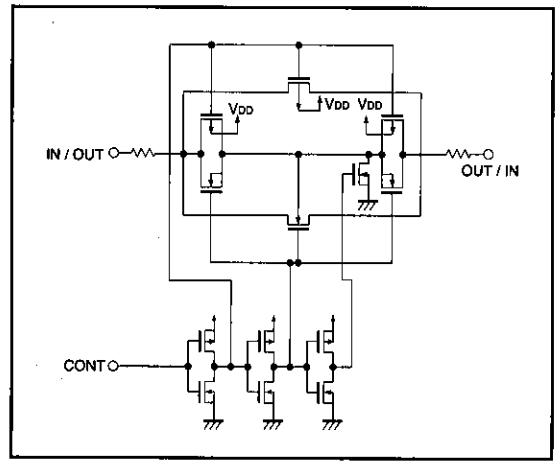
Quad analog switch

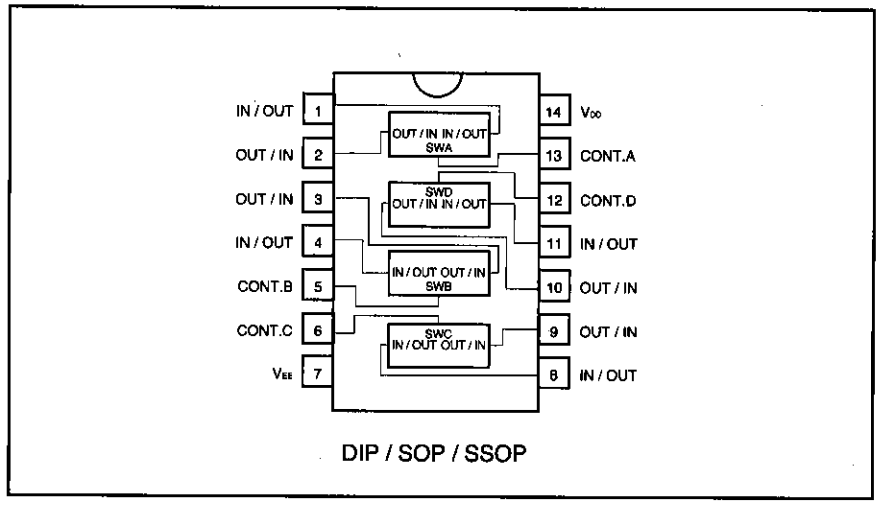
BU4066BC/BU4066BCF/BU4066BCFV

The BU4066BC, BU4066BCF, and BU4066BCFV each consist of four independent switches capable of controlling either digital or analog signals. When Enable Input (CONT) is set to the "H" level, impedance is low (ON status) between switch input and output, and when Enable Input (CONT) is set to the "L" level, impedance is high (OFF status). As the BU4066BC has a good propagation characteristic, it can control large input voltage amplitudes. These switches can be used in analog and digital signal switching and in chopper modulator and demodulator circuits.

●Logic diagram



●Block diagram



DIP / SOP / SSOP

●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	−0.3~20	V
Power dissipation	Pd	1000 (DIP), 450 (SOP) 350 (SSOP)	mW
Operating temperature	Topr	−40~85	℃
Storage temperature	Tstg	−55~150	℃
Input voltage	V_{IN}	−0.3~V_{DD}+0.3	V

