

# Single inverter

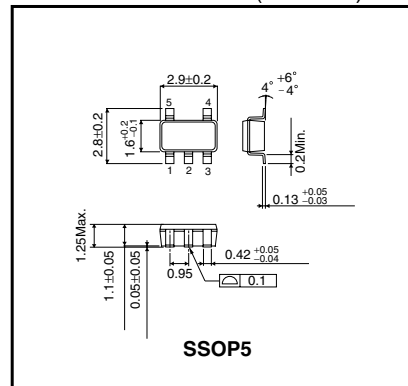
## BU4SU69G2

BU4SU69G2 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.

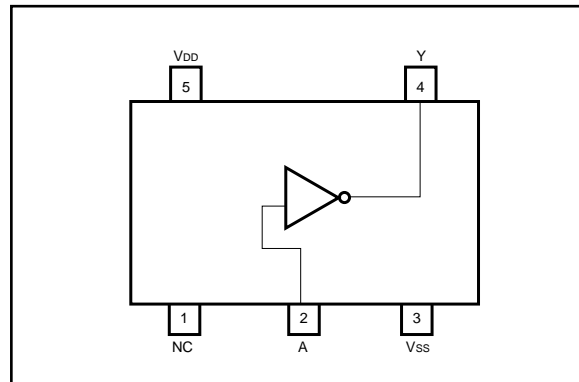
### ●Features

- 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.

### ● External dimensions (Unit : mm)



### ●Block diagram



### ● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>DD</sub>	V <sub>SS</sub> - 0.3 to V <sub>SS</sub> + 18	V
Power dissipation	P <sub>d</sub>	540	mW
Input current	I <sub>IN</sub>	± 10	mA
Operating temperature	T <sub>opr</sub>	- 40 to + 85	C
Storage temperature	T <sub>stg</sub>	- 55 to + 150	C
Input voltage	V <sub>IN</sub>	V <sub>SS</sub> - 0.3 to V <sub>DD</sub> + 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 5.4mW for each increase in Ta of 1°C over 25°C.

## Standard ICs

● Recommended operating conditions (Ta=25°C, V<sub>SS</sub>=0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V <sub>DD</sub>	3	–	16	V
Input voltage	V <sub>IN</sub>	0	–	V <sub>DD</sub>	V

## ● Electrical characteristics

DC characteristics (unless otherwise noted, V<sub>SS</sub> = 0V, Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V <sub>DD</sub> (V)	Conditions	Measurement circuit
Input high level voltage	V <sub>IH</sub>	4.0	–	–	V	5	V <sub>OUT</sub> = 0.5V V <sub>OUT</sub> = 1.0V V <sub>OUT</sub> = 1.5V   I <sub>OUT</sub>   < 1μA	Fig.1
		8.0	–	–	V	10		
		12.0	–	–	V	15		
Input low level voltage	V <sub>IL</sub>	–	–	1.0	V	5	V <sub>OUT</sub> = 4.5V V <sub>OUT</sub> = 9.0V V <sub>OUT</sub> = 13.5V   I <sub>OUT</sub>   < 1μA	
		–	–	2.0	V	10		
		–	–	3.0	V	15		
Input high level current	I <sub>IH</sub>	–	–	0.3	μA	15	V <sub>IH</sub> = 15V	
Input low level current	I <sub>IL</sub>	–	–	–0.3	μA	15	V <sub>IL</sub> = 0V	
Output high level voltage	V <sub>OH</sub>	4.95	–	–	V	5	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> = V <sub>SS</sub>	
		9.95	–	–	V	10		
		14.95	–	–	V	15		
Output low level voltage	V <sub>OL</sub>	–	–	0.05	V	5	I <sub>OUT</sub>   < 1μA V <sub>IN</sub> = V <sub>DD</sub>	
		–	–	0.05	V	10		
		–	–	0.05	V	15		
Output high level current	I <sub>OH</sub>	–0.51	–	–	mA	5	V <sub>OH</sub> = 4.6V	
		–2.1	–	–	mA	5	V <sub>OH</sub> = 2.5V	
		–1.3	–	–	mA	10	V <sub>OH</sub> = 9.5V	
		–3.4	–	–	mA	15	V <sub>OH</sub> = 13.5V V <sub>IN</sub> = V <sub>SS</sub>	
Output low level current	I <sub>OL</sub>	0.51	–	–	mA	5	V <sub>OL</sub> = 0.4V	
		1.3	–	–	mA	10	V <sub>OL</sub> = 0.5V	
		3.4	–	–	mA	15	V <sub>OL</sub> = 1.5V	
							V <sub>IN</sub> = V <sub>DD</sub>	
Static current dissipation	I <sub>DD</sub>	–	–	0.25	μA	5	V <sub>IN</sub> = V <sub>SS</sub> , V <sub>DD</sub>	
		–	–	0.5	μA	10		
		–	–	1.0	μA	15		

Standard ICs

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	$t_{rLH}$	-	70	-	ns	5	-	Fig.2
		-	35	-	ns	10		
		-	30	-	ns	15		
Output fall time	$t_{fHL}$	-	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

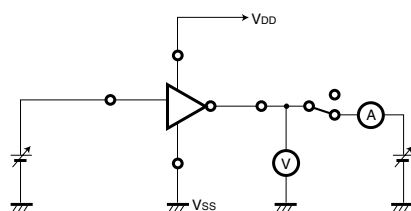


Fig.1 DC characteristics measurement circuit

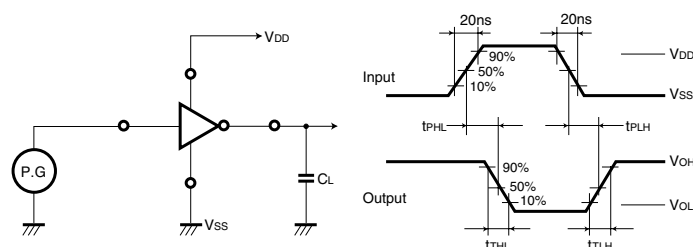


Fig.2 Switching characteristics measurement circuit

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