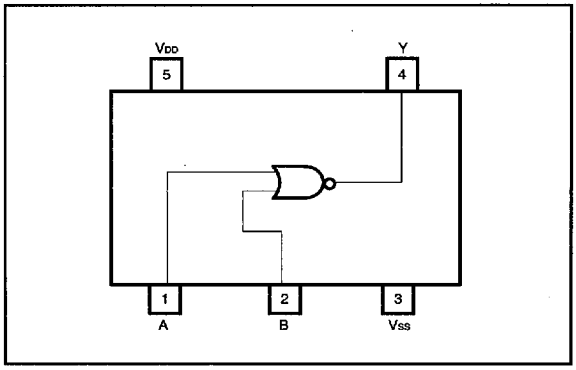
Single 2-input NOR gate
BU4S01

The BU4S01 is an ultra-compact logic IC with one circuit of the dual-input positive logic NOR gate BU4001B built into an SMP package.

●Features

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

●Block diagram



●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	$V_{SS}-0.3 \sim V_{SS}+18$	V
Power dissipation	Pd	170	mW
Input current	I_{IN}	±10	mA
Operating temperature	Topr	−40~85	℃
Storage temperature	Tstg	−55~150	℃
Input voltage	V_{IN}	$V_{SS}-0.3 \sim V_{DD}+0.3$	V

Note 1: These values indicate the range limits of the voltage that can be applied to each pin without destroying it. Operation is not guaranteed at these values.
Note 2: Reduced by 1.7mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25℃, V_{SS} = 0V)

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, V_{SS}=0V, Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions	Measurement Circuit
"H" input voltage	V_{IH}	3.5	—	—	V	5	V_{OUT}=0.5V	Fig.1
		7.0	—	—	V	10	V_{OUT}=1.0V	
		11.0	—	—	V	15	V_{OUT}=1.5V	
							| I_{OUT} | <1 μA	
"L" input voltage	V_{IL}	—	—	1.5	V	5	V_{OUT}=4.5V	
		—	—	3.0	V	10	V_{OUT}=9.0V	
		—	—	4.0	V	15	V_{OUT}=13.5V	
							| I_{OUT} | <1 μA	
"H" input current	I_{IH}	—	—	0.3	μA	15	V_{IH}=15V	
"L" input current	I_{IL}	—	—	—0.3	μA	15	V_{IL}=0V	
"H" output voltage	V_{OH}	4.95	—	—	V	5	| I_{OUT} | <1 μA, V_{IN}=V_{SS}	
		9.95	—	—	V	10		
		14.95	—	—	V	15		
"L" output voltage	V_{OL}	—	—	0.05	V	5	| I_{OUT} | <1 μA, V_{IN}=V_{DD}	
		—	—	0.05	V	10		
		—	—	0.05	V	15		
"H" output current	I_{OH}	—0.51	—	—	mA	5	V_{OH}=4.6V	
		—2.1	—	—	mA	5	V_{OH}=2.5V	
		—1.3	—	—	mA	10	V_{OH}=9.5V	
		—3.4	—	—	mA	15	V_{OH}=13.5V, V_{IN}=V_{SS}	
"L" output current	I_{OL}	0.51	—	—	mA	5	V_{OL}=0.4V	
		1.3	—	—	mA	10	V_{OL}=0.5V	
		3.4	—	—	mA	15	V_{OL}=1.5V, V_{IN}=V_{DD}	
Quiescent supply current	I_{DD}	—	—	0.25	μA	5	V_{IN}=V_{SS}, V_{DD}	
		—	—	0.5	μA	10		
		—	—	1.0	μA	15		

Switching characteristics (unless otherwise noted, V_{SS}=0V, Ta=25℃, C_L=50pF)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions	Measurement Circuit
Output rise time	t_{TLH}	—	70	—	ns	5	—	Fig.2
		—	35	—	ns	10		
		—	30	—	ns	15		
Output fall time	t_{THL}	—	70	—	ns	5	—	
		—	35	—	ns	10		
		—	30	—	ns	15		
Propagation delay time	t_{PLH}	—	85	—	ns	5	—	
		—	40	—	ns	10		
		—	30	—	ns	15		
	t_{PHL}	—	85	—	ns	5	—	
		—	40	—	ns	10		
		—	30	—	ns	15		
Input capacitance	C_{IN}	—	5	—	pF	5	—	—

●Measurement circuits

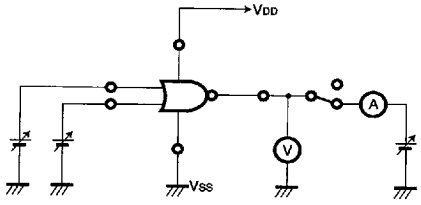


Fig.1 DC characteristics measurement circuit

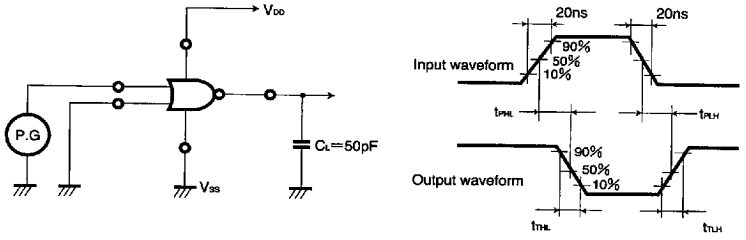
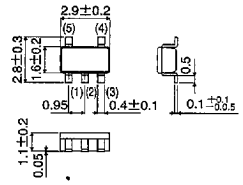


Fig.2 Switching characteristics measurement circuit

●External dimensions (Units: mm)



SMP5