

# Quad analog switch

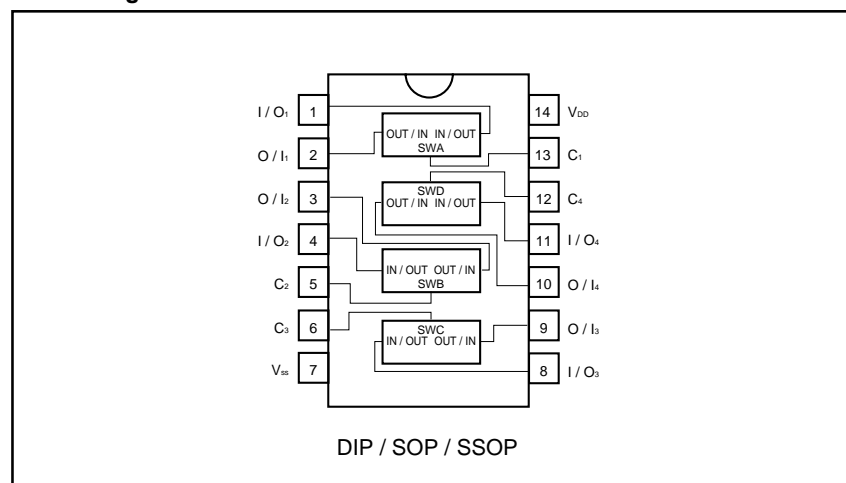
## BU4066BC / BU4066BCF / BU4066BCFV

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.

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

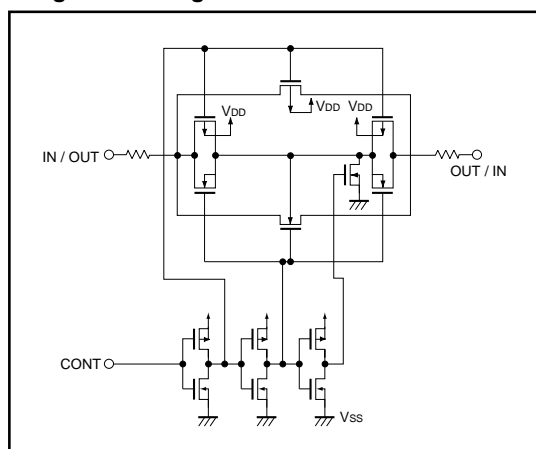
| Parameter             | Symbol           | Limits                           | Unit |
|-----------------------|------------------|----------------------------------|------|
| Power supply voltage  | V <sub>DD</sub>  | -0.3~+20                         | V    |
| Power dissipation     | P <sub>d</sub>   | 1000(DIP), 450(SOP)<br>350(SSOP) | mW   |
| Operating temperature | T <sub>opr</sub> | -40~+85                          | °C   |
| Storage temperature   | T <sub>stg</sub> | -55~+150                         | °C   |
| Input voltage         | V <sub>IN</sub>  | -0.5~V <sub>DD</sub> +0.5        | V    |

### ●Block diagram



Standard ICs

●Logic circuit diagram



●Electrical characteristics

DC characteristics (unless otherwise noted, Ta=25°C, Vss=0V)

| Parameter                         | Symbol           | Min. | Typ. | Max. | Unit | Conditions          |  | Measurement circuit |
|-----------------------------------|------------------|------|------|------|------|---------------------|--|---------------------|
|                                   |                  |      |      |      |      | V <sub>DD</sub> (V) |  |                     |
| Input high-level voltage          | V <sub>IH</sub>  | 3.5  | –    | –    | V    | 5                   | –  | Fig. 1              |
|                                   |                  | 7.0  | –    | –    |      | 10                  |  |                     |
|                                   |                  | 11.0 | –    | –    |      | 15                  |  |                     |
| Input low-level voltage           | V <sub>IL</sub>  | –    | –    | 1.5  | V    | 5                   | –  | Fig. 1              |
|                                   |                  | –    | –    | 3.0  |      | 10                  |  |                     |
|                                   |                  | –    | –    | 3.75 |      | 15                  |  |                     |
| Input high-level current          | I <sub>IH</sub>  | –    | –    | 0.3  | μA   | 15                  | V <sub>IH</sub> =15V                                       | Fig. 1              |
| Input low-level current           | I <sub>IL</sub>  | –    | –    | –0.3 | μA   | 15                  | V <sub>IL</sub> =0V  | Fig. 1              |
| ON resistance                     | R <sub>ON</sub>  | –    | 150  | 600  | Ω    | 5                   | V <sub>IN</sub> =0.25V, R <sub>L</sub> =10kΩ               | Fig. 1              |
|                                   |                  | –    | 500  | 950  |      | 5                   | V <sub>IN</sub> =2.5V, R <sub>L</sub> =10kΩ                |                     |
|                                   |                  | –    | 200  | 600  |      | 5                   | V <sub>IN</sub> =5V, R <sub>L</sub> =10kΩ                  |                     |
|                                   |                  | –    | 230  | 500  |      | 10                  | V <sub>IN</sub> =5V, R <sub>L</sub> =10kΩ                  |                     |
|                                   |                  | –    | 180  | 280  |      | 15                  | V <sub>IN</sub> =7.5V, R <sub>L</sub> =10kΩ                |                     |
| ON resistance deflexion           | ΔR <sub>ON</sub> | –    | 25   | –    | Ω    | 5                   | V <sub>I</sub> =V <sub>DD</sub> /2<br>R <sub>L</sub> =10kΩ | Fig. 1              |
|                                   |                  | –    | 10   | –    |      | 10                  |  |                     |
|                                   |                  | –    | 5    | –    |      | 15                  |  |                     |
| OFF-channel leakage current       | I <sub>OFF</sub> | –    | –    | 0.3  | μA   | 15                  | V <sub>IN</sub> =15V, V <sub>OUT</sub> =0V                 | Fig. 1              |
|                                   |                  | –    | –    | –0.3 |      | 15                  | V <sub>IN</sub> =0V, V <sub>OUT</sub> =15V                 |                     |
| Static current dissipation        | I <sub>DD</sub>  | –    | –    | 1.0  | μA   | 5                   | V <sub>I</sub> =V <sub>DD</sub> or GND                     | –                   |
|                                   |                  | –    | –    | 2.0  |      | 10                  |  |                     |
|                                   |                  | –    | –    | 4.0  |      | 15                  |  |                     |
| Input capacitance (control input) | C <sub>C</sub>   | –    | 8    | –    | pF   | –                   | f=1MHz   | –                   |
| Input capacitance (switch input)  | C <sub>S</sub>   | –    | 10   | –    | pF   | –                   | f=1MHz   | –                   |

