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MPPC® modules

GA type | C13366 series

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

The C13366 series (GA type) are optical measurement modules capable of detecting low level light. These modules consist of a thermoelectrically cooled MPPC, a signal amplifier circuit, a high-voltage power supply circuit, and a temperature control 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 TE-cooled MPPC [MPPC for precision measurement (new product)]**
- **High sensitivity in the short wavelength range**
- **Low noise equivalent power**
- **Built-in temperature control function**
- **Analog output**

Applications

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

Structure

Parameter	Symbol	C13366-1350GA	C13366-3050GA	Unit
Internal MPPC	-	S13362-1350DG	S13362-3050DG	-
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	-10 to +40	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +70	°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)

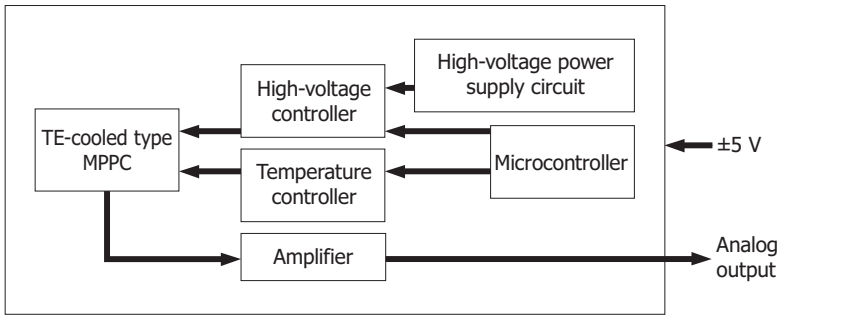
Parameter		Symbol	Condition	C13366-1350GA			C13366-3050GA			Unit
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range		λ		320 to 900			320 to 900			nm
Peak sensitivity wavelength		λp		-	500	-	-	500	-	nm
Element temperature (setting temperature)		Td		-	-20	-	-	-20	-	°C
Photoelectric sensitivity		-		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	fc	-3 dB, sine wave	3	4	-	3	4	-	MHz
	Low band			DC			DC			-
Rise time		tr	10 % to 90%, 1.p.e.	-	5	-	-	9	-	ns
Noise equivalent power		NEP	Dark state	-	0.1	0.2	-	0.15	0.3	$fW/Hz^{1/2}$
Minimum detection limit		-	Dark state	-	0.25	0.5	-	0.35	0.7	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	-	+200	+1000	mA
		-Vs	-	-20	-40	

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

Block diagram



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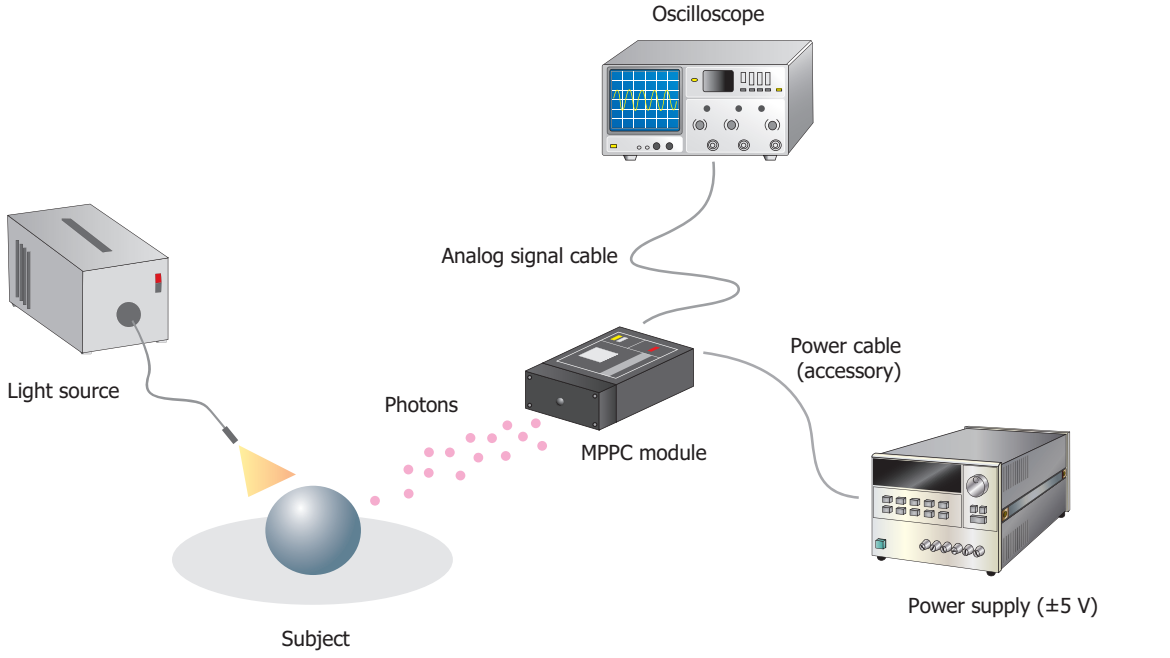
Connection example

