



C13368/C13369 series (Digital output type)

Optical measurement modules for very-low-level light detection, digital output

The C13368/C13369 series (digital output type) are optical measurement modules with an MPPC array that can detect very-low-level light. These modules consist of an MPPC array, an amplifier, a comparator circuit, and a high-voltage power supply circuit with a temperature compensation function, etc. They have a USB port that can be used to retrieve data and change the threshold level using a PC. External power supply is not necessary (USB bus powered). They come in two types with different photosensitive areas, 1 × 1 mm and 3 × 3 mm.

Features

- Built-in MPPC array (1 × 16 ch or 4 × 4 ch)
- High sensitivity in the short wavelength range
- Low dark count
- Low afterpulses
- Digital output

Applications

- Evaluation of MPPC arrays
- Low-light-level measurement
- Non-destructive inspection
- Fluorescence measurement
- Analytical instruments

Structure

Parameter	Symbol	C13368-3050ED-16	C13369-1025GD-04	C13369-3050ED-04	Unit
Number of channels	-	16 (1 × 16)	16 (4 × 4)		-
Effective photosensitive area/ch	-	3 × 3	1 × 1	3 × 3	mm
Pixel pitch	-	50	25	50	μm
Number of pixels/ch	-	3584	1584	3584	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Operating temperature	Topr	No dew condensation*	0 to +60	°C
Storage temperature	Tstg	No dew condensation*	-20 to +80	°C

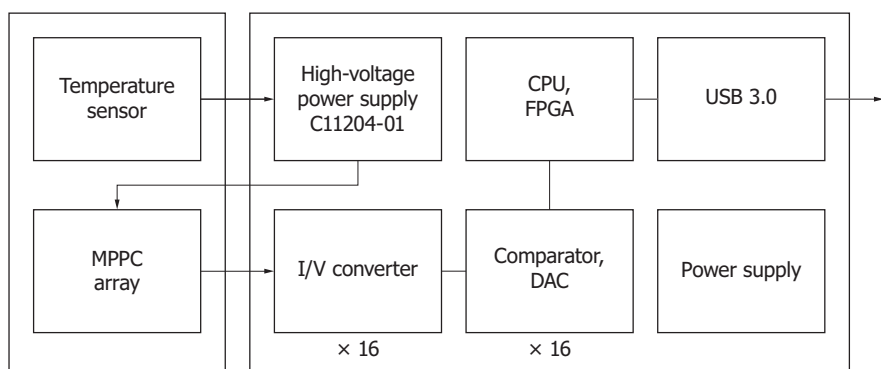
* When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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.

Electrical and optical characteristics (Ta=25 °C, λ=λp, unless otherwise noted)

Parameter	Symbol	Condition	C13368-3050ED-16 C13369-3050ED-04			C13369-1025GD-04			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		320 to 900						nm
Peak sensitivity wavelength	λp		450						nm
Output stability depending on temperature	-	Ta=25 ± 10 °C	-	-	±10	-	-	±10	%
Photon detection efficiency	PDE	Threshold: 0.5 p.e.	-	40	-	-	25	-	%
Dark count/ch	-	Threshold: 0.5 p.e.	-	500	1500	-	90	270	kcps/ch
Threshold level	-		11 adjustable levels: 0.5 to 10.5						p.e.
Maximum count rate interface	-		-	7	-	-	10	-	Mcps
			USB 3.0						-

