

# PS / 2 Mouse Controller

## BU9206

The BU9206 is a PS / 2 mouse communication controller for PCs. This processor shapes waveforms and counts signals from the mouse rotary encoder as the mouse is moved, to provide two-way communication between mouse and PC system.

### ●Applications

PC mouse

### ●Features

- 1) For PS / 2 mouse.
- 2) Compatible with a wide range of input signals, because it automatically sets the input threshold levels for the X and Y direction, corresponding to the output level of the rotary encoder inside the mouse.
- 3) CMOS process enables low current consumption.

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

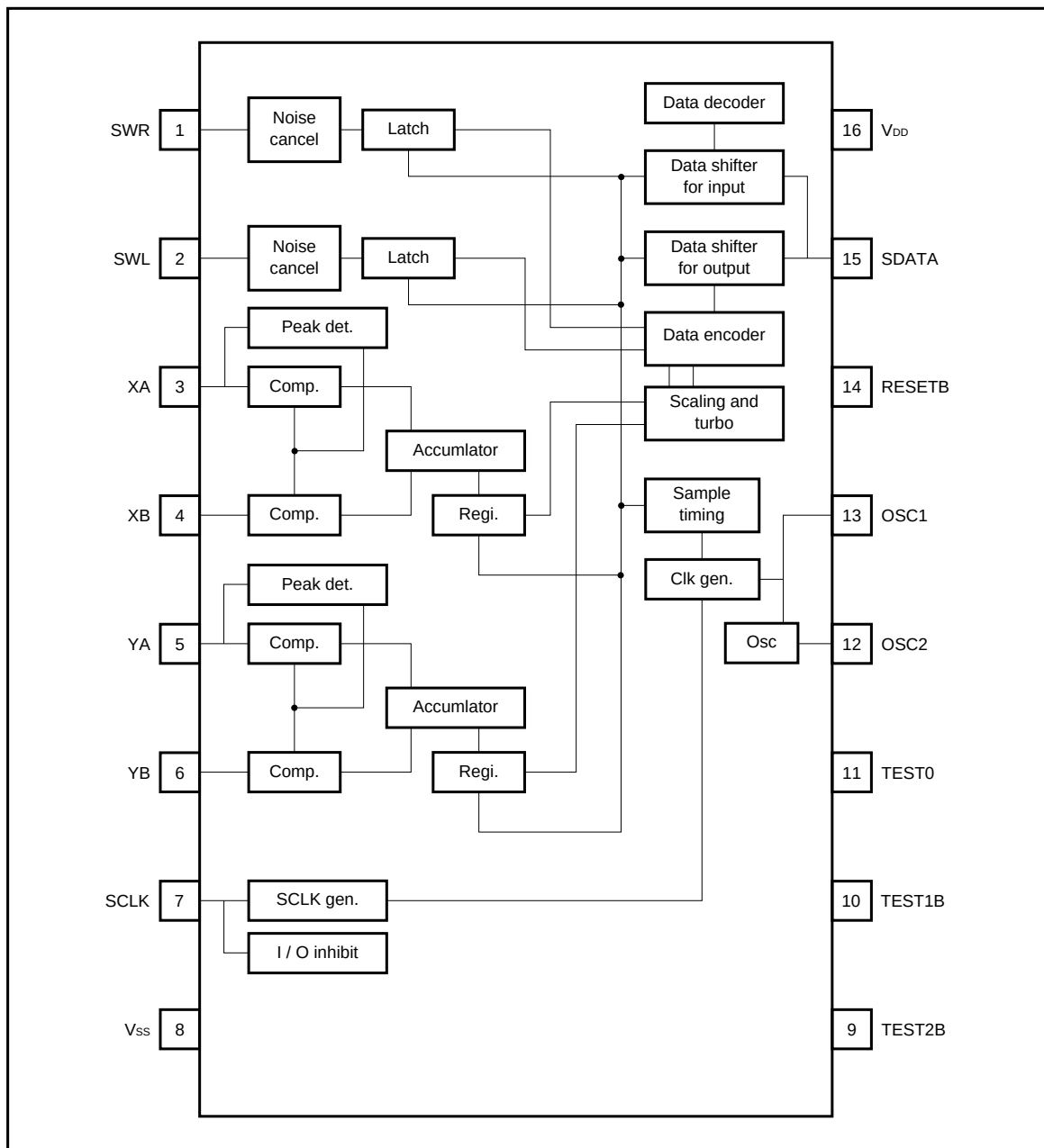
| Parameter             | Symbol           | Limits                        | Unit |
|-----------------------|------------------|-------------------------------|------|
| Power supply voltage  | V <sub>DD</sub>  | − 0.3 ~ + 7.0                 | V    |
| Power dissipation     | P <sub>d</sub>   | 1000*                         | mW   |
| Operating temperature | T <sub>opr</sub> | − 25 ~ + 75                   | °C   |
| Storage temperature   | T <sub>stg</sub> | − 55 ~ + 125                  | °C   |
| Input voltage         | V <sub>IN</sub>  | − 0.3 ~ V <sub>DD</sub> + 0.3 | V    |
| Output voltage        | V <sub>OUT</sub> | − 0.3 ~ V <sub>DD</sub> + 0.3 | V    |

\* Reduced by 10 mW for each increase in Ta of 1°C over 25°C.

