

OVERVIEW

The H11902 series is a photosensor module containing a metal package PMT, a low-power consumption high-voltage power supply circuit, and a low-noise amplifier. The amplifier converts the PMT current output to a voltage output so that the signal can be easily processed. Also, the amplifier is connected close to the PMT anode output pin in order to make the signal less affected by external noise. Six types of products are available with a frequency bandwidth of DC to 20 kHz and different sensitivity characteristics such as spectral response ranges.

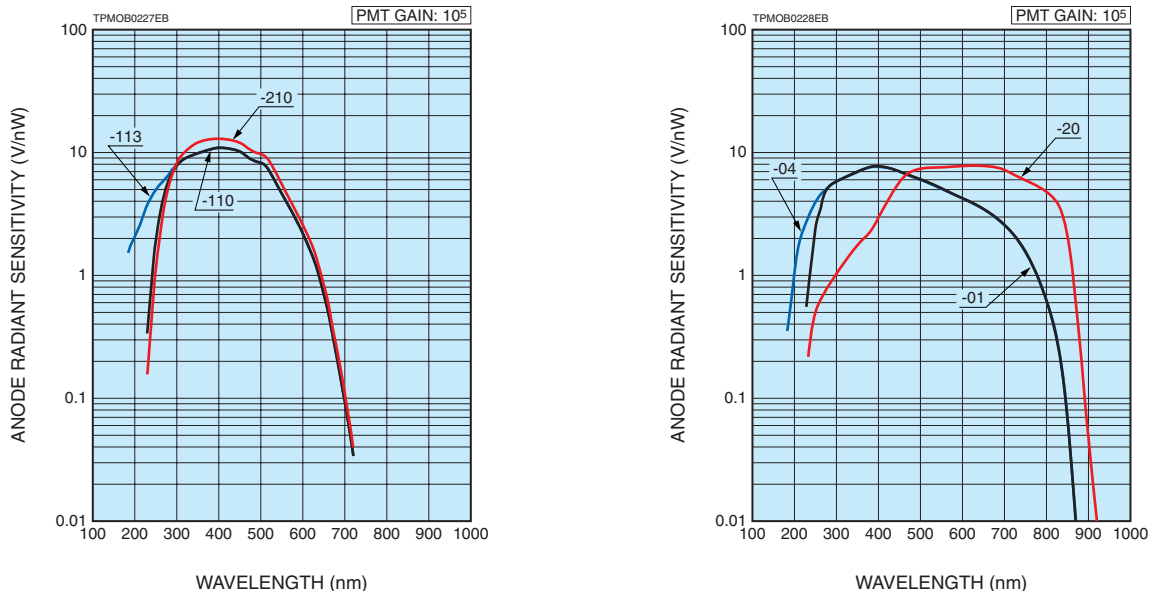


PRODUCT VARIATIONS

| Type No. | Spectral response | Photocathode | Window material | Current-to-voltage conversion factor * | Frequency bandwidth * |
|------------|-------------------|--------------------------|--------------------|--|-----------------------|
| H11902-110 | 230 nm to 700 nm | Super bialkali | Borosilicate glass | 1 V/μA | DC to 20 kHz |
| H11902-113 | 185 nm to 700 nm | Super bialkali | UV glass | | |
| H11902-210 | 230 nm to 700 nm | Ultra bialkali | Borosilicate glass | | |
| H11902-01 | 230 nm to 870 nm | Multialkali | Borosilicate glass | | |
| H11902-04 | 185 nm to 870 nm | Multialkali | UV glass | | |
| H11902-20 | 230 nm to 920 nm | Extended red multialkali | Borosilicate glass | | |

