



## C13368/C13369 series (MCA type)

### MPPC array modules with energy discrimination capability

The C13368/C13369 series [MCA (multichannel analyzer) type] is an optical measurement module with an MPPC array that can detect very-low-level light. These modules consist of a 16 ch MPPC array, a signal processing circuit, an A/D converter, and a high-voltage power supply circuit. It has a USB port that can be used to retrieve energy information of each channel using a PC. External power supply is not necessary (USB bus powered). It comes in two types with different photosensitive areas, 1 × 1 mm and 3 × 3 mm. X-rays and gamma-rays can be detected in combination with a scintillator.

#### Features

- Built-in MPPC array (1 × 16 ch or 4 × 4 ch)
- High sensitivity in the short wavelength range
- Built-in temperature compensation function
- MCA function
- USB 3.0 interface available

#### Applications

- Evaluation of MPPC arrays
- Non-destructive inspection
- Analytical instruments

#### Structure

Parameter	C13368-3050EM-16	C13369-1025GM-04	C13369-3050EM-04	Unit
Number of channels	16 (1 × 16)	16 (4 × 4)		ch
Effective photosensitive area/ch	3 × 3	1 × 1	3 × 3	mm
Pixel pitch	50	25	50	μm
Number of pixels/ch	3584	1584	3584	-
Interface	USB 3.0			-

#### 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

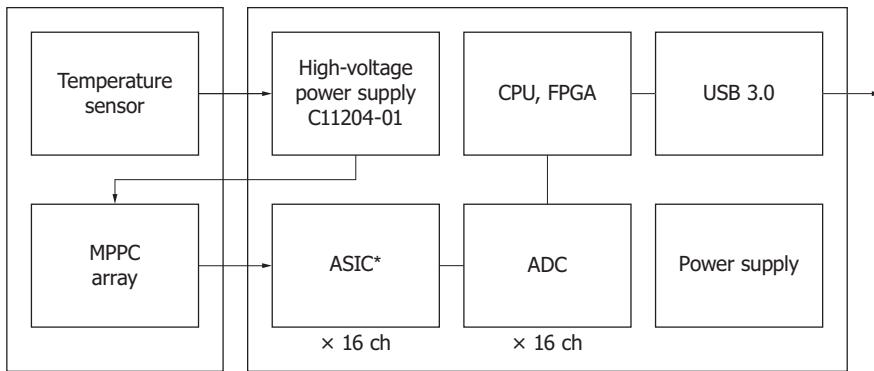
\* When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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 unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ			320 to 900		nm
Peak sensitivity wavelength	λp			450		nm
Output stability depending on temperature	-	Ta=25 ± 10 °C	-	-	±10	%
Maximum count rate	-	1 ch	-	20	-	kcps
	-	Total of all channels	-	200	-	kcps
Input pulse width	-		1	-	5	μs

