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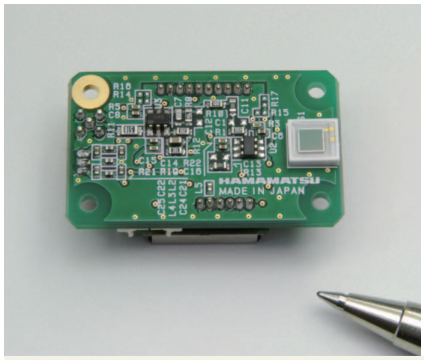
MPPC® modules



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)

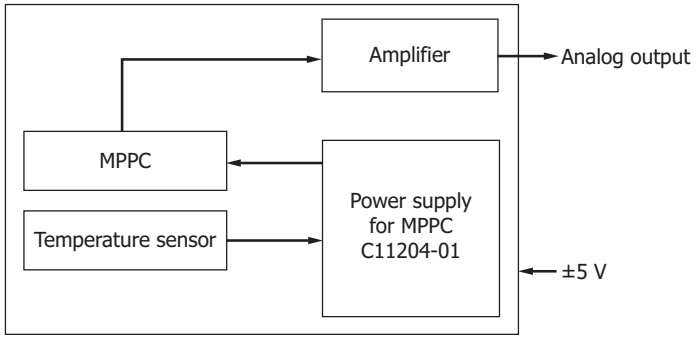
Parameter		Symbol	Condition	C13365-1350SA			C13365-3050SA			Unit
				Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range		λ		270 to 900			270 to 900			nm
Peak sensitivity wavelength		λp		-	500	-	-	500	-	nm
Temperature stability of output voltage		-	Ta=25 ± 10 °C	-	-	±5	-	-	±5	%
Photoelectric sensitivity		-		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	fc	-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



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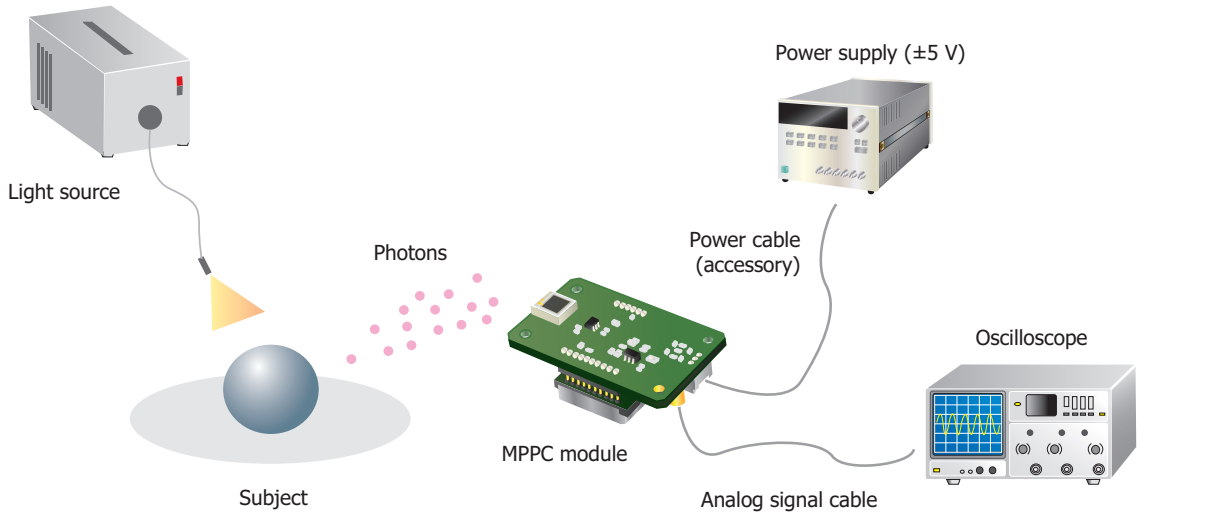
Connection example

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 osilloscope.



