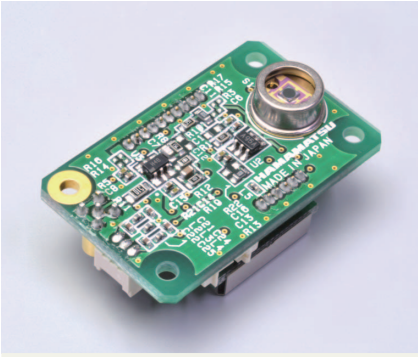
HAMAMATSU
PHOTON IS OUR BUSINESS

NEW

MPPC® modules

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 ϕ1.5 mm and ϕ3 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	-	ϕ1.5	ϕ3	mm
Pixel pitch	-	50		μm
Number of pixels	-	724	2836	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Supply voltage	Vs		±6	V
Operating temperature	Topr	No dew condensation*1	-10 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)

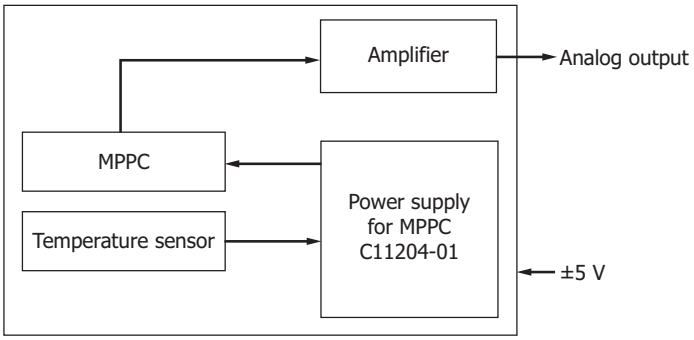
Parameter		Symbol	Condition	C14452-1550GA			C14452-3050GA			Unit
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range		λ		350 to 1000			350 to 1000			nm
Peak sensitivity wavelength		λp		-	600	-	-	600	-	nm
Temperature stability of output voltage		-	Ta=25 ± 10 °C	-	-	±5	-	-	±5	%
Photoelectric conversion 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	fc	-3 dB, sine wave	1.4	2	-	1.4	2	-	MHz
	Low band			DC			DC			-
Rise time		tr	10% to 90%, 1p.e.	-	5	-	-	9	-	ns
Noise equivalent power		NEP	Dark state	-	1.3	2.6	-	3	6	$fW/Hz^{1/2}$
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.