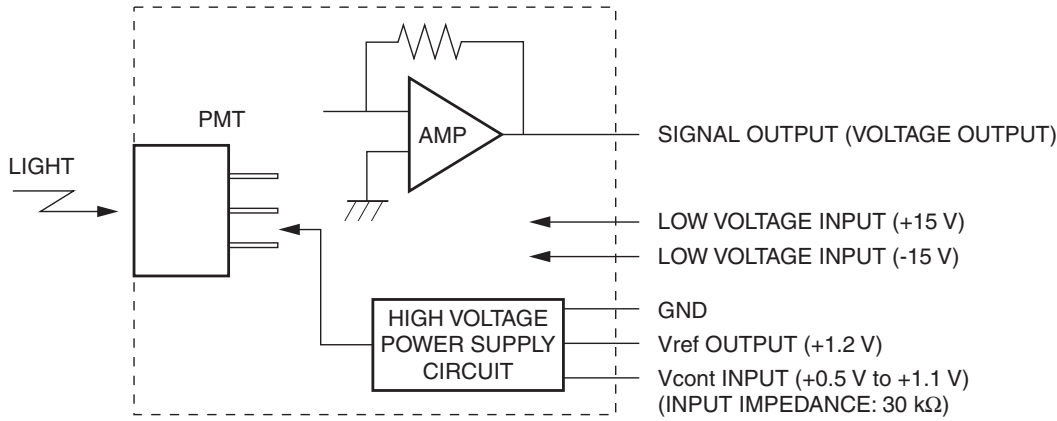
* The amplifier specification can be changed upon request. Feel free to contact our sales office. This product can't be used at vacuum environment or reduced pressure environment.

Figure 1: Typical spectral response



PHOTOSENSOR MODULES H11902 SERIES

Figure 2: Schematic diagram



TPMOC0269EA

SPECIFICATIONS

(at +25 °C)

| Parameter | | | -110, -113 | -210 | -01, -04 | -20 | Unit |
|--|--|------|--------------------------------------|-------------------|-------------------|-------------------|-------|
| Input voltage | | | ±11.5 to ±15.5 | | | | V |
| Max. input voltage | | | ±18 | | | | V |
| Max. input current *1 | | | +13 / -1 | | | | mA |
| Max. output signal voltage *2 | | | +10 (Load resistance 10 kΩ) | | | | V |
| Max. control voltage | | | +1.1 (Input impedance 30 kΩ) | | | | V |
| Recommended control voltage adjustment range | | | +0.5 to +1.1 (Input impedance 30 kΩ) | | | | 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 | Luminous sensitivity *4 | Min. | 8.0×10^7 | 1.0×10^8 | 1.0×10^8 | 3.5×10^8 | V/lm |
| | | Typ. | 2.1×10^8 | 2.7×10^8 | 4.0×10^8 | 1.0×10^9 | |
| | Radiant sensitivity *3 *4 | Typ. | 220 | 260 | 150 | 150 | V/nW |
| | Voltage output depending on PMT dark current *4 *5 | Typ. | 1 | 1 | 1 | 10 | mV |
| Max. | | 10 | 10 | 10 | 100 | | |
| Frequency bandwidth (-3 dB) | | | DC to 20 kHz | | | | — |
| Current-to-voltage conversion factor | | | 1 | | | | V/μA |
| Output offset voltage | | Typ. | ±1 | | | | mV |
| Ripple noise *4 *6 (peak to peak) | | Max. | 1.0 | | | | mV |
| Settling time *7 | | Max. | 0.2 | | | | s |
| Operating ambient temperature *8 | | | +5 to +50 | | | | °C |
| Storage temperature *8 | | | -20 to +50 | | | | °C |
| Weight | | Typ. | 90 | | | | g |

*1: At ±15 V input voltage, +1.0 V control voltage, and output current equal to dark current

*2: At ±15 V input voltage

*3: Measured at the peak sensitivity wavelength

*4: Control voltage = +1.0 V

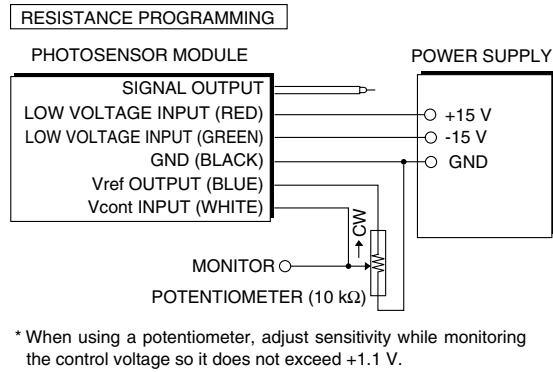
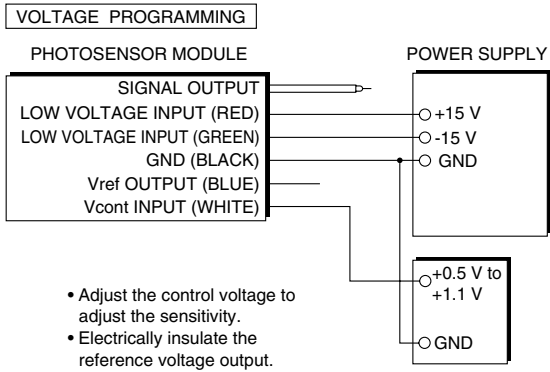
*5: After 30 minutes storage in darkness. The actual output value in darkness is the sum of dark current and offset voltage.