●Electrical characteristics

DC characteristics (unless otherwise noted, Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions	Measurement Circuit
High-level input voltage	V_{IH}	3.5	—	—	V	5	—	Fig. 1
		7.0	—	—		10		
		11.0	—	—		15		
Low-level input voltage	V_{IL}	—	—	1.5	V	5	—	Fig. 1
		—	—	3.0		10		
		—	—	3.75		15		
High-level input current	I_{IH}	—	—	0.3	μA	15	V_{IH}=15V	Fig. 1
Low-level input current	I_{IL}	—	—	−0.3	μA	15	V_{IL}=0V	Fig. 1
ON resistance	R_{ON}	—	150	600	Ω	5	V_{IN}=0.25V, R_L=10kΩ	Fig. 1
		—	500	950		5	V_{IN}=2.5V, R_L=10kΩ	
		—	200	600		5	V_{IN}=5V, R_L=10kΩ	
		—	230	500		10	V_{IN}=5V, R_L=10kΩ	
		—	180	280		15	V_{IN}=7.5V, R_L=10kΩ	
ON resistance deflexion	$\triangle R_{ON}$	—	25	—	Ω	5	V_I=V_{DD}/2 R_L=10kΩ	Fig. 1
		—	10	—		10		
		—	5	—		15		
OFF-channel leakage current	Ioff	—	—	0.3	μA	15	V_{IN}=15V, V_{OUT}=0V	Fig. 1
		—	—	−0.3		15	V_{IN}=0V, V_{OUT}=15V	
Quiescent supply current	I_{DD}	—	—	1.0	μA	5	V_I=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	—

●Electrical characteristics

Switching characteristics (unless otherwise noted, Ta=25℃, C_L=50pF)

Parameter	Symbol	Min.	Typ.	Max.	Unit	V_{DD} (V)	Conditions	Measurement Circuit
Propagation delay time SW IN→OUT	t_{PLH} t_{PHL}	—	20	50	ns	5	R_L=10kΩ	Fig.2
		—	12	40		10		
		—	10	30		15		
Propagation delay time CONT→OUT	t_{PHZ} t_{PLZ}	—	40	90	ns	5	Output "H", "L" → "High Z" R_L=1kΩ	Fig.2
		—	35	80		10		
		—	30	70		15		
Propagation delay time CONT→OUT	t_{PZH} t_{PZL}	—	60	140	ns	5	Output "High Z→ "H", "L" R_L=1kΩ	Fig.2
		—	20	50		10		
		—	15	40		15		
Feedthrough attenuation	FT	—	0.7	—	MHz	5	V_{SS}=−5V, R_L=10kΩ*1	Fig.2
Sinewave distortion	D	—	0.1	—	%	5	V_{SS}=−5V, R_L=10kΩ*2	Fig.2
Crosstalk (CONT→OUT)	CT_C	—	—	600	mV_{P-P}	5	V_{SS}=−5V, R_L=10kΩ f=1MHz	Fig.2
Crosstalk (2) between channels	CT	—	1	—	MHz	5	V_{SS}=−5V, R_L=10kΩ*1	Fig.2

*1 V_{IN} : $5V_{P-P}$ sinewave, frequency that enables $\frac{V_{OUT}}{V_{IN}}$ −50dB at channel off

*2 V_{IN} : $5V_{P-P}$ sinewave

●Measurement circuits

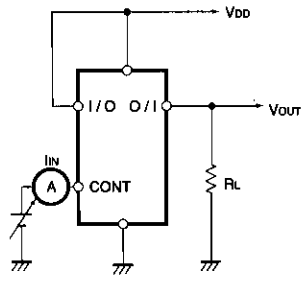


Fig. 1 (a) Input voltage, current

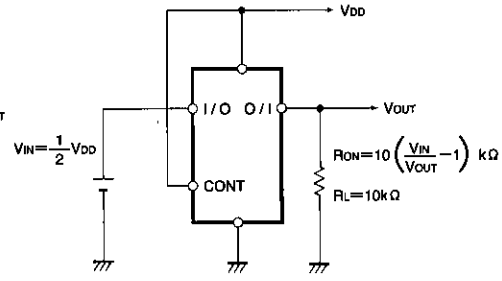


Fig. 1 (b) On resistance

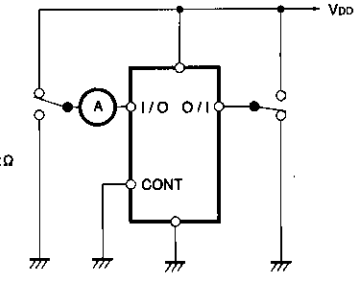


Fig. 1 (c) Channel off leakage current

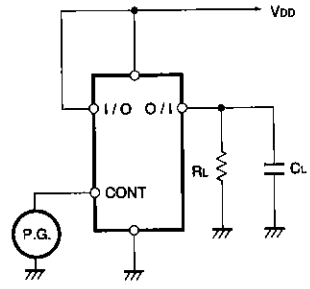


Fig. 2 (a) Propagation delay time (IN to OUT)