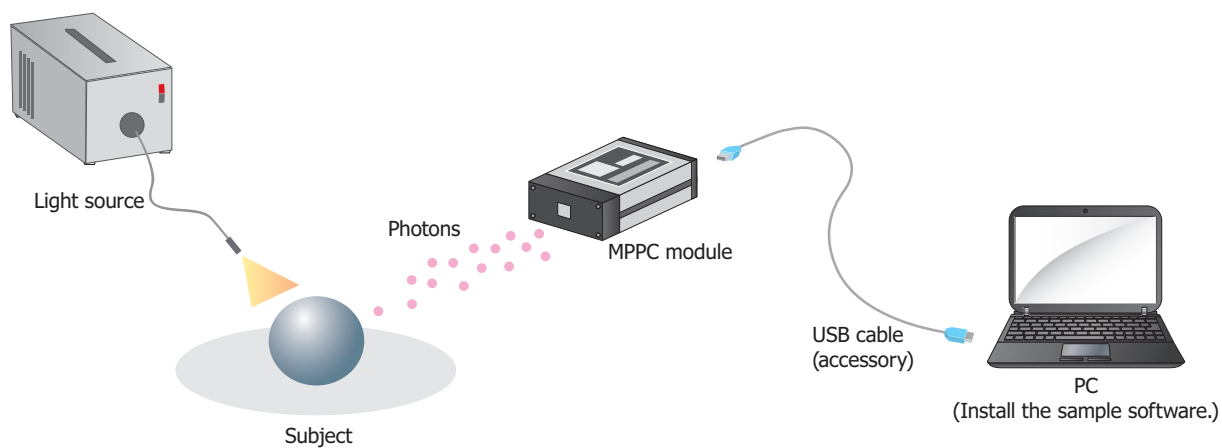
Block diagram



KACCC0830EA

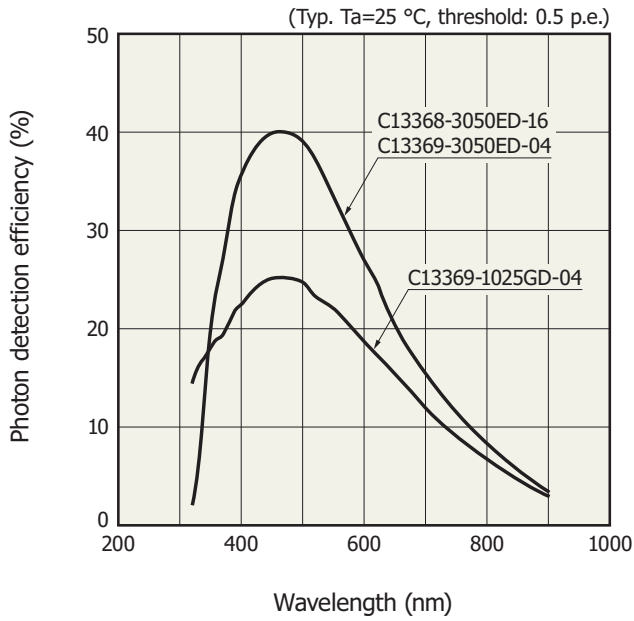
Connection example

Using the supplied USB cable, connect the MPPC module to a PC. Setup is done from a PC. Measured data can be displayed and saved on the PC.



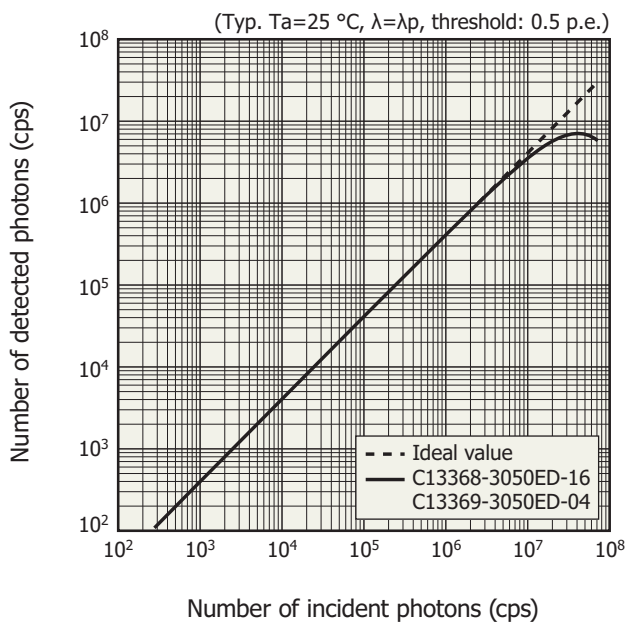
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Photon detection efficiency vs. wavelength

