

# MPPC® modules

C13367 series



## Optical measurement modules for low-level light detection, flexible cable type, analog output

The C13367 series are optical measurement modules that can detect low-level light. It has a built-in MPPC with a flexible cable. 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 three sizes: 1.3 × 1.3 mm, 3 × 3 mm, 6 × 6 mm. The signal output is analog. The modules operate just by connecting them to an external power supply (±5 V).

### Features

- Equipped with an MPPC with a flexible cable (for precision measurement)  
The flexible cable makes it easy to arrange the MPPC.
- Built-in MPPC 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 instruments

### Structure

Parameter	Symbol	C13367-1350EA	C13367-3050EA	C13367-6050EA	Unit
Effective photosensitive area	-	1.3 × 1.3	3 × 3	6 × 6	mm
Pixel pitch	-	50			μm
Number of pixels	-	667	3600	14400	-

### Absolute maximum ratings

Parameter	Symbol	Condition	Values	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)

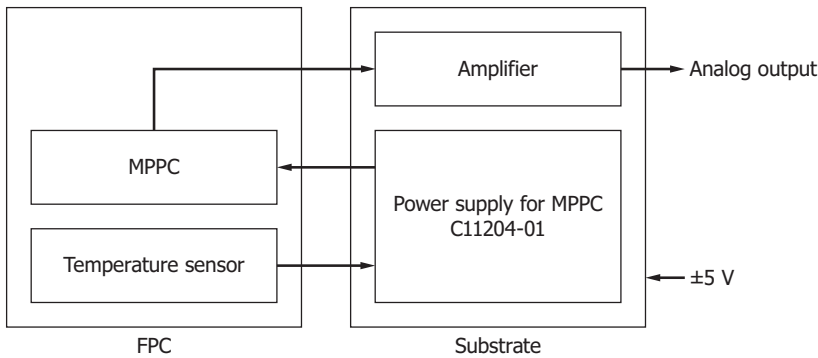
Parameter	Symbol	Condition	C13367-1350EA			C13367-3050EA			C13367-6050EA			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		320 to 900			320 to 900			320 to 900			nm
Peak sensitivity wavelength	λp		-	500	-	-	500	-	-	500	-	nm
Temperature stability of output voltage	-	Ta=25 ± 10 °C	-	-	±5	-	-	±5	-	-	±5	%
Photoelectric sensitivity	-		0.7 × 10 <sup>9</sup>	1.0 × 10 <sup>9</sup>	1.3 × 10 <sup>9</sup>	0.7 × 10 <sup>9</sup>	1.0 × 10 <sup>9</sup>	1.3 × 10 <sup>9</sup>	0.7 × 10 <sup>9</sup>	1.0 × 10 <sup>9</sup>	1.3 × 10 <sup>9</sup>	V/W
Cutoff frequency	High band	-3 dB, sine wave	3.5	5	-	3.5	5	-	2.5	3.5	-	MHz
	Low band		DC			DC			DC			-
Noise equivalent power	NEP	Dark state	-	0.5	1.0	-	1.2	2.0	-	2.3	4.6	fW/Hz <sup>1/2</sup>
Minimum detection limit	-	Dark state	-	1	2	-	2.7	4.5	-	4.3	8.6	pW rms
Maximum output voltage	-		-	4.7	-	-	4.7	-	-	4.7	-	V

## Electrical characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply voltage*	+Vs		+4.75	+5	+5.25	V
	-Vs		-4.75	-5	-5.25	
Current consumption	Ic	+Vs	-	+50	+250	mA
		-Vs	-	-20	-40	

