

## C10443 series

**Integrates a 2-PSD for precision photometry or a 4-segment Si photodiode with low-noise amp in a compact case**

PSD modules contain a high-precision two-dimensional PSD (position sensitive detector) or a 4-segment Si photodiode and a low-noise amplifier, and are able to perform accurate distance measurement. Using a PSD module (excluding the C10443-06) with a dedicated signal processing unit C10460 allows obtaining distance information easily.

### Features

- Easy handling
- High precision analog voltage output
- Only half size of a business card: 34 (W) × 40 (D) × 44 (H) mm

### Applications

- Optical axis alignment
- Distance sensors
- Two-dimensional measurement
- Three-dimensional measurement
- Length measurement
- Liquid level sensors
- Distortion measurement
- Displacement sensor

### Selection guide

Type no.	Detector type	Photosensitive area (mm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Dimensions (mm)	Cutoff frequency $f_c$ -3 dB (Hz)	
					Lower	Upper
C10443-01	Two-dimensional PSD	4 × 4	960	34 × 40 × 44	DC	16 k
C10443-02		9 × 9				
C10443-03		12 × 12	920			
C10443-04						
C10443-06	4-segment photodiode	10 × 10	960			160 k

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

Type no.	Supply voltage $V_s$ (V)		Current consumption $I_s$ Max. Dark state (mA)	Absolute maximum ratings		
	Min.	Max.		Supply voltage $V_s$ max (V)	Operating temperature*1 $T_{opr}$ (°C)	Storage temperature*1 $T_{stg}$ (°C)
C10443-01	±5	±12	±2	±13	0 to +50	-10 to +60
C10443-02						
C10443-03						
C10443-04			±15			
C10443-06						

\*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 (Typ. Ta=25 °C, Vs=±12 V, unless otherwise noted)**

Type no.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Saturation incident light level*2 Past ( $\mu\text{W}$ )	Photosensitivity*2 S ( $\text{mV}/\mu\text{W}$ )	Position detection error*3 E ( $\mu\text{m}$ )		Position resolution*4 $\Delta R$ $\Sigma=10$ V ( $\mu\text{m}$ )
					Typ.	Max.	
C10443-01	320 to 1100	960	167	-60	$\pm 70$	$\pm 150$	0.5
C10443-02							
C10443-03	320 to 1060	920			$\pm 150$	$\pm 250$	1.4
C10443-04							
C10443-06	320 to 1100	960	139	-72	-	-	-

\*2:  $\lambda = \lambda_p$

\*3: Reference value. Values may vary depending on operating environment. Position detection error is specified within a circular range of 80% from the center of the photosensitive area to the edge.

Recommended light spot size:  $\phi 0.2$  mm or more

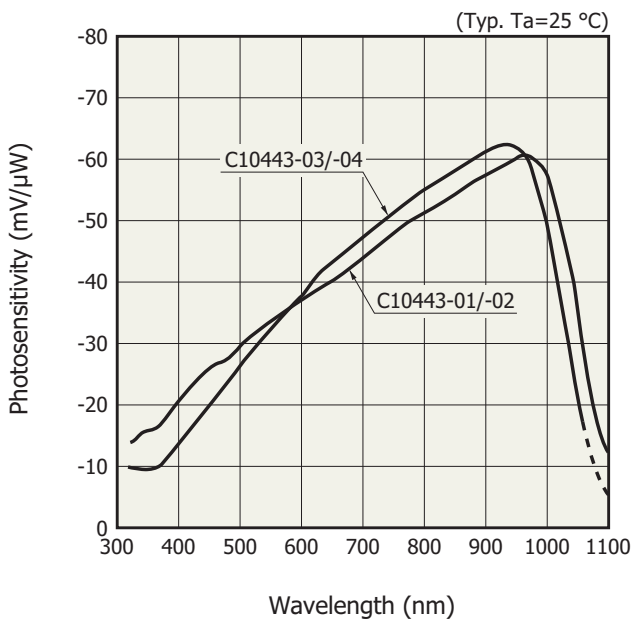
\*4: Reference value. Values may vary depending on operating environment.  $\Sigma$  is the sum of each output voltage and calculated as follows.  $\Sigma = V_{X1} + V_{X2} + V_{Y1} + V_{Y2}$

