

C13365 series

**Optical measurement modules for low-level-light detection,
Analog output**

The C13365 series are optical measurement modules capable of detecting low level light. These modules consist of an MPPC, a signal amplifier circuit, a high-voltage power supply circuit, and a temperature compensation circuit. The photosensitive area is available in two sizes of 1.3 × 1.3 mm and 3 × 3 mm, and the signal output is analog. Modules operate just by connecting them to an external power supply (±5 V).

Features

- ➔ Built-in MPPC (new product) for precision measurement
- ➔ High sensitivity in the short wavelength range
- ➔ 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	C13365-1350SA	C13365-3050SA	Unit
Effective photosensitive area	-	1.3 × 1.3	3 × 3	mm
Pixel pitch	-	50		µm
Number of pixels	-	667	3600	-

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 (Typ. Ta=25 °C, λ=λp, Vs=±5 V, unless otherwise noted)

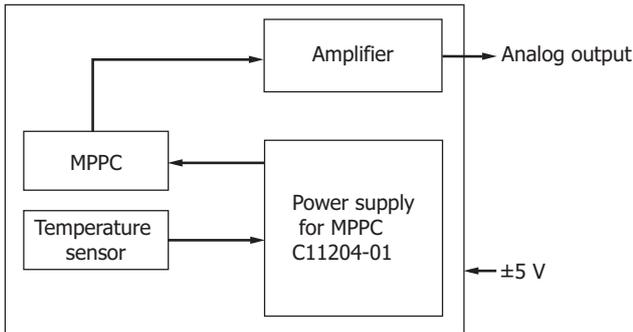
Parameter	Symbol	Condition	C13365-1350SA			C13365-3050SA			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		270 to 900			270 to 900			nm
Peak sensitivity wavelength	λp		-	500	-	-	500	-	nm
Temperature stability of output voltage	-	Ta=25 ± 10 °C	-	-	±5	-	-	±5	%
Photoelectric sensitivity	-		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	3.5	5	-	3.5	5	-	MHz
	Low band		DC			DC			-
Rise time	tr	10% to 90%, 1 p.e.	-	5	-	-	9	-	ns
Noise equivalent power	NEP	Dark state	-	0.5	1.0	-	1.2	2.0	fW/Hz ^{1/2}
Minimum detection limit	-	Dark state	-	1	2	-	2.7	4.5	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.

