



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)

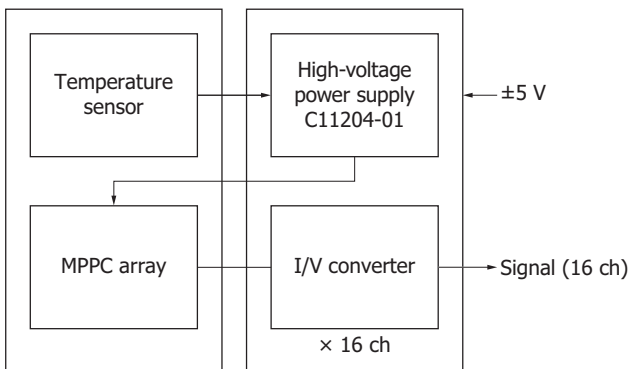
Parameter	Symbol	Condition	C13368-3050EA-16 C13369-3050EA-04			C13369-1025GA-04			Unit	
			Min.	Typ.	Max.	Min.	Typ.	Max.		
Spectral response range	λ		320 to 900						nm	
Peak sensitivity wavelength	λp		500						nm	
Output voltage stability depending on temperature	-	Ta=25 ± 10 °C	-	-	±10	-	-	±10	%	
Photoelectric 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.

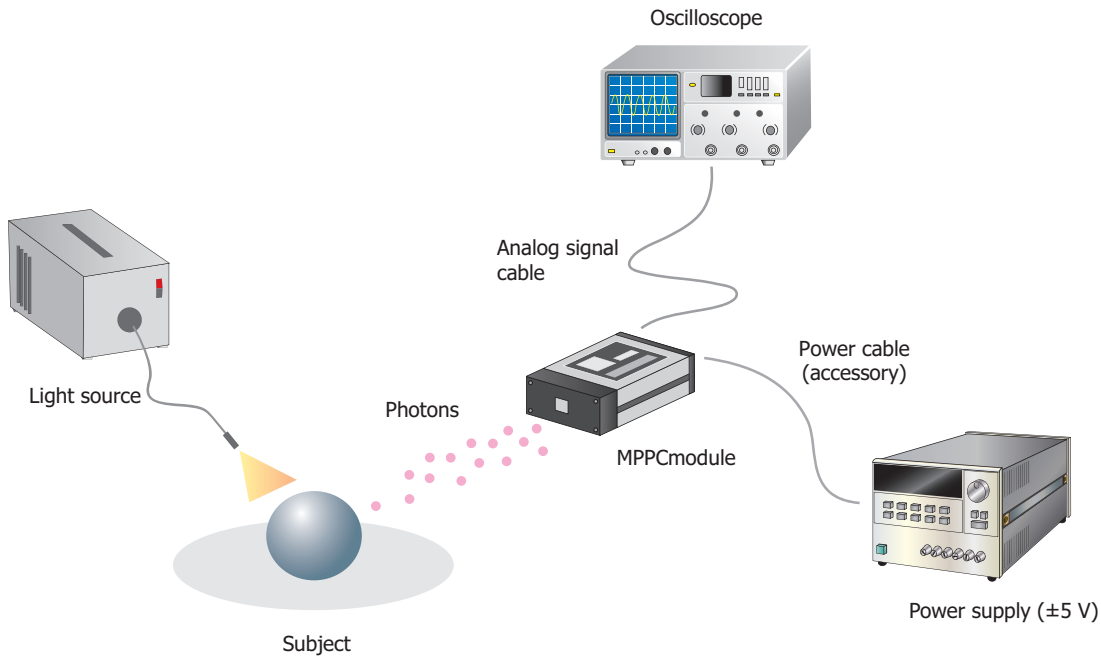
Block diagram



KACCC0824EA

Connection example

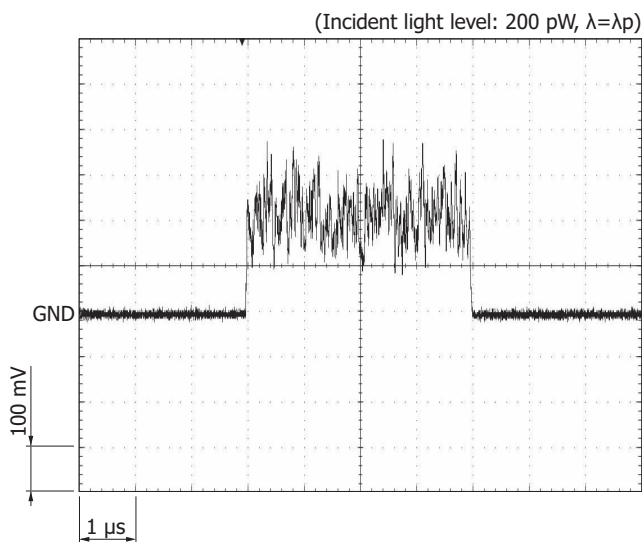
Using the supplied power cable, connect the MPPC module to a power supply. You can observe the MPPC module's output waveform by connecting the module to an oscilloscope.



