



C13368/C13369 series (Analog output type)

MPPC array modules for very-low-level light detection, 16 ch analog output

The C13368/C13369 series (analog output 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, an amplifier, and a high-voltage power supply circuit. It comes in two types with different photosensitive areas, 1 × 1 mm and 3 × 3 mm. The signal output type of these MPPC modules is 16 ch analog. You can simply connect an external power supply (±5 V) to use this module.

Features

- Built-in MPPC array (1 × 16 ch or 4 × 4 ch)
- High sensitivity in the short wavelength range
- Low noise equivalent power
- Built-in temperature compensation function
- Analog output

Applications

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

Structure

Parameter	C13368-3050EA-16	C13369-1025GA-04	C13369-3050EA-04	Unit
Number of MPPC channels	16 (1 × 16)	16 (4 × 4)		ch
Photosensitive area/ch	3 × 3	1 × 1	3 × 3	mm
Pixel pitch	50	25	50	μm
Number of pixels/ch	3584	1584	3584	-
Number of output channels	16			ch
Output connector	MMCX			-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs		±6	V
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +80	°C

*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.

Electrical and optical characteristics (Ta=25 °C, λ=λp, Vs=±5 V, unless otherwise noted)

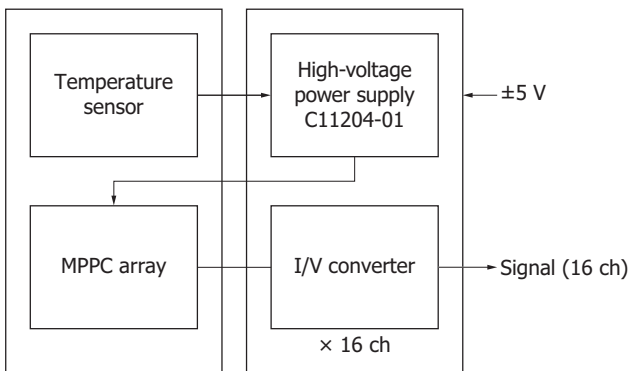
Parameter	Symbol	Condition	C13368-3050EA-16 C13369-3050EA-04			C13369-1025GA-04			Unit	
			Min.	Typ.	Max.	Min.	Typ.	Max.		
Spectral response range	λ		320 to 900						nm	
Peak sensitivity wavelength	λp		500						nm	
Output voltage stability depending on temperature	-	Ta=25 ± 10 °C	-	-	±10	-	-	±10	%	
Photoelectric conversion sensitivity	-		0.7 × 10 ⁹	1 × 10 ⁹	1.3 × 10 ⁹	2.5 × 10 ⁸	3.5 × 10 ⁸	4.5 × 10 ⁸	V/W	
Cutoff frequency	High band	fc	-3 dB, sine wave	3.5	5	-	5.5	8	-	MHz
	Low band			DC						-
Rise time	tr	10% to 90%, 1 p.e.	-	9	-	-	5	-	ns	
Noise equivalent power	NEP	Dark state	-	1.2	2	-	0.8	1.6	fW/Hz ^{1/2}	
Minimum detection limit	-	Dark state	-	2.7	4.5	-	2.3	4.5	pW rms	
Maximum output voltage	-		-	4.7	-	-	4.7	-	V	
Saturation input light level	-	Total of all channels	-	6	-	-	30	-	nW	
Output offset voltage	-		-	-	±30	-	-	±30	mV	

Electrical characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage*2	+Vs		+4.75	+5	+5.25	V
	-Vs		-4.75	-5	-5.25	
Current consumption	Ic	+Vs	-	+250	+500	mA
		-Vs	-	-200	-500	

*2: A power supply with 1 A or higher output must be used.

