

# PSD modules



## 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.

### 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				
C10443-06	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* <sup>1</sup> $T_{opr}$ (°C)	Storage temperature* <sup>1</sup> $T_{stg}$ (°C)
C10443-01	±5	±12	±2	±13	0 to +50	-10 to +60
C10443-02			±2			
C10443-06			±15			

\*1: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environments, 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 (mV/ $\mu\text{W}$ )	Position detection error*3 E ( $\mu\text{m}$ )		Position resolution*4 $\Delta R$ $\Sigma=10\text{ V}$ ( $\mu\text{m}$ )
					Typ.	Max.	
C10443-01	320 to 1100	960	167	-60	±70	±150	0.5
C10443-02					±150	±250	1.0
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:  $\phi 0.2\text{ mm}$  or more

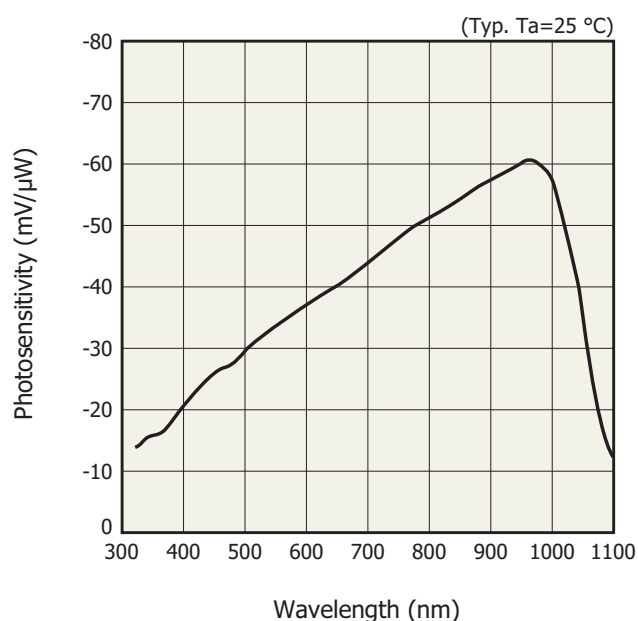
\*4: Reference value. Values may vary depending on operating environment.  $\Sigma$  is the sum of each output voltage and calculated as follows.  
 $\Sigma = V_{X1} + V_{X2} + V_{Y1} + V_{Y2}$