### ●Recommended operating conditions (Ta = 25°C)

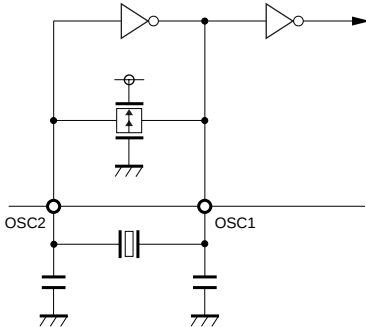
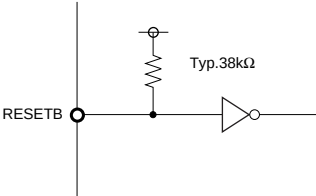
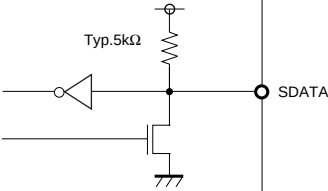
| Parameter            | Symbol           | Min.                | Typ. | Max.                  | Unit | Application pin                         |
|----------------------|------------------|---------------------|------|-----------------------|------|-----------------------------------------|
| Power supply voltage | V <sub>DD</sub>  | 4.5                 | 5.0  | 5.5                   | V    | V <sub>DD</sub>                         |
| H input voltage 1    | V <sub>IH1</sub> | 0.8*V <sub>DD</sub> | —    | V <sub>DD</sub>       | V    | SWR, SWL, TEST2B, TEST1B, TEST0, RESETB |
| H input voltage 2    | V <sub>IH2</sub> | 0.4*V <sub>DD</sub> | —    | V <sub>DD</sub>       | V    | SCLK, SDATA                             |
| L input voltage 1    | V <sub>IL1</sub> | 0                   | —    | 0.2*V <sub>DD</sub>   | V    | SWR, SWL, TEST2B, TEST1B, TEST0, RESETB |
| L input voltage 2    | V <sub>IL2</sub> | 0                   | —    | 0.16*V <sub>DD</sub>  | V    | SCLK, SDATA                             |
| XY input H voltage   | V <sub>AUP</sub> | 0.3*V <sub>DD</sub> | —    | 0.8*V <sub>DD</sub>   | V    | XA, XB, YA, YB                          |
| XY input L voltage   | V <sub>ALP</sub> | 0                   | —    | 0.48*V <sub>AUP</sub> | V    | XA, XB, YA, YB                          |

## ● Block diagram



## ● Pin descriptions

| Pin No. | Pin name        | I / O | Function                                                                      | I / O format |
|---------|-----------------|-------|-------------------------------------------------------------------------------|--------------|
| 1       | SWR             | IN    | Right switch input<br>Pull-up resistor built in<br>Low active                 |              |
| 2       | SWL             | IN    | Left switch input<br>Pull-up resistor built in<br>Low active                  |              |
| 3       | XA              | IN    | Rotary encoder X-direction, A-phase input                                     |              |
| 4       | XB              | IN    | Rotary encoder X-direction, B-phase input                                     |              |
| 5       | YA              | IN    | Rotary encoder Y-direction, A-phase input                                     |              |
| 6       | YB              | IN    | Rotary encoder Y-direction, B-phase input                                     |              |
| 7       | SCLK            | I / O | Serial clock input / output<br>Pull-up resistor built in<br>Open drain output |              |
| 8       | V <sub>SS</sub> | —     | Input / output reference voltage: 0V                                          | —            |
| 9       | TEST2B          | IN    | Tip test input<br>Pull-up resistor built in<br>Low active                     |              |
| 10      | TEST1B          | IN    | Normally open or connected to V <sub>DD</sub>                                 |              |
| 11      | TEST0           | IN    | Pull-up resistor built in<br>Normally connected to GND                        |              |

| Pin No. | Pin name | I / O | Function                                                                                    | I / O format                                                                        |
|---------|----------|-------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 12      | OSC2     | IN    | Pin to connect oscillator for clock<br><br>Connect a 4MHz oscillator between OSC1 and OSC2. |   |
| 13      | OSC1     | OUT   |                                                                                             |                                                                                     |
| 14      | RESETB   | IN    | Reset input<br>Pull-up resistor built in<br>Low active                                      |   |
| 15      | SDATA    | I / O | Serial data input / output<br>Pull-up resistor built in<br>Open drain output                |  |
| 16      | VDD      | —     | Power supply pin<br>Connect a 4.5 - 5.5V power supply.                                      | —                                                                                   |

