



C14452 series

Optical measurement modules for low-level light detection, analog output

The C14452 series are optical measurement modules capable of detecting low-level light using its built-in MPPC for the visible to near infrared region. These modules consist of an MPPC, an amplifier, a high-voltage power supply circuit, and a temperature compensation circuit. The photosensitive area is available in two sizes of $\phi 1.5$ mm and $\phi 3$ mm, and the signal output is analog. The modules operate just by connecting them to an external power supply (± 5 V).

Features

- For the visible to near infrared region
- Low noise equivalent power
- Built-in temperature compensation circuit
- Compact and lightweight
- Analog output

Applications

- Flow cytometry
- Low-level light measurement
- Fluorescence measurement
- Analytical instrument

Structure

Parameter	Symbol	C14452-1550GA	C14452-3050GA	Unit
Effective photosensitive area	-	$\phi 1.5$	$\phi 3$	mm
Pixel pitch	-	50		μm
Number of pixels	-	724	2836	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	V_s		± 6	V
Operating temperature	T_{opr}	No dew condensation*1	-10 to +60	$^{\circ}\text{C}$
Storage temperature	T_{stg}	No dew condensation*1	-20 to +80	$^{\circ}\text{C}$

*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 ($T_a=25^{\circ}\text{C}$, $\lambda=\lambda_p$, $V_s=\pm 5$ V, unless otherwise noted)

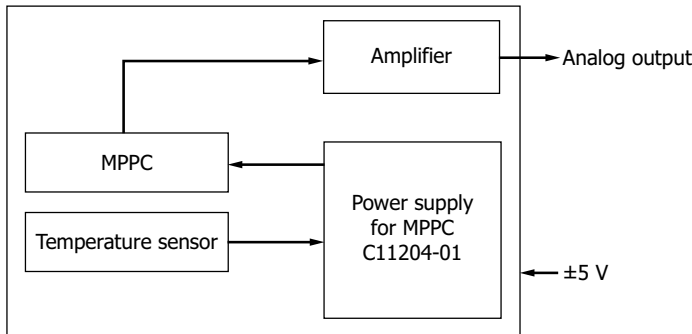
Parameter	Symbol	Condition	C14452-1550GA			C14452-3050GA			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		350 to 1000			350 to 1000			nm
Peak sensitivity wavelength	λ_p		-	600	-	-	600	-	nm
Temperature stability of output voltage	-	$T_a=25 \pm 10^{\circ}\text{C}$	-	-	± 5	-	-	± 5	%
Photoelectric conversion sensitivity	-		0.7×10^9	1.0×10^9	1.3×10^9	0.7×10^9	1.0×10^9	1.3×10^9	V/W
Cutoff frequency	High band	-3 dB, sine wave	1.4	2	-	1.4	2	-	MHz
	Low band		DC			DC			-
Rise time	t_r	10% to 90%, 1p.e.	-	5	-	-	9	-	ns
Noise equivalent power	NEP	Dark state	-	1.3	2.6	-	3	6	$\text{fW}/\text{Hz}^{1/2}$
Minimum detection limit	-	Dark state	-	2	4	-	4.3	8.6	pW rms
Maximum output voltage	-		-	4.7	-	-	4.7	-	V

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	-	+50	+250	mA
		-Vs	-	-20	-40	

*2: A power supply with 300 mA or higher output must be used.

