Metal Package PMT

Photosensor Modules H10720/H10721 Series

The H10720 and H10721 series are photosensor modules containing a metal package PMT and a high-voltage power supply circuit. The built-in PMT uses a metallic package with the same diameter as a TO-8 metal package used for semiconductor photodetectors. Despite the small size nearly equal to photodiodes, this PMT delivers high gain, wide dynamic range, and high-speed response. Four types of photocathodes are available, including a super bialkali photocathode that has higher sensitivity than conventional bialkali photocathodes, an ultra bialkali photocathode that offers even higher sensitivity, a multialkali photocathode with sensitivity extending to the near infrared region, and a red sensitivity enhanced multialkali photocathode. Hamamatsu also provides "P" type with low dark count selected for photon counting measurement.

The H10720 series are lead pin output type, while the H10721 are flexible cable output type.

Product Variations

Type No.	Spectral Response	Output Type	Features
H10720-110 / H10721-110	230 nm to 700 nm	H10720 Series On-board H10721 Series Cable output	Super bialkali photocathode, high sensitivity in visible range
H10720-210 / H10721-210	230 nm to 700 nm		Ultra bialkali photocathode, high sensitivity in visible range
H10720-01 / H10721-01	230 nm to 870 nm		For UV to near IR range
H10720-20 / H10721-20	230 nm to 920 nm		Infrared-extended multialkali photocathode with enhanced sensitivity
H10720P-110 / H10721P-110	230 nm to 700 nm		For photon counting

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

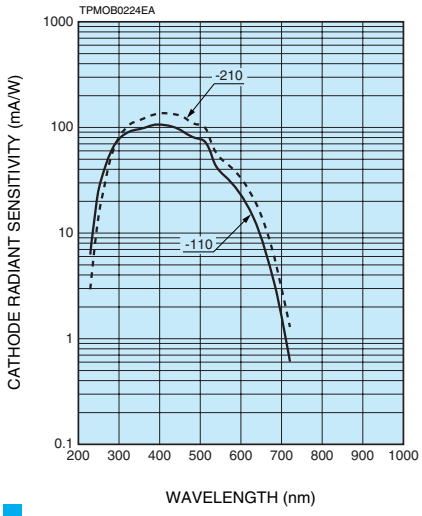
Specifications

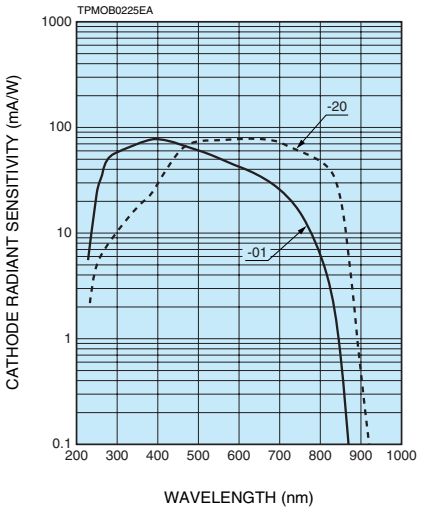
(at +25 °C)

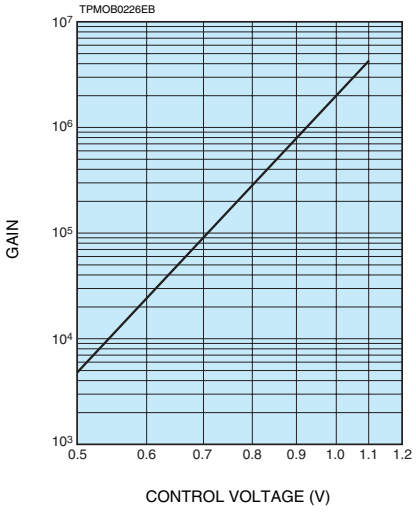
Parameter			H10720 / H10721 Series				Unit
Suffix			-110	-210	-01	-20	—
Input Voltage			+4.5 to +5.5				V
Max. Input Voltage			+5.5				V
Max. Input Current *1			2.7				mA
Max. Output Signal Current *2			100				μA
Max. Control Voltage			+1.1 (Input Impedance 1 MΩ)				V
Recommended Control Voltage Adjustment Range			+0.5 to +1.1 (Input Impedance 1 MΩ)				V
Effective Area			φ8				mm
Peak Sensitivity Wavelength			400	400	400	630	nm
Cathode	Luminous Sensitivity	Min.	80	100	100	350	μA/lm
		Typ.	105	135	200	500	
	Blue Sensitivity Index (CS 5-58)	Typ.	13.5	15.5	—	—	—
	Red / White Ratio	Typ.	—	—	0.2	0.45	—
	Radiant Sensitivity *3	Typ.	110	130	77	78	mA/W
Anode	Standard Type: Luminous Sensitivity *2	Min.	80	100	100	350	A/lm
		Typ.	210	270	400	1000	
	Standard Type: Radiant Sensitivity *2 *3	Typ.	2.2×10^5	2.6×10^5	1.5×10^5	1.5×10^5	A/W
	Standard Type: Dark Current *2 *4	Typ.	1	1	1	10	nA
		Max.	10	10	10	100	
	P Type Dark Count *2 *4	Typ.	50	—	—	—	s^{-1}
		Max.	100	—	—	—	
Rise Time *2			0.57				ns
Ripple Noise *2 *5 (peak to peak)		Max.	0.3				mV
Settling Time *6		Max.	10				s
Operating Ambient Temperature *7			+5 to +50				°C
Storage Temperature *7			-20 to +50				°C
Weight		Typ.	45 (H10720 Series), 80 (H10721 Series)				g