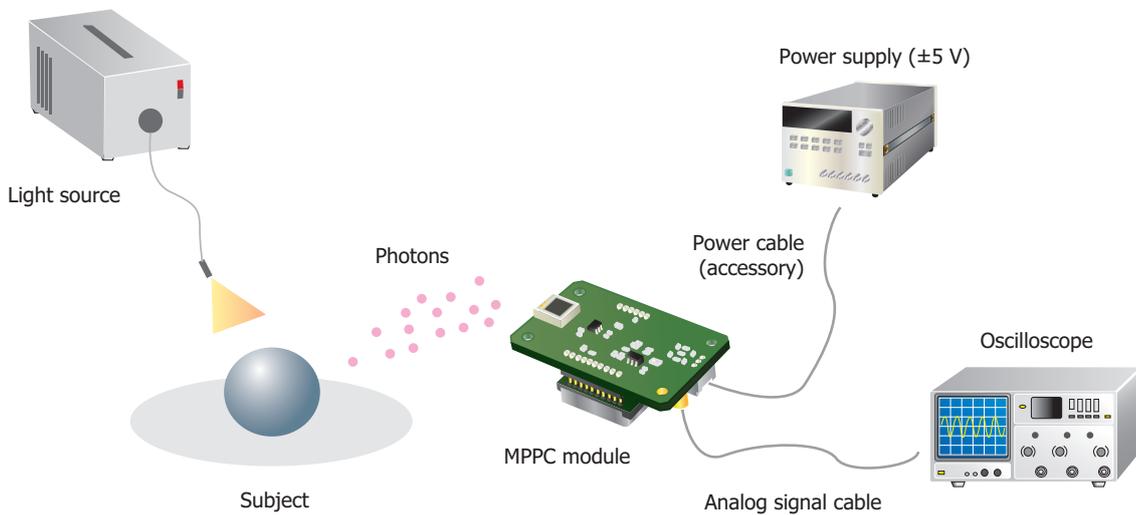
Block diagram



KACCC0675EA

Connection example

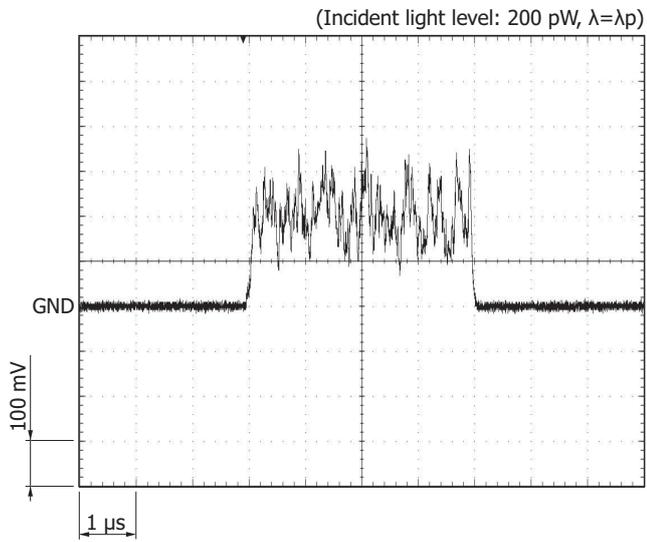
Using the supplied power cable, connect the MPPC module to a power supply. You can monitor the output waveform by connecting the MPPC module to an oscilloscope.



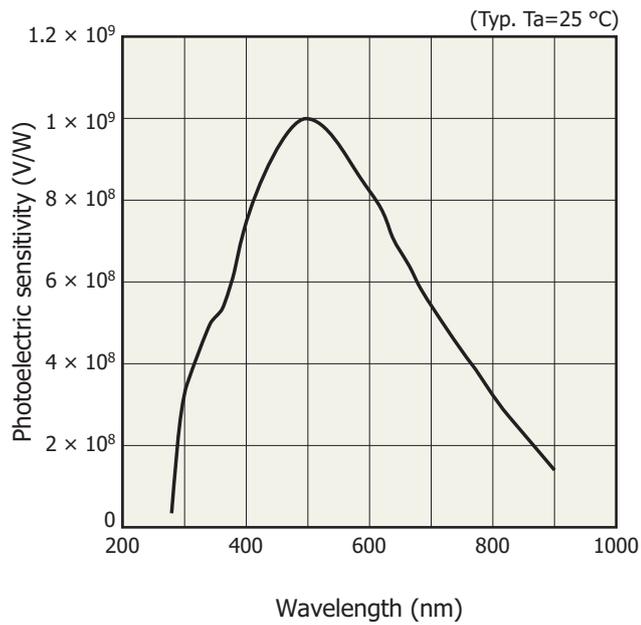
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Measurement example