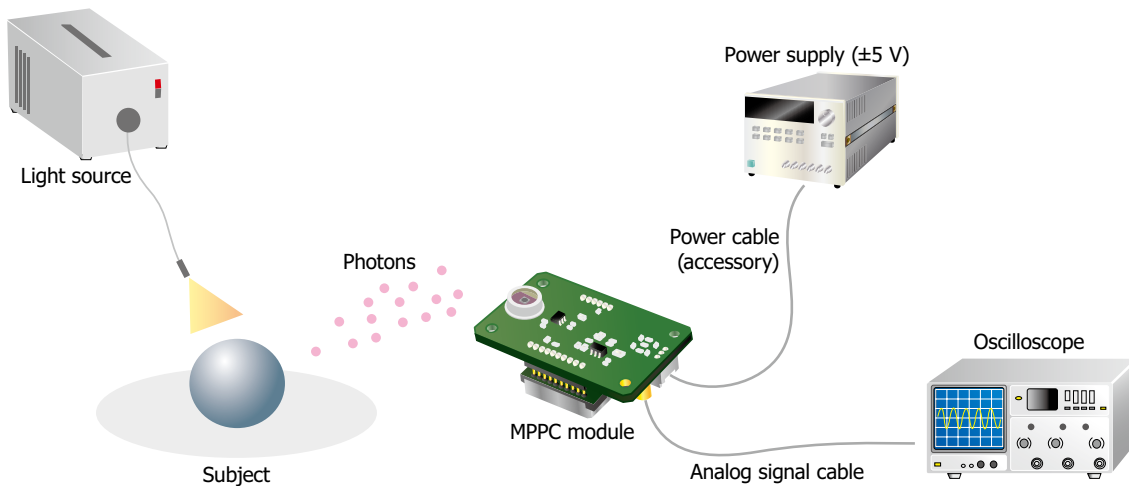
Block diagram



KACCC0675EA

Connection example

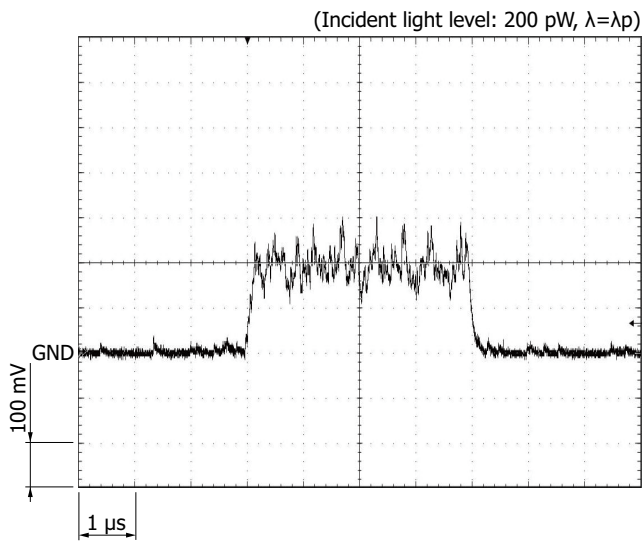
Using the supplied power cable, connect the MPPC module to a power supply. You can observe the MPPC module's output waveform by connecting the module to an oscilloscope.



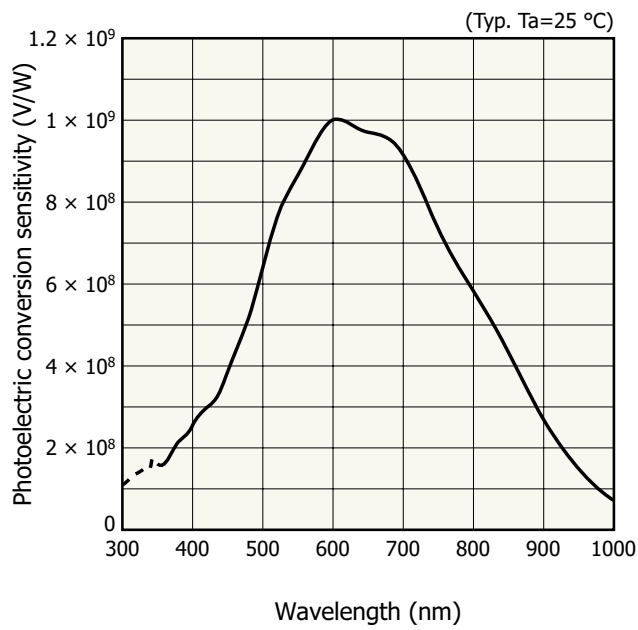
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Measurement example