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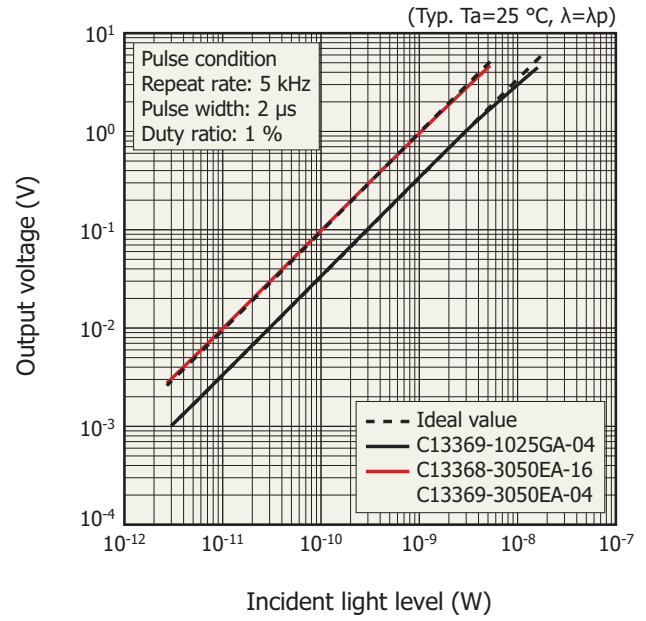
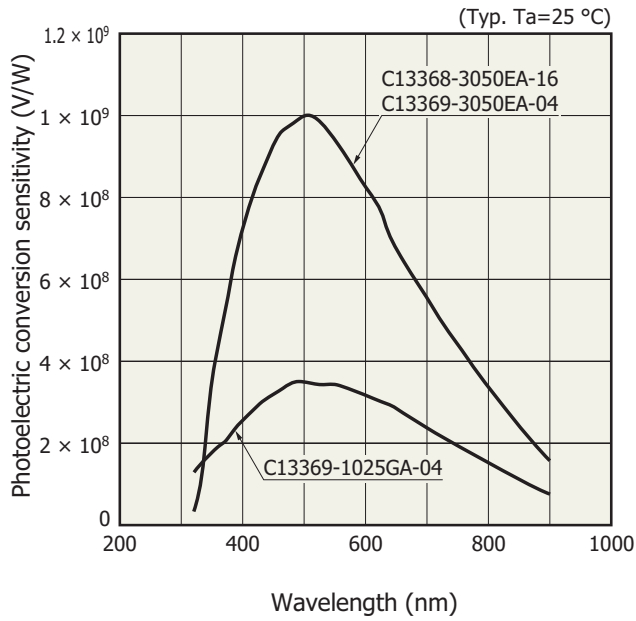
Measurement example

