

Balanced detectors



C12668 series

Balanced detectors with reduced multiple reflections

These are differential amplification type photoelectric conversion modules containing two Hamamatsu photodiodes with balanced characteristics. The photodiodes are connected in a direction that cancels out the photocurrent of each photodiode. This configuration cancels out the common mode noise of the two incident light rays. The minute difference in light levels is treated as a displacement signal, converted into an electrical signal, and output. Moreover, the adoption of our unique structure that suppresses multiple reflections of incident light has made it possible to reduce the noise caused by the reflections. These products can be applied to optical coherence tomography (OCT) used in ophthalmologic examinations and the like. The balanced detector can convert into electrical signals the minute difference in the signal light produced when the back scattering light from the subject is made to interfere with the reference light.

Features

- Employs our unique structure that reduces multiple reflections at the incident light wavelength of 1.0 μm or 1.3 μm
- Cutoff frequency: 200 MHz
- Common-mode rejection ratio (CMRR): 35 dB typ.
- Input section: FC receptacle (APC polished)
A single-mode fiber with an FC connector can be connected.
- Output section: SMA receptacle
- Compact

Application

- OCT

Structure

Parameter	Specification	Unit
Built-in element	InGaAs PIN photodiode	-
Dimensions	65 × 75 × 25	mm
Weight	168	g
Input section	FC receptacle (APC polished)	-
Output section	SMA receptacle	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs	Ta=25 °C	±17	V
Operating temperature*1	Topr		0 to +50	°C
Storage temperature*1	Tstg		-10 to +60	°C

*1: No condensation

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 characteristics (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage*2	Vs	±12 V	±11	±12	±13	V
Current consumption	Ic	±12 V, dark state	±52	±60	±64	mA
Output impedance	Zo	OUT terminal	-	50	-	Ω
		Monitor terminal	-	220	-	

*2: Use a power supply with at least 200 mA output.

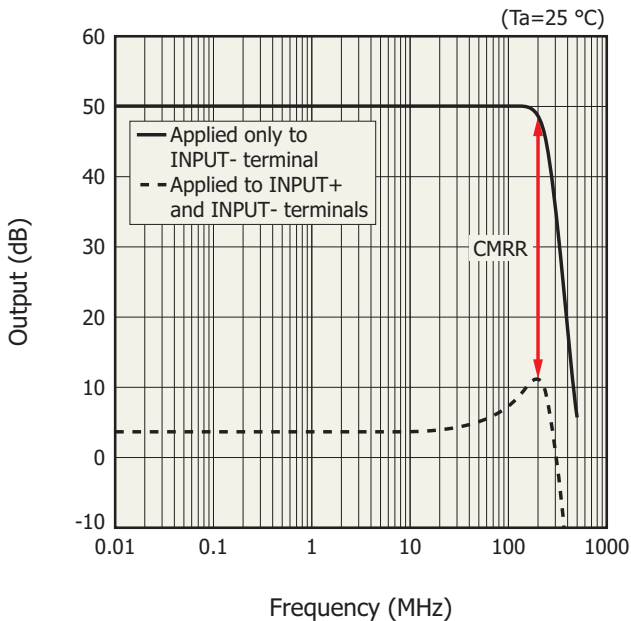
Electrical and optical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Condition	C12668-01	C12668-02	Unit
Optimal wavelength band*3	λ_o	-	1.0	1.3	μm
Photosensitivity	SPD	Optimal wavelength	0.75	0.95	A/W
Frequency bandwidth	fb	-3 dB, OUT terminal	DC to 200		MHz
		-3 dB, Monitor terminal	DC to 0.1		
Common-mode rejection ratio*4	CMRR	OUT terminal	35		dB
Transimpedance gain	Zt	OUT terminal	3×10^4		V/A
		Monitor terminal	1×10^4		V/A
Output noise voltage	Vn	Dark state, 50 Ω termination, OUT terminal	40 max.		mVp-p

*3: Wavelength band in which multiple reflections can be reduced the most

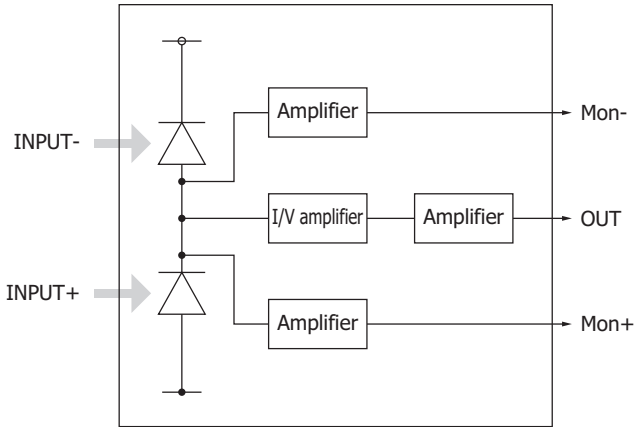
*4: Output difference when an approximately 70 μW light is applied to only the INPUT- terminal and when applied to INPUT+ and INPUT- terminals (see the frequency characteristics)

Frequency characteristics (typical example)