# BU4066BC / BU4066BCF / BU4066BCFV

## Standard ICs

Switching characteristics (unless otherwise noted, Ta=25°C, CL=50pF)

| Parameter                           | Symbol           | Min. | Typ. | Max. | Unit              | V <sub>DD</sub> (V) | Conditions   | Measurement circuit |
|-------------------------------------|------------------|------|------|------|-------------------|---------------------|--|---------------------|
|                                     |                  |      |      |      |                   |                     |  |                     |
| Propagation delay time<br>SW IN→OUT | t <sub>PLH</sub> | –    | 20   | 50   | ns                | 5                   | R <sub>L</sub> =10kΩ                                 | Fig.2               |
|                                     | t <sub>PHL</sub> | –    | 12   | 40   |                   | 10                  |  |                     |
|                                     |                  | –    | 10   | 30   |                   | 15                  |  |                     |
| Propagation delay time<br>CONT→OUT  | t <sub>PHZ</sub> | –    | 40   | 90   | ns                | 5                   | Output "H", "L"<br>→ "High-Z"<br>R <sub>L</sub> =1kΩ | Fig.2               |
|                                     | t <sub>PLZ</sub> | –    | 35   | 80   |                   | 10                  |  |                     |
|                                     |                  | –    | 30   | 70   |                   | 15                  |  |                     |
| Propagation delay time<br>CONT→OUT  | t <sub>PZH</sub> | –    | 60   | 140  | ns                | 5                   | Output "High-Z"→ "H", "L"<br>R <sub>L</sub> =1kΩ     | Fig.2               |
|                                     | t <sub>PZL</sub> | –    | 20   | 50   |                   | 10                  |  |                     |
|                                     |                  | –    | 15   | 40   |                   | 15                  |  |                     |
| Feedthrough attenuation             | FT               | –    | 0.7  | –    | MHz               | 5                   | V <sub>SS</sub> =-5V, R <sub>L</sub> =10kΩ *1        | Fig.2               |
| Sine wave distortion                | D                | –    | 0.1  | –    | %                 | 5                   | V <sub>SS</sub> =-5V, R <sub>L</sub> =10kΩ *2        | Fig.2               |
| Crosstalk<br>(CONT→OUT)             | CT <sub>C</sub>  | –    | –    | 600  | mV <sub>P-P</sub> | 5                   | V <sub>SS</sub> =-5V, R <sub>L</sub> =10kΩ<br>f=1MHz | Fig.2               |
| Crosstalk (2)<br>between channels   | CT               | –    | 1    | –    | MHz               | 5                   | V <sub>SS</sub> =-5V, R <sub>L</sub> =10kΩ *1        | Fig.2               |

\*1 V<sub>IN</sub> : 5V<sub>P-P</sub> sine wave, frequency that enables  $\frac{V_{OUT}}{V_{IN}} - 50\text{dB}$  at channel off.

\*2 V<sub>IN</sub> : 5V<sub>P-P</sub> sine wave.