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

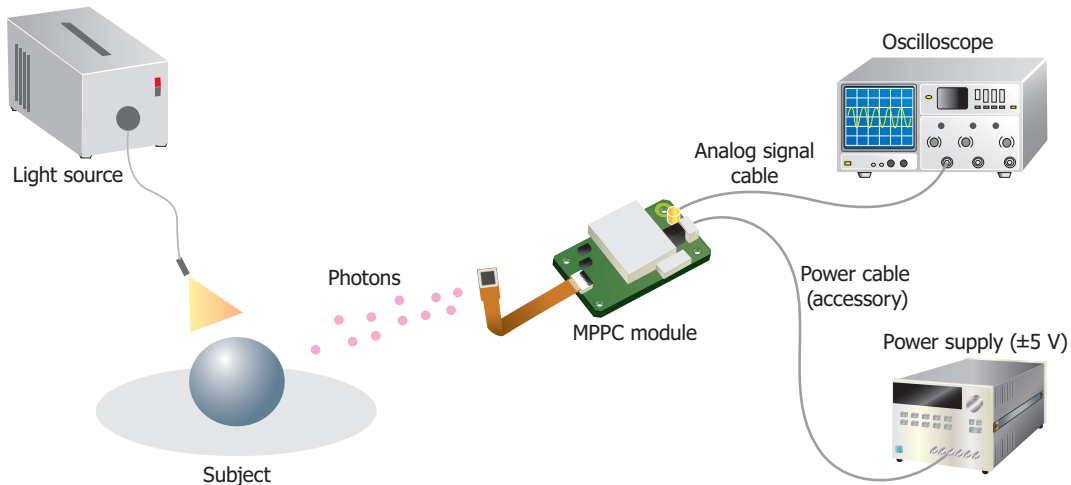
## Block diagram



KACCC0929EA

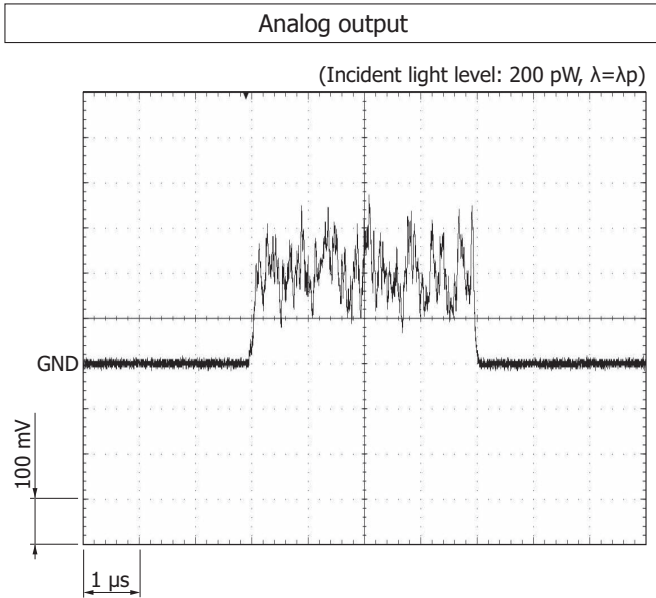
## Connection example

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.

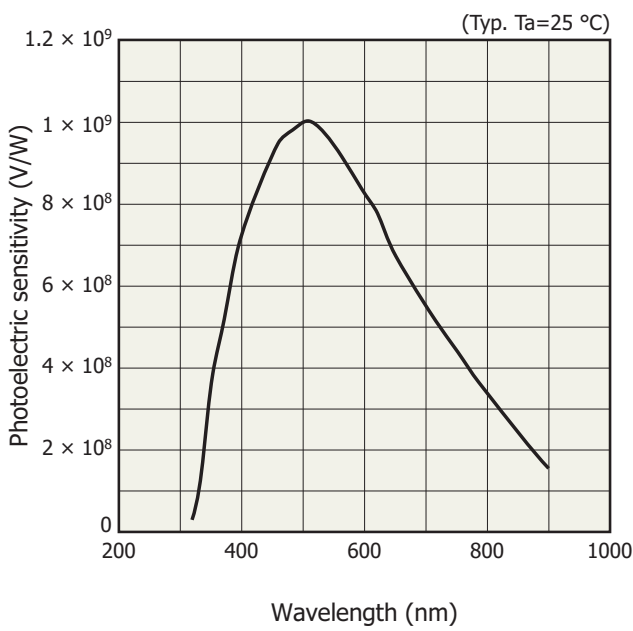


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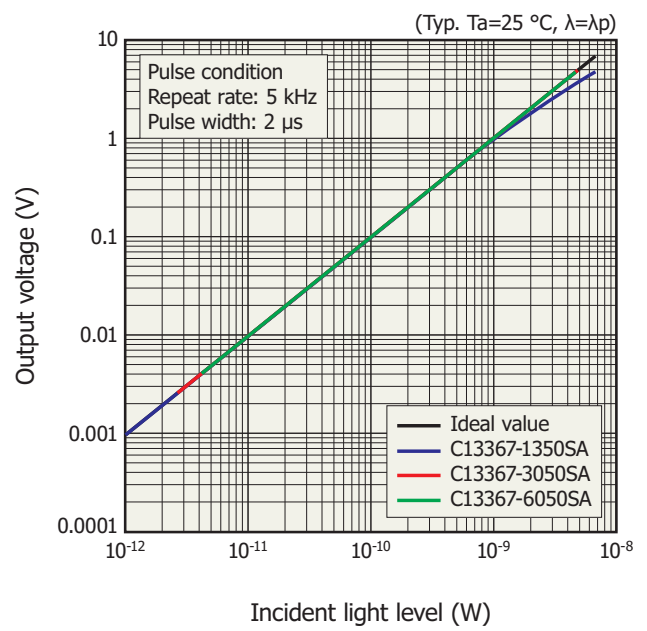
**Measurement example**



