

Optics module

C16028-01

Compact fluorescence detection optics module containing excitation light source and detector

C16028-01 is an optics module specialized for fluorescence detection applications. It consists of Si photodiodes, LEDs for exciting fluorescent reagents, optical systems, and circuits. Two pairs of optical systems for emitting excitation LED light/ detecting fluorescent are integrated, which allows measurement of two types of fluorescent reagents (FAM, ROX) with one module. It is also equipped with trigger input for independently controlling ON/OFF of each LED. Contact us for options tailored to different emission/excitation pairs or detectors or other possible customizations.

Features

- Low-level light detection in 10^{-10} W order
- Excitation light source capable of irradiating with constantly fixed light level
- Supports detection of two types of fluorescent reagents (FAM, ROX)
- Compact case: 60 × 60 × 22 mm
- Easy construction of evaluation system, such as alignment with other optical components

Applications

- PCR inspection equipment
- Fluorescence measurement equipment

Absolute maximum ratings (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply voltage	Vs max.	±6	V
Trigger input voltage	Vtrig	-0.5 to +6	V
Operating temperature*1	Topr	0 to +50	°C
Storage temperature*1	Tstg	-10 to +50	°C

*1: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environments, 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.

Recommended operating conditions (Ta=25 °C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vs	±4.5	±5	±5.5	V

Electrical characteristics (Ta=25 °C, Vs=5 V, unless otherwise noted)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Trigger input voltage	High	Vtrig		+4	+5	+5.5	V
	Low			-0.1	0	+1	
Current consumption		Is	Dark state, CH1 and CH2 LEDs OFF	+1	+3	+10	mA
				-0.4	-3	-10	
			Dark state, CH1 or CH2 LED ON	+3	-	+70	
				-0.4	-3	-10	
Maximum output amplitude voltage		Vfs		+Vs - 0.4	-	+Vs - 0.2	V
Conversion impedance		Zt		-	1×10 ⁹	-	V/A
Cutoff frequency	Low band	fc	-3 dB	-	DC	-	Hz
	High band			-	10	-	
Output offset voltage		Vos	Dark state, CH1 and CH2 LEDs OFF	-10	-	+10	mV
			Dark state, CH1 or CH2 LED ON	-	-	+50	
Output noise voltage		Vn	Dark state, CH1 and CH2 LEDs OFF	-	1	10	mVp-p

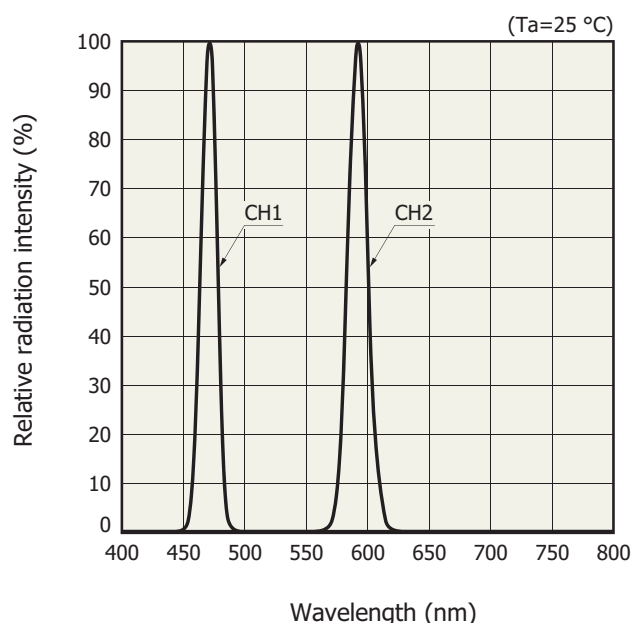
Optical characteristics (Ta=25 °C, Vs=5 V, unless otherwise noted)

Parameter			Symbol	Condition	Min.	Typ.	Max.	Unit
Light emission	Output (excitation) wavelength range	CH1	$\lambda E1$	*2	430	470	510	nm
		CH2	$\lambda E2$		550	590	630	
	Output light level	CH1	P1	$\lambda=\lambda E1$	-	1.0	-	mW
		CH2	P2	$\lambda=\lambda E2$	-	0.5	-	
	Output light spot diameter		$\phi 1, 2$	$f_b=3.5\text{ mm}$	-	-	1.5	mm
Light detection	Detection (fluorescence) wavelength range	CH1	$\lambda F1$	*2	480	515	550	nm
		CH2	$\lambda F2$		Cuton wavelength	620	-	
	Photosensitivity	CH1	S1	$\lambda F1=515\text{ nm}$	-	300	-	V/ μ W
		CH2	S2	$\lambda F2=690\text{ nm}$	-	200	-	
Light emission/ detection	Back focus		f_b	*3	-	3.5	-	mm

