

C10443 series

Integrates a PSD for precision photometry with low-noise amp in a compact case

PSD modules contain a high-precision two-dimensional PSD (position sensitive detector) and a low-noise amplifier, and are able to perform accurate distance measurement. Using a PSD module 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) × 44 (H) × 40 (D) mm
- Three-types with different active areas available

Applications

- Optical axis alignment
- Range finder
- Three-dimensional measurement
- Length measurement
- Liquid level sensors
- Distortion measurement

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc max	±13	V
Operating temperature*1	Topr	0 to +50	°C
Storage temperature*1	Tstg	-10 to +60	°C

*1: No condensation

Specifications (Ta=25 °C, Vcc=±12 V)

Parameter	Symbol	Condition	C10443			Unit
			-01	-02	-03	
Built-in PSD	-		Two-dimensional PSD			-
Photosensitive area	-		4 × 4	9 × 9	12 × 12	mm
Spectral response range	λ		320 to 1100		320 to 1060	nm
Peak sensitivity wavelength	λ_p		960		920	nm
Photosensitivity	S	$\lambda = \lambda_p$	-60			mV/μW
Maximum input optical power	-	$\lambda = \lambda_p$	167			μW
Position detection error*3	E		±70 typ. ±150 max.	±150 typ. ±250 max.	±150 typ. ±250 max.	μm
Position resolution*4	ΔR	$\Sigma = -10 V$	0.5	1.0	1.4	μm

*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 active area to the edge. Recommended light spot size: $\phi 0.2$ mm or more

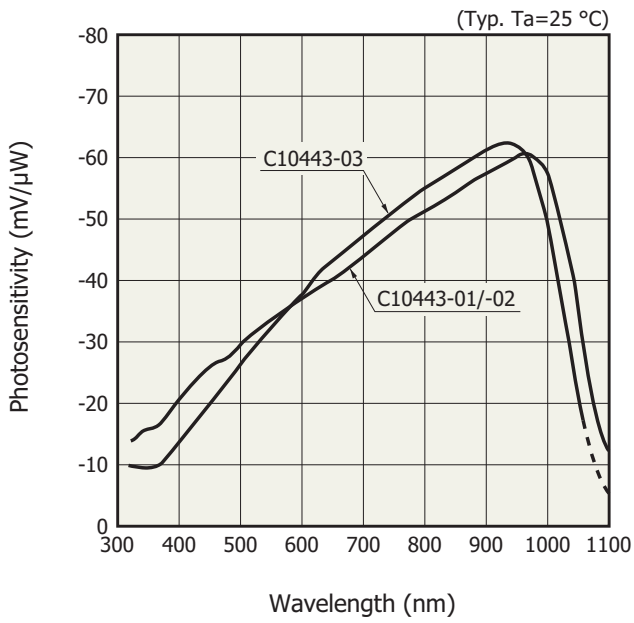
*4: Reference value. Values may vary depending on operating environment. Σ is the sum of each output voltage and calculated as follows. $\Sigma = V_{X1} + V_{X2} + V_{Y1} + V_{Y2}$

Electrical and optical characteristics (Ta=25 °C, Vcc=±12 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating supply voltage	Vcc		±5	-	±12	V
Current consumption	Icc	Dark state	-	-	±2	mA
Output amplitude voltage	Vout	*5	0	-	-Vcc + 1.1	V
Output noise voltage	Vn	Dark state	-	1	-	mVp-p
Offset voltage	Vos	Dark state	-5	-	+5	mV
Cut-off frequency	fc	-3 dB	-	16	-	kHz

