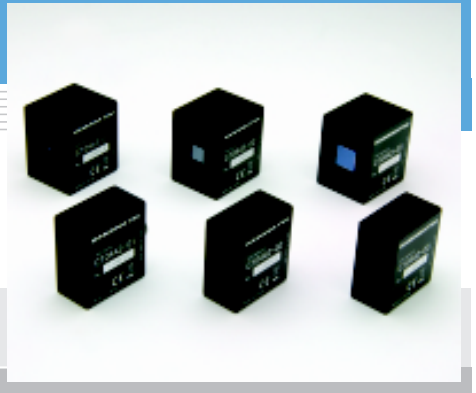


PSD module

C10442/C10443 series

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



PSD modules contain a high-precision PSD (Position Sensitive Detector) and a low-noise amplifier, and are able to perform accurate distance measurement. C10442 series uses a one-dimensional PSD, and C10443 series uses a two-dimensional PSD. Using a PSD module with a dedicated signal processing unit (C10459 or C10460) allows obtaining distance information easily.

Features

- Easy handling
- High precision analog voltage output
- Only half size of a business card
C10442 series: 22 (W) × 44 (H) × 40 (D) mm
C10443 series: 34 (W) × 44 (H) × 40 (D) mm
- Six-types with different active areas available

■ 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

Applications

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

■ General ratings (Ta=25 °C, Vcc=±12 V)

Parameter	Symbol	Condition	C10442			C10443			Unit
			-01	-02	-03	-01	-02	-03	
Built-in PSD	-		One-dimensional PSD			Two-dimensional PSD			-
Active area size	-		3 × 1	6 × 1	12 × 1	4 × 4	9 × 9	12 × 12	mm
Spectral response range	λ		320 to 1100			320 to 1100		320 to 1060	nm
Peak sensitivity wavelength	λ_p		920			960		920	nm
Photo sensitivity	S	$\lambda = \lambda_p$	-55			-60			mV/μW
Maximum input optical power	-	$\lambda = \lambda_p$	182			167			μW
Position detection error *3	E		±15 Typ. ±60 Max.	±30 Typ. ±120 Max.	±60 Typ. ±240 Max.	±70 Typ. ±150 Max.	±150 Typ. ±250 Max.	±150 Typ. ±250 Max.	μm
Position resolution *4	ΔR	$\Sigma = -10 V$	0.3	0.6	1.2	0.5	1.0	1.4	μm

*3: Reference value. Values may vary depending on operating environment. C10442 series position detection error is specified within a range of 75 % from the center of the active area to the edge, while C10443 series 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. C10442 series: $\Sigma = V_{X1} + V_{X2}$. C10443 series: $\Sigma = V_{X1} + V_{X2} + V_{Y1} + V_{Y2}$.

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

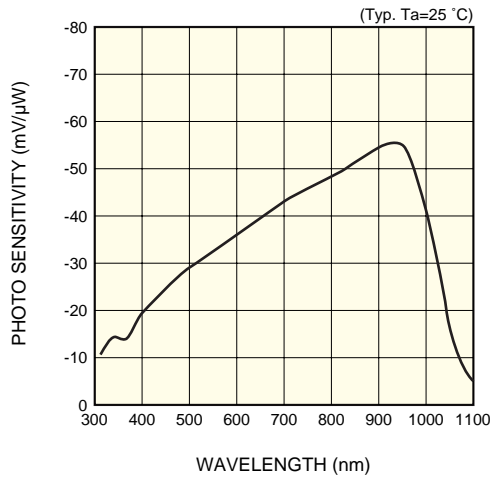
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating supply voltage	Vcc		±5	-	±12	V
Current consumption	Icc	Dark state	-	-	±2	mA
Output amplitude voltage	Vout	*5	0	-	-Vcc + 1.1	V
Output noise voltage	Vn	Dark state	-	1	-	mVp-p
Offset voltage	Vos	Dark state	-5	-	+5	mV
Cut-off frequency	fc	-3 dB	-	16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