*2: Min.=minimum wavelength value defining FWHM, Typ.=center wavelength, Max.=maximum wavelength value defining FWHM

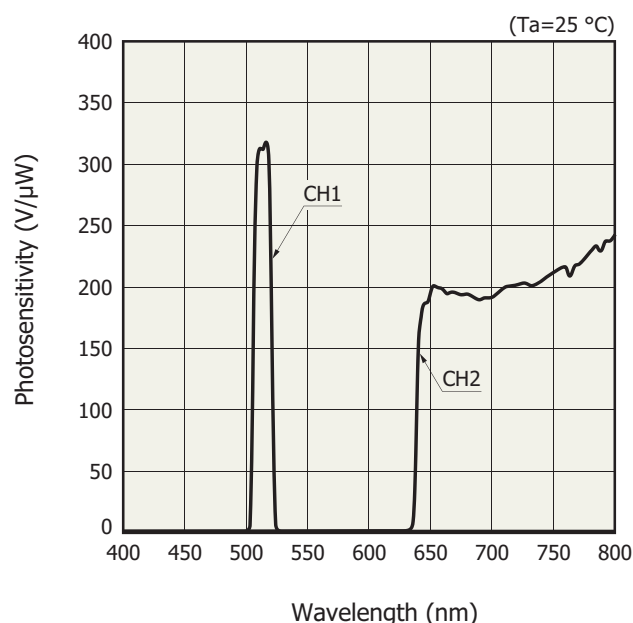
*3: Distance from light input/output part end face to focal point

Emission spectrum (typical example)



KACCB0752EA

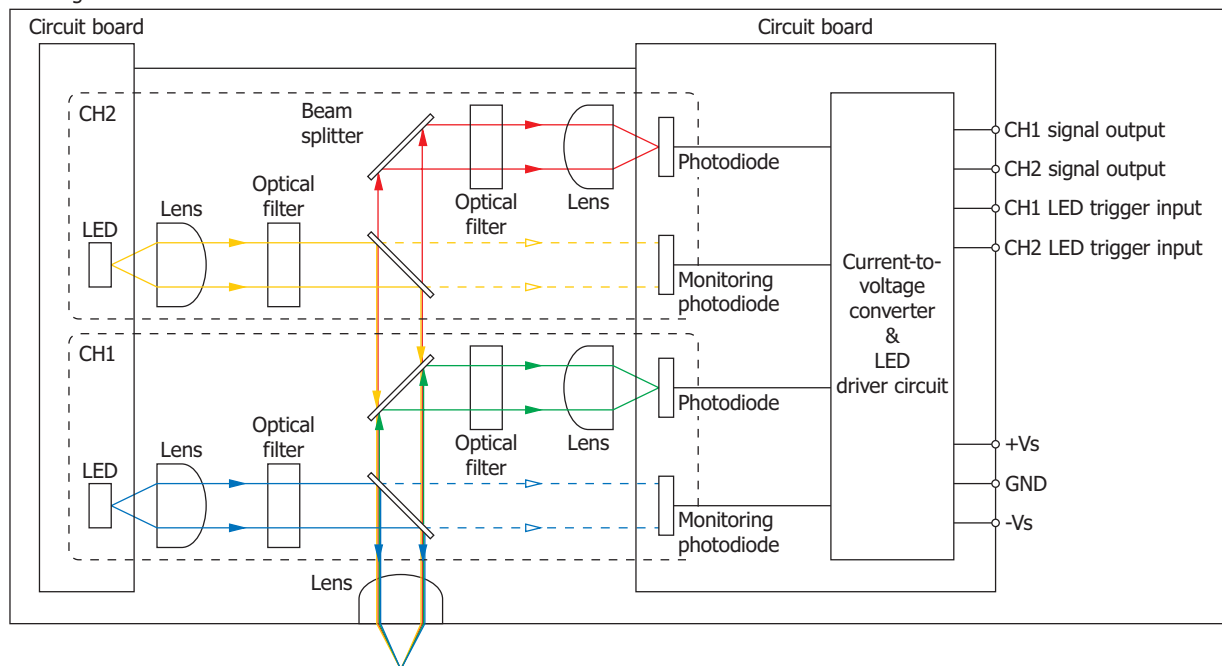
Spectral response (typical example)