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

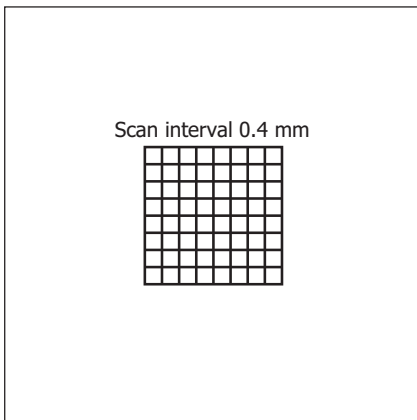
Spectral response



KACCB0151EA

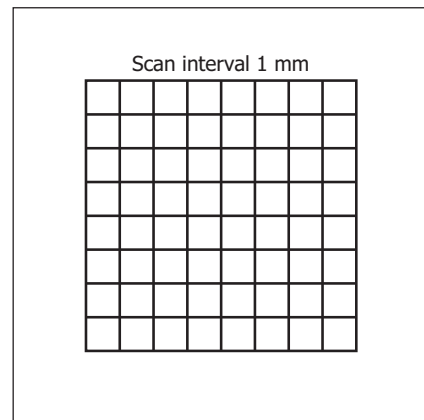
Example of position detectability (Ta=25 °C, λ=900 nm, spot light size: φ0.2 mm)

C10443-01



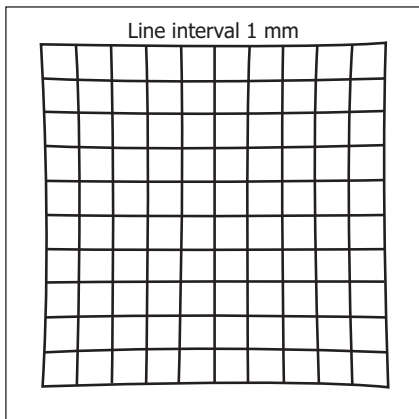
KPSDC0064EA

C10443-02



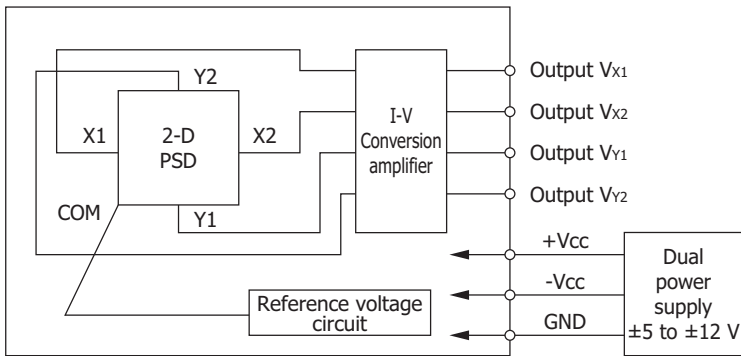
KPSDC0065EA

C10443-03



KP5DC0020EA

Block diagram



KACCC0345EA

Conversion formula

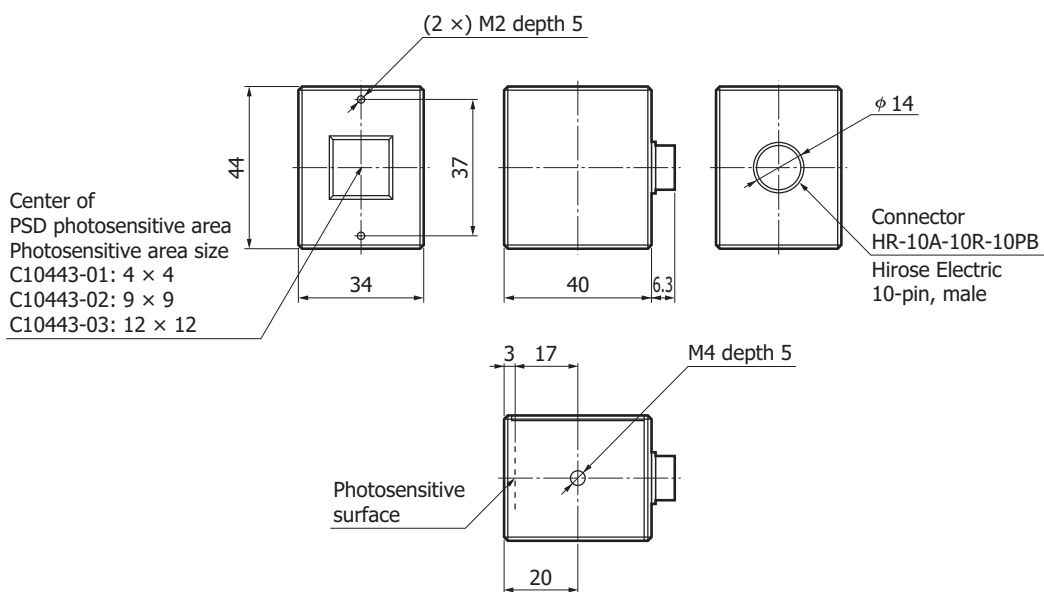
$$x = \frac{(V_{X2} + V_{Y1}) - (V_{X1} + V_{Y2})}{V_{X1} + V_{X2} + V_{Y1} + V_{Y2}} \times \frac{L}{2}$$

