

Photon counting heads H10682 series



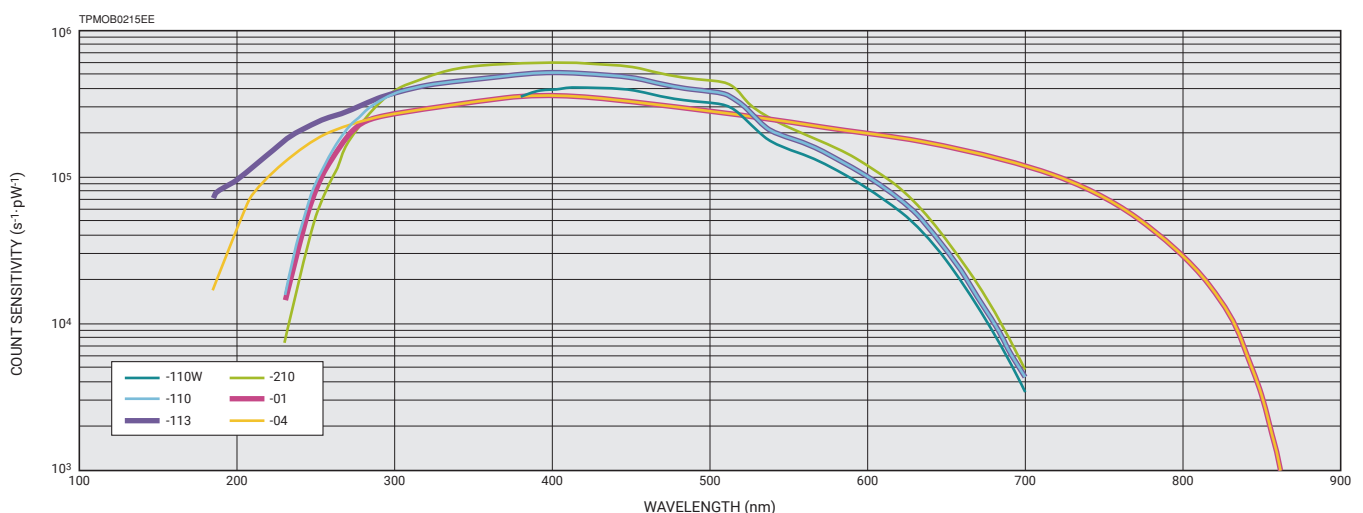
The H10682 series is a photon counting head device consisting of a metal package photomultiplier tube, along with a high-speed photon counting circuit and a high-voltage power supply circuit. The high voltage power supply for photomultiplier tube and the discrimination level are preset to optimum values, allowing photon counting measurement by just connecting a +5 V supply. The H10682 series has also over light detection function to output a signal at the state that output counts fall by excessive incident light. By this signal, measurement data can be judged that it is normal or not. The H10682-110W is integrated with a newly designed condenser lens offering high light-collecting efficiency while using a thin profile.

Product variations

Parameter	H10682						Unit
Suffix	-110W	-110	-113	-210	-01	-04	—
Product type	With lens type	Standard type					—
Effective area	Φ21	Φ8					mm
Peak sensitivity wavelength	400						nm
Spectral response	380 to 700	230 to 700	185 to 700	230 to 700	230 to 870	185 to 870	nm
Photocathode	Super bialkali			Ultra bialkali	Multialkali		—
Window material	Borosilicate glass		UV glass	Borosilicate glass		UV glass	—

This product can't be used at vacuum environment or reduced pressure environment.

Typical count sensitivity



-110W: Parallel and homogenized light is irradiated over the entire incident surface with a diameter of 21 mm.

With lens type

Specifications

(at +25 °C)

Parameter		H10682-110W	Unit
Input voltage		+4.75 to +5.25	V
Max. input voltage		+6	V
Max. input current ①		40	mA
Count sensitivity ②	200 nm	Typ.	—
	300 nm	Typ.	—
	400 nm	Typ.	3.8×10^5
	500 nm	Typ.	3.0×10^5
	600 nm	Typ.	8.8×10^4
	700 nm	Typ.	6.0×10^3
Count linearity ③		5.0×10^6	s^{-1}
Dark count ④	Typ.	50	s^{-1}
	Max.	100	
Pulse-pair resolution		Typ. 20	ns
Output pulse width		Typ. 10	ns
Output pulse height	Load resistance 50 Ω	Min.	+2
		Typ.	+2.2
	Un-terminated	Min.	+4
		Typ.	+4.4
Recommended load resistance		50	Ω
Signal output logic		Positive logic	—
Over light detection output ⑤	High level	Min.	+3.5
	Low level	Max.	+0.5
Operating ambient temperature ⑥		+5 to +40	$^{\circ}\text{C}$
Storage temperature ⑥		-20 to +50	$^{\circ}\text{C}$
Storage humidity ⑥		Below 85	%RH
Weight		50	g

①At $5.0 \times 10^6 s^{-1}$ count rate

②Parallel and homogenized light is irradiated over the entire incident surface with a diameter of 21 mm.