**Block diagram**

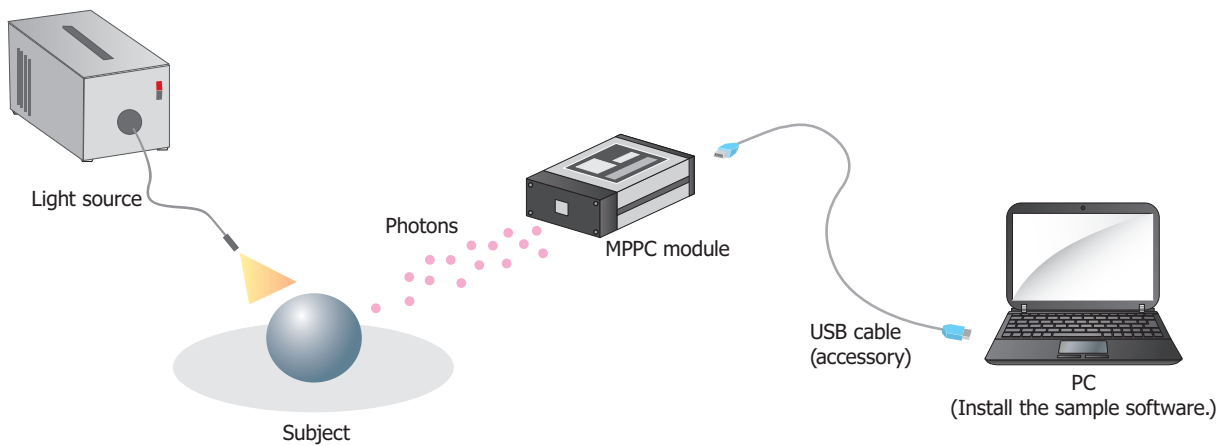


\* Includes the peak hold circuit, baseline restorer circuit, and comparator circuit

KACCC0831EA

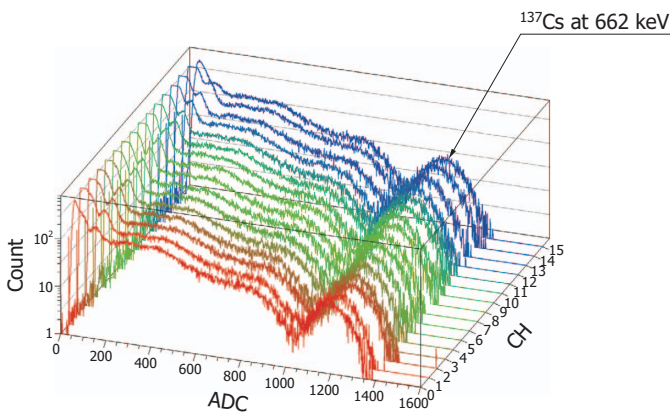
**Connection example**

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.



KACCC0877EA

**Measurement example**



KACCB0426EA

**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.

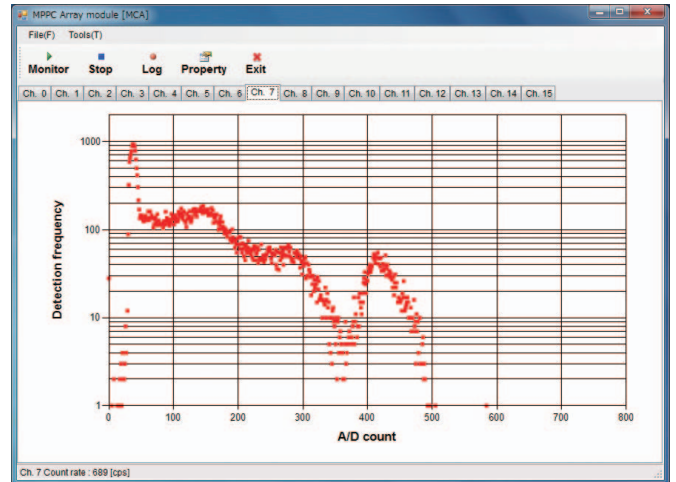
■ Systems compatible with the sample software

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

Microsoft Windows 7 Professional  
 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.