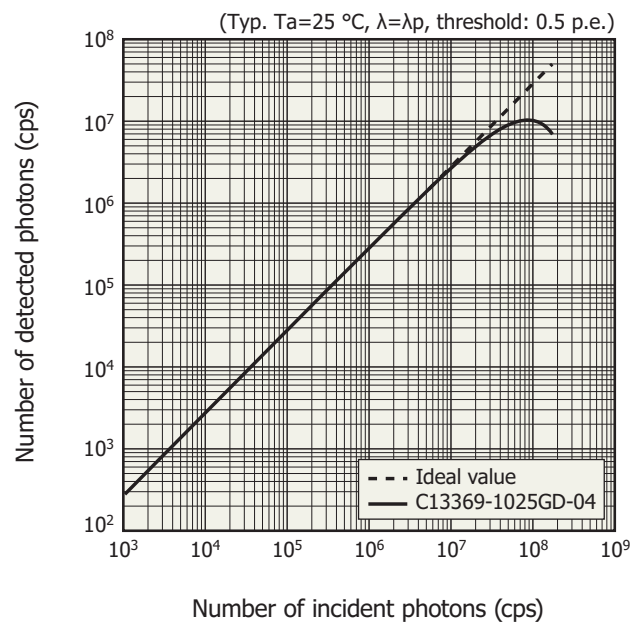


Linearity

C13368-3050ED-16, C13369-3050ED-04



C13369-1025GD-04



Sample software

The included sample software can be used to easily perform basic operations of the MPPC module. The sample software provides functions for acquiring and saving data, drawing graphs, etc.

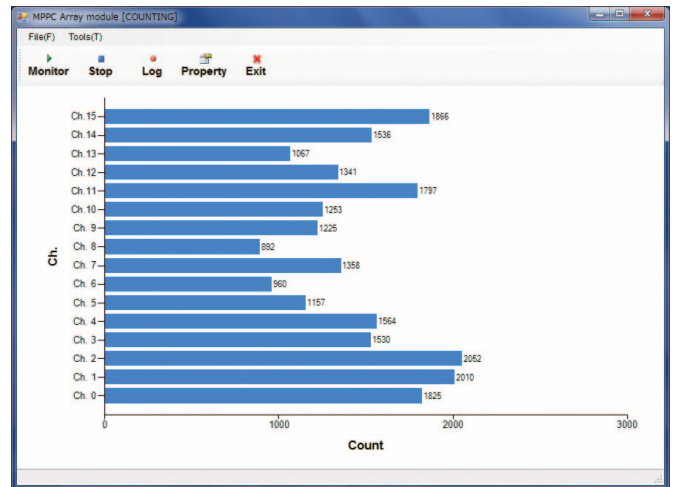
Systems compatible with the sample software

The sample software has been confirmed to work with the following systems. Operation on other systems is not guaranteed.

- Microsoft Windows 7 Professional (32-bit, 64-bit)
- Microsoft Windows 7 Professional SP1 (32-bit, 64-bit)

PC with high-performance CPU and memory is recommended. This is especially true when running multiple MPPC modules simultaneously.

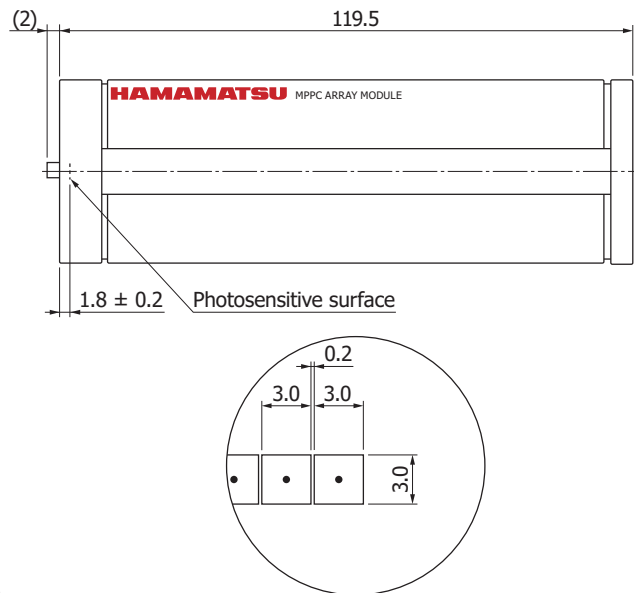
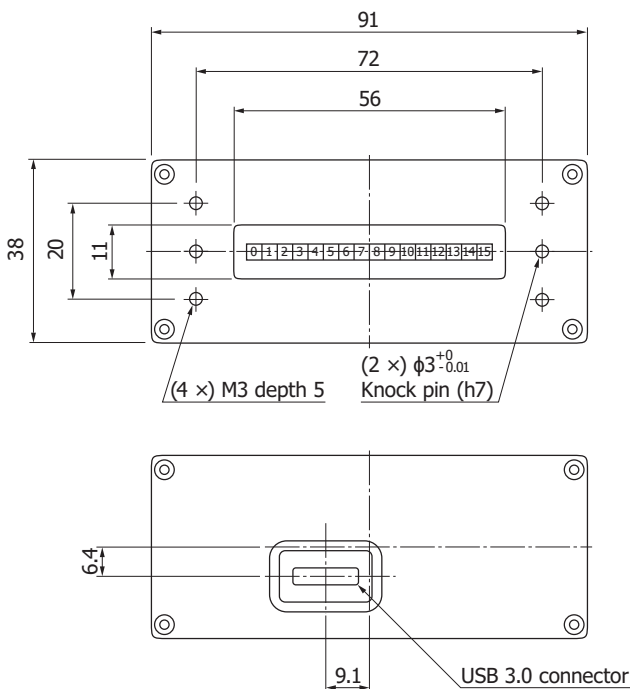
Measurement example