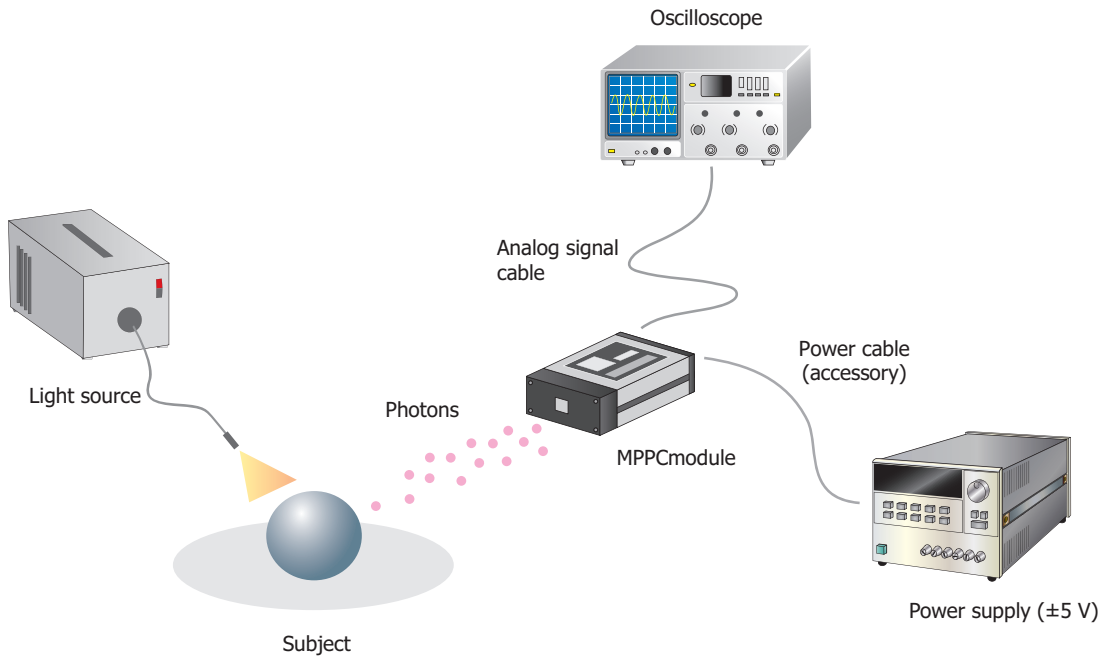
Block diagram



KACCC0824EA

Connection example

Using the supplied power cable, connect the MPPC module to a power supply. You can observe the MPPC module's output waveform by connecting the module to an oscilloscope.