**Photoelectric sensitivity vs. wavelength**

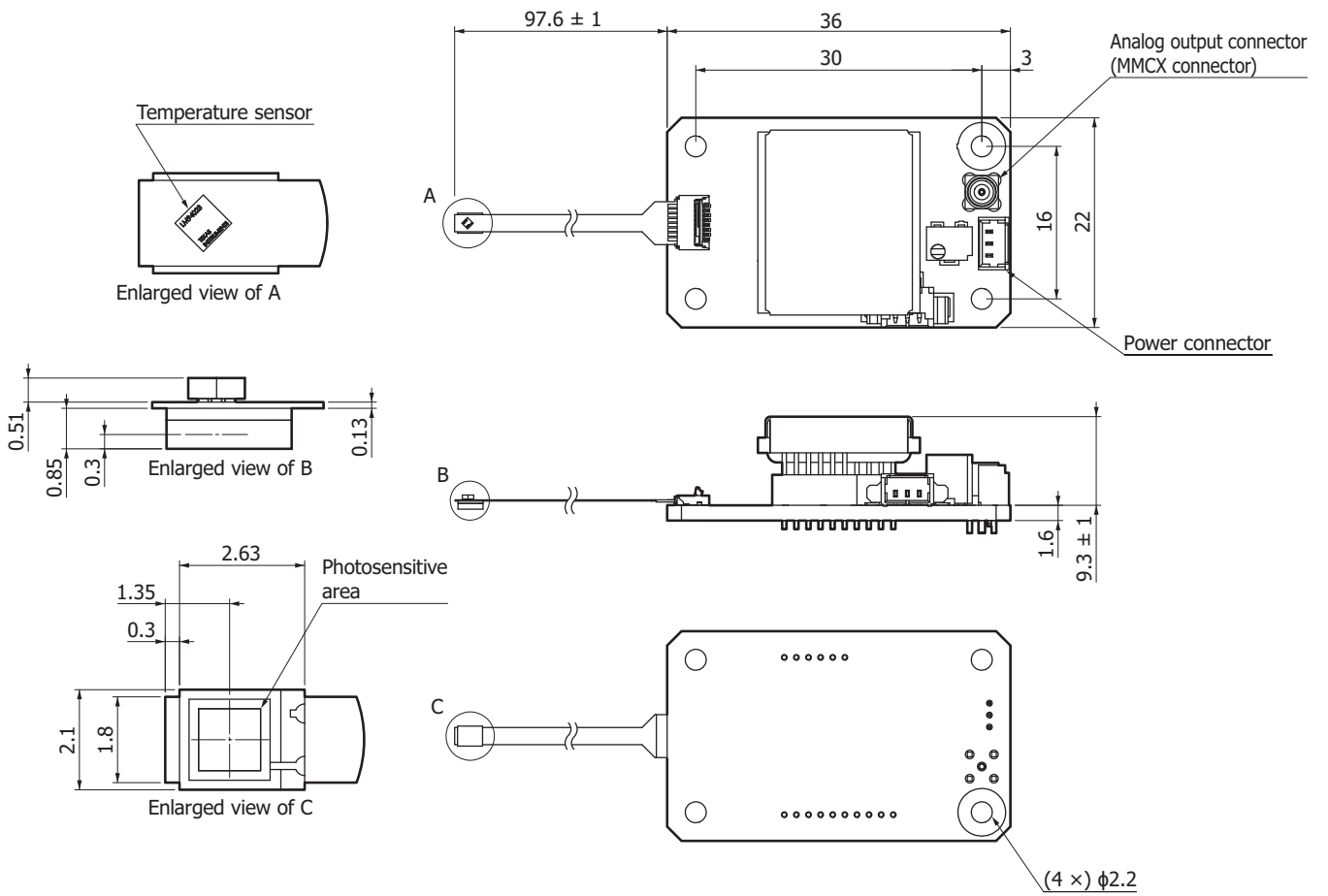


**Linearity**



**Dimensional outlines (unit: mm)**

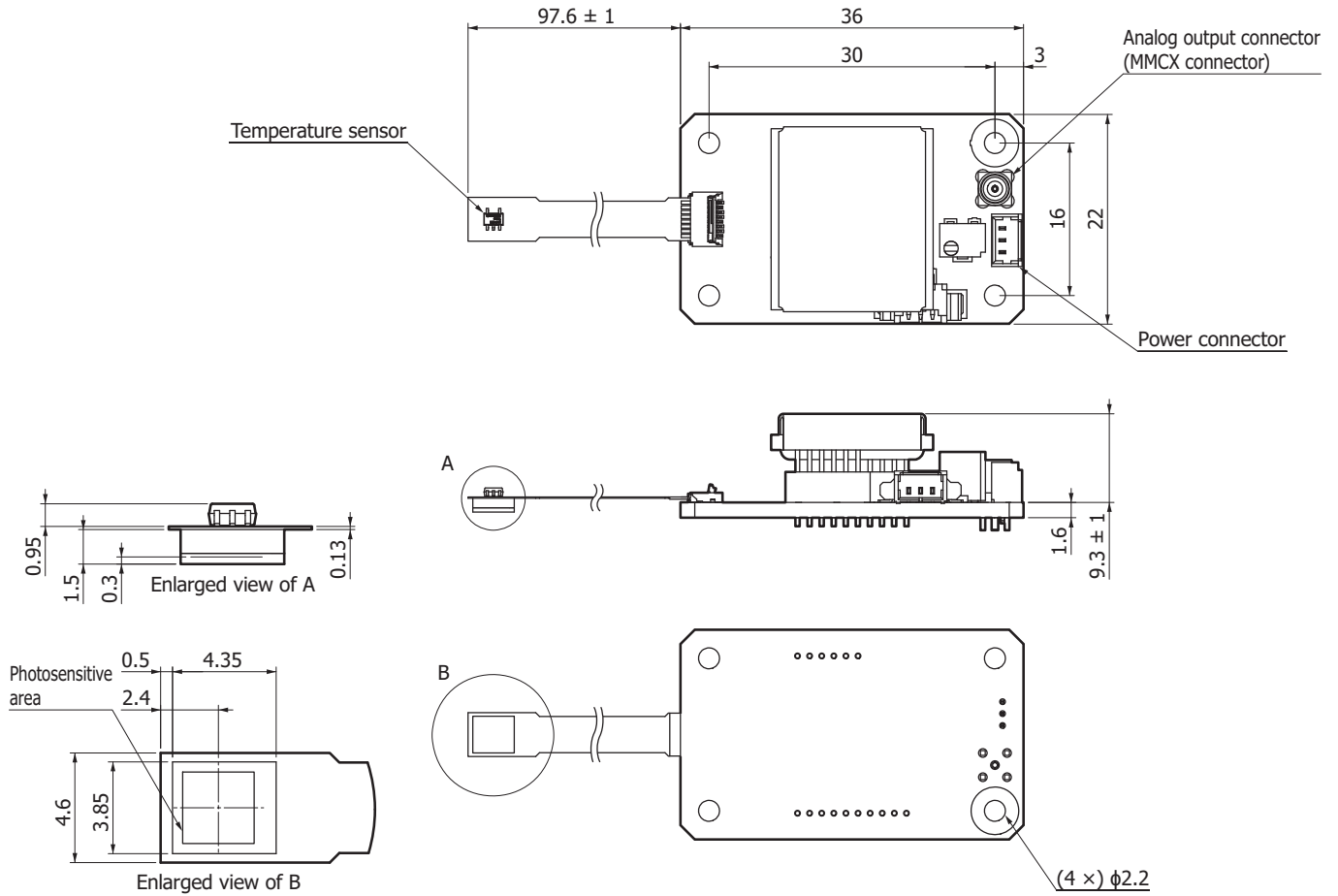
C13367-1350EA



Tolerance unless otherwise noted:  $\pm 0.3$

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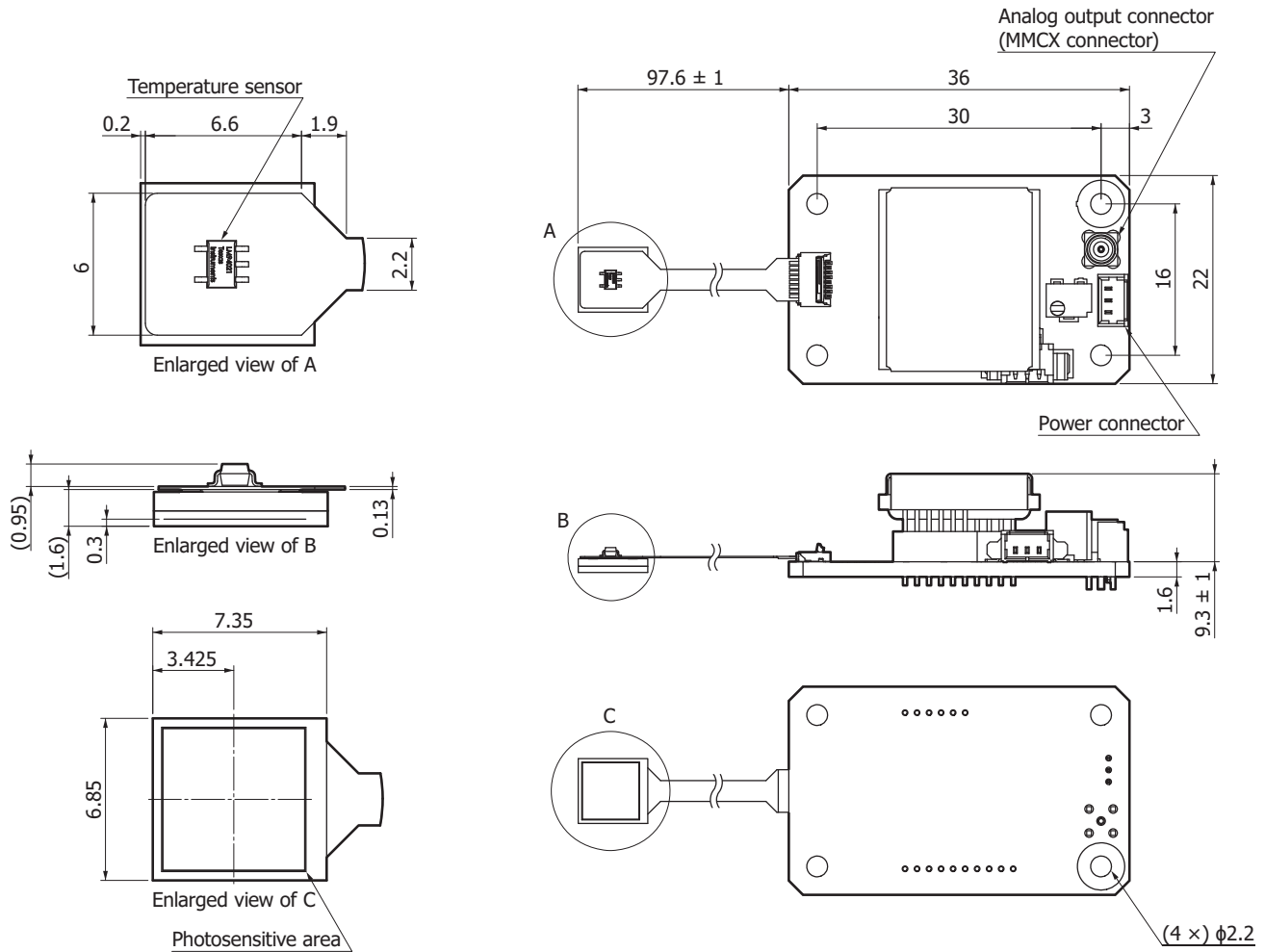
C13367-3050EA



Tolerance unless otherwise noted:  $\pm 0.3$

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C13367-6050EA



Tolerance unless otherwise noted: ±0.3

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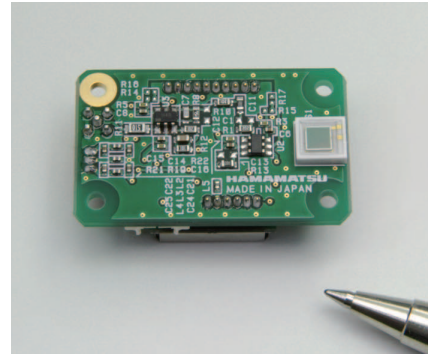
**Accessories**

- Power cable
- Instruction manual

## Related products

### MPPC module C13365 series

The C13365 series are optical measurement modules with an MPPC that can detect low-level light. These modules consist of an MPPC, an amplifier, a high-voltage power supply circuit, and a temperature compensation circuit. The signal output is analog. The MPPC of the C13367 series has a flexible cable, but that of the C13365 series is mounted on the circuit board.



## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

- Precautions
- Disclaimer

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