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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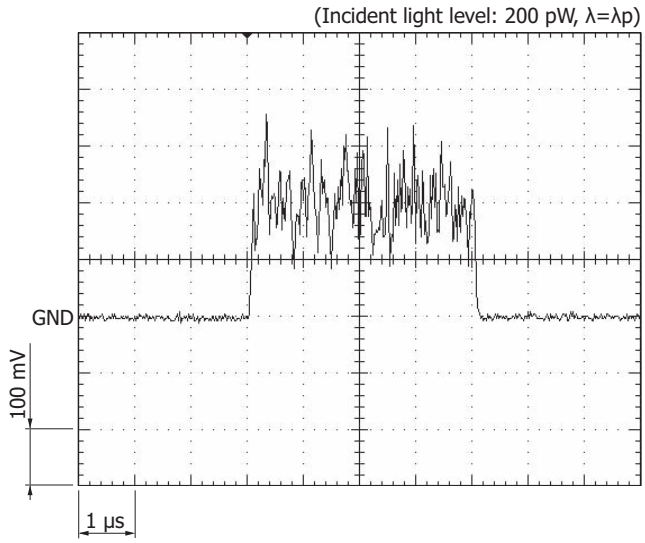
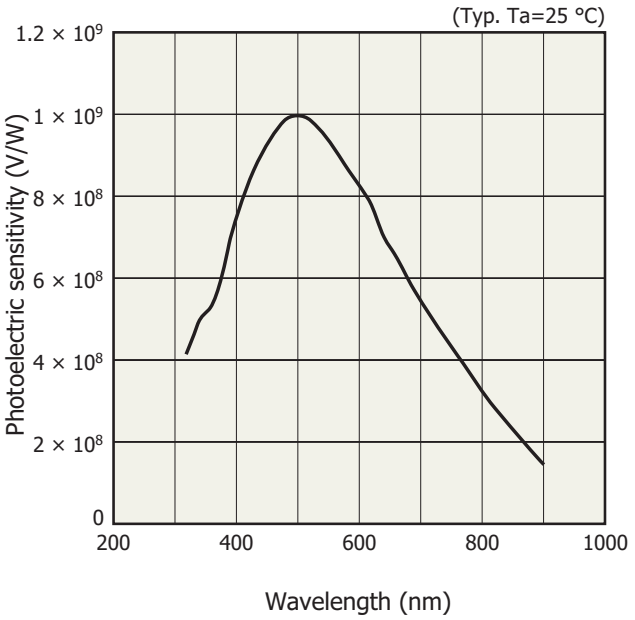
Measurement example