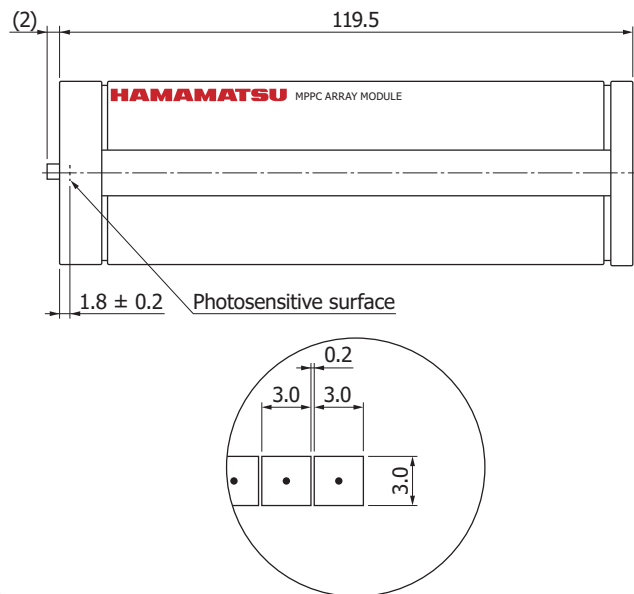
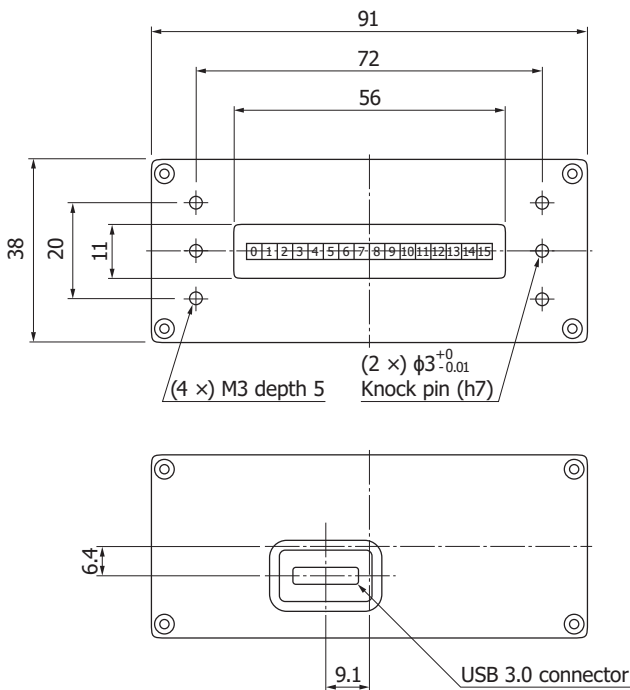
■ Measurement example



