

C9068

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## Digital output for connection with PC

The C9068 (for one-dimensional PSD) and C9069 (for pin-cushion type two-dimensional PSD) are DC signal processing circuits specifically designed for position measurement using PSD. Digital output allows direct connection with a personal computer through a serial (RS-232C) interface. The C9068 and C9069 are capable of detecting accurate positions of a spot light regardless of light intensity.

A D/A conversion signal is also output for monitoring, and when a voltmeter is connected to this D/A conversion output, the output voltage value directly represents position data. (Output voltage represents the distance from the center of PSD. 1 V=1 mm)

### Features

- Digital output
- Serial (RS-232C) connection with PC
- D/A conversion signal output for monitoring
- Easy handling due to single +12 V supply operation
- No complicated adjustment required

### Applications

- Displacement measurement
- Testing using PSD
- PSD performance evaluation

### Absolute maximum ratings (Ta=25 °C unless otherwise noted)

| Parameter               | Symbol  | Value              | Unit |
|-------------------------|---------|--------------------|------|
| Supply voltage          | Vs max  | +18                | V    |
| Operating temperature*1 | Topr    | 0 to +40           | °C   |
| Storage temperature*1   | Tstg    | -10 to +60         | °C   |
| Input current           | Iin max | $9 \times 10^{-4}$ | A    |

\*1: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

### Electrical and optical characteristics (Ta=25 °C, Vs=+12 V)

| Parameter                                       | Symbol | Min.   | Typ.            | Max.               | Unit |
|---|--------|--|-----------------|--------------------|------|
| Conversion impedance                            | Zt     | -  | $1 \times 10^5$ | -                  | V/A  |
| Feedback capacitance                            | Cf     | -  | 100             | -                  | pF   |
| Input photocurrent*2                            | Ip     | $1 \times 10^{-5}$   | -               | $9 \times 10^{-5}$ | A    |
|   |        | $1 \times 10^{-5}$   | -               | $9 \times 10^{-5}$ | A    |
| Signal conversion time*3                        | -      | 5  | -               | -                  | ms   |
| Digital output format                           | -      | Conforms to RS-232C (position signal, light level monitor output) 12-bit |                 |                    | -    |
| D/A conversion maximum output amplitude voltage | Vfs    | -  | -               | ±10                | V    |
| Operating supply voltage                        | Vs     | +9   | +12             | +18                | V    |
| Current consumption                             | Is     | -  | 200             | -                  | mA   |

\*2: Photocurrent Ip (total input signals) from PSD mounted on the C9068 or C9069 circuit board

\*3: Output response time versus spot light position change

### Combination with a PSD

A PSD is installed (soldered) on the signal processing circuit.

Note: PSDs are sold separately.

#### ■ C9068 (applicable PSD: one-dimensional PSD)

| Type no.                   | Photosensitive area size (mm) | Position resolution* <sup>4</sup> * <sup>5</sup> (μm) | Package (mm)         | Installation on board | External attachment* <sup>6</sup> |
|----------------------------|-------------------------------|---|----------------------|-----------------------|-----------------------------------|
| S3931                      | 6 × 1                         | 1.5   | Ceramic (9.2 × 4.8)  | ○                     | ○                                 |
| S3932                      | 12 × 1                        | 3   | Ceramic (15.2 × 4.8) | ○                     | ○                                 |
| S8543* <sup>7</sup>        | 24 × 0.7                      | 5.9   | Ceramic (36.7 × 4)   | ×                     | ○                                 |
| S4583-04* <sup>7</sup>     | 3 × 1                         | 0.8   | Plastic              | ×                     | ○                                 |
| S4584 series* <sup>7</sup> | 3.5 × 1                       | 0.9   | Plastic              | ×                     | ○                                 |
| S3274-05* <sup>7</sup>     | 3.5 × 1                       | 0.9   | Plastic              | ×                     | ○                                 |
| S7105 series* <sup>7</sup> | 4.2 × 1                       | 1.1   | Plastic              | ×                     | ○                                 |

