

Single inverter

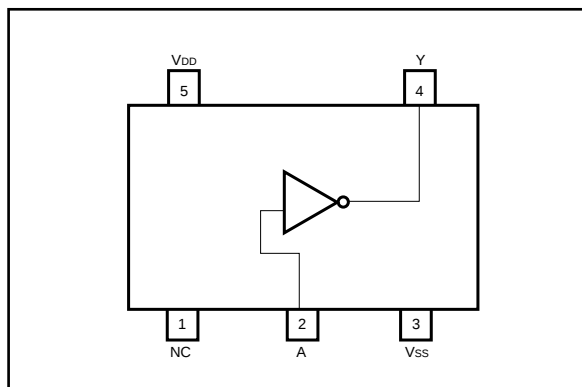
BU4SU69

The BU4SU69 is an ultra-compact IC with one circuit of the bufferless inverter, BU4069UB, built into the SMP package. The single-stage gate configuration enables a short propagation time.

●Features

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

●Block diagram



●Absolute maximum ratings (Ta = 25°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}	$-40 \sim +85$	°C
Storage temperature	T_{stg}	$-55 \sim +150$	°C
Input voltage	V_{IN}	$V_{SS} - 0.3 \sim V_{DD} + 0.3$	V

*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.

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	V _{DD} (V)	Conditions	Measurement circuit		
Input high level voltage	V _{IH}	4.0	—	—	V	5	V _{OUT} = 0.5V V _{OUT} = 1.0V V _{OUT} = 1.5V I _{OUT} < 1μA	Fig.1		
		8.0	—	—	V	10				
		12.0	—	—	V	15				
Input low level voltage	V _{IL}	—	—	1.0	V	5	V _{OUT} = 4.5V V _{OUT} = 9.0V V _{OUT} = 13.5V I _{OUT} < 1μA			
		—	—	2.0	V	10				
		—	—	3.0	V	15				
Input high level current	I _{IH}	—	—	0.3	μA	15	V _{IH} = 15V			
Input low level current	I _{IL}	—	—	− 0.3	μA	15	V _{IL} = 0V			
Output high level voltage	V _{OH}	4.95	—	—	V	5	I _{OUT} < 1μA V _{IN} = V _{SS}			
		9.95	—	—	V	10				
		14.95	—	—	V	15				
Output low level voltage	V _{OL}	—	—	0.05	V	5	I _{OUT} < 1μA V _{IN} = V _{DD}			
		—	—	0.05	V	10				
		—	—	0.05	V	15				
Output high level 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}			
Output low level 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}			
Static current dissipation	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, $V_{SS} = 0V$, $T_a = 25^{\circ}C$, $C_L = 50pF$)

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}	—	55	—	ns	5	—	
		—	30	—	ns	10		
		—	25	—	ns	15		
	t _{PHL}	—	55	—	ns	5	—	
		—	30	—	ns	10		
		—	25	—	ns	15		
Input capacitance	C _{IN}	—	5	—	pF	5	—	—

●Measurement circuits

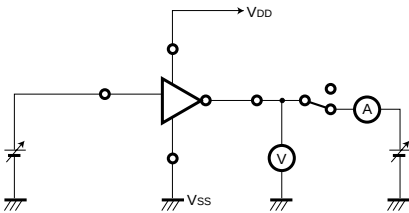


Fig.1 DC characteristics measurement circuit

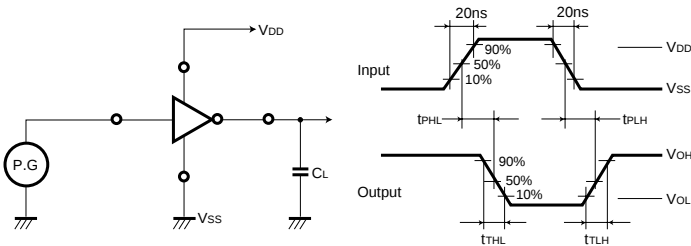
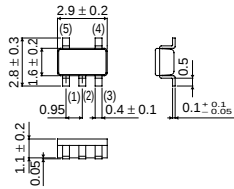


Fig.2 Switching characteristics measurement circuit

●External dimensions (Units: mm)



SMP5