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

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

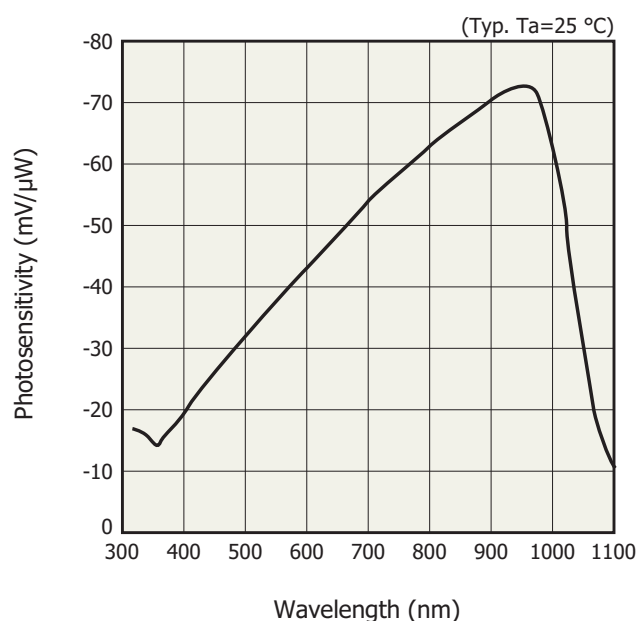
### Spectral response

C10443-01/-02



KACCB0151EB

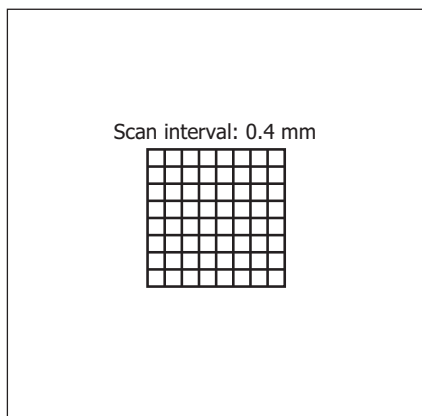
C10443-06



KACCB0349EA

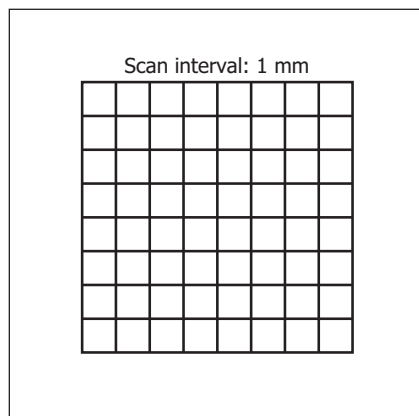
Example of position detectability ( $T_a=25\text{ }^{\circ}\text{C}$ ,  $\lambda=900\text{ nm}$ , light spot size:  $\phi 0.2\text{ mm}$ )

C10443-01



KPSPDC0064EA

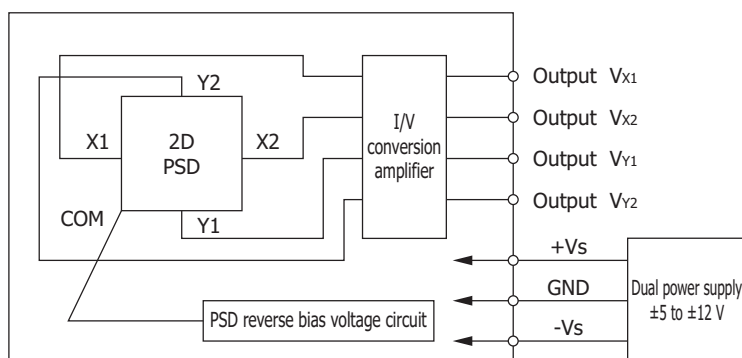
C10443-02



KPSPDC0065EA

Block diagram

C10443-01/-02



KACCC0345EC

Conversion formula

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

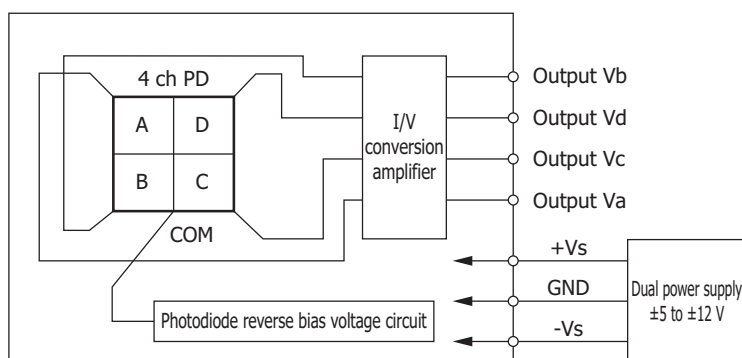
$$y = \frac{(V_{X2} + V_{Y2}) - (V_{X1} + V_{Y1})}{V_{X1} + V_{X2} + V_{Y1} + V_{Y2}} \times \frac{L}{2}$$

$x, y$ : Position (mm) of light spot relative to center of PSD photosensitive area

$L$ : 4.5 mm (C10443-01)

