

**OVERVIEW**

The H9306/H9307 series voltage output type photosensor modules contain a high-voltage power supply circuit, low noise amplifier and 13-mm(1/2") diameter side-on photomultiplier tube. The amplifier contained in H9306 series has 1 V/μA of current to voltage conversion factor and 20 kHz of frequency bandwidth. The amplifier contained in H9307 series has 0.1V/μA of current to voltage conversion factor and 200 kHz of frequency bandwidth.



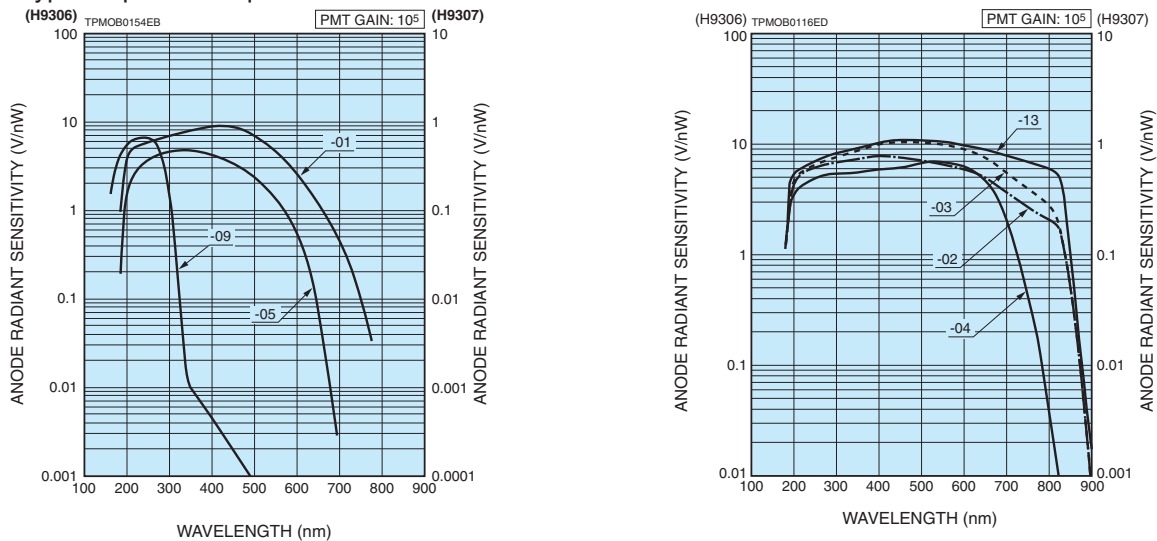
**PRODUCT VARIATIONS**

Type No.	Spectral response	Photocathode	Window material	Current-to-voltage conversion factor	Frequency bandwidth
H9306-01	185 nm to 750 nm	Bialkali	UV glass	1 V/μA	DC to 20 kHz
H9306-02	185 nm to 900 nm	Multialkali	UV glass		
H9306-03	185 nm to 900 nm	Multialkali	UV glass		
H9306-13	185 nm to 900 nm	Multialkali	UV glass		
H9306-04	185 nm to 830 nm	Multialkali	UV glass		
H9306-05	185 nm to 650 nm	Bialkali	UV glass		
H9306-09	160 nm to 320 nm	Cs-Te	Quartz		

Type No.	Spectral response	Photocathode	Window material	Current-to-voltage conversion factor	Frequency bandwidth
H9307-01	185 nm to 750 nm	Bialkali	UV glass	0.1 V/μA	DC to 200 kHz
H9307-02	185 nm to 900 nm	Multialkali	UV glass		
H9307-03	185 nm to 900 nm	Multialkali	UV glass		
H9307-13	185 nm to 900 nm	Multialkali	UV glass		
H9307-04	185 nm to 830 nm	Multialkali	UV glass		
H9307-05	185 nm to 650 nm	Bialkali	UV glass		
H9307-09	160 nm to 320 nm	Cs-Te	Quartz		

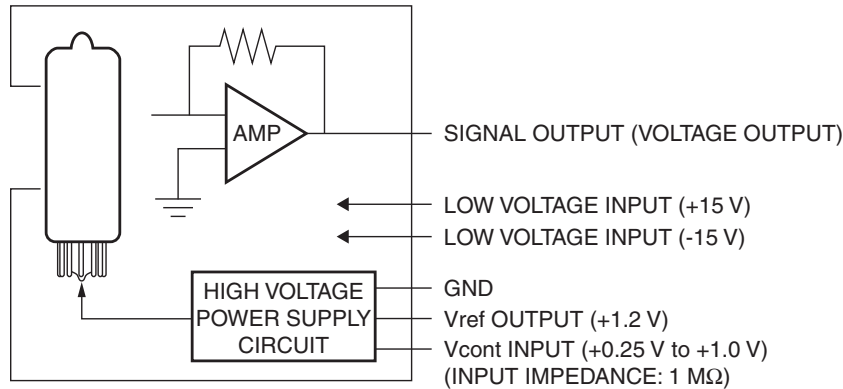
This product can't be used at vacuum environment or reduced pressure environment. Please pay attention when the H9306/H9307 series is used for measuring the light below 190 nm.

