

# Photon counting module



C14076-01

## Fiber coupling type, low-light-level detection

The C14076-01 is a photon counting module that can detect low-level light. It consists of a TE-cooled single pixel photon counter (SPPC), amplifier, comparator, high-voltage power supply circuit, and temperature controller. This product is a fiber coupling type module. The module operates by supplying an external power supply ( $\pm 5$  V). As this product is compact and lightweight, it is suitable for integration into devices.

### Features

- Fiber coupling type
- Single photon counting is possible.
- High short-wavelength sensitivity
- Low dark count
- Compact and lightweight

### Applications

- Low-level-light measurement
- Particle diameter measurement
- Fluorescence measurement
- Analytical instruments

### Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs		$\pm 6$	V
Operating temperature	T <sub>opr</sub>	No dew condensation*1	-10 to +40	°C
Storage temperature	T <sub>stg</sub>	No dew condensation*1	-20 to +70	°C
Maximum incident light level	-	$\lambda=450$ nm	50	$\mu$ W

\*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, 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.

### Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage*2	Positive power supply	4.75	5	5.25	V
	Negative power supply	-4.75	-5	-5.25	

\*2: A power supply with 2 A or higher output must be used.

### Electrical and optical characteristics (T<sub>a</sub>=25 °C, $\lambda=450$ nm, V<sub>s</sub>= $\pm 5$ V, unless otherwise noted)

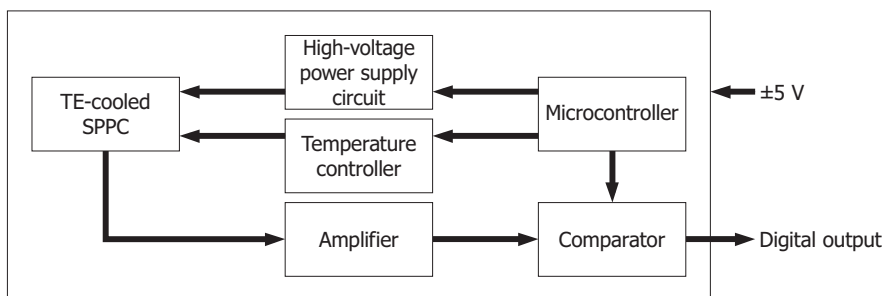
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$			370 to 900		nm
Peak sensitivity wavelength	$\lambda_p$		-	450	-	nm
Fiber connector*3	-			FC type		-
Chip temperature (setting temperature)*4 *5	T <sub>chip</sub>		-	-20	-	°C
Photon detection efficiency	PDE		35	45	-	%
Dark count	CD		-	7	25	cps
Afterpulse probability	-	100 ns to 500 ns	-	0.1	-	%
Comparator output	-			TTL compatible		-
Current consumption	+5 V	I <sub>c</sub>	-	+200	+1500	mA
	-5 V		-	-20	-40	

\*3: Recommended fiber: GI 50/125 multimode fiber

\*4: When the chip temperature strays from the setting temperature by 5 °C, cooling automatically stops, and signals are no longer output.

\*5: The setting temperature cannot be changed.