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

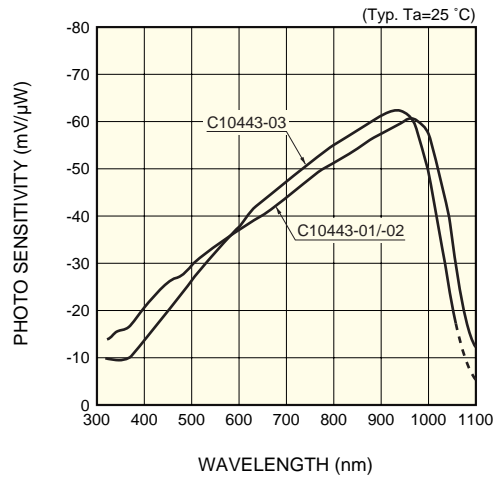
SOLID STATE DIVISION

■ Spectral response

C10442 series

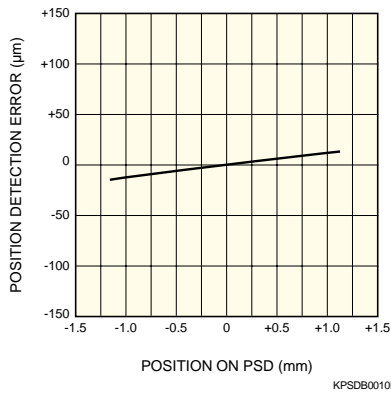


C10443 series

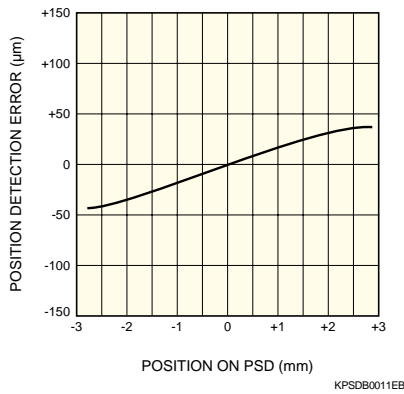


■ Examples of position detectability (Ta=25 °C, λ=900 nm, spot light size: φ0.2 mm)

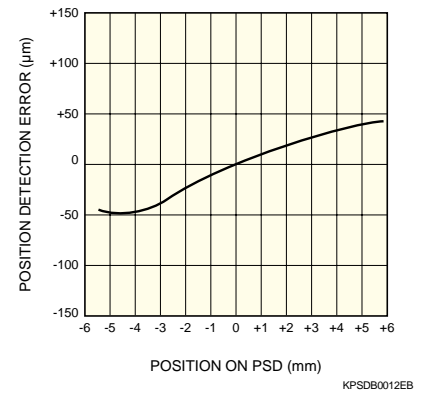
C10442-01



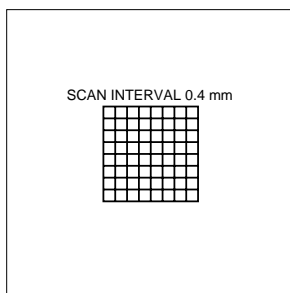
C10442-02



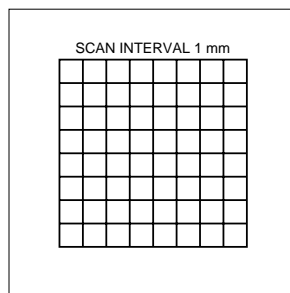
C10442-03



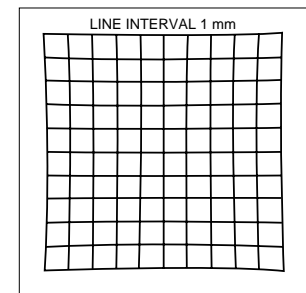
C10443-01



C10443-02

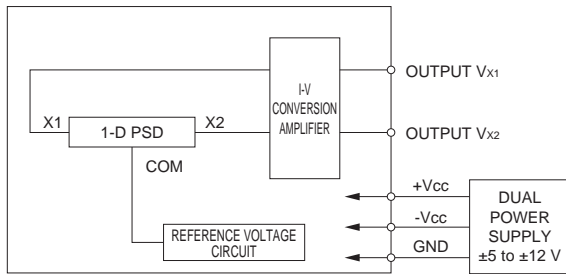


C10443-03



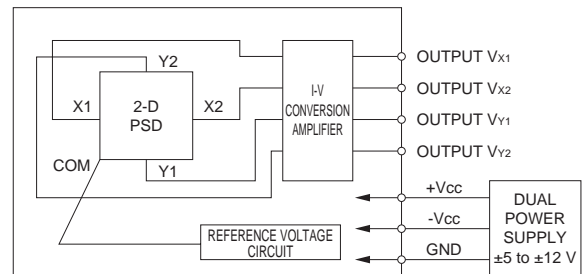
Block diagram

C10442 series



KACCC0344EA

C10443 series



KACCC0345EA

Conversion formula

C10442 series

$$x = \frac{V_{X2} - V_{X1}}{V_{X1} + V_{X2}} \times \frac{L}{2}$$

x: Position (mm) of light spot relative to center of PSD active area
 L: 3 mm (C10442-01)
 6 mm (C10442-02)
 12 mm (C10442-03)