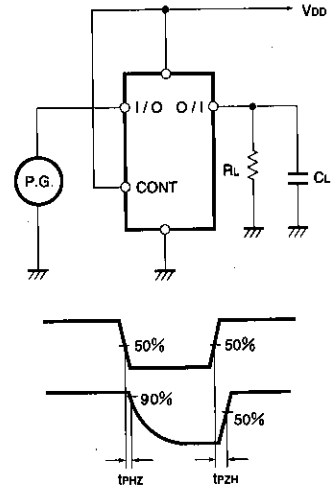


Fig. 2 (b) Propagation delay time (CONT to OUT)

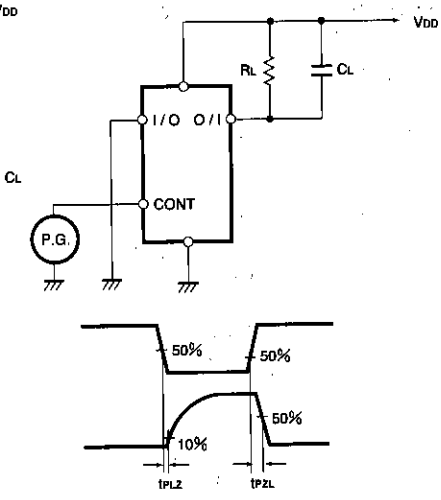


Fig. 2 (c) Propagation delay time (CONT to OUT)

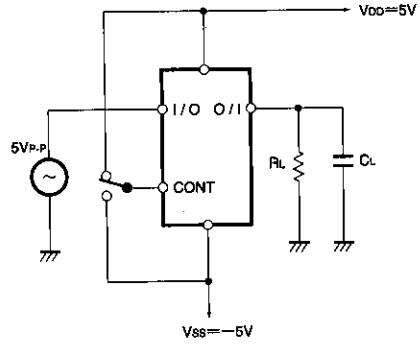


Fig. 2 (d) Sinewave distortion, feedthrough attenuation

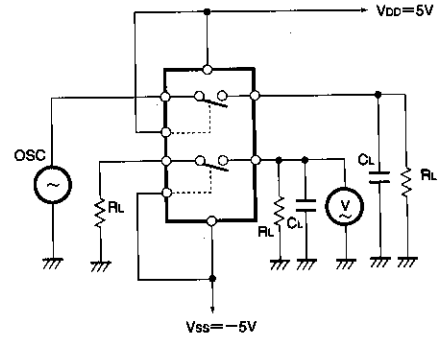


Fig. 2 (e) Crosstalk

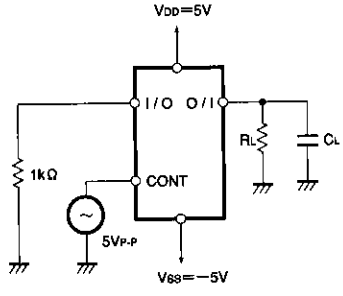


Fig. 2 (f) Control IN → OUT crosstalk

●Electrical characteristic curve

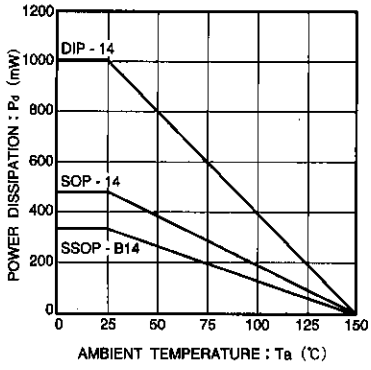
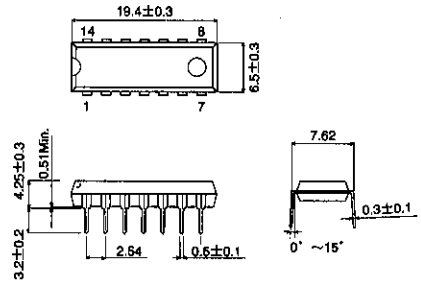