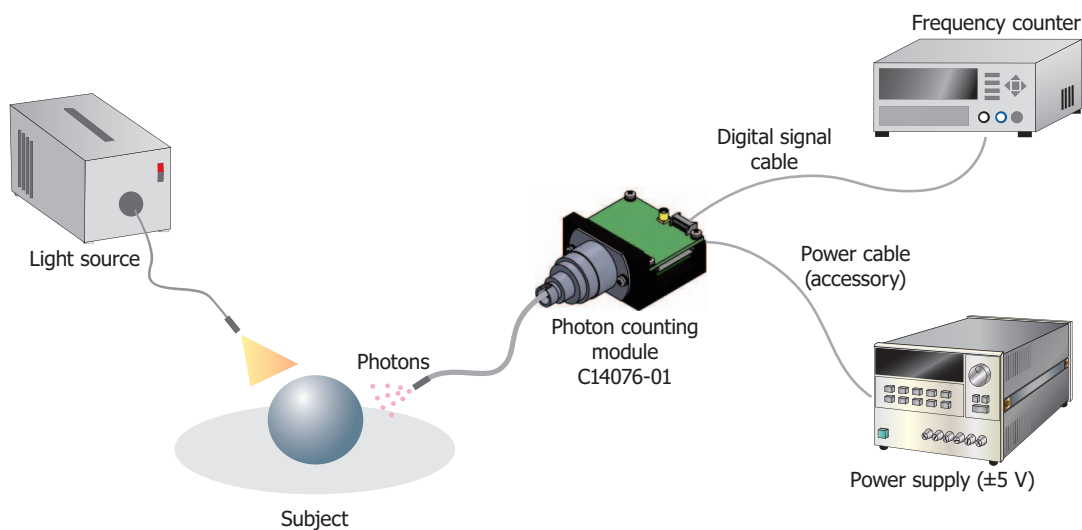
**Block diagram**



KACCC0857EA

**Connection example**

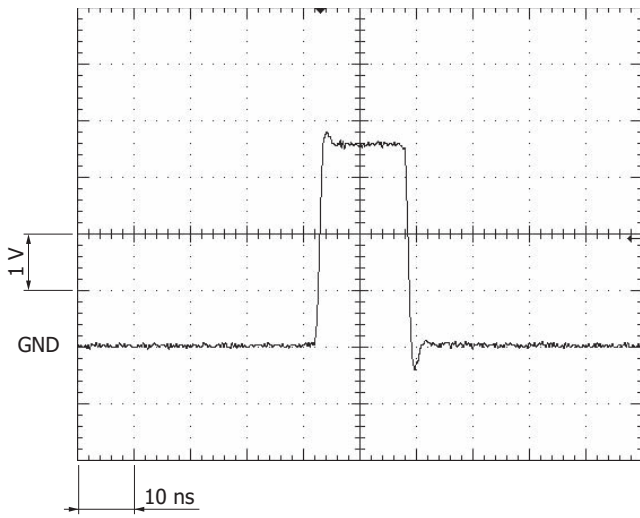
Using the supplied power cable, connect the module to a power supply. You can count output pulses by connecting the module to a frequency counter.



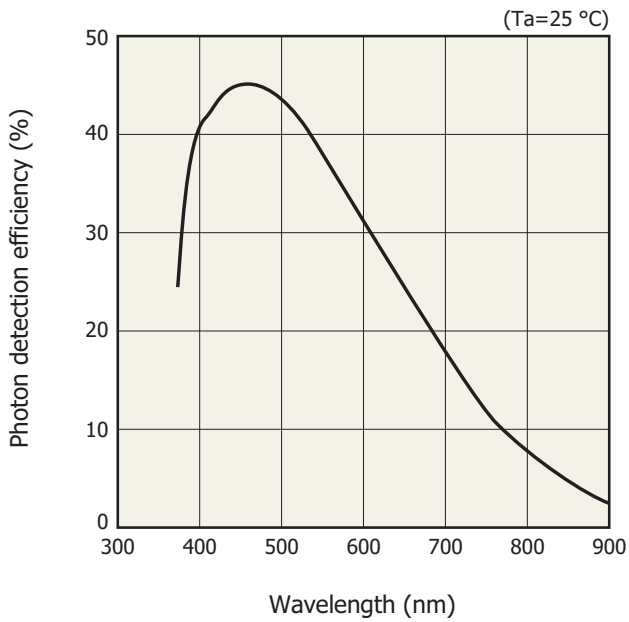
KACCC0925EA

Measurement example

Comparator output

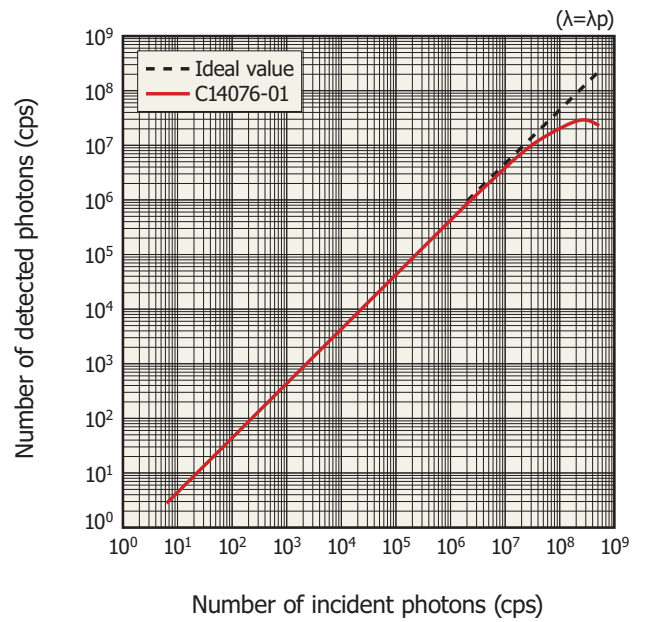


Photon detection efficiency vs. wavelength (typical example)



