\mu\text{A}$	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 <sub>DD</sub> (V)	Conditions	Measurement circuit
						5		
Output rise time	t <sub>RLH</sub>	—	180	—	ns	5	—	Fig.2
		—	90	—		10		
		—	65	—		15		
Output fall time	t <sub>rHL</sub>	—	100	—	ns	5	—	Fig.2
		—	50	—		10		
		—	40	—		15		
“L” to “H” Propagation delay time	t <sub>PLH</sub>	—	160	—	ns	5	—	Fig.2
		—	65	—		10		
		—	50	—		15		
“H” to “L” Propagation delay time	t <sub>PHL</sub>	—	160	—	ns	5	—	Fig.2
		—	65	—		10		
		—	50	—		15		
Input capacitance	C <sub>IN</sub>	—	5	—	pF	—	—	—

● Measurement circuits

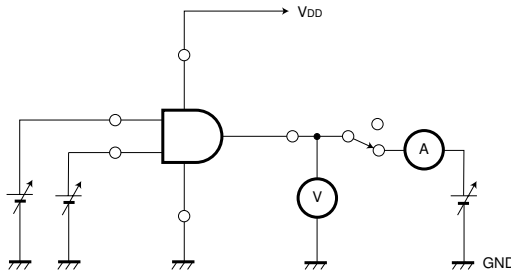


Fig. 1 DC characteristics

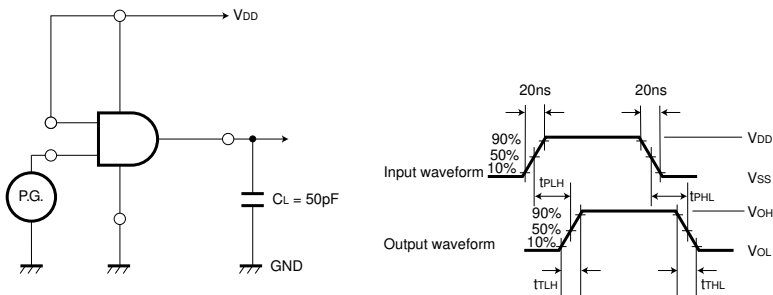


Fig. 2 Switching characteristics

●Electrical characteristic curve

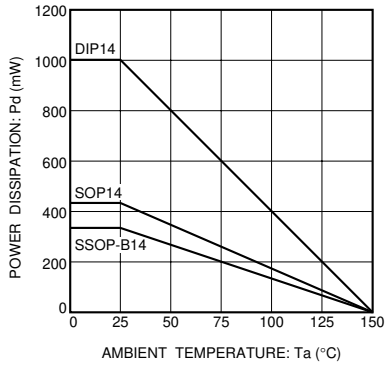
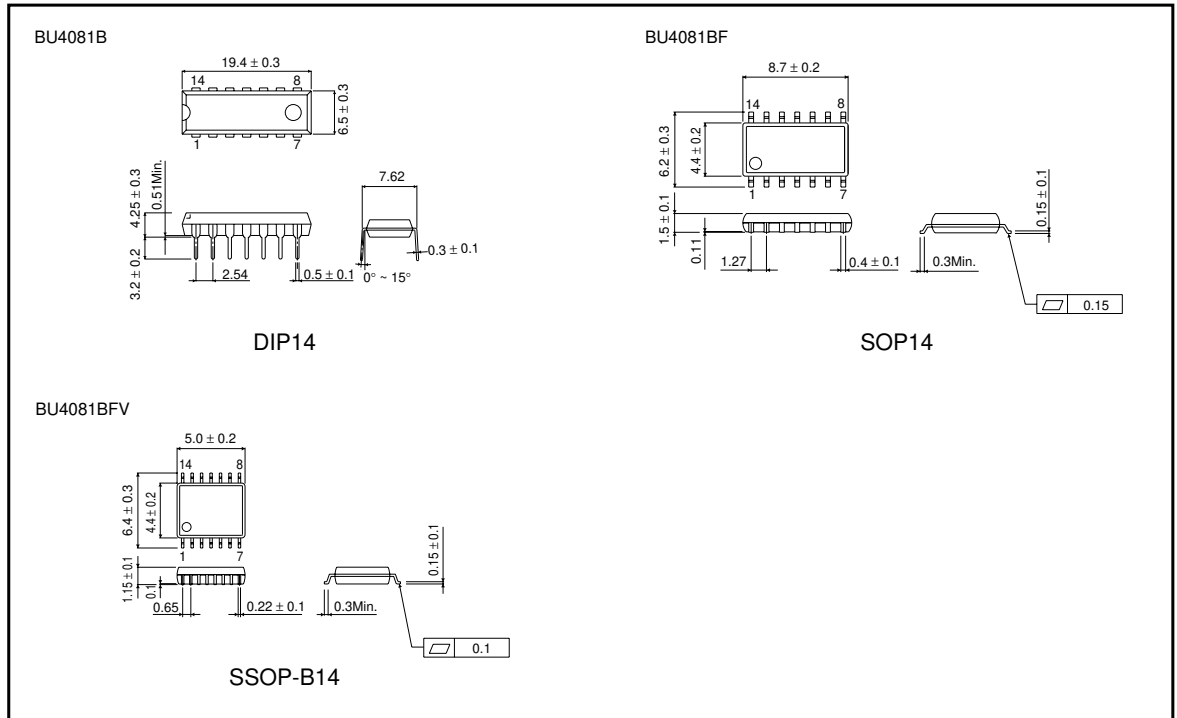


Fig. 3 Power dissipation vs. Ta

●External dimensions (Units: mm)



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