*6: Cable RG-174/U, Cable length 450 mm, Load resistance = 1 MΩ, Load capacitance = 22 pF

*7: 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.

*8: No condensation

Figure 3: Sensitivity adjustment method



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Figure 4: Typical gain

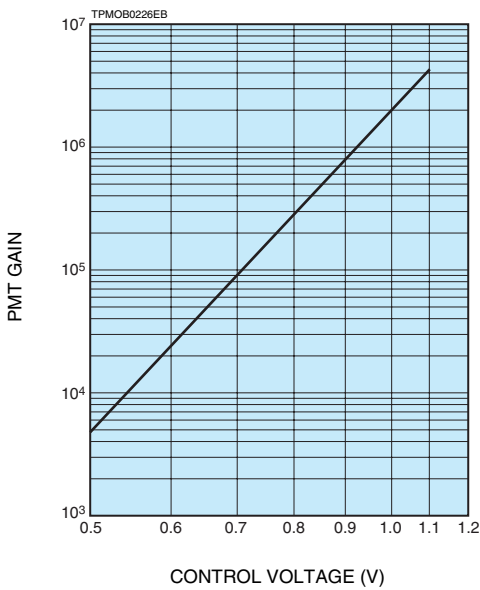


Figure 5: Typical frequency response

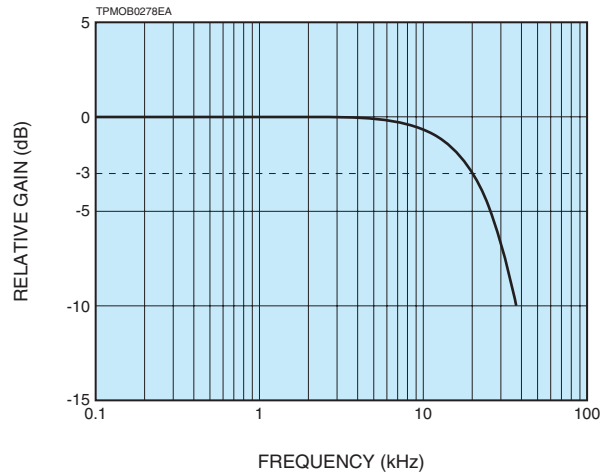


Figure 6: Typical ripple noise

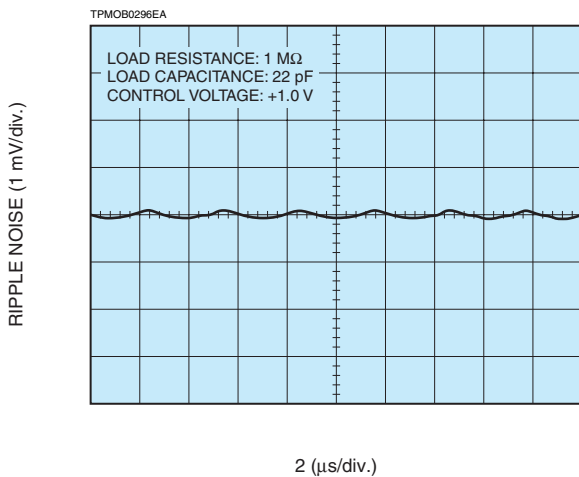
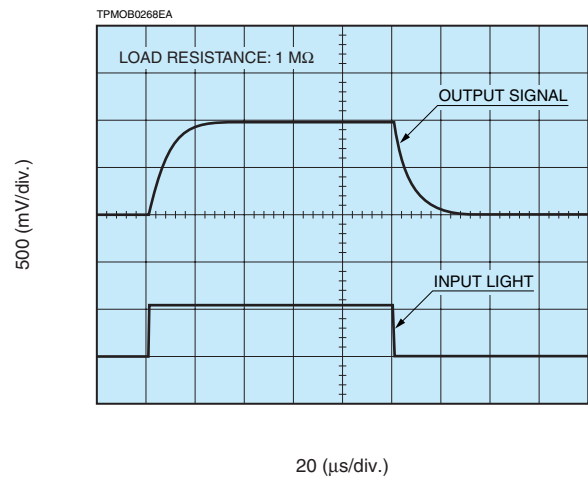
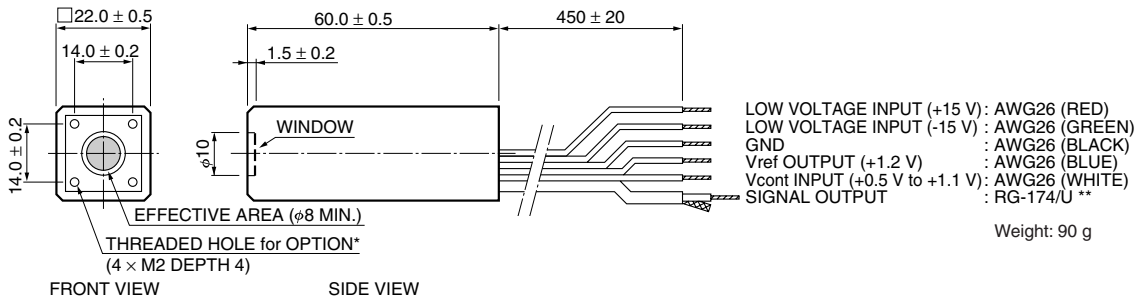


Figure 7: Typical output characteristics



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Figure 8: Dimensional outlines (Unit: mm)



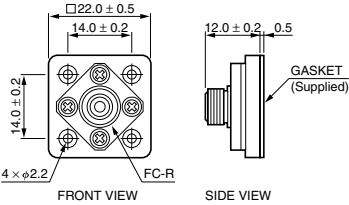
* Option: E5776, E5776-51, A9865, A10030-01
 ** Option: Available with BNC/SMA connector.

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OPTION

OPTICAL FIBER ADAPTER E5776 / E5776-51

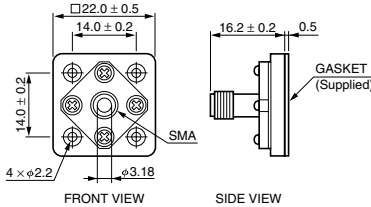
E5776 (FC Type)



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

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E5776-51 (SMA Type)