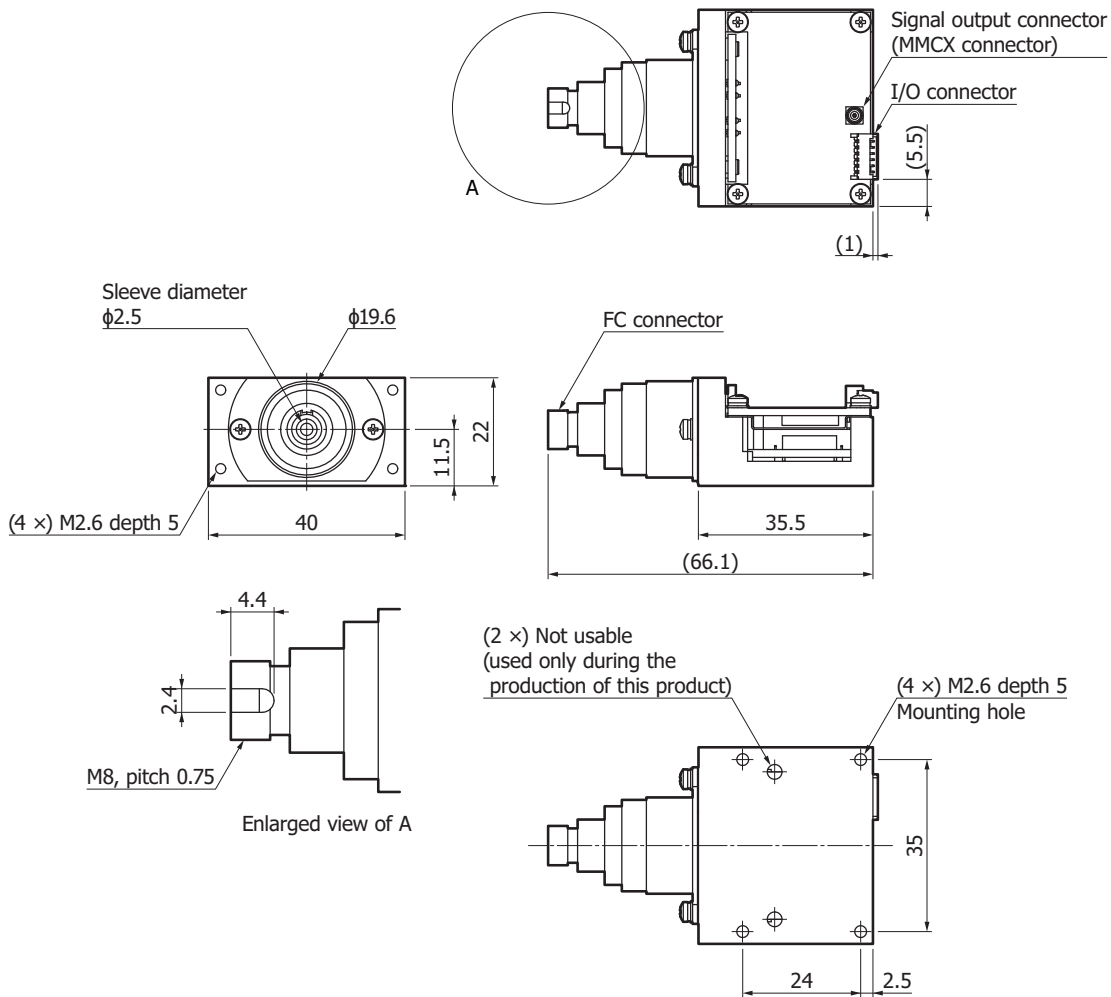
KACCB0464EA

Linearity (typical example)



KACCB0546EA

**Dimensional outline (unit: mm)**



KACCA0421EA

Note: When using this product, provide heat dissipation measures by using heatsinks or through thermal coupling with the enclosure that you will use. Keep the thermal resistance to 3 °C/W or less.

### Accessories

- Power cable
- Instruction manual

### Precautions

- Use the product by referring to the supplied instruction manual.

### Related products

#### Photon counting module C13001-01

The C13001-01 is a module for evaluating fiber coupling type single pixel photon counters (SPPCs). This module consists of a fiber coupling type SPPC, amplifier, comparator, high-voltage power supply circuit, and temperature controller. The module operates by supplying an external power supply ( $\pm 5$  V). The C13001-01 series has nearly the same functions as the C14076-01. Note that the C13001-01 does not require heat dissipation measures.



### Related information

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

- Precautions
- Disclaimer

Information described in this material is current as of February 2019.

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HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218, E-mail: [usa@hamamatsu.com](mailto:usa@hamamatsu.com)

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8, E-mail: [info@hamamatsu.de](mailto:info@hamamatsu.de)

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10, E-mail: [infos@hamamatsu.fr](mailto:infos@hamamatsu.fr)

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44)1707-294888, Fax: (44)1707-325777, E-mail: [info@hamamatsu.co.uk](mailto:info@hamamatsu.co.uk)

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: [info@hamamatsu.se](mailto:info@hamamatsu.se)

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: [info@hamamatsu.it](mailto:info@hamamatsu.it)

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866, E-mail: [hpc@hamamatsu.com.cn](mailto:hpc@hamamatsu.com.cn)

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081, E-mail: [info@hamamatsu.com.tw](mailto:info@hamamatsu.com.tw)