



C14076-01

## Embedded use, fiber coupling type 1 ch SPAD module (for VIS region)

The C14076-01 is a fiber coupling type photon counting module that can detect low-level light. It consists of a thermoelectric cooled single photon avalanche diode (SPAD), an amplifier, a comparator, a SPAD bias circuit, and a temperature controller. The module operates by simply connecting to 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	Topr	No dew condensation*1	-10 to +40	°C
Storage temperature	Tstg	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 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 (Ta=25 °C, $\lambda=450$ nm, Vs= $\pm 5$ 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*2	-			FC type		-	
Chip temperature (setting temperature)*3 *4	Tchip		-	-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	Positive power supply	Ic	Vs=+5 V	-	+200	+1500	mA
	Negative power supply		Vs=-5 V	-	-20	-40	

\*2: Recommended fiber: GI 50/125 multimode fiber

\*3: When the chip temperature strays from the setting temperature by 5 °C, cooling automatically stops, and signals are no longer output.

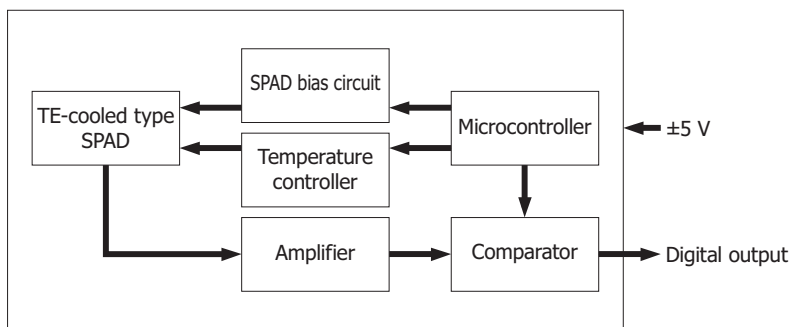
\*4: The setting temperature cannot be changed.

### Recommended operating conditions

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

\*5: A power supply with 2 A or higher output must be used.