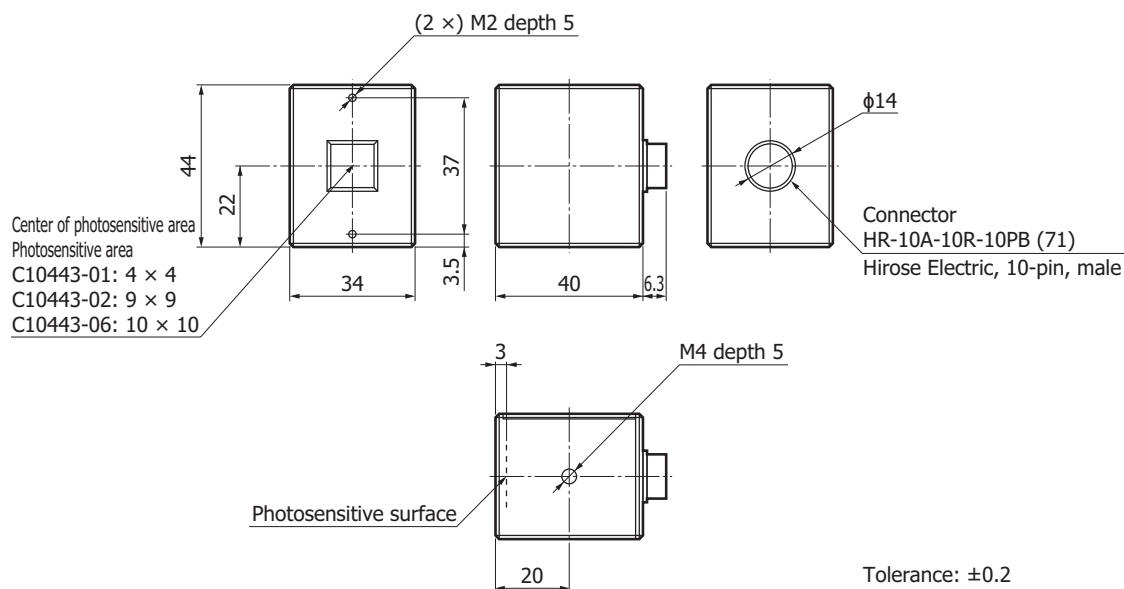
10 mm (C10443-02)

C10443-06



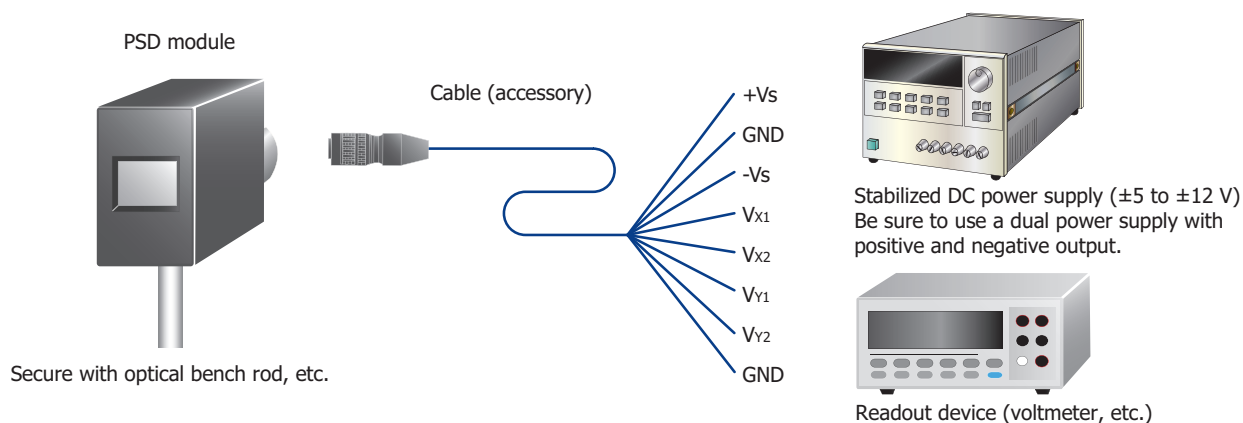
KACCC0753ED

### Dimensional outline (unit: mm)



KACCA0193EC

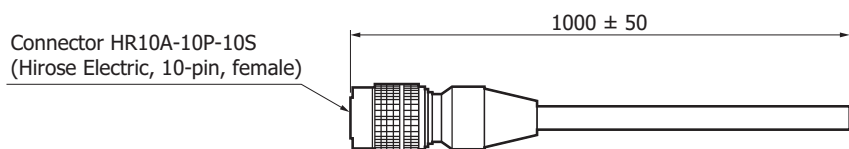
### Connection example



KACCC0349EG

### Accessories (unit: mm)

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



KACCA0338EA

## Related information

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

### ■ Precaution

- Disclaimer

### ■ Catalogs

- Technical note / PSD
- Technical note / PSD processing circuits, PSD modules

Information described in this material is current as of February 2025.

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