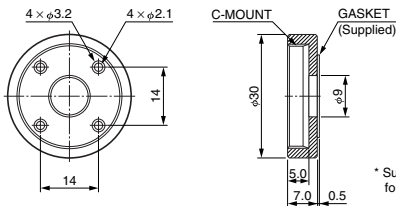


* Supplied with M2 screws(4 pcs) for fixing to module

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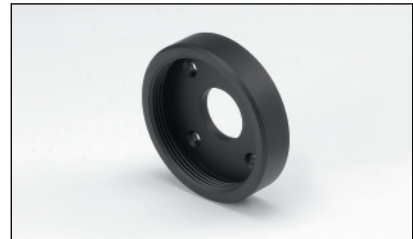


C-MOUNT ADAPTER A9865



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

TPMOA0056EB



Note: Optical blocks are available for these photosensor modules to make compact optical systems without light leakage.

RELATED PRODUCT

POWER SUPPLY FOR PHOTOMULTIPLIER TUBE MODULES C7169

The C7169 is the power supply for photomultiplier tube modules which has 15 V input voltage.

This unit can provide both the driving voltage and the control voltage. This feature enables users to operate the modules easily.



| Parameter | Description / Value | Unit |
|---|-------------------------------|------|
| Output Voltage | ± 15 | V |
| Output Current | Max. 0.3 (+15 V), 0.2 (-15 V) | A |
| Control Voltage ^(A) (variable voltage range) | +0.25 to +1.8 | V |
| Input Voltage | AC 100 to AC 240 | V |

NOTE: ^(A) Adjust within the recommended control voltage range for the photomultiplier tube module being used.

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