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V<sub>DD</sub> = 5.0V)

| Parameter                  | Symbol           | Min. | Typ. | Max. | Unit | Conditions                               | Applied pin             |
|----------------------------|------------------|------|------|------|------|------------------------------------------|-------------------------|
| Supply current             | I <sub>DD</sub>  | 0.5  | 2.1  | 4.0  | mA   | f <sub>CK</sub> = 4.0MHz                 | V <sub>DD</sub>         |
| Output low level voltage 1 | V <sub>OL1</sub> | —    | 0.43 | 0.6  | V    | I <sub>SINK</sub> = 4.0mA                | SCLK, SDATA             |
| Input low level current 1  | I <sub>IL1</sub> | 98   | 130  | 195  | μA   | V <sub>IN</sub> = V <sub>SS</sub>        | SWR, SWL, TEST0, RESETB |
| Input low level current 2  | I <sub>IL2</sub> | 330  | 440  | 660  | μA   | V <sub>IN</sub> = V <sub>SS</sub>        | TEST1B, TEST2B          |
| Input low level current 3  | I <sub>IL3</sub> | 0.75 | 1.0  | 1.5  | mA   | V <sub>IN</sub> = V <sub>SS</sub>        | SCLK, SDATA             |
| Input low level current 4  | I <sub>IL4</sub> | —    | —    | 10   | μA   | V <sub>IN</sub> = V <sub>SS</sub>        | XA, XB, YA, YB          |
| Input high level current 1 | I <sub>IH1</sub> | —    | —    | 10   | μA   | V <sub>IN</sub> = V <sub>DD</sub>        | SWR, SWL, TEST0, RESETB |
| Input high level current 2 | I <sub>IH2</sub> | —    | —    | 10   | μA   | V <sub>IN</sub> = V <sub>DD</sub>        | TEST1B, TEST2B          |
| Input high level current 3 | I <sub>IH3</sub> | —    | —    | 10   | μA   | V <sub>IN</sub> = V <sub>DD</sub>        | SCLK, SDATA             |
| Input high level current 4 | I <sub>IH4</sub> | —    | —    | 10   | μA   | V <sub>IN</sub> = V <sub>DD</sub>        | XA, XB, YA, YB          |
| OSC2 input current         | I <sub>OSC</sub> | —    | ± 6  | ± 20 | μA   | V <sub>IN</sub> = GND or V <sub>DD</sub> | OSC2                    |
| Oscillation frequency      | f <sub>OSC</sub> | —    | 4.0  | —    | MHz  |                                          | OSC1                    |

●Application circuit

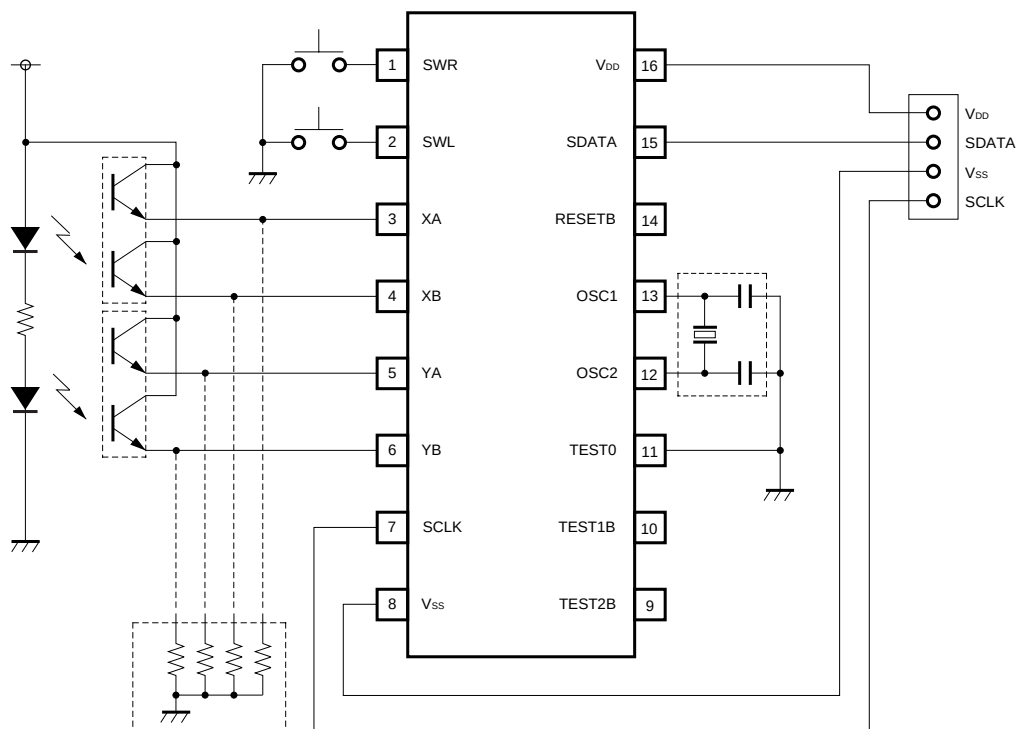
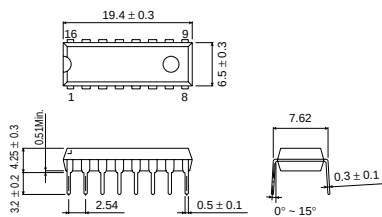


Fig. 1

## ● External dimensions (Units: mm)



DIP16