③Random pulse, at 10 % count loss

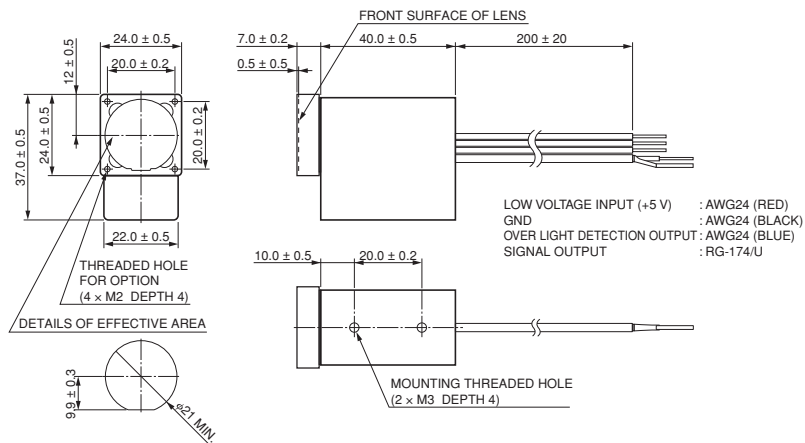
④After 30 min storage in darkness

⑤Load resistance 10 k Ω

⑥No condensation

Because it is equipped with a resin lens, even if the storage temperature/humidity is within the range, avoid sudden temperature changes or long-term storage at high temperatures and high humidity.

Dimensional outline (Unit:mm)



Note: Do not push the lens and the plastic around the PMT strongly.
Excessive load may damage the lens and the PMT.

Standard type

Specifications

(at +25 °C)

Parameter		H10682-110	H10682-113	H10682-210	H10682-01	H10682-04	Unit	
Input voltage		+4.75 to +5.25						V
Max. input voltage		+6						V
Max. input current ^①		40						mA
Count sensitivity	200 nm	Typ.	—	9.7 × 10 ⁴	—	4.3 × 10 ⁴	s ⁻¹ ·pW ⁻¹	
	300 nm	Typ.	3.7 × 10 ⁵		3.9 × 10 ⁵	2.7 × 10 ⁵		
	400 nm	Typ.	4.9 × 10 ⁵		6.1 × 10 ⁵	3.6 × 10 ⁵		
	500 nm	Typ.	3.7 × 10 ⁵		4.6 × 10 ⁵	2.8 × 10 ⁵		
	600 nm	Typ.	1.1 × 10 ⁵		1.3 × 10 ⁵	2.0 × 10 ⁵		
	700 nm	Typ.	7.7 × 10 ³		9.1 × 10 ³	1.2 × 10 ⁵		
Count linearity ^②		5.0 × 10 ⁶						s ⁻¹
Dark count ^③		Typ.	50		600		s ⁻¹	
		Max.	100		1000			
Pulse-pair resolution		Typ.		20			ns	
Output pulse width		Typ.		10			ns	
Output pulse height		Load resistance 50 Ω	Min.	+2			V	
			Typ.	+2.2				
		Un-terminated	Min.	+4				
			Typ.	+4.4				
Recommended load resistance		50					Ω	
Signal output logic		Positive logic					—	
Over light detection output ^④		High level	Min.	+3.5			V	
		Low level	Max.	+0.5				
Operating ambient temperature ^⑤		+5 to +40					°C	
Storage temperature ^⑤		-20 to +50					°C	
Storage humidity ^⑤		Below 85					%RH	
Weight		47					g	

①At 5.0 × 10⁶ s⁻¹ count rate

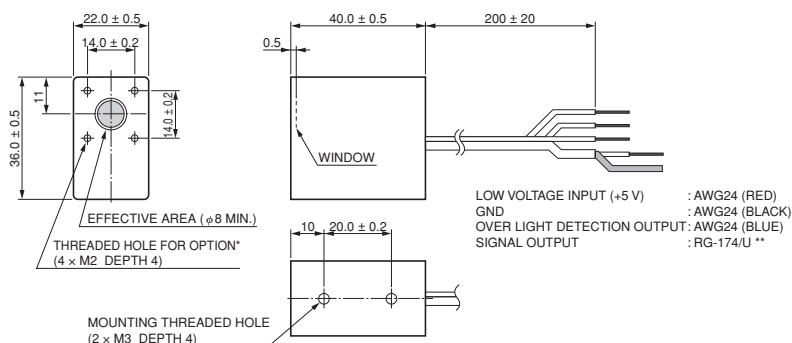
②Random pulse, at 10 % count loss

③After 30 min storage in darkness

④Load resistance 10 kΩ

⑤No condensation

Dimensional outline (Unit:mm)



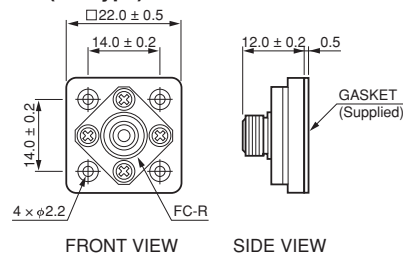
* Option: E5776, E5776-51, A9865, A10030-01