#### ■ C9069 (applicable PSD: two-dimensional PSD)

| Type no.               | Photosensitive area size (mm) | Position resolution* <sup>5</sup> * <sup>8</sup> (μm) | Package (mm)                       | Installation on board | External* <sup>6</sup> attachment |
|------------------------|-------------------------------|---|------------------------------------|-----------------------|-----------------------------------|
| S1880                  | 12 × 12                       | 3.5   | Ceramic (φ28)                      | ○                     | ○                                 |
| S2044                  | 4.7 × 4.7                     | 1.4   | Metal (TO-8 φ14)                   | ○                     | ○                                 |
| S5990-01* <sup>9</sup> | 4 × 4                         | 1.1   | Ceramic chip carrier (8.8 × 10.6)  | ×                     | ○                                 |
| S5991-01* <sup>9</sup> | 9 × 9                         | 2.5   | Ceramic chip carrier (14.5 × 16.5) | ×                     | ○                                 |

\*4: Reference value. Digital output  $\Sigma=5$  to 9 V. 40% range from the center to the end with respect to the PSD photosensitive length L.

\*5: When PSD is mounted. The position resolution may vary depending on the connection method, operating environment, and so on.

\*6: Wiring using shielded wires or AWG#26 or equivalent twisted pair wires (no longer than 30 cm) is recommended.

\*7: These PSDs cannot be directly mounted on the circuit board. Connect to the through-hole terminals at the edge of the circuit board by external wiring.

\*8: Reference value. Digital output  $\Sigma=5$  to 9 V. Within a circle with a diameter equal to 40% of PSD photosensitive area length L.

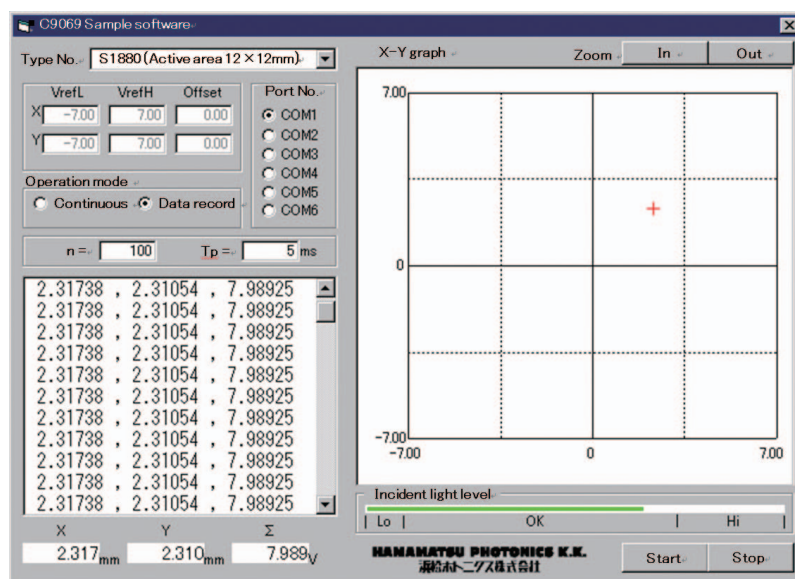
\*9: The S5990-01 or S5991-01 can be mounted on the C9069 using the supplied dedicated circuit board.

### Accessory sample software display example (C9069)

Position data is displayed in numerical values and graphs.