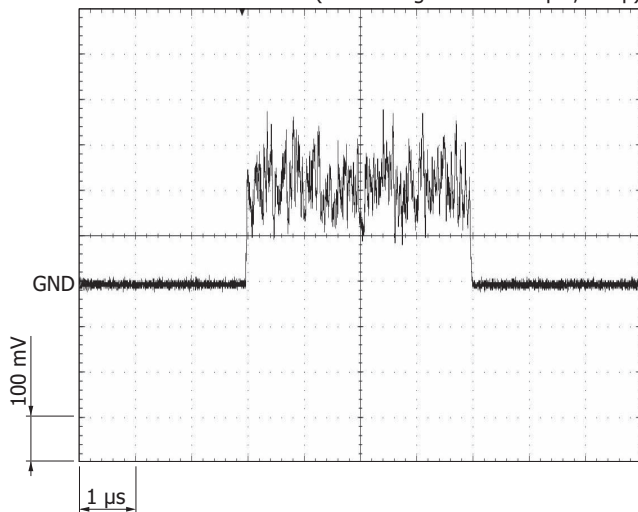


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Measurement example

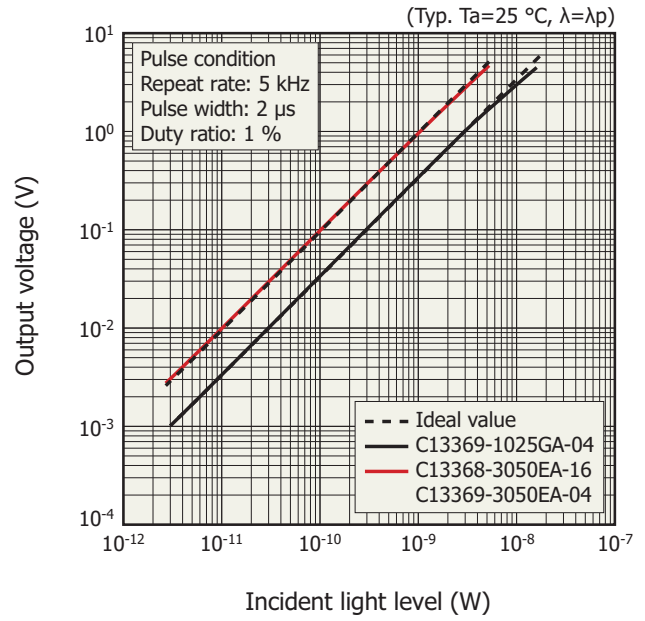
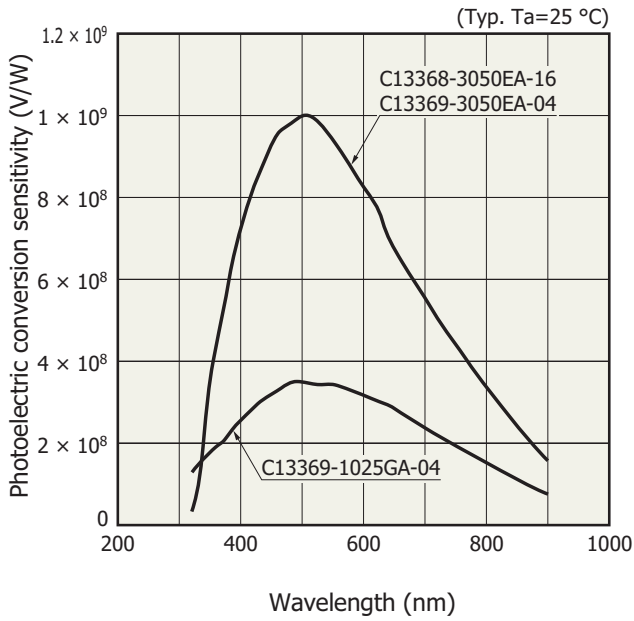