Note: Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

Dimensional outlines (unit: mm)

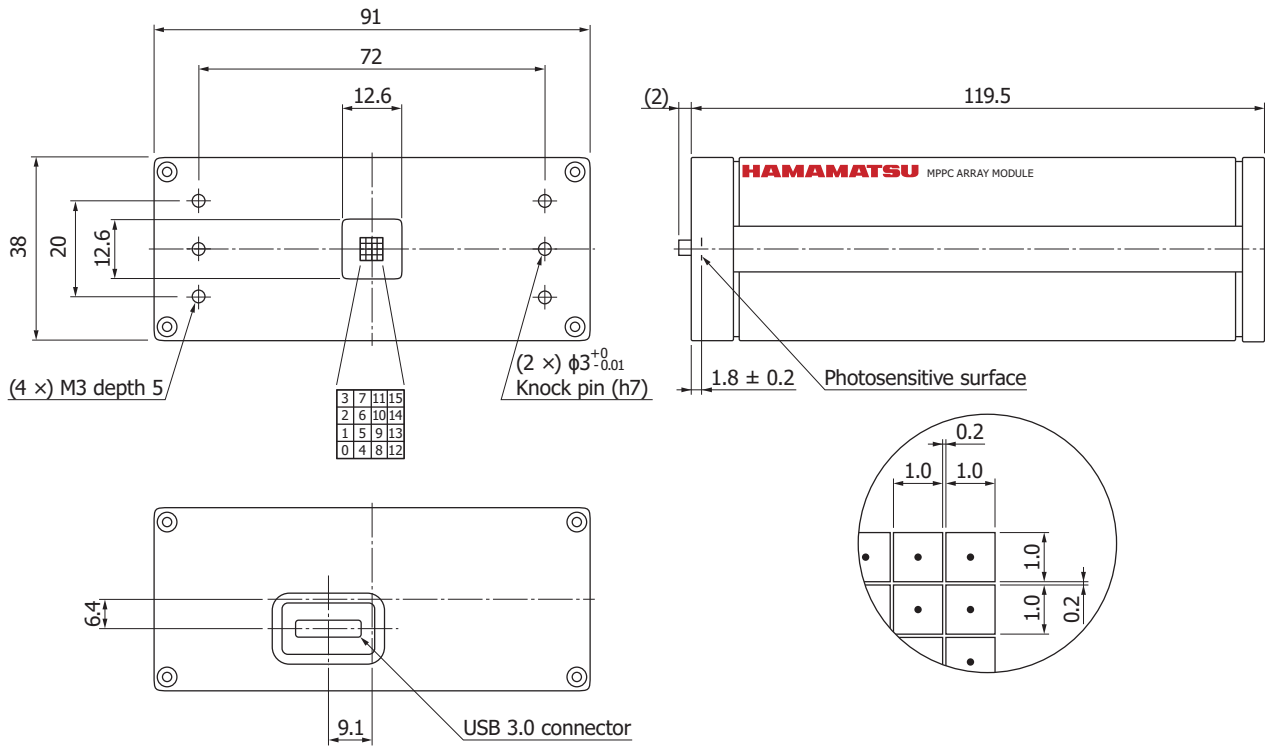
C13368-3050ED-16



Tolerance unless otherwise noted: ± 0.5
 Weight: 440 g

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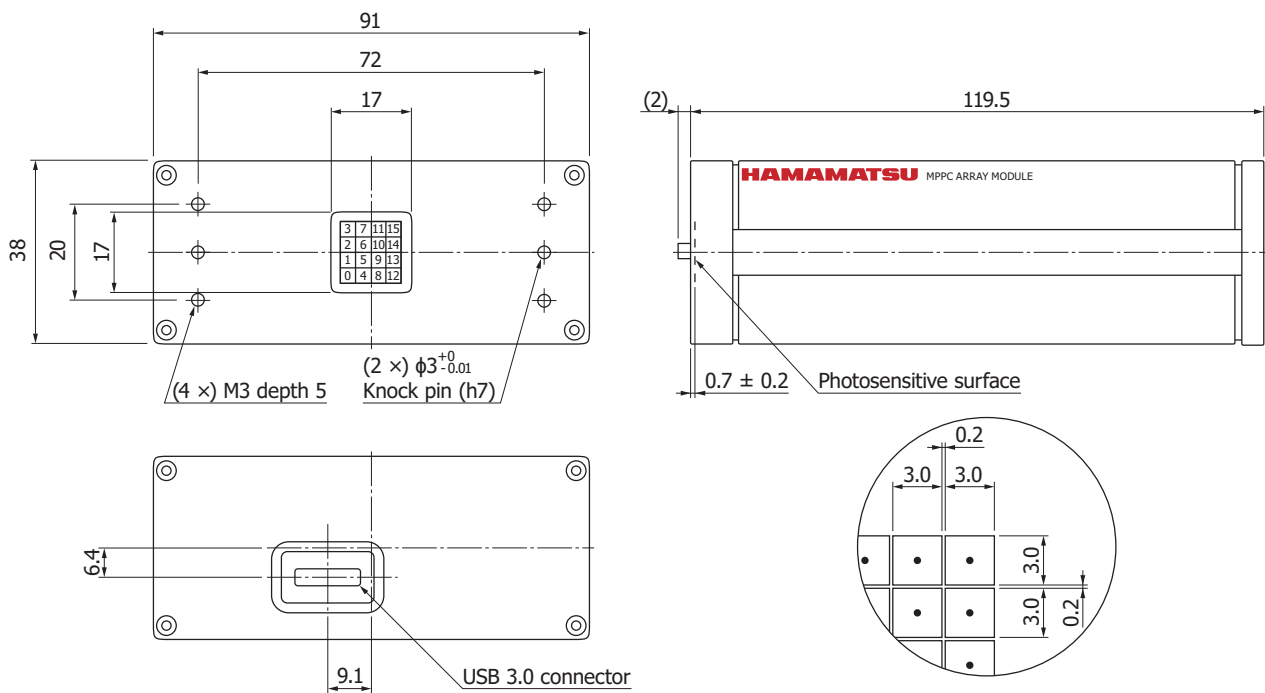
C13369-1025GD-04



Tolerance unless otherwise noted: ± 0.5
Weight: 440 g

KACCA0402EA

C13369-3050ED-04



Tolerance unless otherwise noted: ± 0.5
Weight: 440 g

KACCA0383EA

Accessories

- CD-ROM (instruction manual, sample software, etc.)
- USB cable
- Instruction manual

Precautions

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

MPPC array module lineup

Type no.	Output format	Photosensitive area/ch (mm)	Pixel pitch (μm)	Number of channels
C13369-1025GA-04	Analog	1 × 1	25	4 × 4
C13369-3050EA-04		3 × 3	50	4 × 4
C13368-3050EA-16		3 × 3	50	1 × 16
C13369-1025GD-04	Digital	1 × 1	25	4 × 4
C13369-3050ED-04		3 × 3	50	4 × 4
C13368-3050ED-16		3 × 3	50	1 × 16
C13369-1025GM-04	MCA (multichannel analyzer)	1 × 1	25	4 × 4
C13369-3050EM-04		3 × 3	50	4 × 4
C13368-3050EM-16		3 × 3	50	1 × 16

Related information

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

Precautions

- Disclaimer

MPPC is a registered trademark of Hamamatsu Photonics K.K.

Information described in this material is current as of November 2017.

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