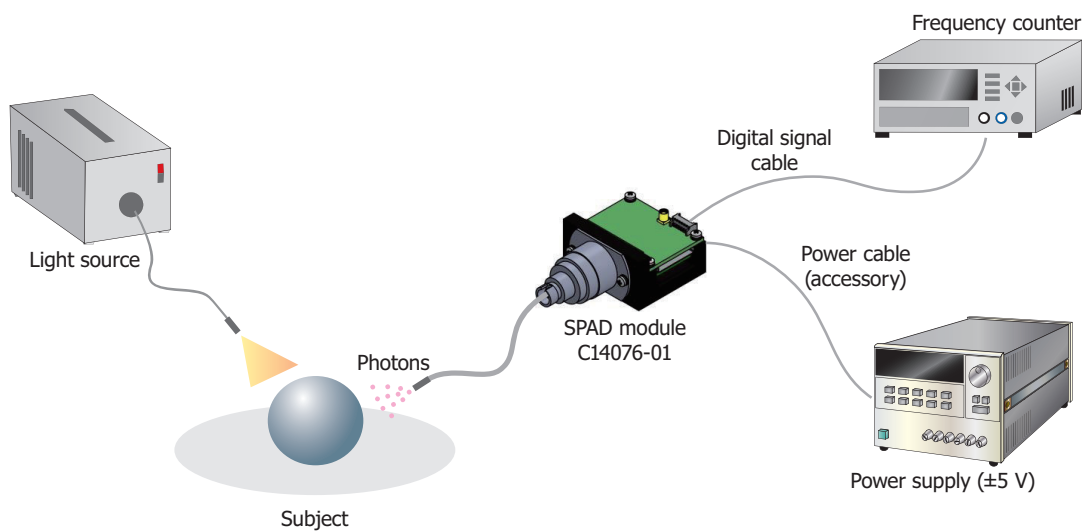
**Block diagram**



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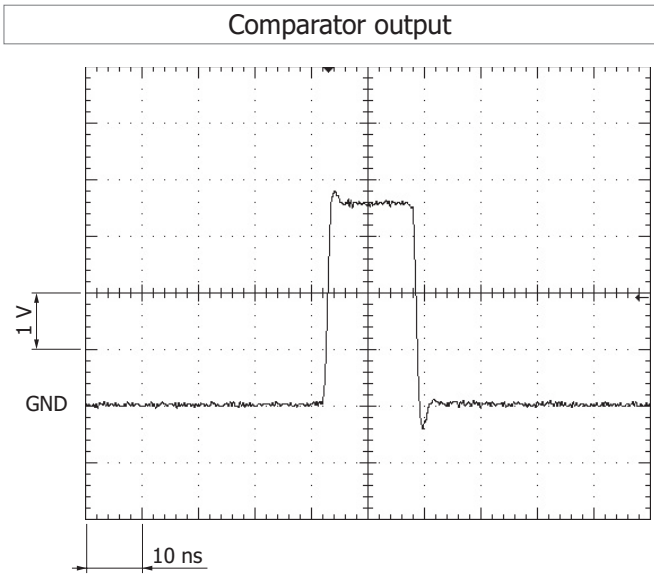
**Connection example**

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

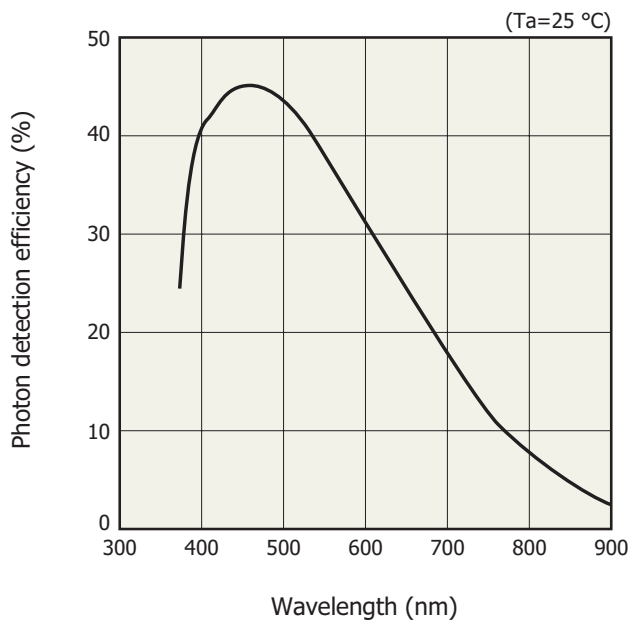


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Measurement example

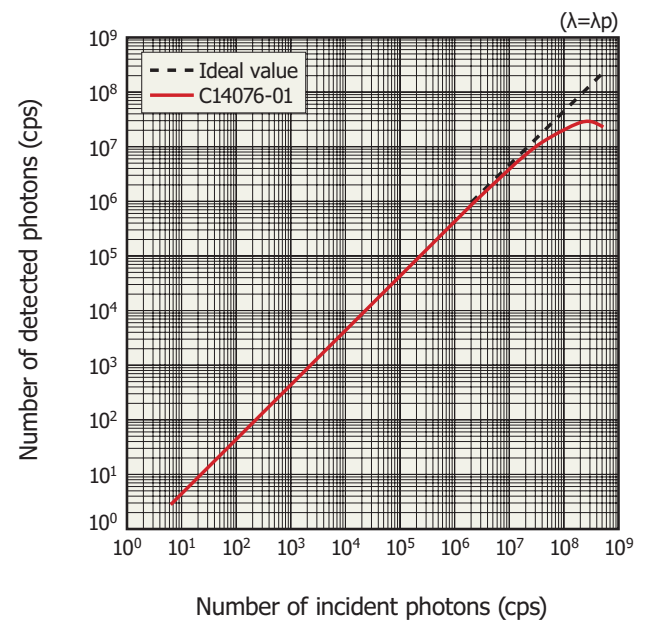


Photon detection efficiency vs. wavelength (typical example)



