HAMAMATSU
PHOTON IS OUR BUSINESS

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. Using a PSD module (excluding the C10443-06) with a dedicated signal processing unit C10460-01 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 λp (nm)	Dimensions (mm)	Cutoff frequency fc -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 Vs (V)		Current consumption Is Max. Dark state (mA)	Absolute maximum ratings		
				Supply voltage Vs max (V)	Operating temperature*1 Topr (°C)	Storage temperature*1 Tstg (°C)
	Min.	Max.				
C10443-01	±5	±12	±2	±13	0 to +50	-10 to +60
C10443-02						
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 λ (nm)	Peak sensitivity wavelength λp (nm)	Saturation incident light level*2 Past (μW)	Photosensitivity*2 S (mV/μW)	Position detection error*3 E (μm)		Position resolution*4 ΔR Σ=10 V (μm)
					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	-	-	-

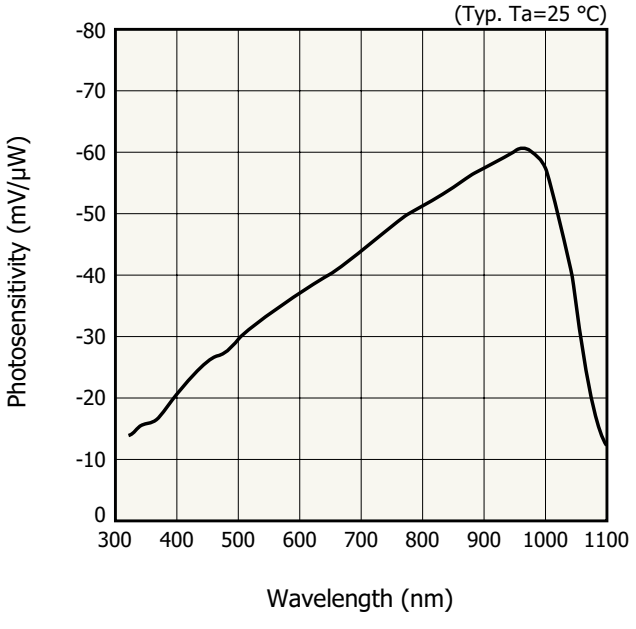
*2: λ=λp
*3: Reference value. Values may vary depending on operating environment. Position detection error is specified within a circular range of 80% from the center of the photosensitive area to the edge.
Recommended light spot size: ϕ0.2 mm or more
*4: Reference value. Values may vary depending on operating environment. Σ 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



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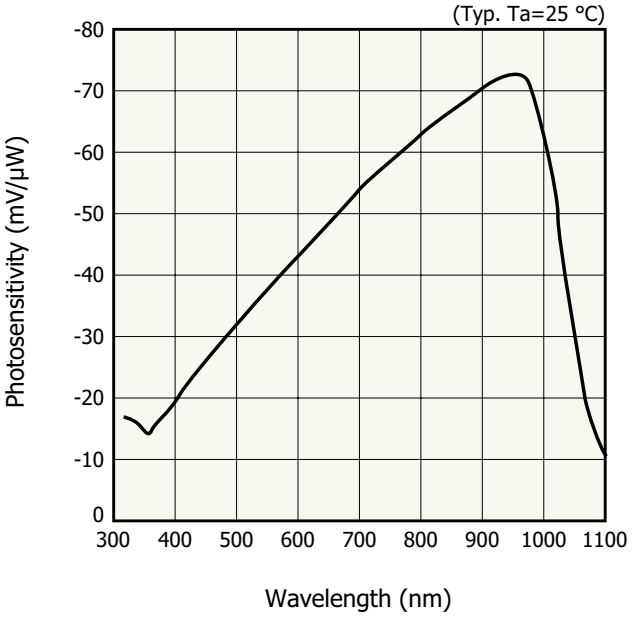
C10443-06



