Single analog switch

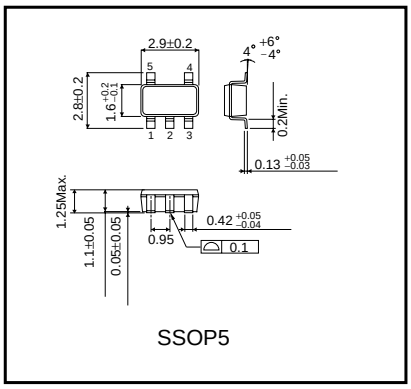
BU4S66G2

The BU4S66G2 is an ultra-compact IC with one circuit of the bi-directional analog switch BU4066B built into an SMP package. Setting the enable input (CONT) to the “H” level sets the impedance between the switch input and the output pins low (ON state) and setting CONT to the “L” level sets the impedance high (OFF state).

●Features

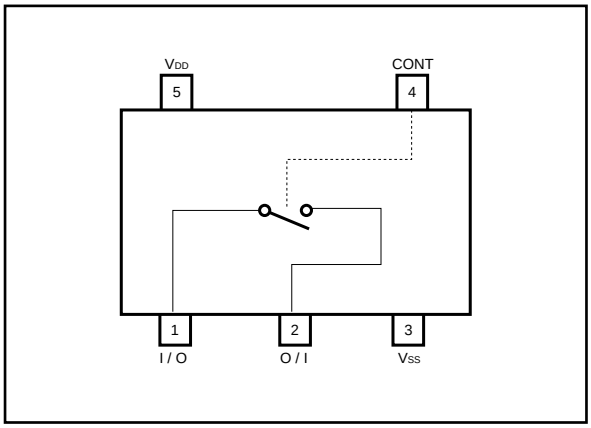
1) Low current dissipation.
2) Super-mini mold package designed for surface mounting.
3) Wide range of operating power supply voltage.
4) Direct drive of 2 L-TTL inputs and 1 LS-TTL input.

●External dimensions (Unit : mm)



SSOP5

●Block diagram



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

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	V_{SS} – 0.3 to V_{SS} + 18	V
Power dissipation	Pd	540	mW
Input current	I_{IN}	± 10	mA
Operating temperature	Topr	– 40 to + 85	˚C
Storage temperature	Tstg	– 55 to + 150	˚C
Input voltage	V_{IN}	V_{SS} – 0.3 to 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 Reduced by 1.7mW for each increase in Ta of 1˚C over 25˚C.

●**Recommended operating conditions** (Ta=25°C, 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°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD}(V)	Conditions	Measurement circuit
Control input high level voltage	V_{IH}	3.5	–	–	V	5	Current between input and output = 10μA	Fig.1
		7.0	–	–	V	10		
		11.0	–	–	V	15		
Control input low level voltage	V_{IL}	–	–	1.5	V	5	Current between input and output = 10μA	
		–	–	3.0	V	10		
		–	–	4.0	V	15		
ON resistance	R_{ON}	–	290	950	Ω	5	$0 \leqq V_{IN} \leqq V_{DD}$ R_L= 10kΩ	Fig.2
		–	120	250	Ω	10		
		–	85	160	Ω	15		
OFF-channel leakage current	I_{off}	–	–	0.3	μA	15	V_{IN} = 15V, V_{OUT} = 0V	Fig.3
		–	–	–0.3		15	V_{IN} = 0V, V_{OUT} = 15V	
Static current dissipation	I_{DD}	–	–	1.0	μA	5	V_{IN} = V_{DD} or GND	–
		–	–	2.0		10		
		–	–	4.0		15		
Input capacitance (control input)	C_C	–	8	–	pF	–	f = 1MHz	–
Input capacitance (switch input)	C_S	–	10	–	pF	–	f = 1MHz	–