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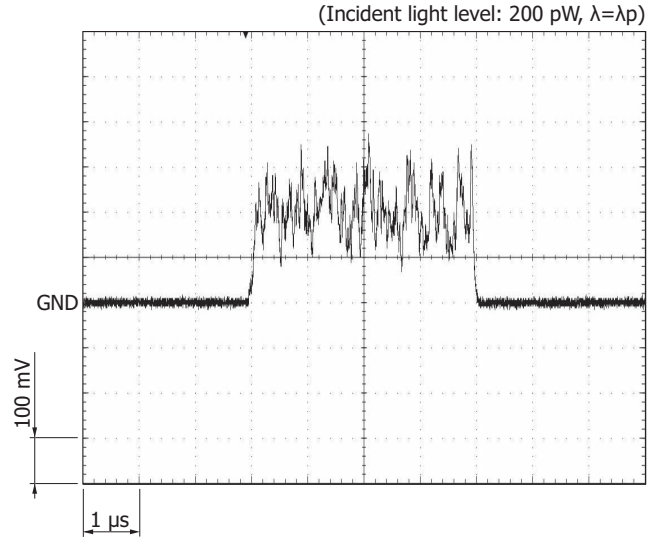
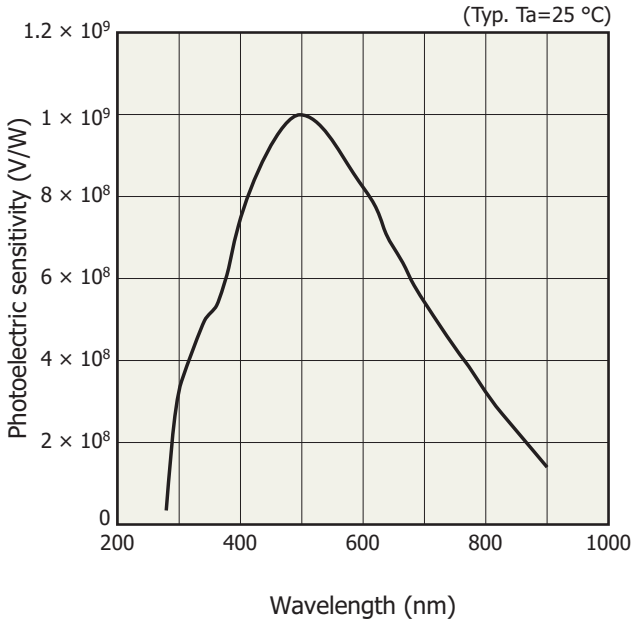
Measurement example

Analog output

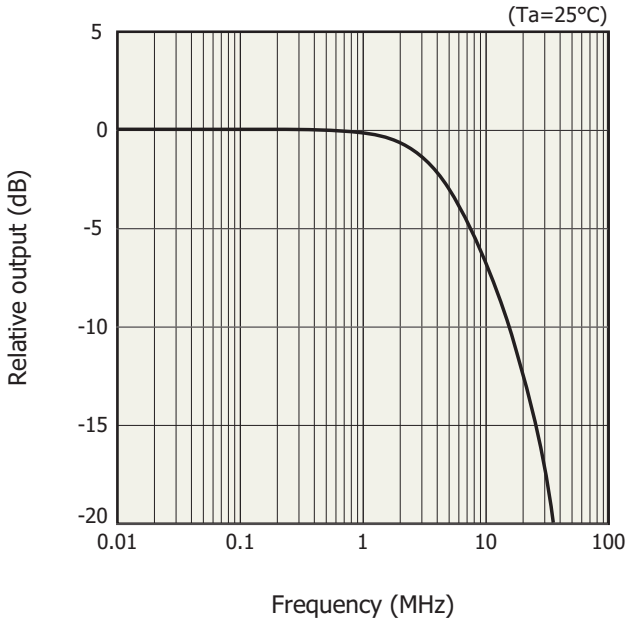
(Incident light level: 200 pW, λ=λp)