Fig. 3 Power dissipation - ambient temperature characteristic

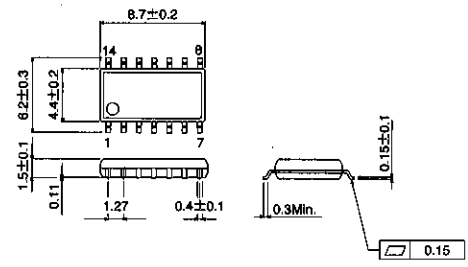
●External dimensions (Units: mm)

BU4066BC



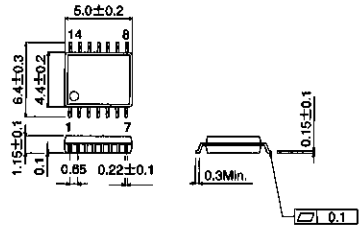
DIP14

BU4066BCF



SOP14

BU4066BCFV



SSOP-14

Series Standard
BU4000B

The BU4000 Series are CMOS ICs featuring low voltage and low power consumption. The wide range of operating power supply voltages is compatible with the general-purpose 4000B Series, and when a 5V power supply voltage is used, the LS-TTL IC can be driven directly.
These ICs are available in SOP and SSOP packages as well as the standard DIP package.

●Features

1) Low power consumption.
2) Wide range of operating power supply voltages.
3) High input impedance.
4) High fan-out.
5) Direct drive of 2 L-TTL inputs and 1 LS-TTL input.

●Absolute maximum ratings (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	18 *1	V
Input voltage	V_{IN}	−0.3~V_{DD}+0.3	V
Power dissipation *2	Pd	Please refer to specifications for individual package	mW
Storage temperature	Tstg	−55~150	℃

*1 For the BU4XXXBC type, V_{DD} = 20 V.
*2 The values for the SOP and SSOP packages are the values when mounted on a glass epoxy PCB (50 mm x 50 mm x 1.6 mm).

●Recommended operating conditions (Ta = 25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	3~16 *	V
Input voltage	V_{IN}	0~V_{DD}	V
Operating temperature	Topr	−40~85	℃

* For the BU4XXXBC type, V_{DD} = 3 to 18 V.