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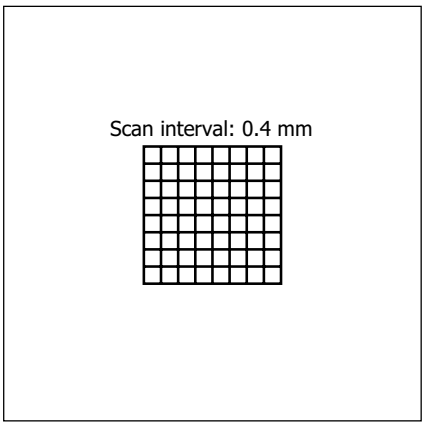
Example of position detectability (Ta=25 °C, λ=900 nm, light spot size: ϕ0.2 mm)

C10443-01



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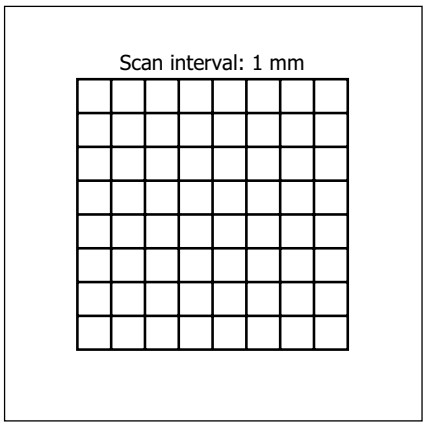
C10443-02



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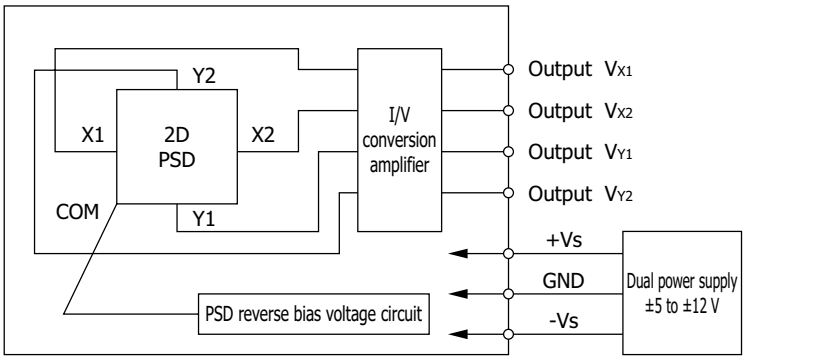
Block diagram

C10443-01/-02



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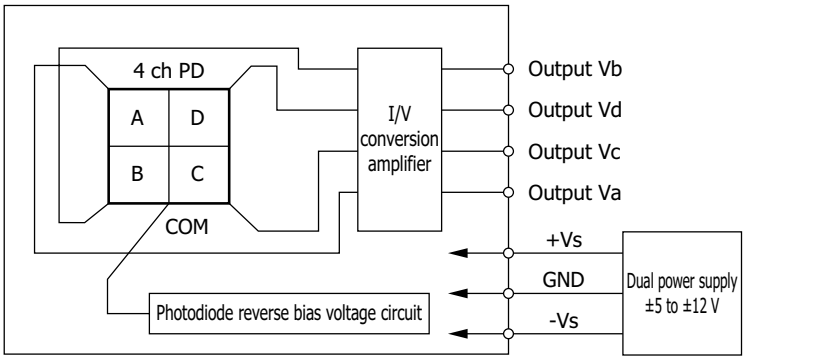
■ Conversion formula