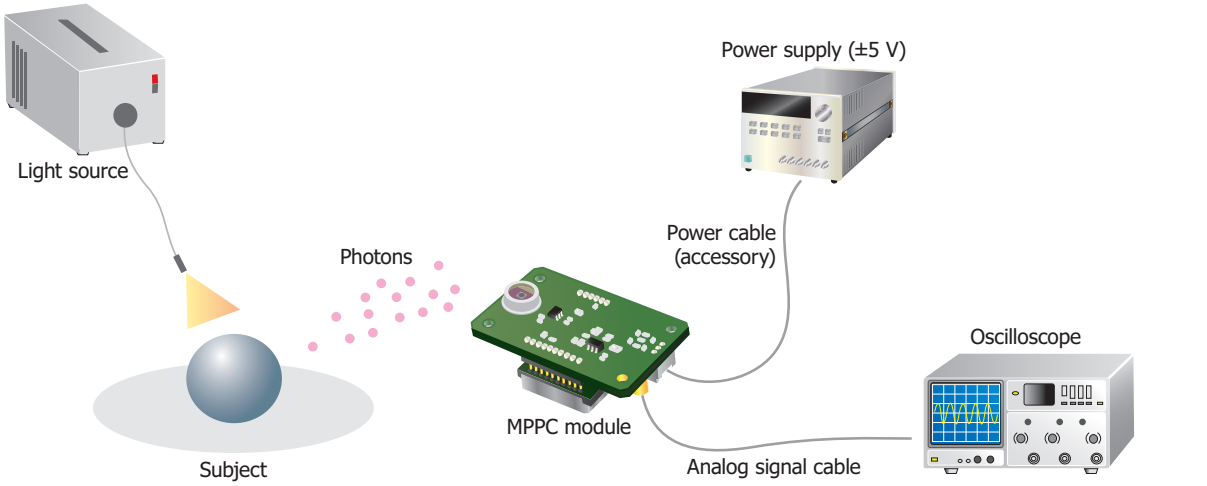
Block diagram



KACCC0675EA

Connection example

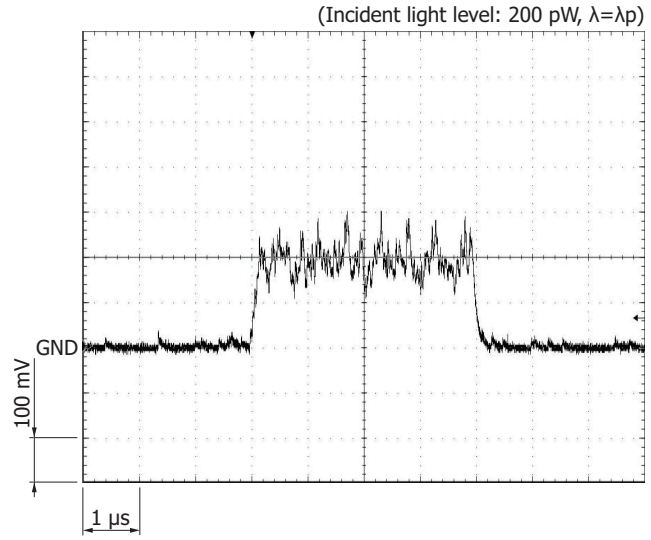
Using the supplied power cable, connect the MPPC module to a power supply. You can observe the MPPC module's output waveform by connecting the module to an oscilloscope.