●Electrical characteristic curves

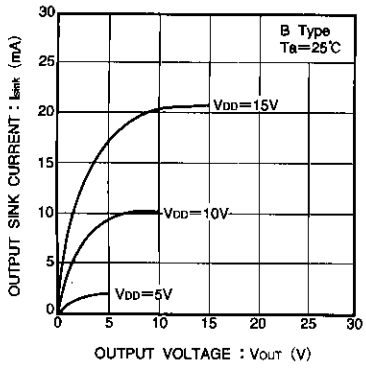


Fig.1 Output sink current - output voltage characteristic

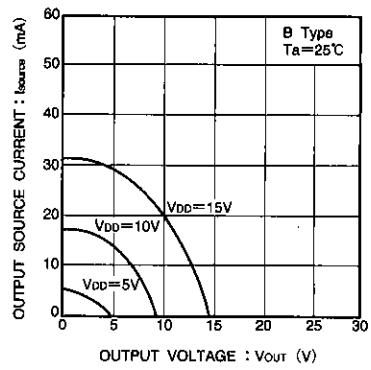


Fig.2 Output source current - output voltage characteristic

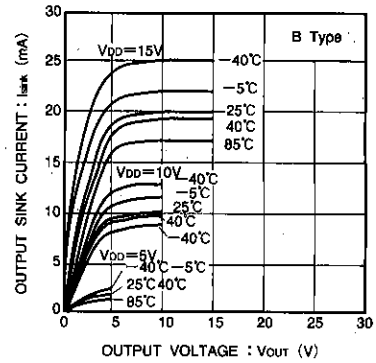


Fig.3 Output SINK current - output voltage characteristic

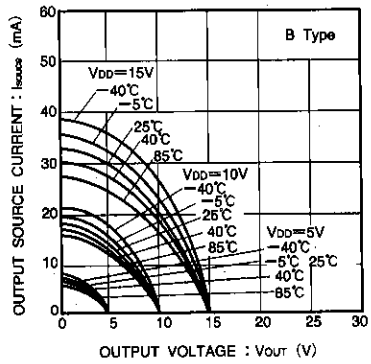


Fig.4 Output source current - output voltage characteristic

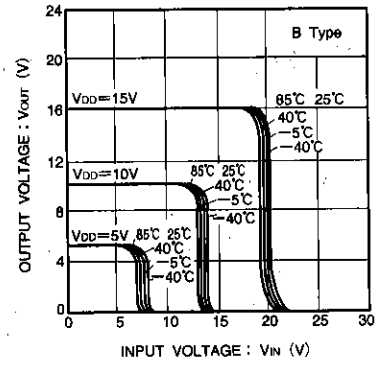


Fig.5 Output voltage - input voltage characteristic

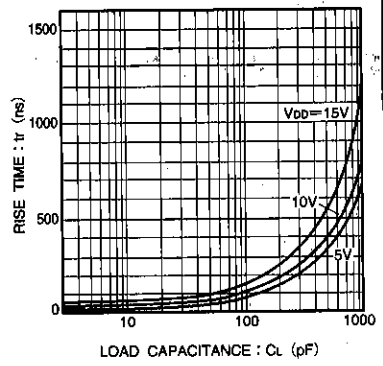


Fig.6 Rise time - load capacitance characteristic

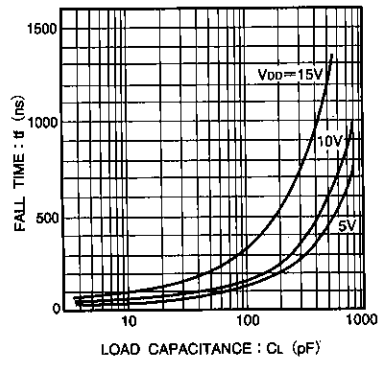


Fig.7 Fall time - load capacitance characteristic

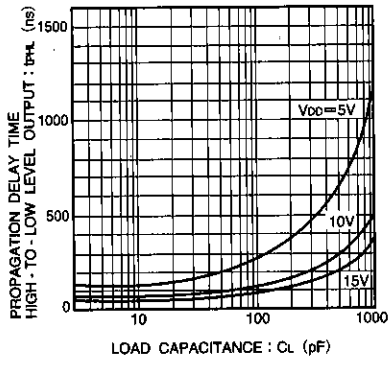


Fig.8 "H" to "L" propagation delay time - load capacitance characteristic

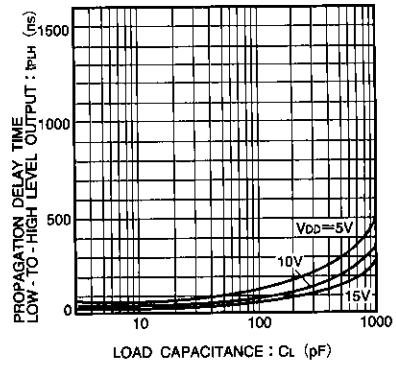


Fig.9 "L" to "H" propagation delay time - load capacitance characteristic

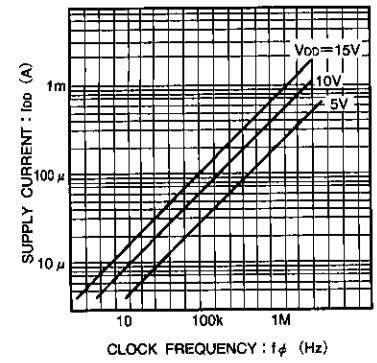


Fig.10 Supply current - clock frequency characteristic

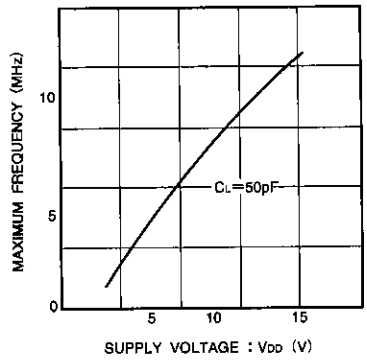


Fig.11 Maximum clock frequency - power supply voltage characteristic

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