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

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

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



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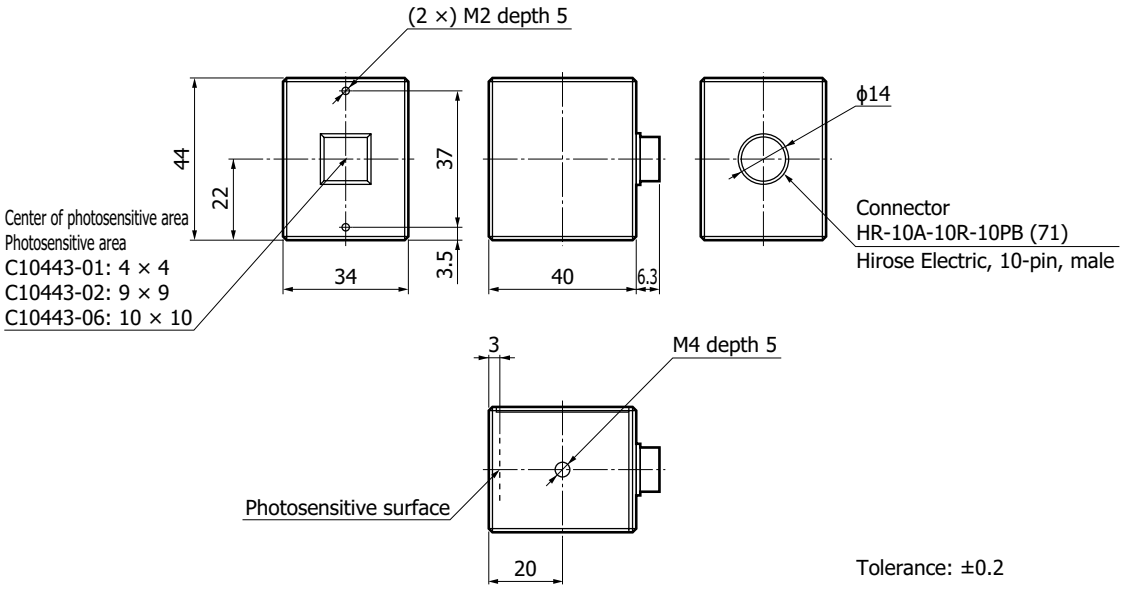
Dimensional outline (unit: mm)



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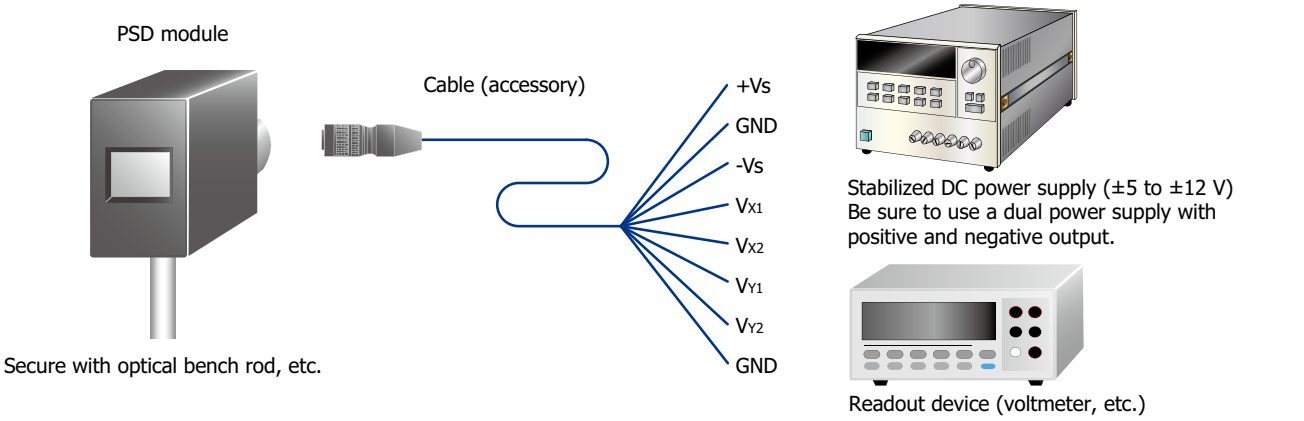
Connection example



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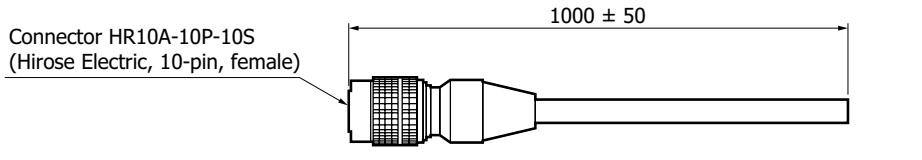
Accessories (unit: mm)

· Instruction manual

· Cable (One end of cable is cut off.)



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Options (sold separately)

Signal processing unit for PSD module C10460-01

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 the 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 C10460-01 datasheet.

■ Dimensions: 150 × 100 × 30 mm

■ Applicable PSD modules

· C10443-01
· C10443-02

Note: The C10443-06 is not supported.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer

■ Technical notes
· PSD
· PSD processing circuits, PSD modules

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