*1: At +5 V input voltage, +1.0 V control voltage, and output current equal to dark current
*2: Control voltage = +1.0 V
*3: Measured at the peak sensitivity wavelength
*4: After 30 minutes storage in darkness.
*5: Cable RG-174/U, Cable length 450 mm, Load resistance = 1 MΩ, Load capacitance = 22 pF
*6: The time required for the output to reach a stable level following a change in the control voltage from +1.0 V to +0.5 V.
*7: No condensation

Characteristics (Cathode radiant sensitivity, Gain)

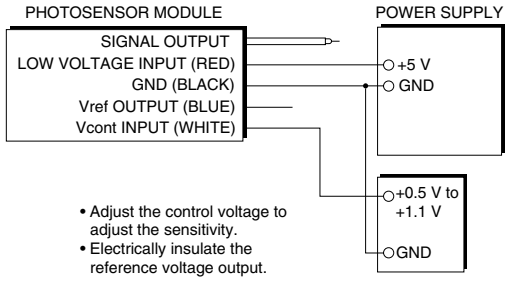






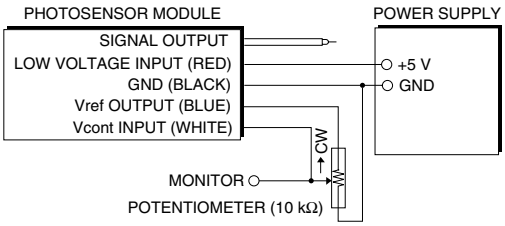
Sensitivity Adjustment Method

VOLTAGE PROGRAMMING



- Adjust the control voltage to adjust the sensitivity.
- Electrically insulate the reference voltage output.

RESISTANCE PROGRAMMING



* When using a potentiometer, adjust sensitivity while monitoring the control voltage so it does not exceed +1.1 V.

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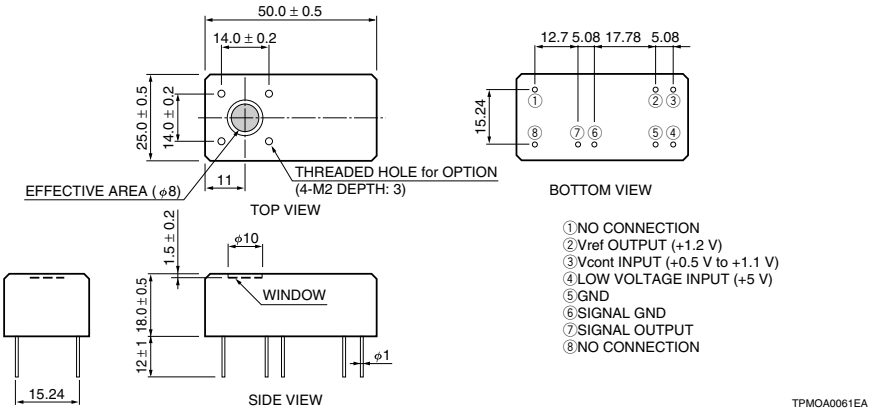
Dimensional Outlines (Unit: mm)

H10720 Series



①NO CONNECTION
②Vref OUTPUT (+1.2 V)
③Vcont INPUT (+0.5 V to +1.1 V)
④LOW VOLTAGE INPUT (+5 V)
⑤GND
⑥SIGNAL GND
⑦SIGNAL OUTPUT
⑧NO CONNECTION

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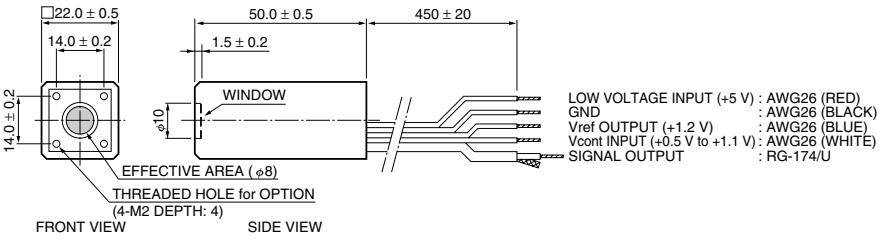
H10721 Series



LOW VOLTAGE INPUT (+5 V) : AWG26 (RED)
GND : AWG26 (BLACK)
Vref OUTPUT (+1.2 V) : AWG26 (BLUE)
Vcont INPUT (+0.5 V to +1.1 V) : AWG26 (WHITE)
SIGNAL OUTPUT : RG-174/U

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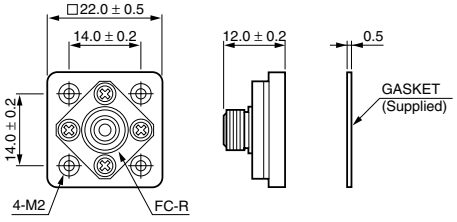
Options (Optical Fiber Adapter) (Unit: mm)

E5776 (FC Type)



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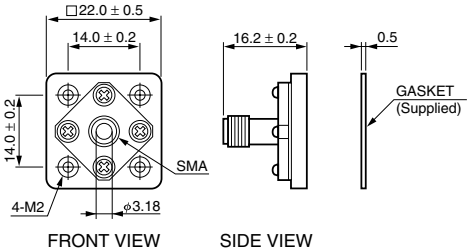
E5776-51 (SMA Type)



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