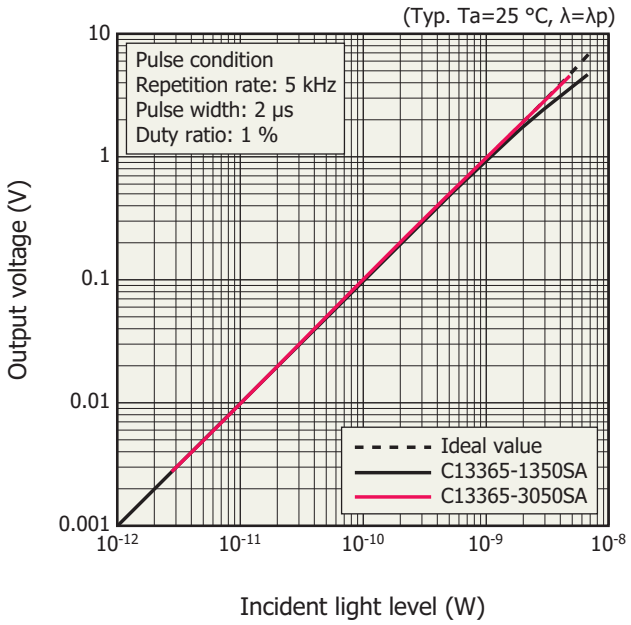
Photoelectric sensitivity vs. wavelength



Frequency response (typical example)