Analog output



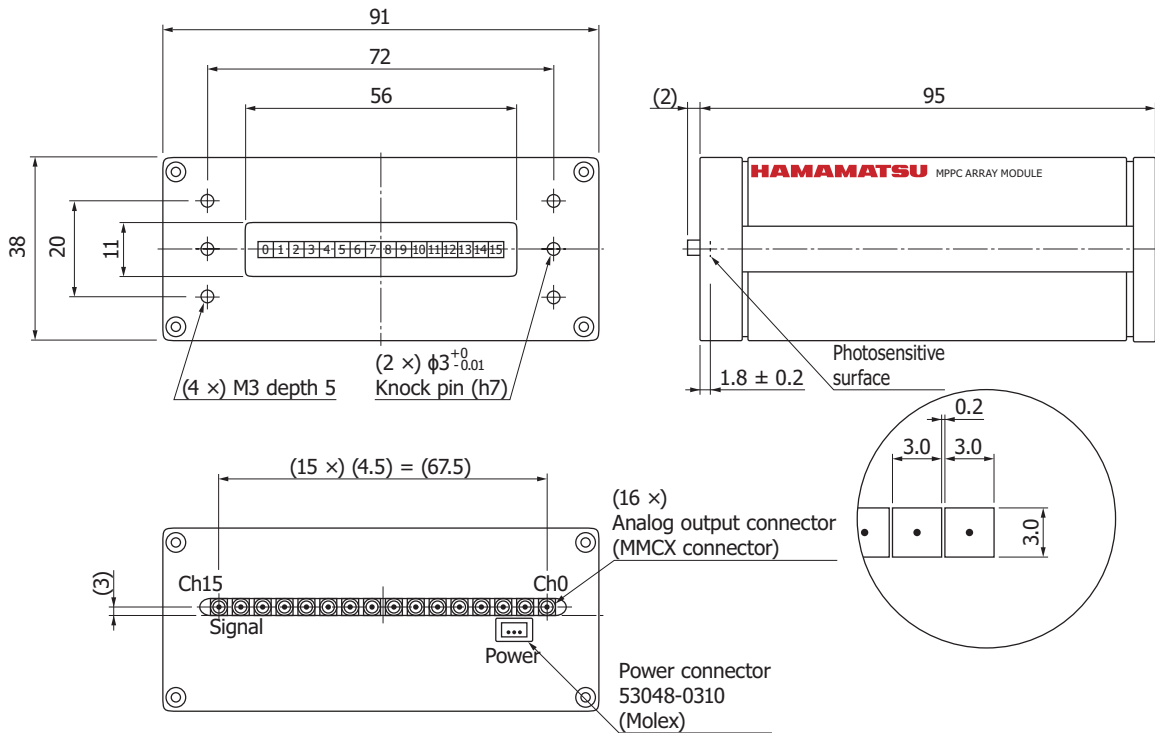
Photoelectric conversion sensitivity vs. wavelength

Linearity



Dimensional outline (unit: mm)