C10443 series

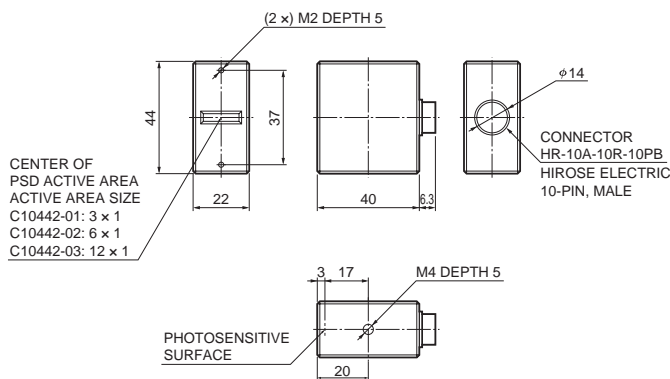
$$x = \frac{(V_{X2} + V_{Y1}) - (V_{X1} + V_{Y2})}{V_{X1} + V_{X2} + V_{Y1} + V_{Y2}} \times \frac{L}{2}$$

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

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

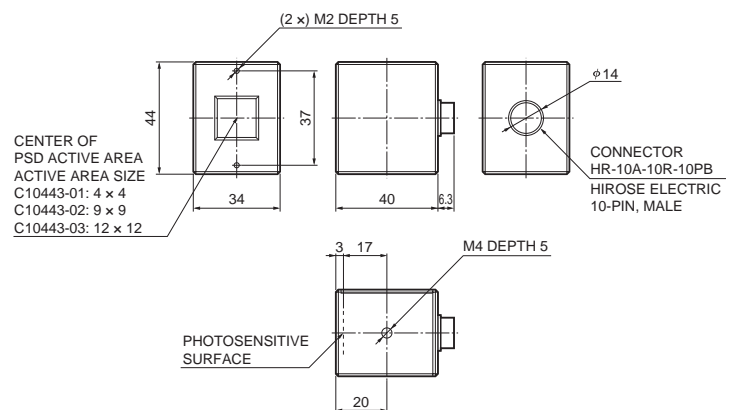
Dimensional outlines (unit: mm)

C10442 series



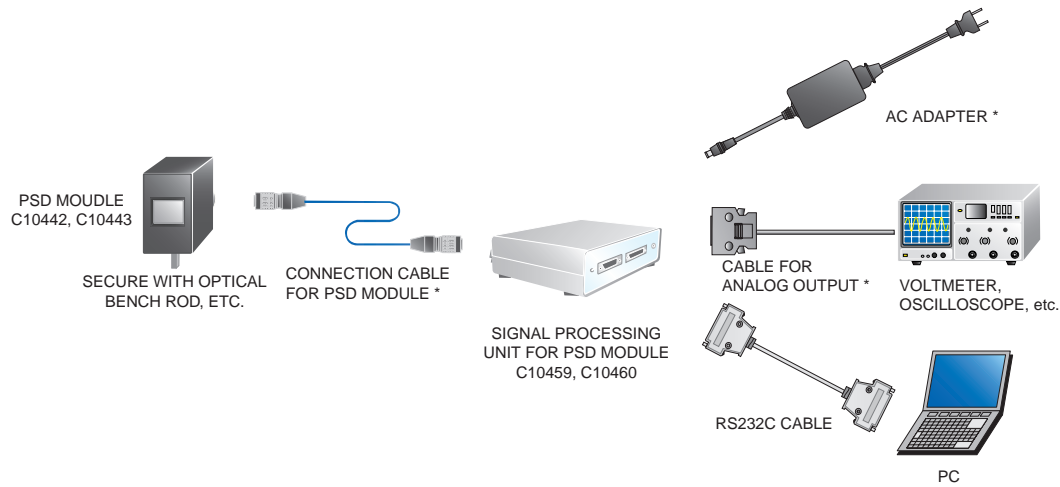
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C10443 series



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■ Connection example

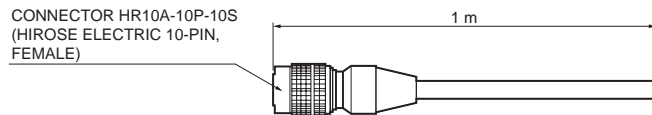


* Accessory of a signal processing unit for PSD module C10459, C10460

KACCC0349EB

■ Accessory

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



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