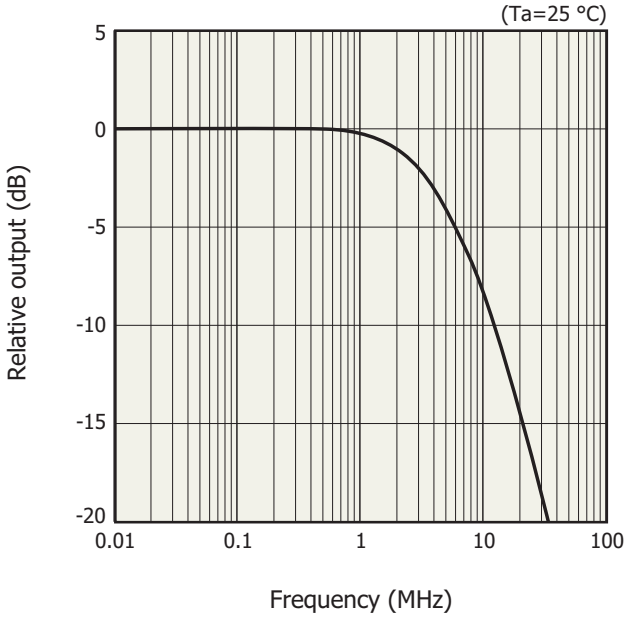
Analog output



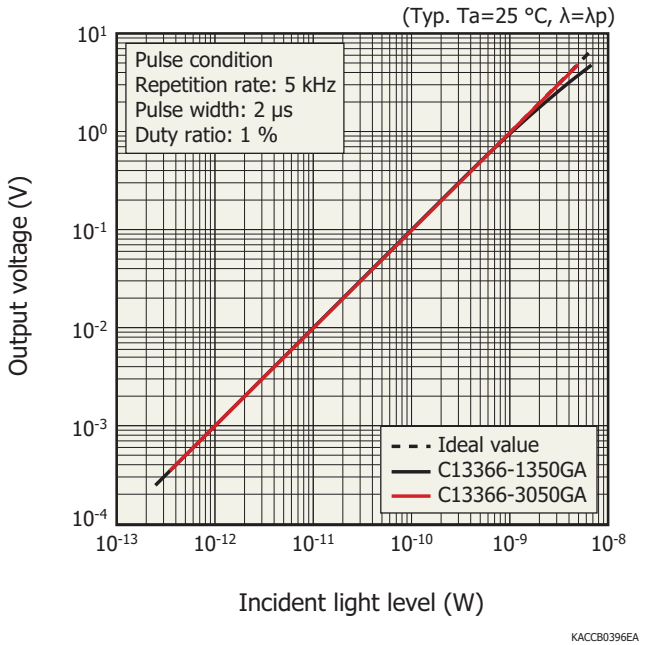
Photoelectric sensitivity vs. wavelength



Frequency response (typical example)



Linearity



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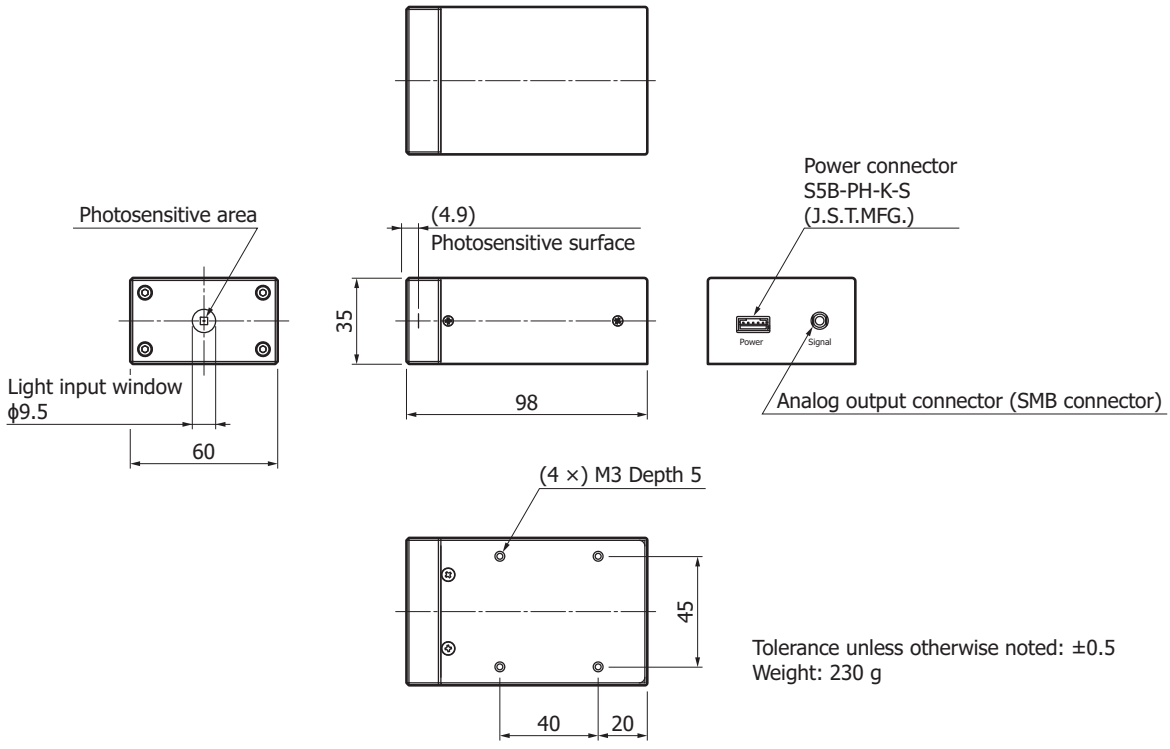
Dimensional outline (unit: mm)



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Accessories

· Power cable
· Instruction manual

Options (sold separately)

Coaxial converter adapter A10613 series

The A10613 series is a coaxial adapter that converts the SMB coaxial connector for signal-output on the MPPC module to a BNC or SMA coaxial connector. This adapter allows connecting a BNC or SMA cable to the MPPC module.

A10613-01 (SMB-BNC)

A10613-02 (SMB-SMA)

Precautions

· For cleaning the product, wipe using a clean, soft, dry cloth. Do not use organic solvents such as thinner and acetone.
· Do not cover the product with a dark cloth or something similar while the product is running. Covering it can cause the internal temperature to rise and cause abnormal operation.

Lineup of MPPC modules

Type no.	Output	Effective photosensitive area (mm)	Pixel pitch (µm)	Cooling
C13365-1350SA	Analog	1.3 × 1.3	50	Non-cooled
C13365-3050SA		3 × 3		
C13366-1350GA	Analog	1.3 × 1.3		TE-cooled
C13366-3050GA		3 × 3		
C13366-1350GD	Digital	1.3 × 1.3		TE-cooled
C13366-3050GD		3 × 3		

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer

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