Analog output

(Incident light level: 200 pW, $\lambda = \lambda_p$)



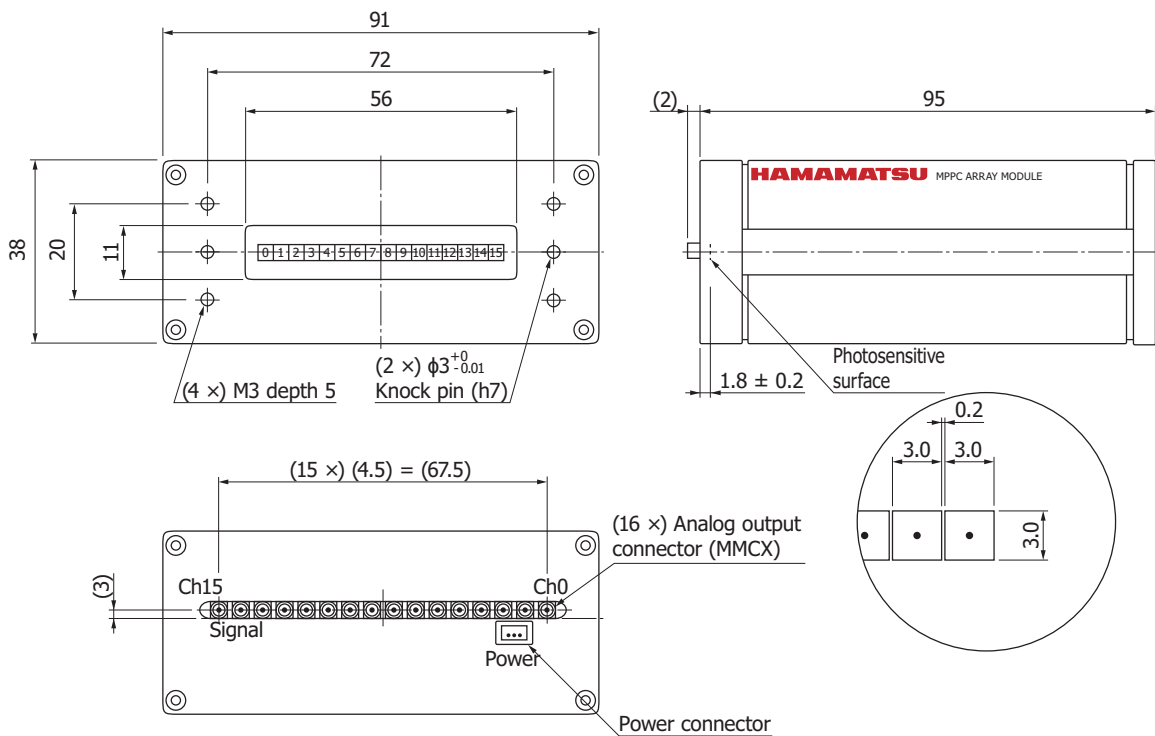
Photoelectric conversion sensitivity vs. wavelength