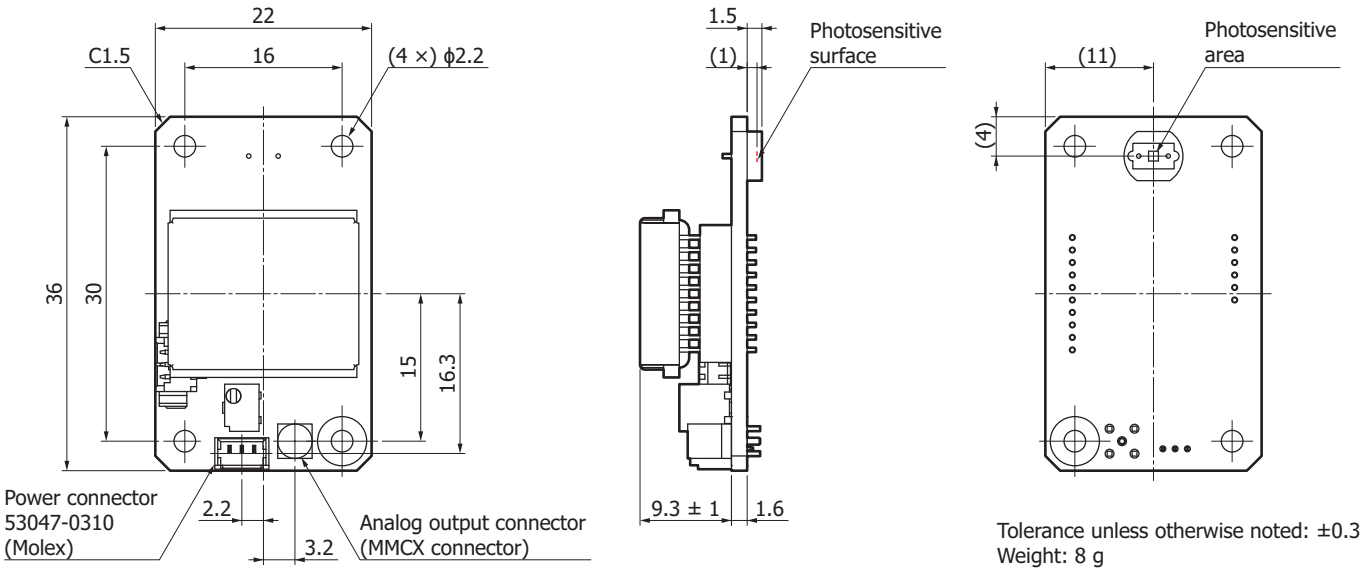


Linearity

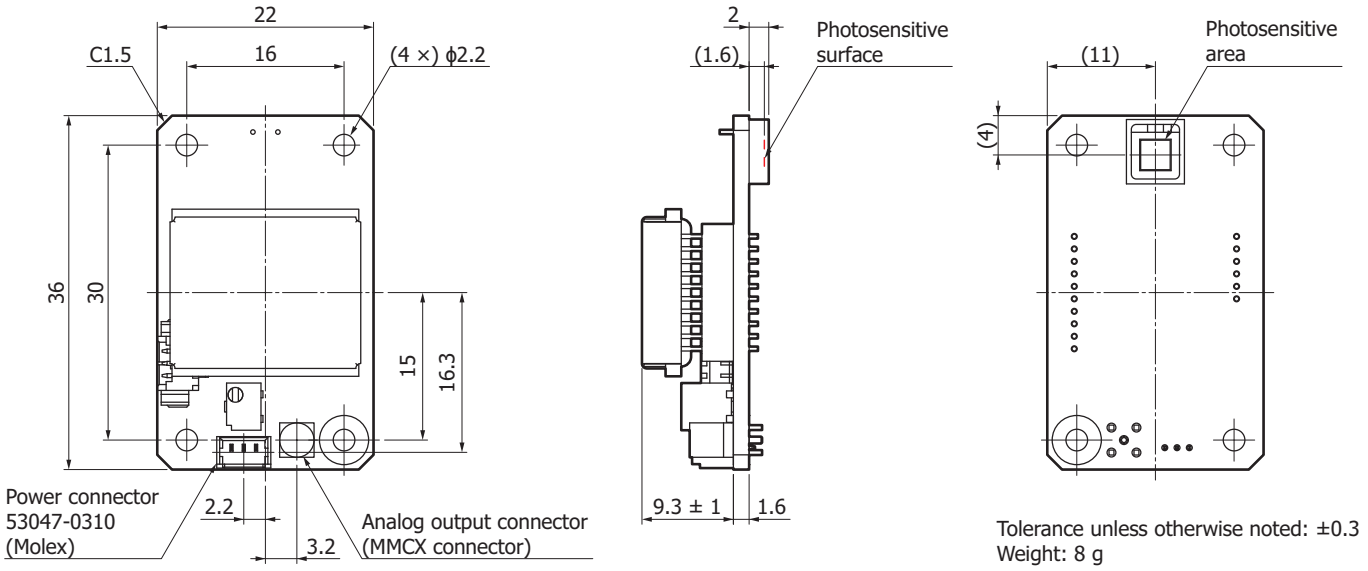


Dimensional outlines (unit: mm)

C13365-1350SA



C13365-3050SA



Tolerance unless otherwise noted: ±0.3
Weight: 8 g

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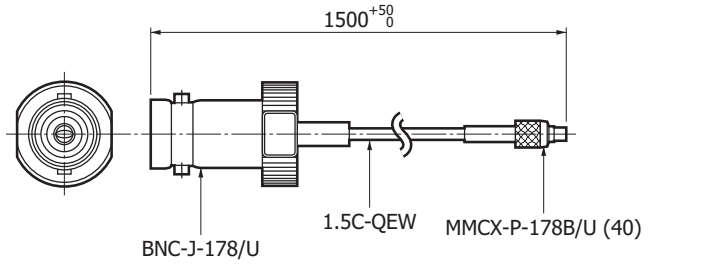
Accessories

· Power cable
· Instruction manual

Options (sold separately)

MMCX-BNC cable A12763

Dimensional outline (unit: mm)



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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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Cat. No. KACC1227E02 Mar. 2020 DN