●**Switching characteristics** (unless otherwise noted, VSS = 0V, Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD}(V)	V_{SS}(V)	Conditions	Measurement circuit
Propagation delay time (I / O→O / I)	t_{PLH}	–	15	–	ns	5	–	R_L = 10kΩ C_L = 50pF	Fig.4
		–	8	–	ns	10			
		–	5	–	ns	15			
	t_{PHL}	–	15	–	ns	5	–	R_L = 10kΩ C_L = 50pF	
		–	8	–	ns	10			
		–	5	–	ns	15			
Propagation delay time (CONTROL→O / I)	t_{PHZ}	–	100	–	ns	5	–	R_L = 10kΩ C_L = 50pF	Fig.5
		–	70	–	ns	10			
		–	65	–	ns	15			
	t_{PLZ}	–	100	–	ns	5	–	R_L = 10kΩ C_L = 50pF	Fig.6
		–	70	–	ns	10			
		–	65	–	ns	15			
	t_{PZH}	–	80	–	ns	5	–	R_L = 10kΩ C_L = 50pF	Fig.5
		–	35	–	ns	10			
		–	25	–	ns	15			
	t_{PZL}	–	80	–	ns	5	–	R_L = 10kΩ C_L = 50pF	Fig.6
		–	35	–	ns	10			
		–	25	–	ns	15			
Maximum control frequency	$f_{Max.}$(C)	–	10	–	MHz	5	–	R_L = 1kΩ C_L = 50pF	–
		–	12	–	MHz	10			
		–	12	–	MHz	15			
Max. propagation frequency	$f_{Max.}$ (I – O)*1	–	30	–	MHz	5	– 5	R_L = 1kΩ C_L = 50pF	–
Feedthrough attenuation	F.T.*2	–	600	–	kHz	5	– 5	R_L = 1kΩ	Fig.7
Sinewave distortion (1kHz)	THD*3	–	0.05	–	%	5	– 5	R_L = 10kΩ C_L = 50pF	
Crosstalk (CONTROL→O / I)	CT_C	–	200	–	mV	5	–	R_{IN} = 1kΩ R_{OUT} = 10kΩ C_L = 50pF	Fig.8
		–	400	–	mV	10			
		–	600	–	mV	15			

*1 Frequency that enables 20 log (V_{OUT} / V_{IN}) = – 3dB

*2 Frequency that enables 20 log (V_{OUT} / V_{IN}) = – 50dB

*1 *2 *3 Use a V_{IN} = ± 2.5V_{P-P} sine wave.

●Measurement circuits

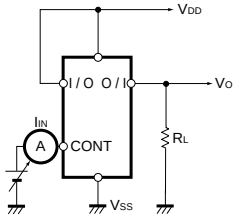


Fig. 1 Input voltage, current

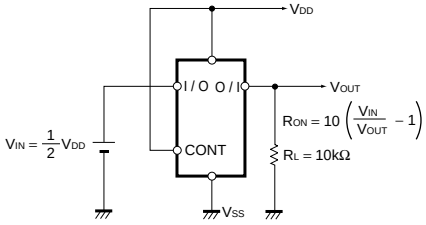


Fig. 2 ON resistance

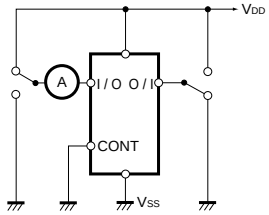
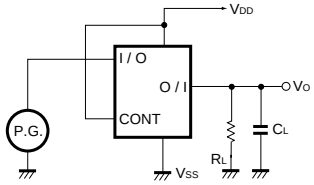


Fig. 3 Channel OFF leakage current



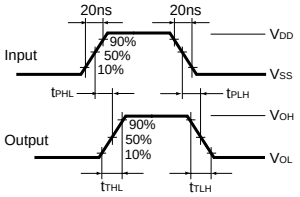


Fig. 4 Switching characteristic measurement circuit

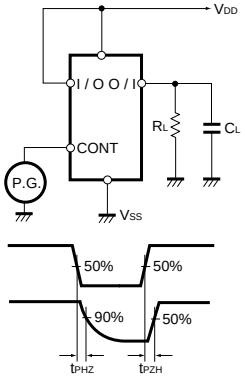


Fig. 5 Propagation delay time (CONT→ OUT)

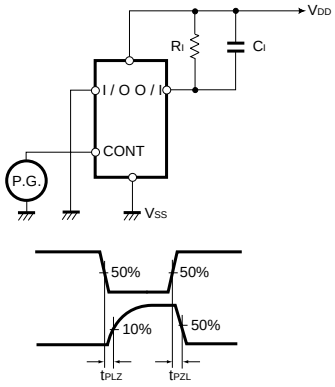


Fig. 6 Propagation delay time (CONT→OUT)

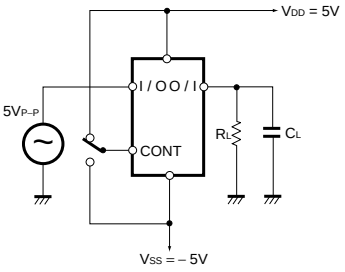


Fig. 7 Sine wave distortion, feedthrough attenuation

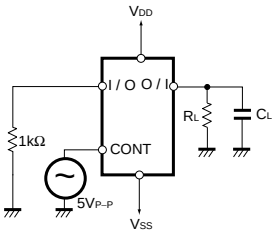


Fig. 8 Control IN → OUT crosstalk

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