Linearity



Dimensional outline (unit: mm)

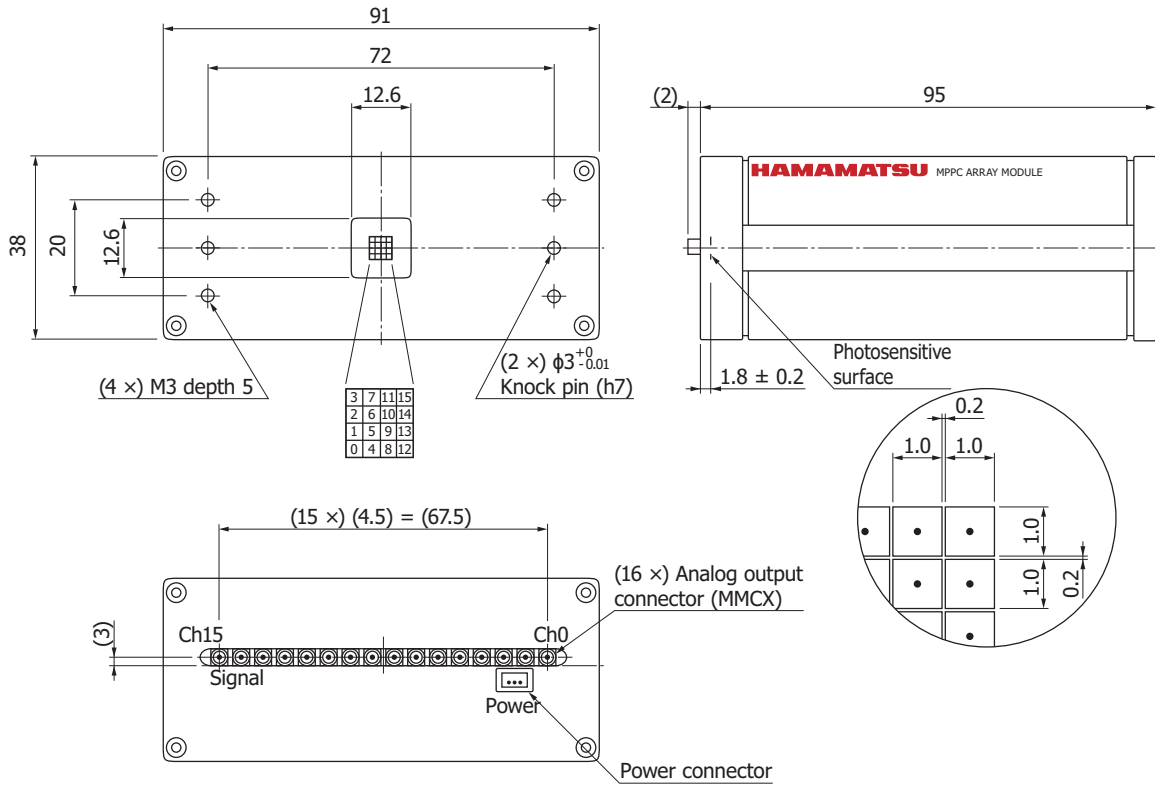
C13368-3050EA-16



Tolerance unless otherwise noted: ±0.5
Weight: 380 g

KACCA0400EA

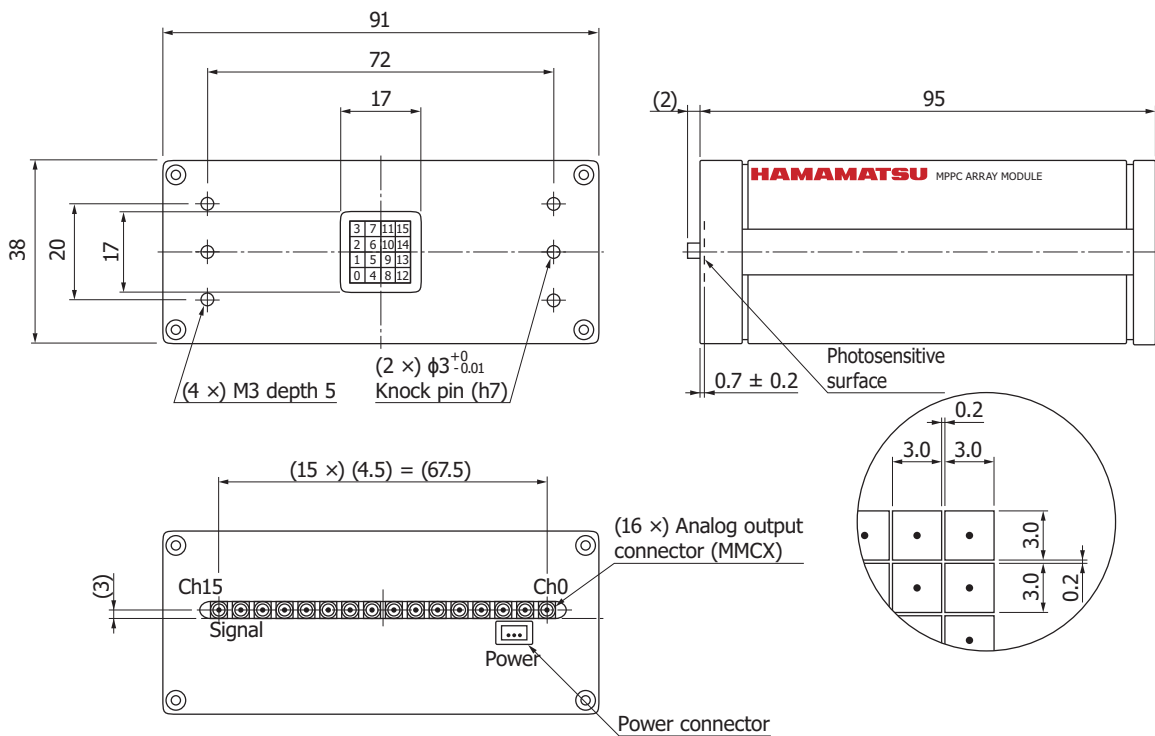
C13369-1025GA-04



Tolerance unless otherwise noted: ± 0.5
Weight: 380 g

KACCA0401EA

C13369-3050EA-04



Tolerance unless otherwise noted: ± 0.5
Weight: 380 g

KACCA0380EA

Accessories

- Power cable
- Instruction manual

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

- Precautions
- Disclaimer

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

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