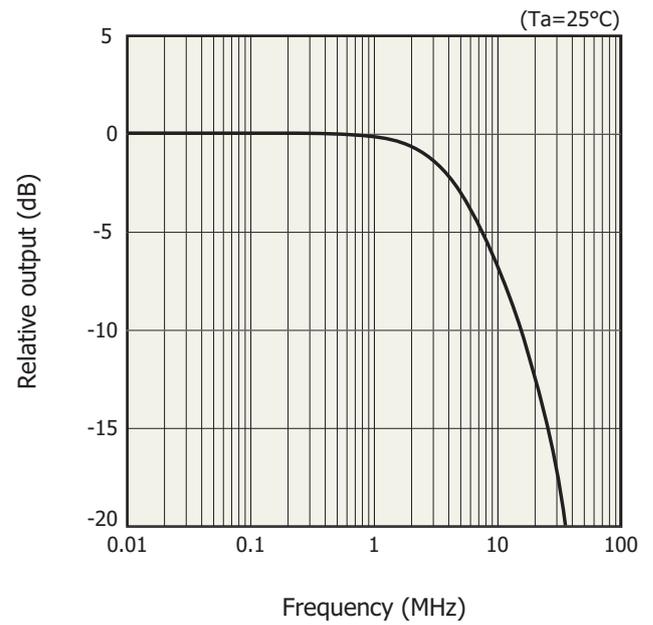
Analog output



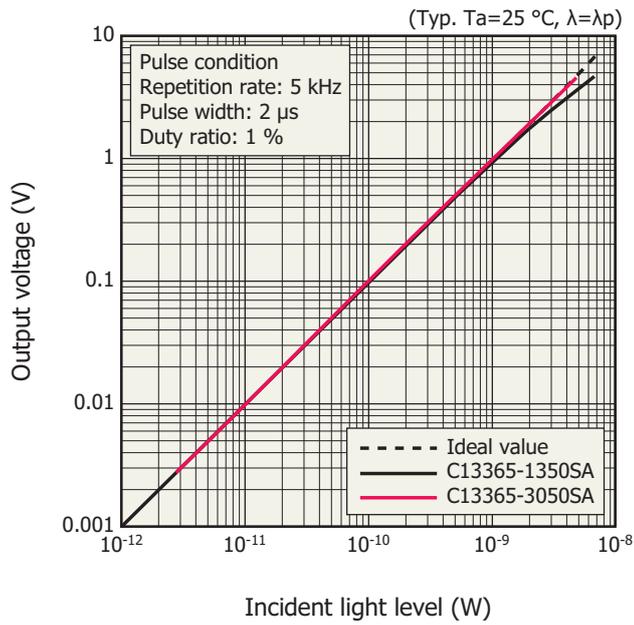
Photoelectric sensitivity vs. wavelength



Frequency response (typical example)



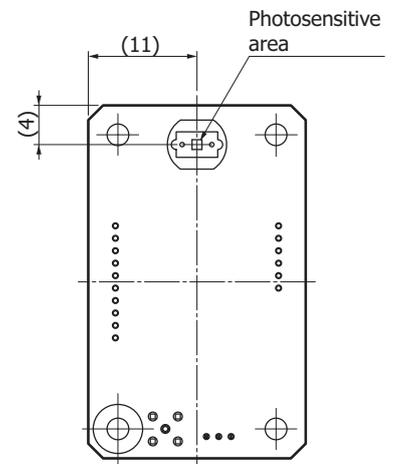
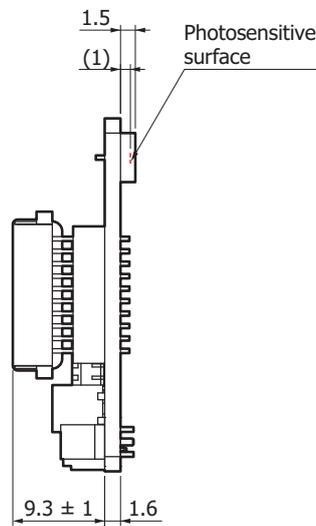
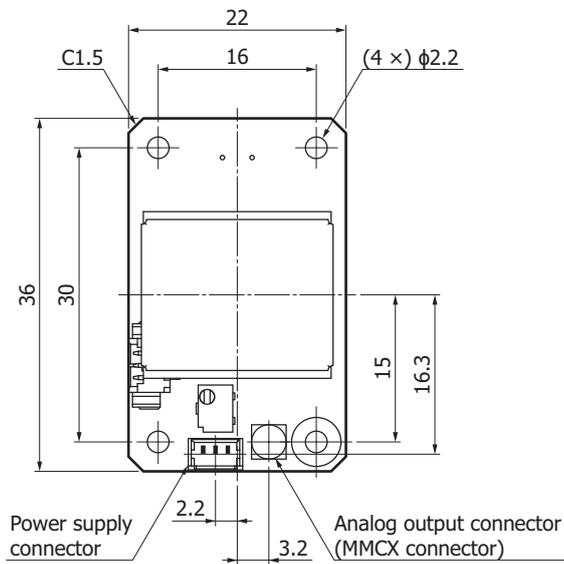
Linearity



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Dimensional outlines (unit: mm)

C13365-1350SA



Tolerance unless otherwise noted: ± 0.3
 Weight: 8 g

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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 January, 2016.

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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

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8

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

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

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39) 02-93581733, Fax: (39) 02-93581741

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866