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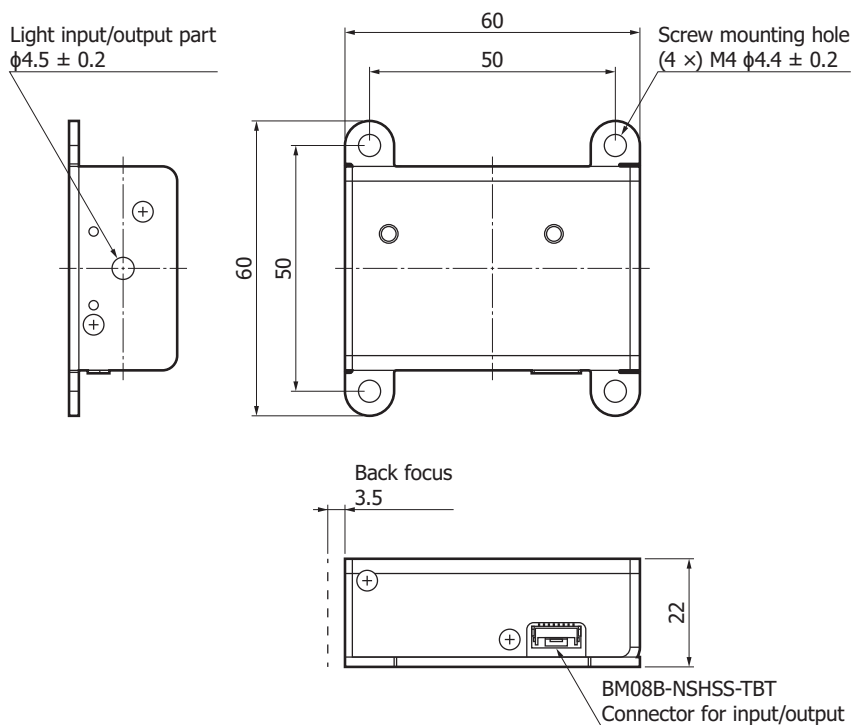
Block diagram

Housing



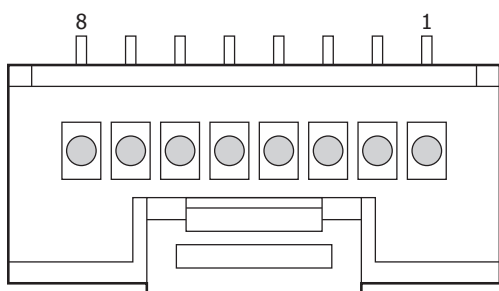
KACCC1231EA

Dimensional outline (unit: mm)

Tolerance unless otherwise noted: ± 0.5

KACCA0500EA

Pin layout

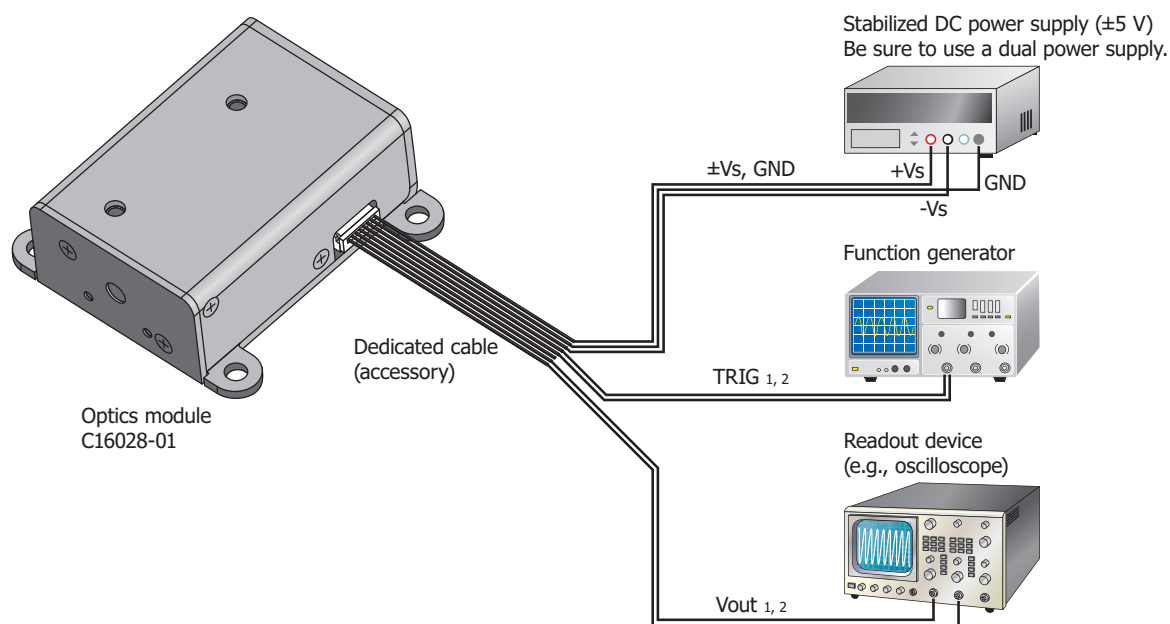


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Connector header: BM08B-NSHSS-TBT / 8-pin, male pin, made by JST