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

**Dimensional outlines (unit: mm)**

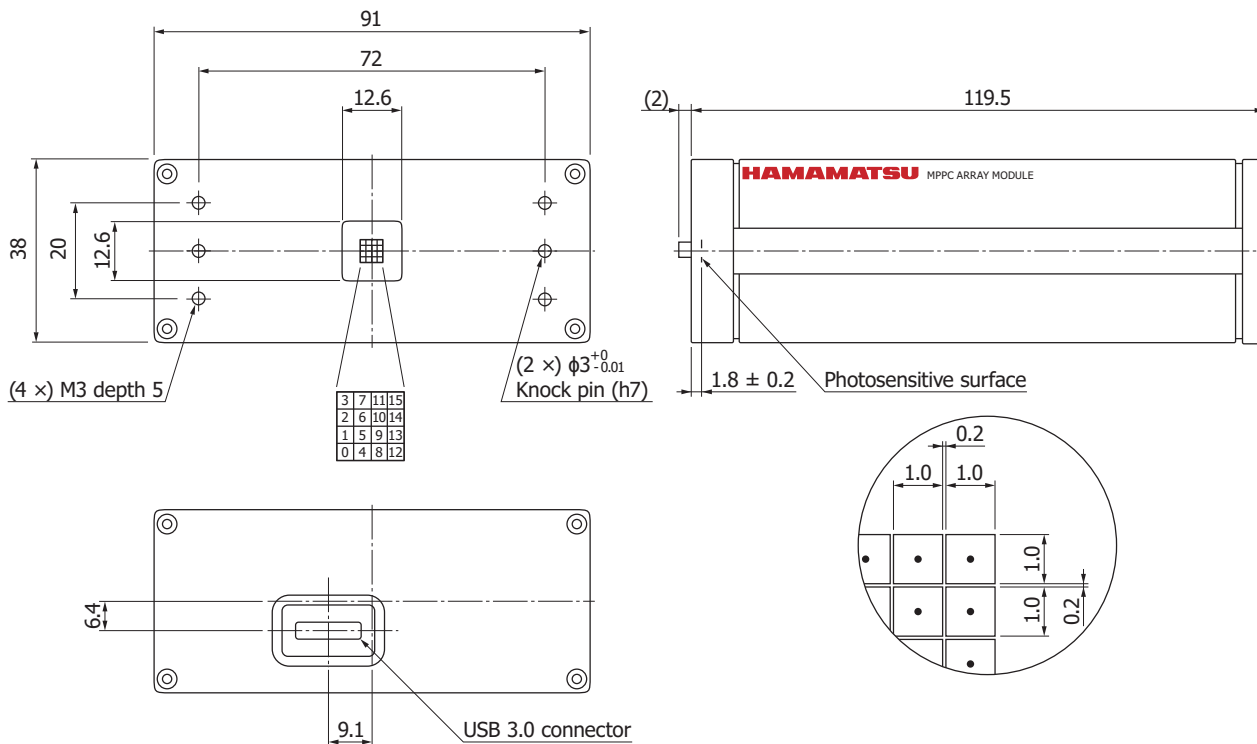
C13368-3050EM-16



Tolerance unless otherwise noted: ±0.5  
 Weight: 440 g

KACCA0403EA

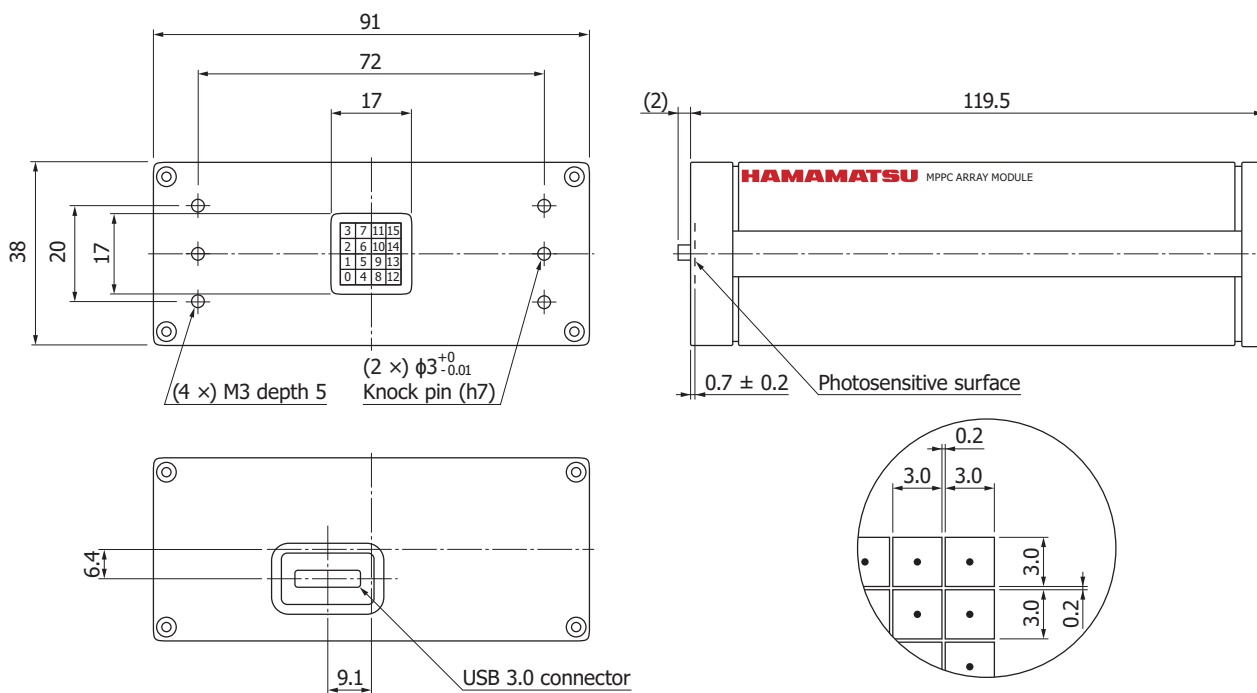
C13369-1025GM-04



Tolerance unless otherwise noted:  $\pm 0.5$   
Weight: 440 g

KACCA0402EA

C13369-3050EM-04



Tolerance unless otherwise noted:  $\pm 0.5$   
Weight: 440 g

KACCA0383EA

## Accessories

- USB cable
- Instruction manual
- CD-ROM (sample software)

## Precautions

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

## MPPC 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](http://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 August 2017.

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