Type no.	Maximum output amplitude voltage Vfs (V)		Offset voltage Vos Dark state (mV)		Output noise voltage*5 Vn Dark state ( $\text{mVp-p}$ )	Cutoff frequency fc -3 dB (Hz)	
	Min.	Max.	Min.	Max.		Lower	Upper
C10443-01	-	$-V_s + 1.1$	-5	+5	1	DC	16 k
C10443-02							
C10443-03	-	$-V_s + 2.5$	-10	+10	3	DC	160 k
C10443-04							
C10443-06							

\*5: 0 V in dark state. A negative voltage output appears when light is input.

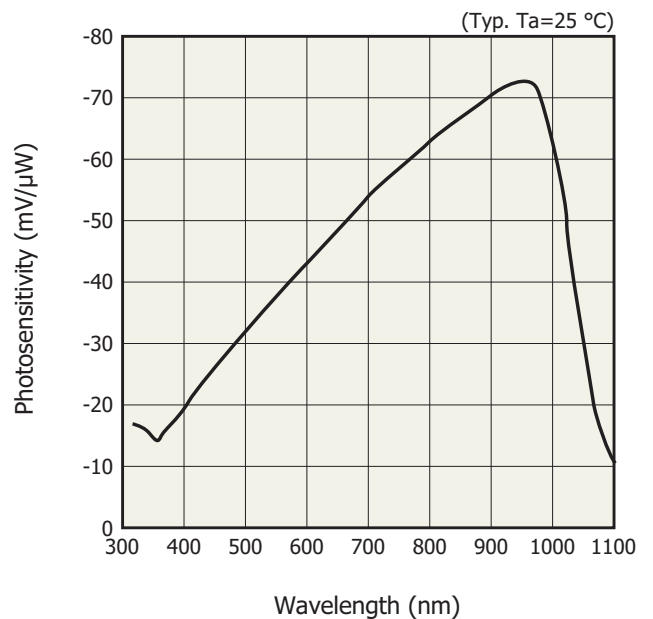
**Spectral response**

C10443-01/-02/-03/-04



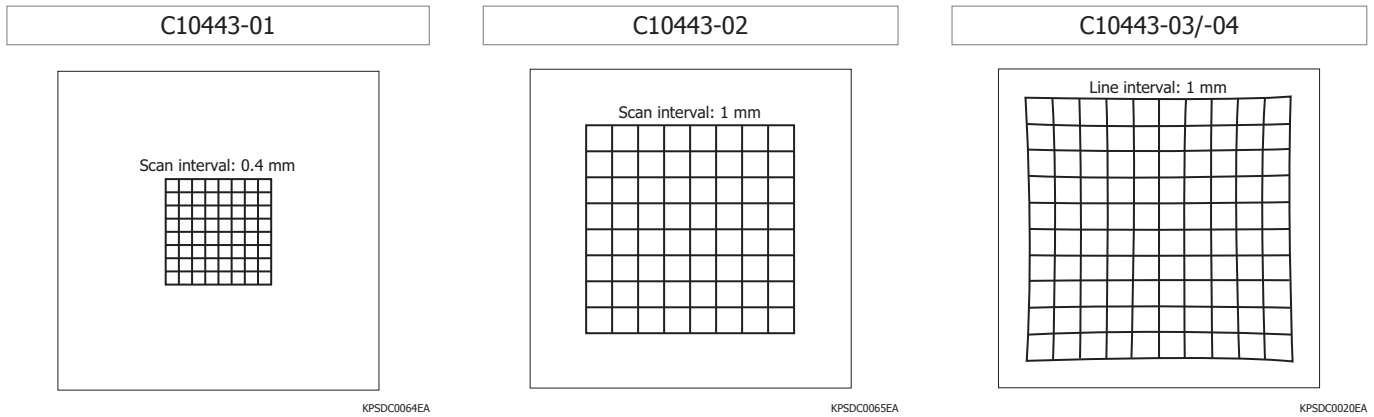
KACCB0151EA

C10443-06



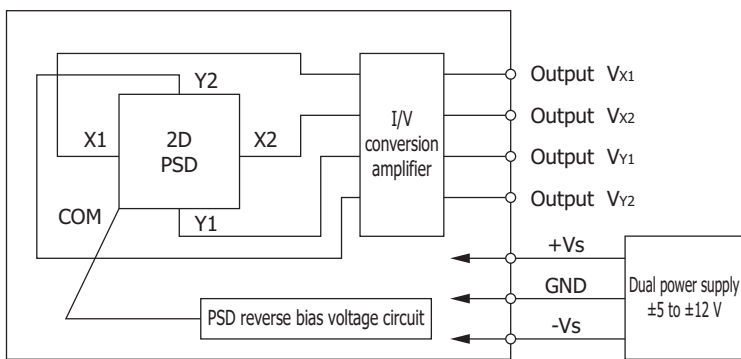