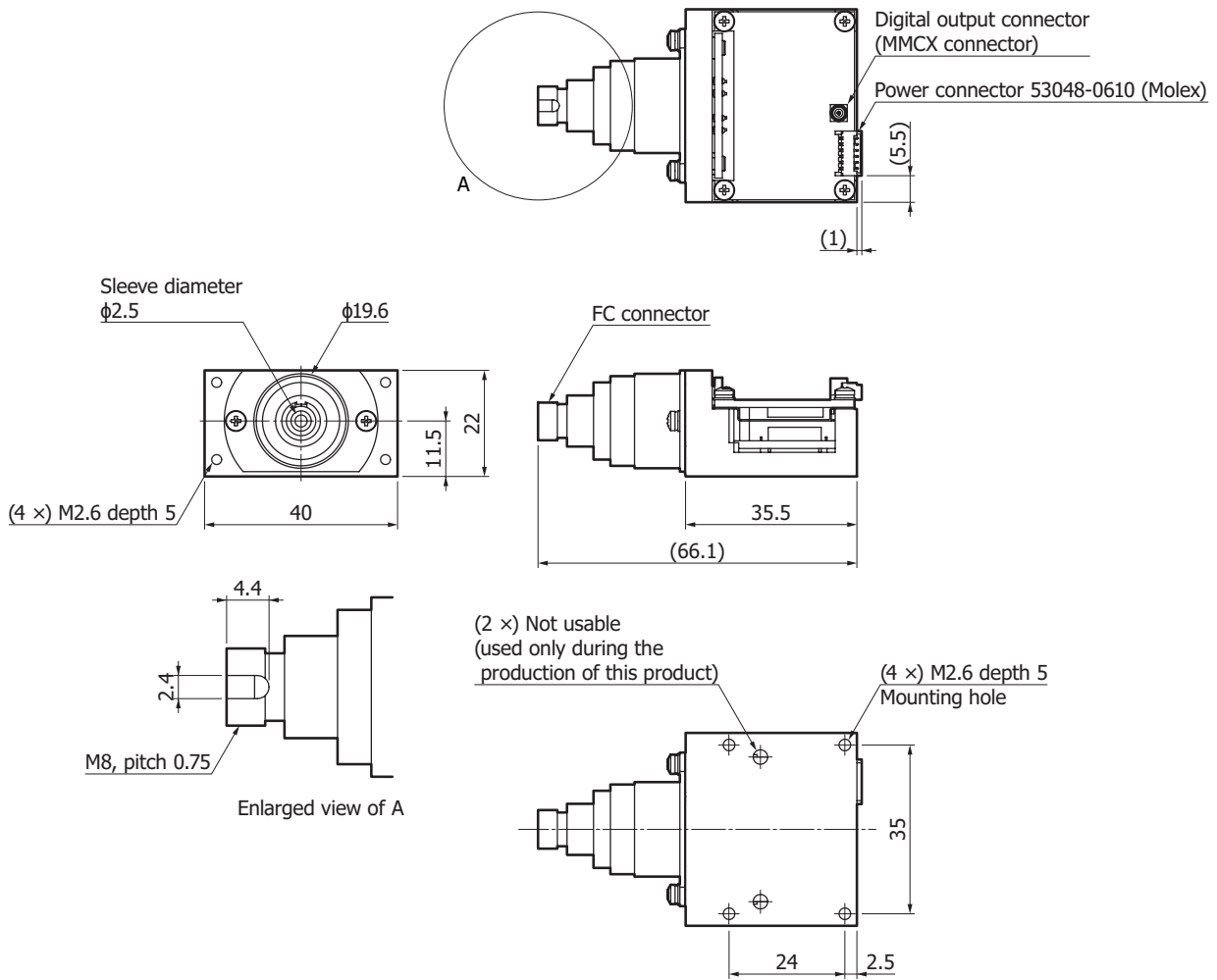
KACCB0464EA

Linearity (typical example)



KACCB0546EA

**Dimensional outline (unit: mm)**



KACCA0421EC

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.

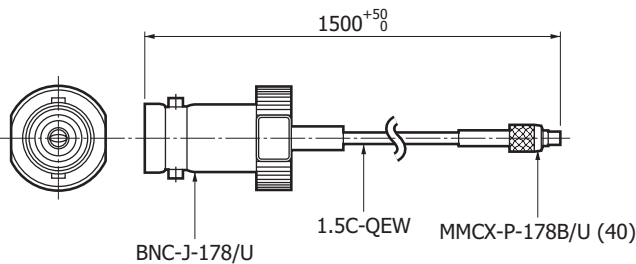
**Accessories**

- Power cable
- Instruction manual

### Options (sold separately)

MMCX-BNC cable A12763

Dimensional outline (unit: mm)



KACCA0358EA

### Precautions

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

### Related products

SPAD module C13001-01



The C13001-01 is a module for evaluating fiber coupling type single photon avalanche diode (SPAD). This module consists of a fiber coupling type (SPAD), an amplifier, a comparator, a SPAD bias circuit, and a temperature controller. The module operates by simply connecting to 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 September 2022.

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.

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