Analog output

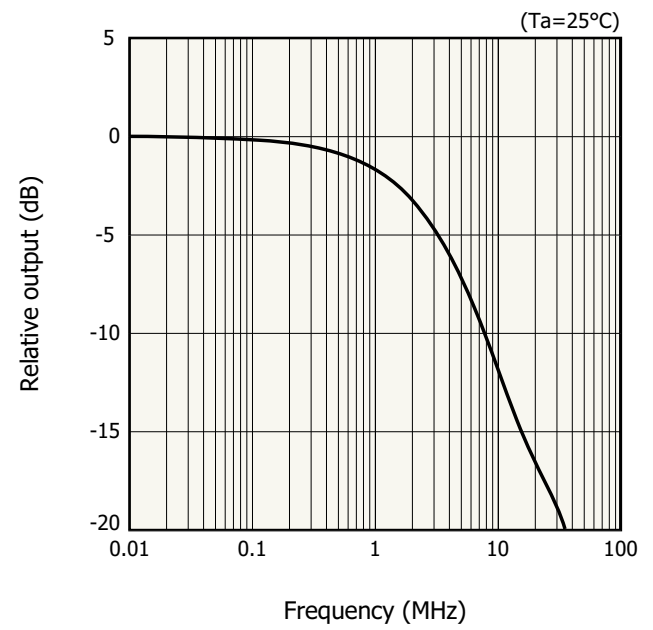


Photoelectric conversion sensitivity vs. wavelength



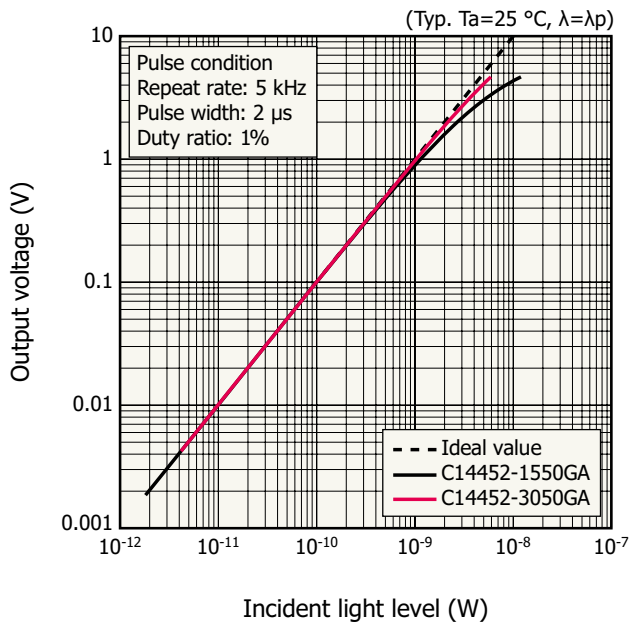
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Frequency characteristics (typical example)



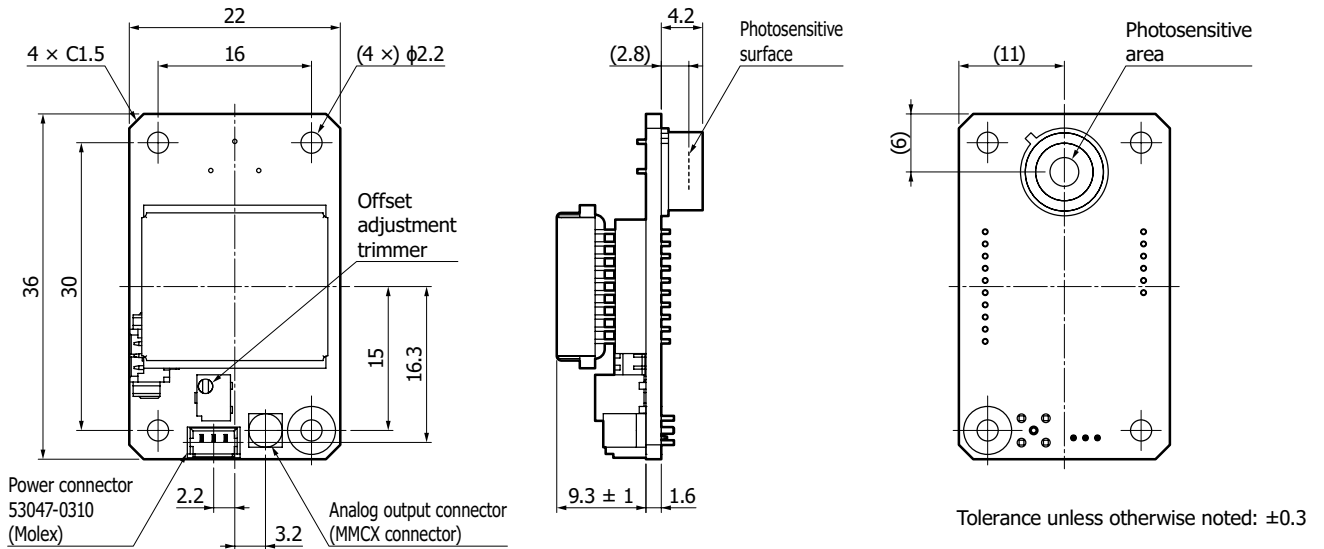
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▣ Linearity



KACCB0584EA

▣ Dimensional outline (unit: mm)



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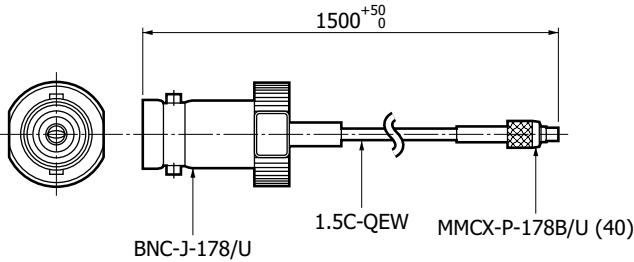
Accessories

- Power cable
- Instruction manual

Options (sold separately)

MMCX-BNC cable A12763

Dimensional outline (unit: mm)



MPPC module lineup

Type no.	Output format	Photosensitive area (mm)	Pixel pitch (μm)	Cooling
C14455-1550GA	Analog	φ1.5	50	TE-cooled
C14455-3050GA		φ3		
C14455-1550GD	Digital	φ1.5		TE-cooled
C14455-3050GD		φ3		

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 May 2022.

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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, NJ 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, 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, UK, 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, 20044 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.: 1201 Tower B, Jiaming Center, 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, Section 2, 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