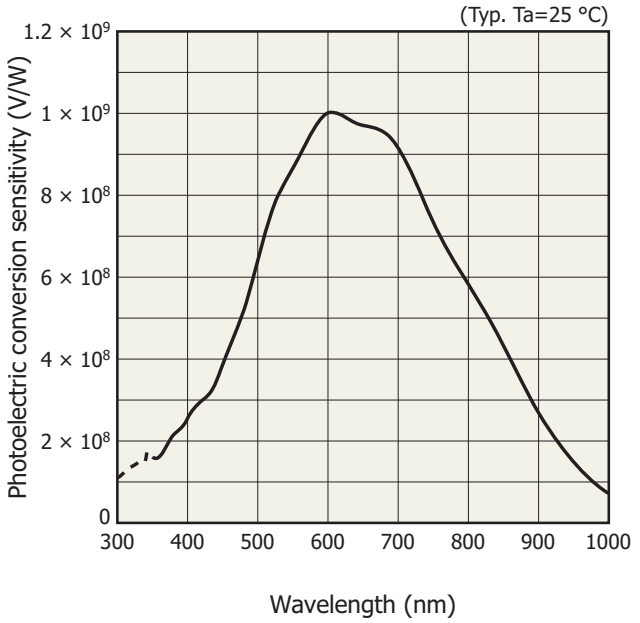
KACCC1001EA

Measurement example

Analog output

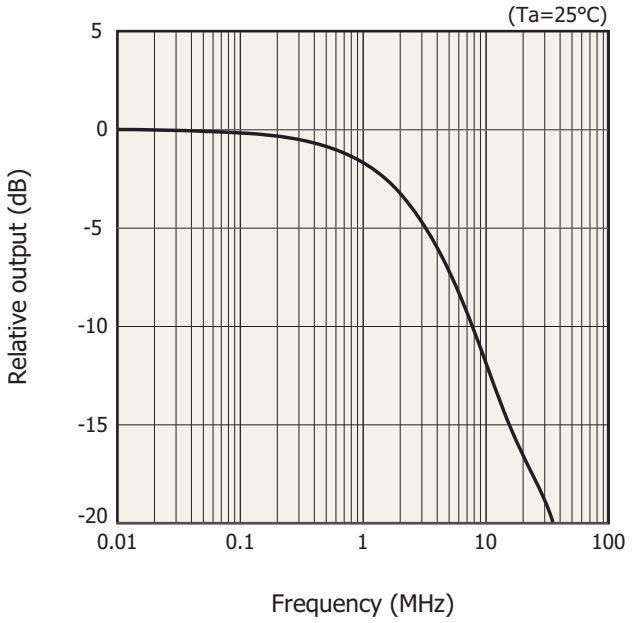


Photoelectric conversion sensitivity vs. wavelength



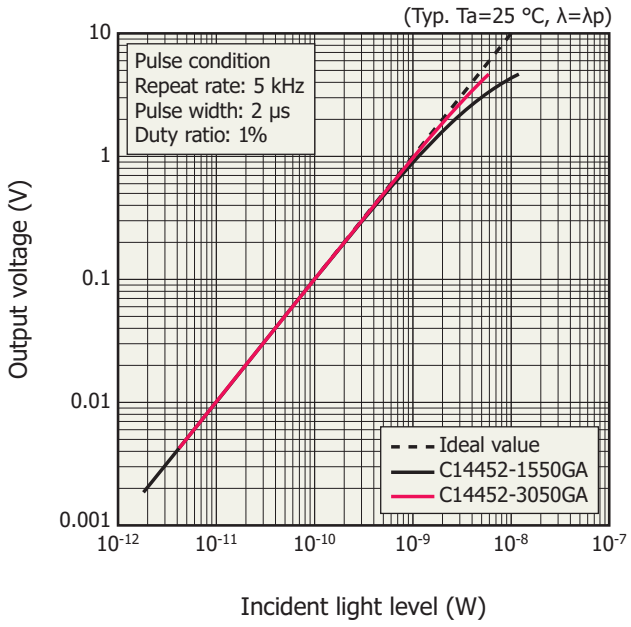
KACCB0536EA

Frequency characteristics (typical example)



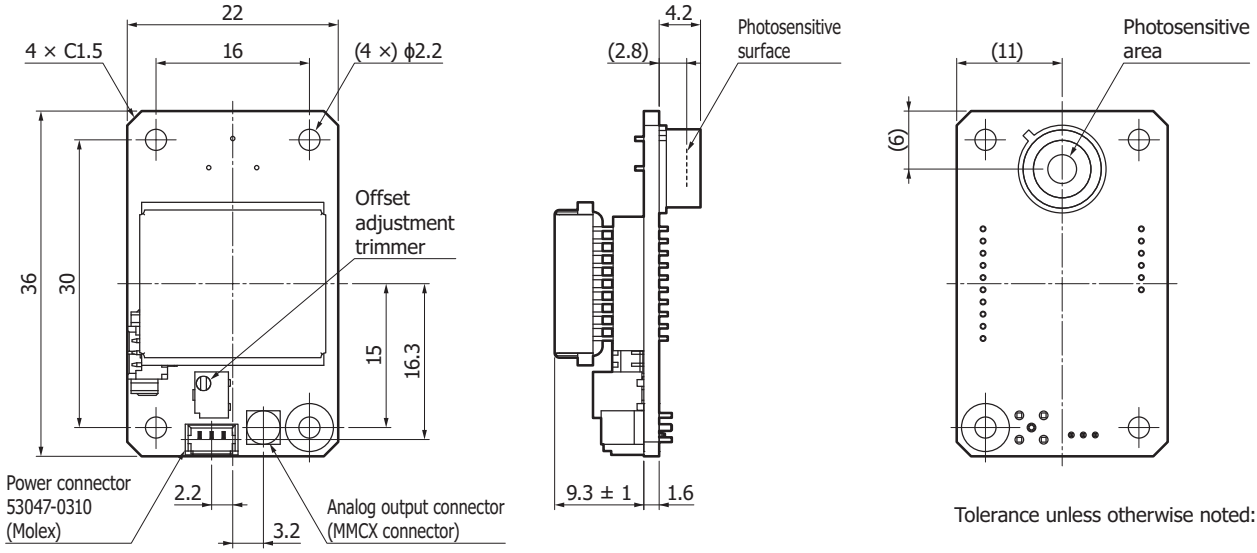
KACCB0590EA

Linearity



KACCB0584EA

Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.3

KACCA0420EB

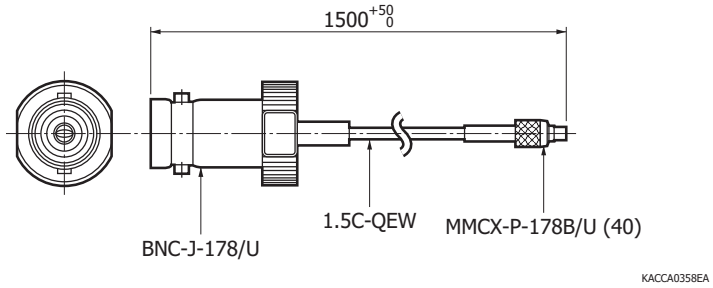
Accessories

· 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

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

Cat. No. KACC1267E01 Mar. 2020 DN