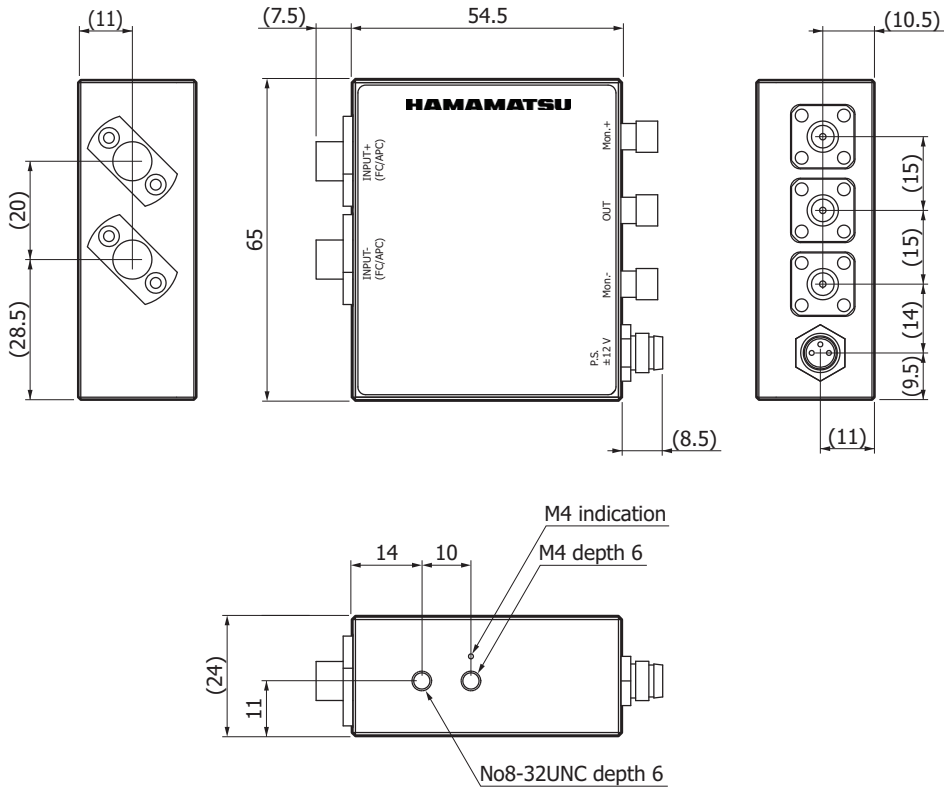
KACCB0358EA

Block diagram



KACCC0761EA

Dimensional outline (unit: mm)

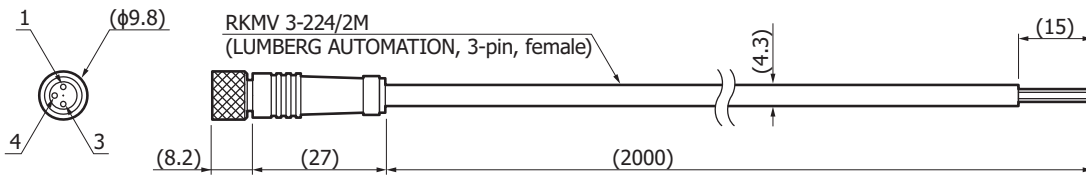


Tolerance unless otherwise noted: ± 0.3

KACCA0351EA

Accessory (unit: mm)

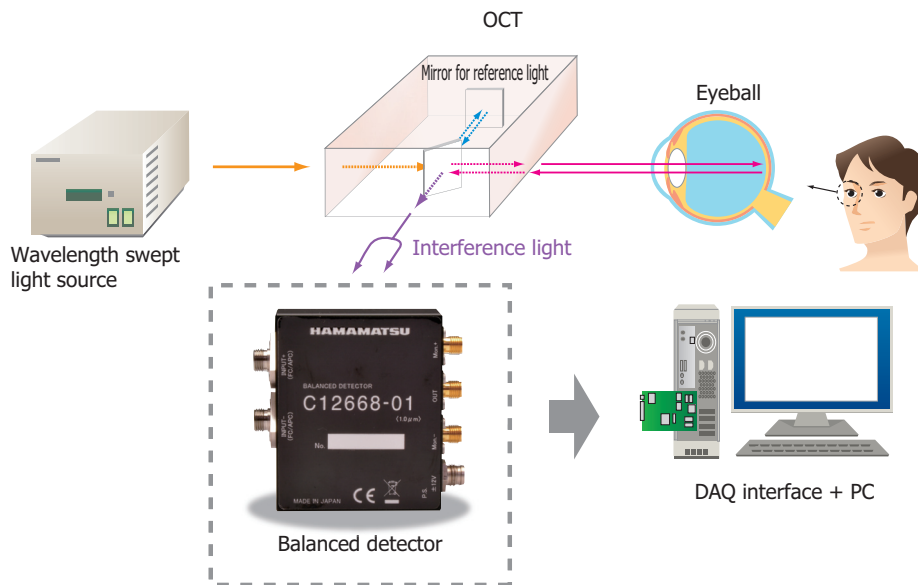
- Cable for power supply (no connector on one end)



Pin no.	Wire color
1	Brown (+12 V)
3	Blue (-12 V)
4	Black (GND)

KACCA0352EA

Connection example (ophthalmic medical OCT)



KACCC0762EA

Related information

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

- Precautions
 - Disclaimer

Information described in this material is current as of February, 2015.

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.

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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