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

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

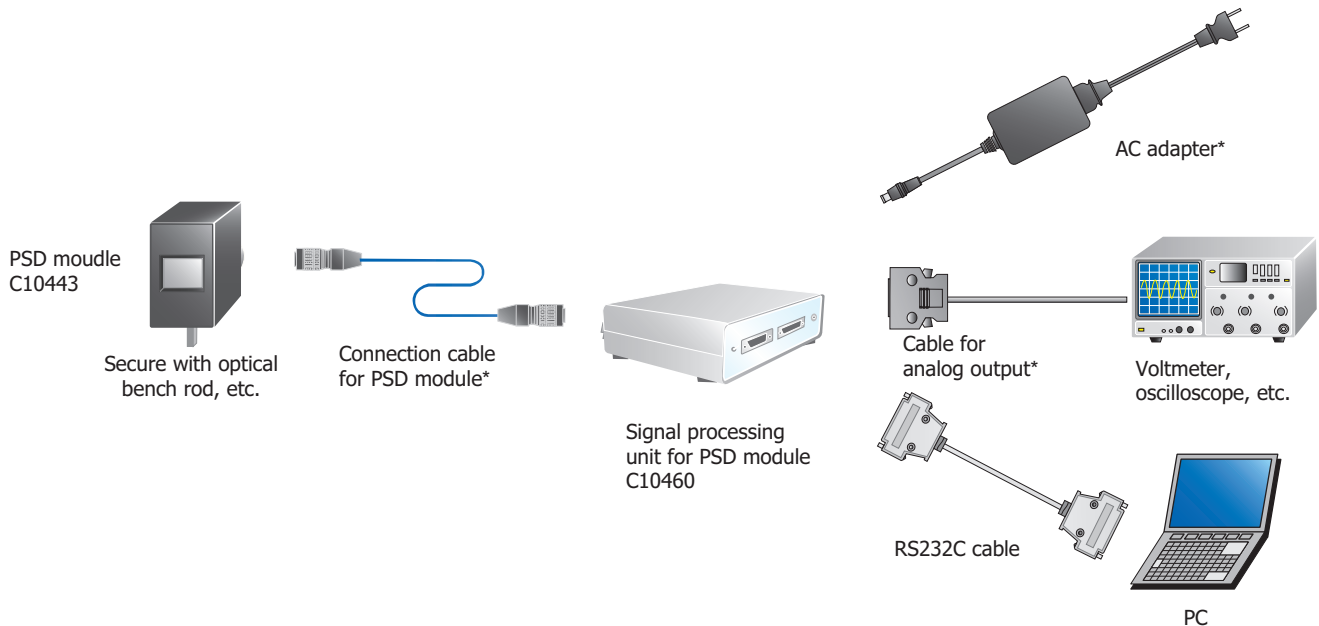
- L: 4.5 mm (C10443-01)
- 10 mm (C10443-02)
- 14 mm (C10443-03)

Dimensional outline (unit: mm)



KACCA0193EA

Connection example



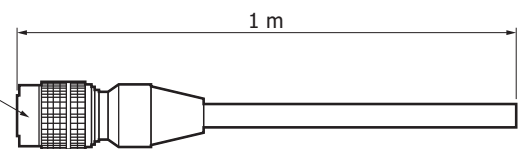
* Accessory of a signal processing unit for PSD module C10460

KACCC0349EC

Accessory

- Cable: length 1 m (One end of cable is cut off.)

Connector HR10A-10P-10S
(Hirose electric 10-pin,
female)



KACCC0194EA

Information described in this material is current as of December, 2011.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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