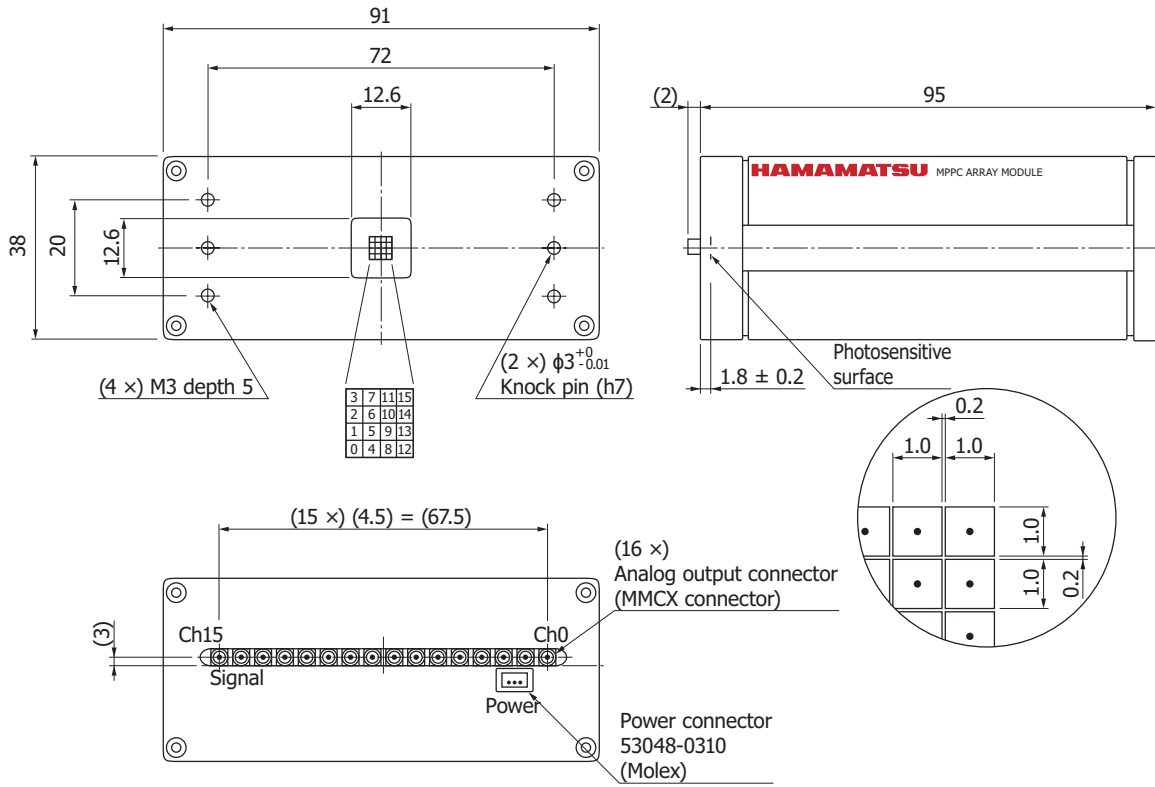
C13368-3050EA-16



Tolerance unless otherwise noted: ± 0.5
Weight: 380 g

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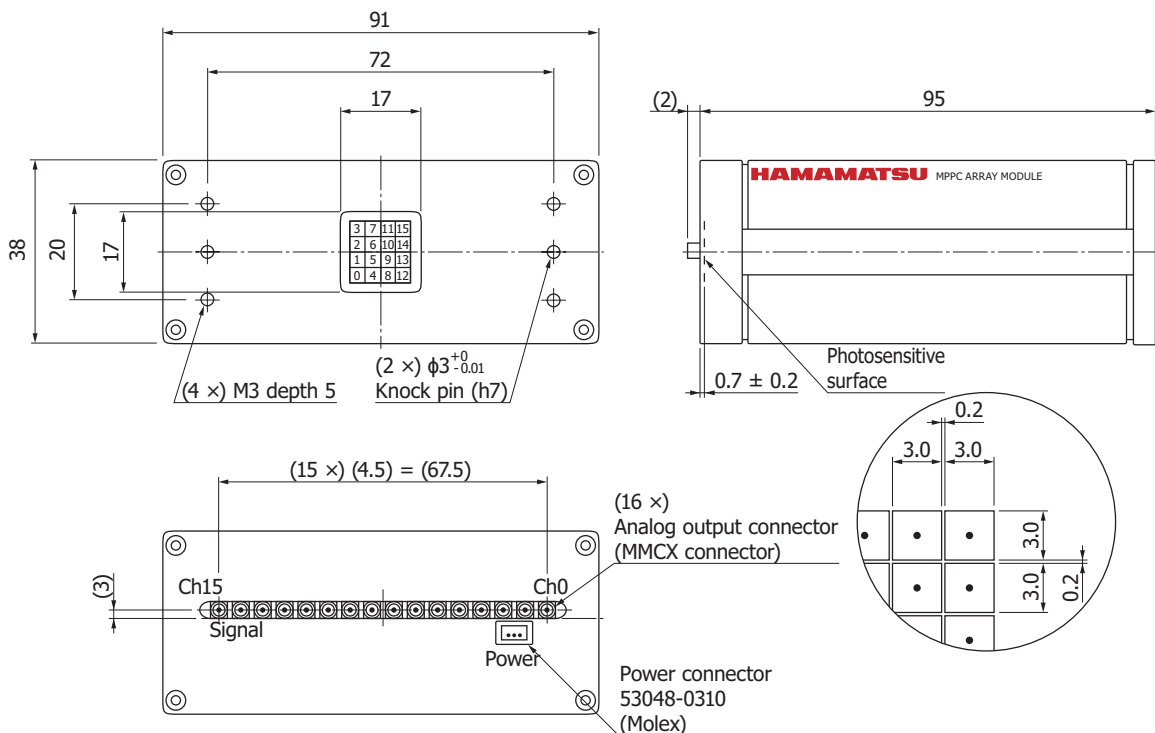
C13369-1025GA-04



Tolerance unless otherwise noted: ± 0.5
Weight: 380 g

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C13369-3050EA-04



Tolerance unless otherwise noted: ± 0.5
Weight: 380 g

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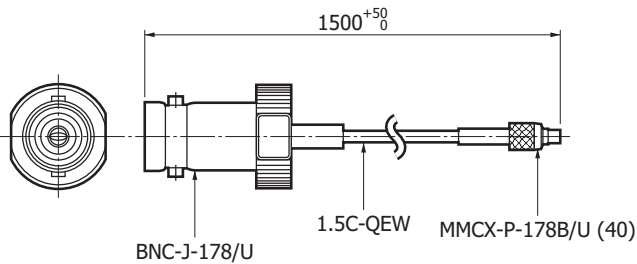
Accessories

- 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.

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 March 2020.

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HAMAMATSU

www.hamamatsu.com

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

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

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

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

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

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

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

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