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Example of position detectability (Ta=25 °C, λ=900 nm, light spot size: φ0.2 mm)



Block diagram

C10443-01/-02/-03/-04



KACCC0345EC

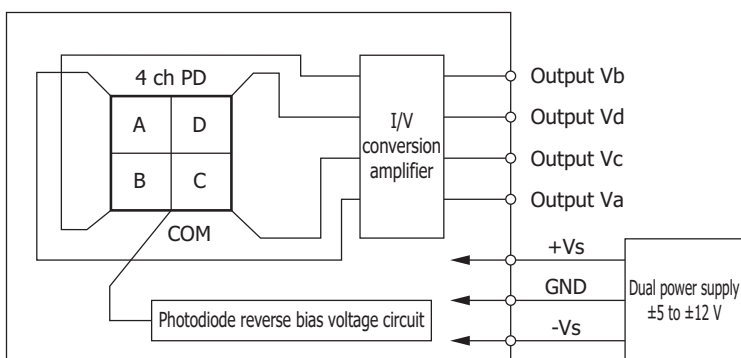
Conversion formula

$$x = \frac{(V_{X2} + V_{Y1}) - (V_{X1} + V_{Y2})}{V_{X1} + V_{X2} + V_{Y1} + V_{Y2}} \times \frac{L}{2}$$

$$y = \frac{(V_{X2} + V_{Y2}) - (V_{X1} + V_{Y1})}{V_{X1} + V_{X2} + V_{Y1} + V_{Y2}} \times \frac{L}{2}$$

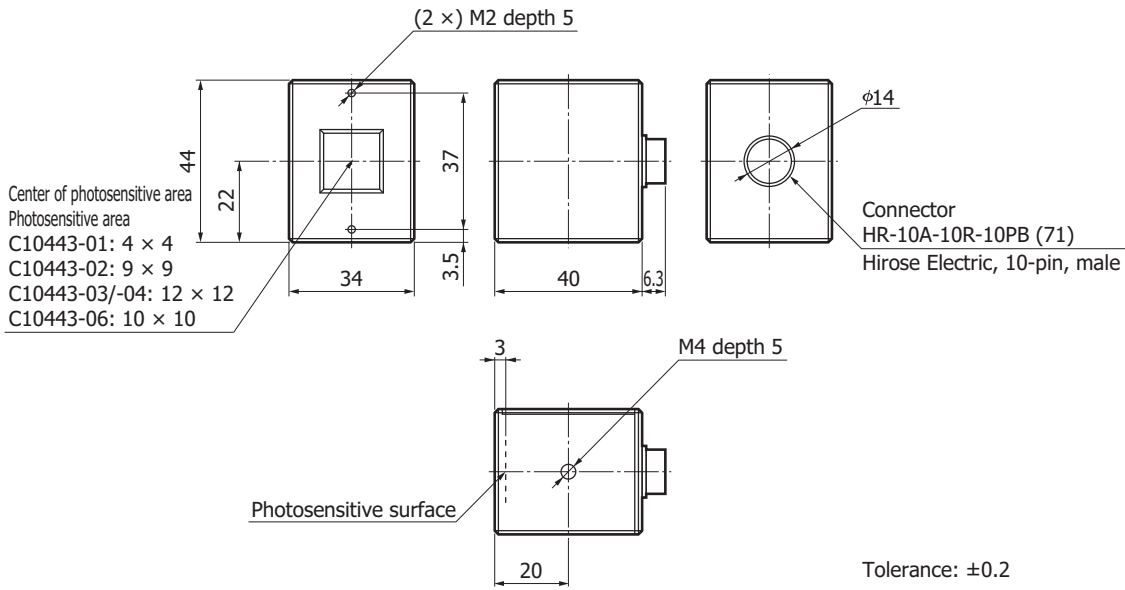
x, y: Position (mm) of light spot relative to center of PSD photosensitive area  
 L: 4.5 mm (C10443-01)  
 10 mm (C10443-02)  
 14 mm (C10443-03/-04)