### ● Measurement circuits

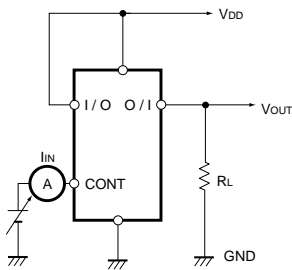


Fig.1 (a) Input voltage, current

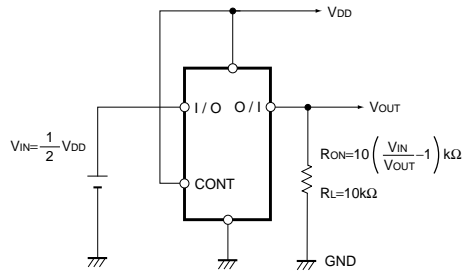


Fig.1 (b) On resistance

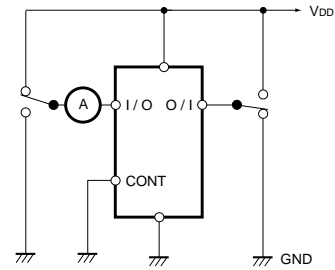


Fig.1 (c) Channel off leakage current

Standard ICs

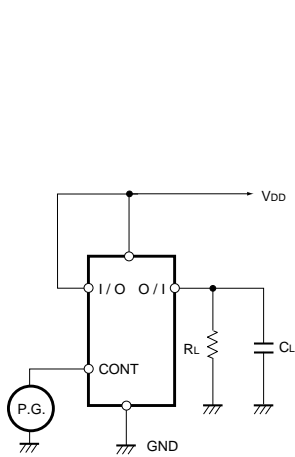


Fig.2 (a) Propagation delay time (IN to OUT)

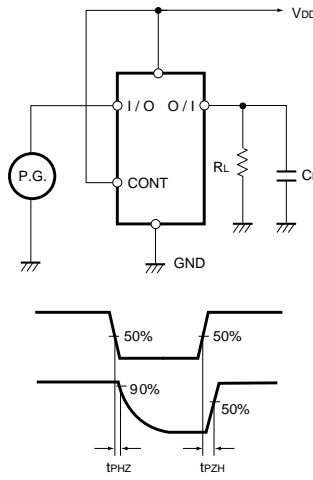


Fig.2 (b) Propagation delay time (CONT to OUT)

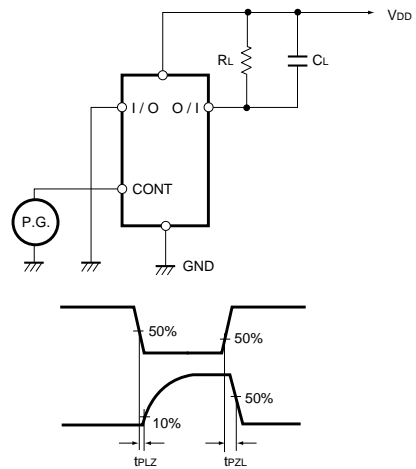


Fig.2 (c) Propagation delay time (CONT to OUT)

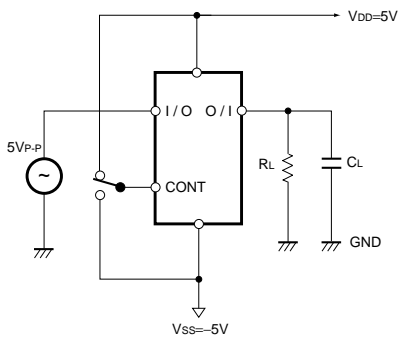


Fig.2 (d) Sine wave distortion, feedthrough attenuation

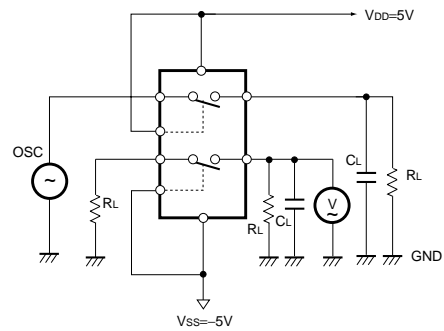


Fig.2 (e) Crosstalk

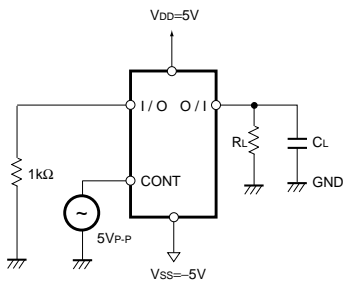


Fig.2 (f) Control IN to OUT crosstalk

Standard ICs

●Electrical characteristics curves

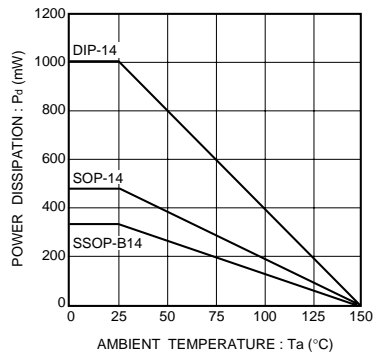


Fig.3 Power dissipation vs. ambient temperature

●External dimensions (Units : mm)