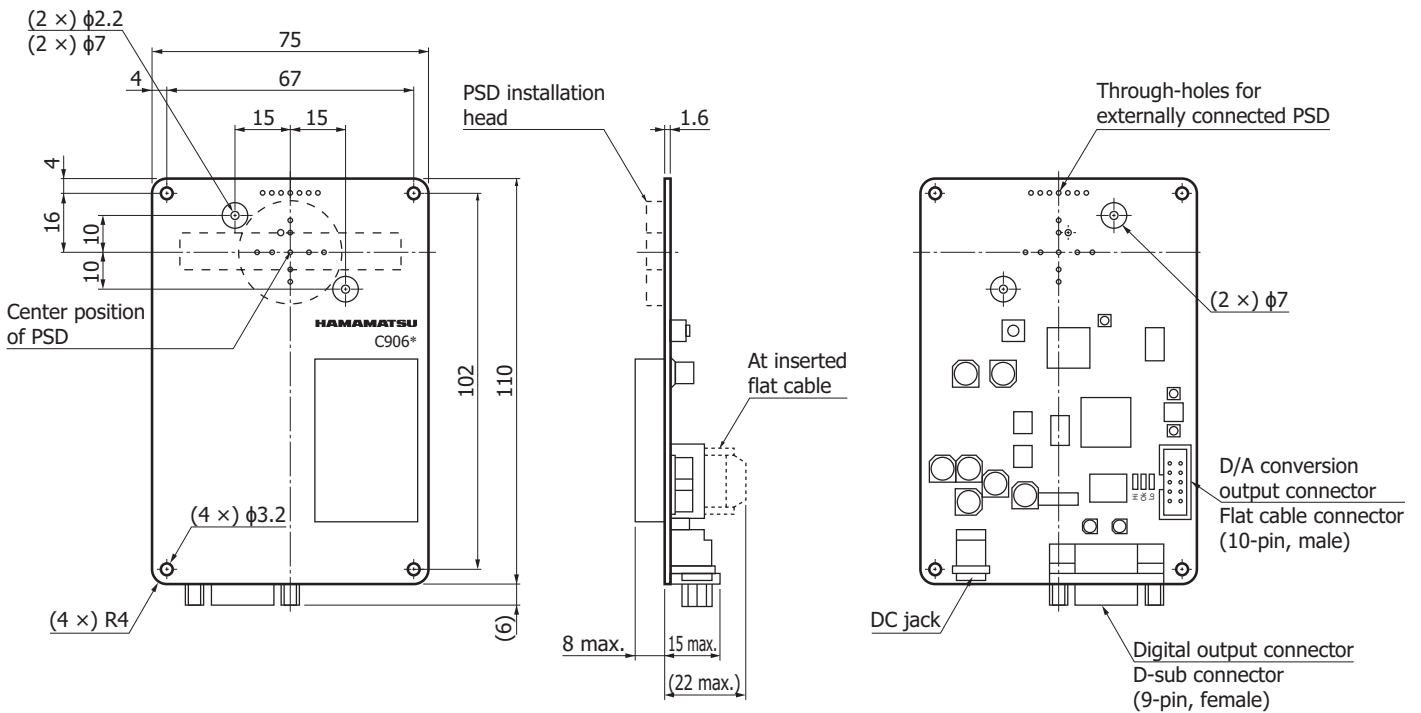
Compatible OS: Microsoft® Windows® 8.1 Pro (32-bit, 64-bit)

Microsoft® Windows® 10 Pro (32-bit, 64-bit)



Note: Microsoft, Windows, and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

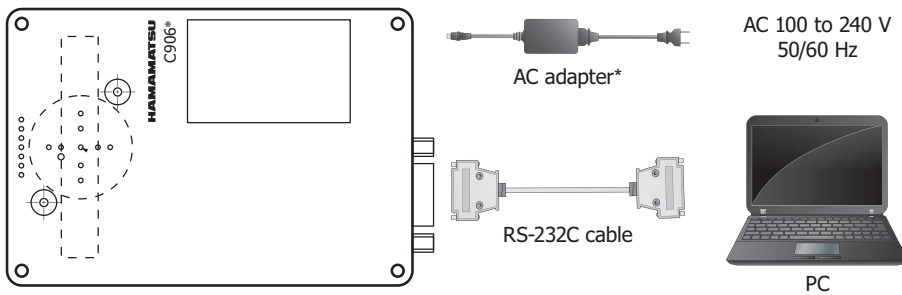
**Dimensional outline (unit: mm)**



Tolerance unless otherwise noted  
 $\leq 6$  :  $\pm 0.1$   
 $6 <$   $\leq 30$  :  $\pm 0.2$   
 $30 <$  :  $\pm 0.3$

KACCA0118EC

**Connection example**



\* Accessory

KACCC0811EA

**Accessories**

- Instruction manual
- Sample software (CD-ROM)
- AC adapter
- Flat cable (48 cm) with connector for D/A conversion signal output
- Attachment board for S5990-01/S5991-01 (C9069 only)

Note: RS-232C cable is not supplied. Prepare an off-the-shelf cable (straight) with 9-pin D-sub connectors (male to female).

## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

- Precautions
- Disclaimer

- Technical information
- PSD

Information described in this material is current as of August 2020.

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