C10443-06



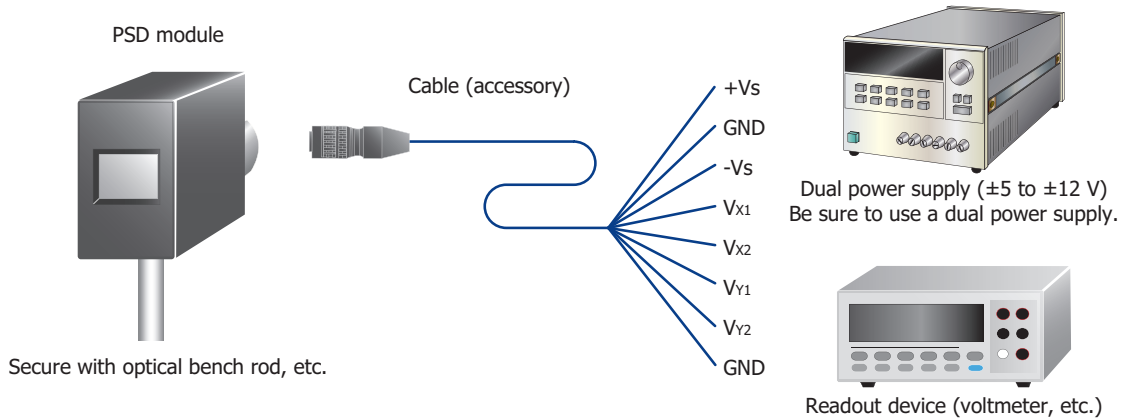
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**Dimensional outline (unit: mm)**



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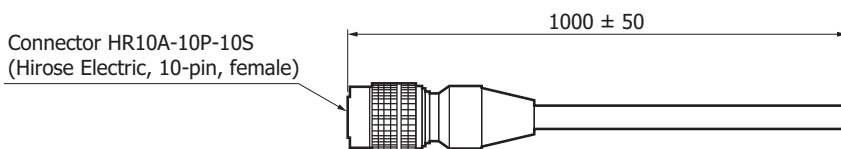
**Connection example**



KACCC0349EF

**Accessories (unit: mm)**

- Instruction manual
- Cable (One end of cable is cut off.)



KACCA0338EA

## Options (sold separately)

### Signal processing unit for PSD module C10460

This unit converts PSD module output into position signals. The position signals are output as both analog and digital signals. With the analog signal, simply connect a voltmeter to the connector, and the readout voltage will display the position information [output voltage (V) = position relative to the PSD center (mm), excluding C10443-06]. With the digital signal, use a serial connection (RS-232C) to connect with a PC. Use the supplied sample software to easily retrieve position information into a PC. For the specifications, refer to the C10460 datasheet.

■ Dimensions: 150 × 100 × 30 mm

#### ■ Applicable PSD modules

- C10443-01
- C10443-02
- C10443-03
- C10443-04 (When used in combination with C10460, the cutoff frequency is 13.5 kHz.)

Note: C10443-06 is not supported.



## Related information

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

#### ■ Precautions

- Disclaimer

Information described in this material is current as of August 2019.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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