** Option: Available with BNC/SMA connector.

PM0A0058EB

Related products (Options)

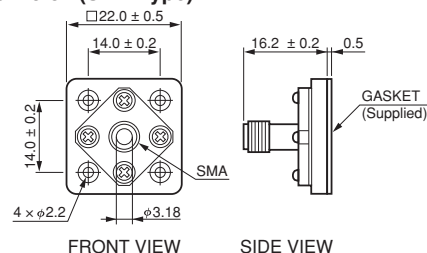
E5776 (FC Type)



* Supplied with M2 screws (4 pcs) for fixing to module

TACCA0058EB

E5776-51 (SMA Type)

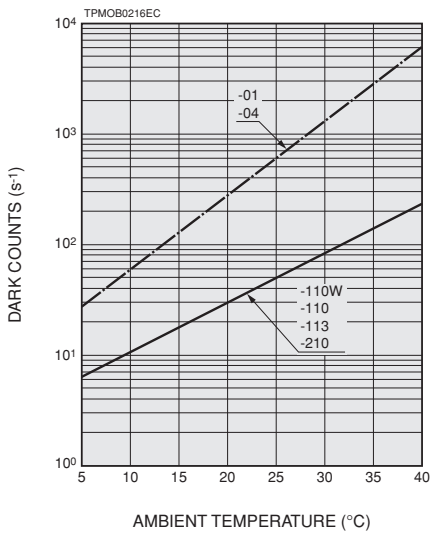


* Supplied with M2 screws (4 pcs) for fixing to module

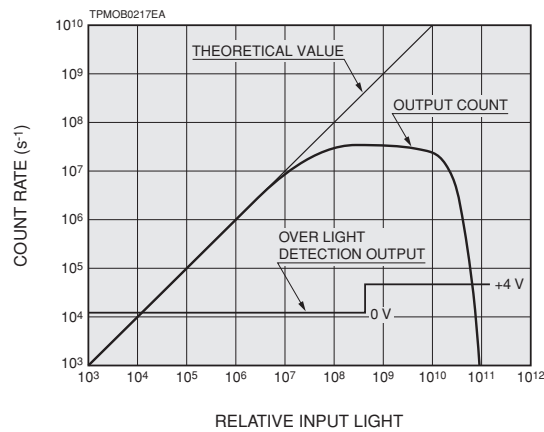
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Characteristics

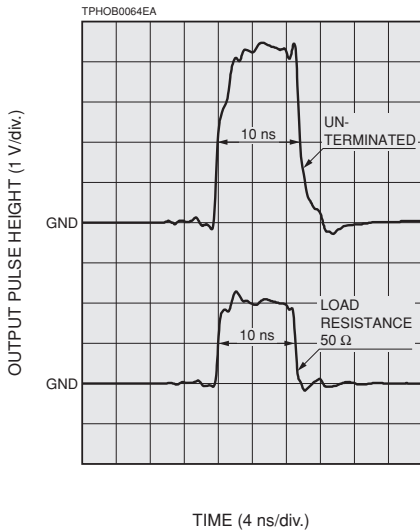
Typical dark count



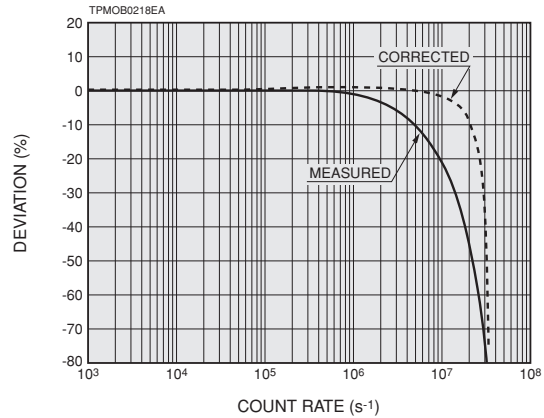
Typical count rate linearity and over light detection output



Typical output waveform



Typical count rate linearity correction



Correction formula

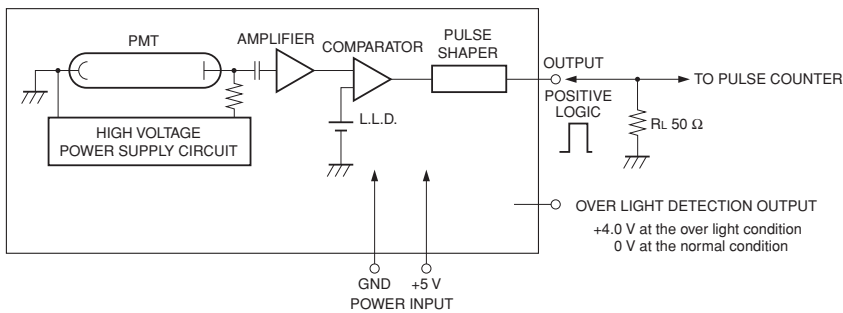
$$N = \frac{M}{1-Mt}$$

N: Real count rate (s⁻¹)

M: Measured count rate (s⁻¹)

t: Pulse pair resolution (s)

Block diagram



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