Pin no.	Name	Description
1	+Vs	Positive supply voltage terminal
2	GND	Ground
3	-Vs	Negative supply voltage terminal
4	TRIG1	CH1 LED lighting control terminal
5	TRIG2	CH2 LED lighting control terminal
6	GND	Ground
7	Vout1	CH1 signal output terminal
8	Vout2	CH2 signal output terminal

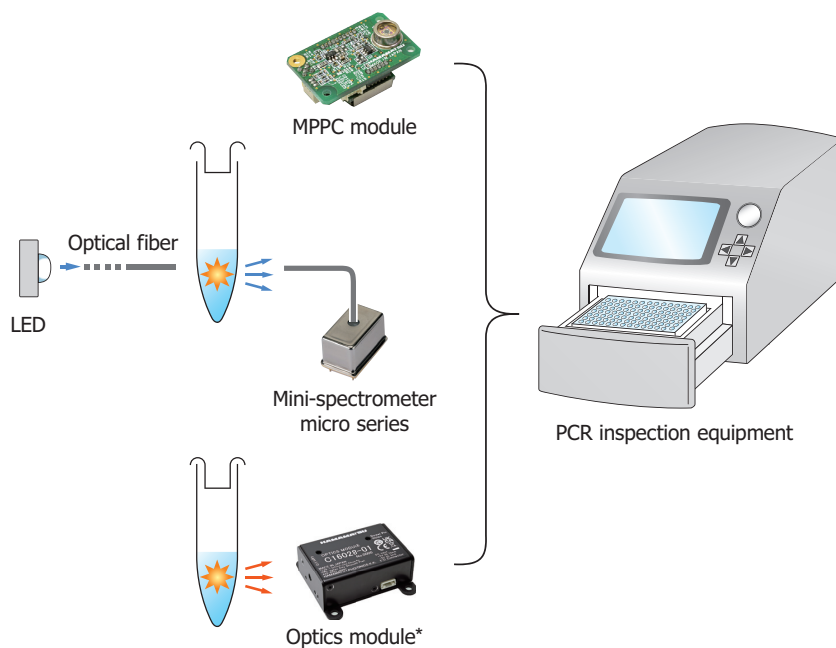
Connection example



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Application example (PCR inspection equipment)

The optics module is used to detect the fluorescent light generated by illuminating light on DNA with an added fluorescent reagent.



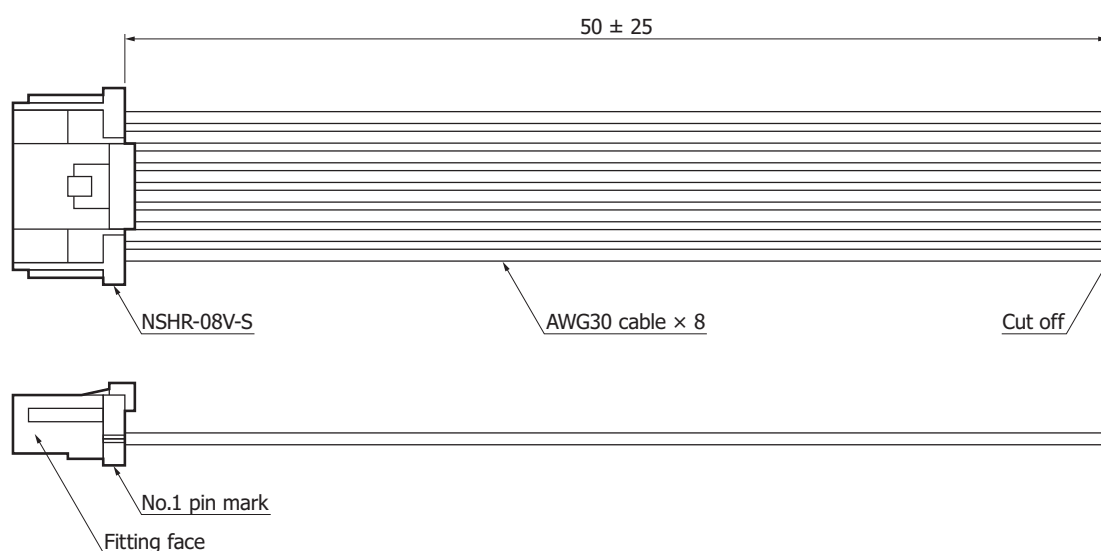
* Capable of guiding light through optical fiber

KACCC1030EC

Accessories

- Instruction manual
- Dedicated cable

Dimensional outline (unit: mm)



KACCC1229EA

Related information

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

- Precautions
- Disclaimer

The content of this document is current as of July 2024.

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