

Single 2-input AND gate

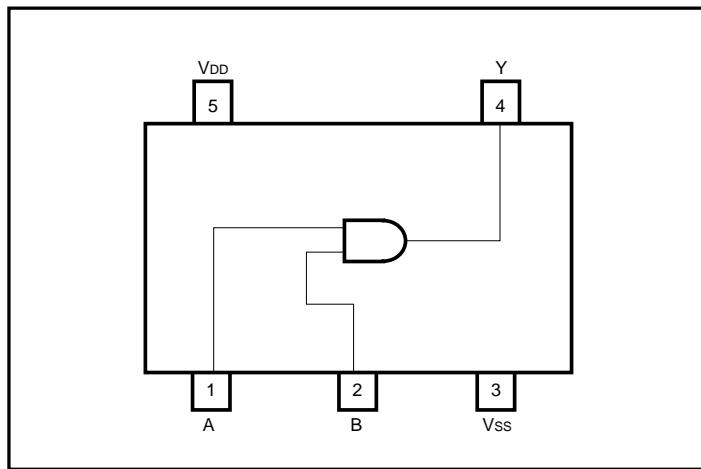
BU4S81

The BU4S81 is an ultra-compact IC with one dual-input positive logic AND gate BU4081B circuit built into an SMP.

●Features

- 1) Low current dissipation.
- 2) Super-mini mold package designed for surface mounting.
- 3) Wide range of operating power supply voltages.
- 4) Direct drive of 2 L-TTL inputs and 1 LS-TTL input.

●Block diagram



●Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	$V_{SS} - 0.3 \sim V_{SS} + 18$	V
Power dissipation	P_d	170	mW
Input current	I_{IN}	± 10	mA
Operating temperature	T_{OPR}	$-40 \sim +85$	$^\circ\text{C}$
Storage temperature	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$
Input voltage	V_{IN}	$V_{SS} - 0.3 \sim V_{DD} + 0.3$	V

*1 These values indicate the limits at which voltage can be applied to the terminal without causing destruction, but operation is not guaranteed at these values.

*2 Power dissipation is reduced by 1.7mW for each increase in T_a of 1°C over 25°C .

●Recommended operating conditions ($T_a = 25^\circ\text{C}$, $V_{SS} = 0\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{DD}	3	—	16	V
Input voltage	V_{IN}	0	—	V_{DD}	V

● Electrical characteristics

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions	Measurement circuit
Input high level voltage	V_{IH}	3.5	2.75	—	V	5	$ I_{OUT} < 1\mu\text{A}$	
		7.0	5.5	—	V	10		
		11.0	8.25	—	V	15		
Input low level voltage	V_{IL}	—	2.25	1.5	V	5	$ I_{OUT} < 1\mu\text{A}$	
		—	4.5	3.0	V	10		
		—	6.75	4.0	V	15		
Input high level current	I_{IH}	—	—	0.3	μA	18	$V_{IH} = 18\text{V}$	
Input low level current	I_{IL}	—	—	-0.3	μA	18	$V_{IL} = 0\text{V}$	
Output high level voltage	V_{OH}	4.95	5.0	—	V	5	$ I_{OUT} < 1\mu\text{A}$ $V_{IN} = V_{ss}$ or V_{DD}	
		9.95	10.0	—	V	10		
		14.95	15.0	—	V	15		
Output low level voltage	V_{OL}	—	—	0.05	V	5	$ I_{OUT} < 1\mu\text{A}$ $V_{IN} = V_{ss}$	
		—	—	0.05	V	10		
		—	—	0.05	V	15		
Output high level current	I_{OH}	-0.51	-1.0	—	mA	5	$V_{OH} = 4.6\text{V}$	
		-2.1	-4.0	—	mA	5	$V_{OH} = 2.5\text{V}$	
		-1.3	-2.2	—	mA	10	$V_{OH} = 9.5\text{V}$	
		-3.4	-9.0	—	mA	15	$V_{OH} = 13.5\text{V}$	
Output low level current	I_{OL}	0.51	1.2	—	mA	5	$V_{OL} = 0.4\text{V}$	
		1.3	3.2	—	mA	10	$V_{OL} = 0.5\text{V}$	
		3.4	12.0	—	mA	15	$V_{OL} = 1.5\text{V}$	
Static current dissipation	I_{DD}	—	0.001	0.25	μA	5	$V_{IN} = V_{ss}$ or V_{DD}	
		—	0.001	0.5	μA	10		
		—	0.002	1.0	μA	15		

Fig.1

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	$V_{DD} (\text{V})$	Conditions	Measurement circuit	
Output rise time	t_{TLH}	—	70	200	ns	5	—	Fig.2	
		—	35	100	ns	10			
		—	30	80	ns	15			
Output fall time	t_{THL}	—	70	200	ns	5	—		
		—	35	100	ns	10			
		—	30	80	ns	15			
Propagation delay time	t_{PLH}	—	90	200	ns	5	—		
		—	45	100	ns	10			
		—	30	80	ns	15			
	t_{PHL}	—	90	200	ns	5	—		
		—	45	100	ns	10			
		—	30	80	ns	15			

● Measurement circuits

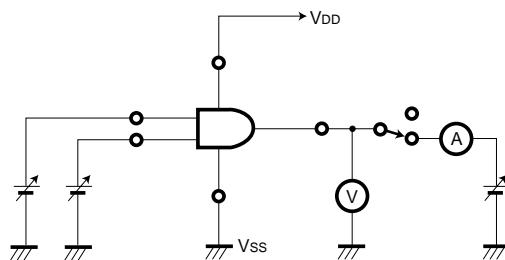


Fig.1 DC characteristics measurement circuit

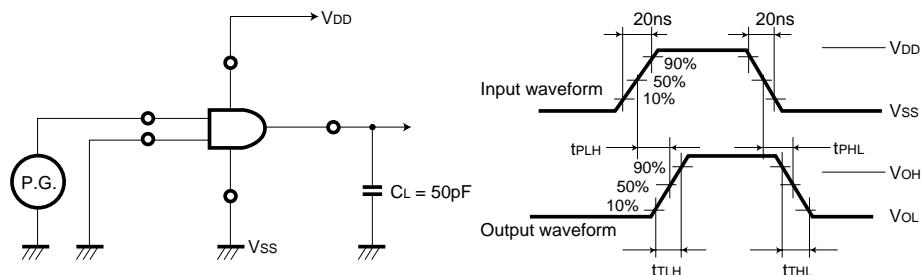


Fig.2 Switching characteristics measurement circuit

● External dimensions (Units: mm)