Figure 1: Typical spectral response



# PHOTOSENSOR MODULES H9306/H9307 SERIES

Figure 2: Schematic diagram



TPMOC0284EA

## SPECIFICATIONS

(at +25 °C)

Parameter		H9306/H9307 series							Unit
Suffix		-01	-02	-03	-13	-04	-05	-09	—
Input voltage		±11.5 to ±15.5							V
Max. input voltage		±18							V
Max. input current *1		+9/-1 (H9306), +15/-8 (H9307)							mA
Max. control voltage		+1.2 (Input impedance: 1 MΩ)							V
Recommended control voltage adjustment range		+0.25 to +1.0 (Input impedance: 1 MΩ)							V
Effective area		3.7 × 13.0							mm
Peak sensitivity wavelength		420	400	450	450	530	340	230	nm
Cathode	Luminous sensitivity	Min. 80	200	350	620	140	20	—	μA/lm
		Typ. 120	300	500	650	200	40	—	
	Blue sensitivity index (CS 5-58)	Typ. 10	—	—	15	—	5	—	—
	Red/White ratio	Typ. —	0.3	0.4	0.43	0.15	—	—	—
	Radiant sensitivity *2	Typ. 90	77	105	109	70	48	50 *3	mA/W
Offset voltage		Typ. ±3							mV
Ripple noise *4 *5 (peak to peak)		Max. 0.8							mV
Settling time *6		Max. 10							s
Operating ambient temperature *7		+5 to +50							°C
Storage temperature *7		-20 to +50							°C
Weight		110					115		g

Parameter		H9306 series (with internal 20 kHz amp)							Unit
Suffix		-01	-02	-03	-13	-04	-05	-09	—
Anode	Luminous sensitivity *4	Min. $1.0 \times 10^8$	$4.0 \times 10^8$	$1.0 \times 10^9$	$4.0 \times 10^8$	$3.0 \times 10^8$	$5.0 \times 10^7$	—	V/lm
		Typ. $7.0 \times 10^8$	$1.2 \times 10^9$	$2.0 \times 10^9$	$2.6 \times 10^9$	$7.0 \times 10^8$	$3.0 \times 10^8$	—	
	Radiant sensitivity *2 *4	Typ. 520	310	420	430	250	360	200 *3	V/nW
	Voltage output due to PMT dark current *4 *8	Typ. 1	1	2	3	0.1	0.5	0.5	mV
		Max. 10	10	10	10	1	5	5	
Max. output signal voltage		+10 (Load resistance 10 kΩ)							V
Current-to-voltage conversion factor		1							V/μA

Parameter		H9307 series (with internal 200 kHz amp)							Unit
Suffix		-01	-02	-03	-13	-04	-05	-09	—
Anode	Luminous sensitivity *4	Min. $1.0 \times 10^7$	$4.0 \times 10^7$	$1.0 \times 10^8$	$4.0 \times 10^7$	$3.0 \times 10^7$	$5.0 \times 10^6$	—	V/lm
		Typ. $7.0 \times 10^7$	$1.2 \times 10^8$	$2.0 \times 10^8$	$2.6 \times 10^8$	$7.0 \times 10^7$	$3.0 \times 10^7$	—	
	Radiant sensitivity *2 *4	Typ. 52	31	42	43	25	36	20 *3	V/nW
	Voltage output due to PMT dark current *4 *8	Typ. 0.1	0.1	0.2	0.3	0.01	0.05	0.05	mV
		Max. 1	1	1	1	0.1	0.5	0.5	
Max. output signal voltage		+1 (Load resistance 10 kΩ)							V
Current-to-voltage conversion factor		0.1							V/μA

\*1: Input voltage = +15 V, Control voltage = +1.0 V, Dark current output

\*2: Measured at the peak sensitivity wavelength

\*3: Measured at 254 nm

\*4: Control voltage = +1.0 V

\*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 \*8: After 30 minutes storage in darkness

Figure 3: Sensitivity adjustment method

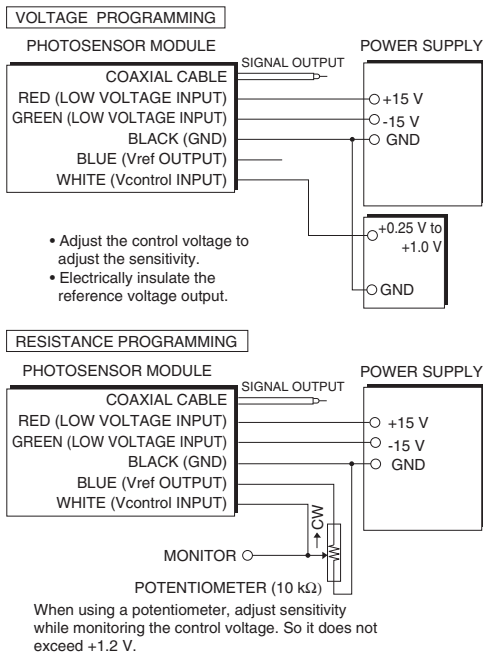


Figure 4: Gain

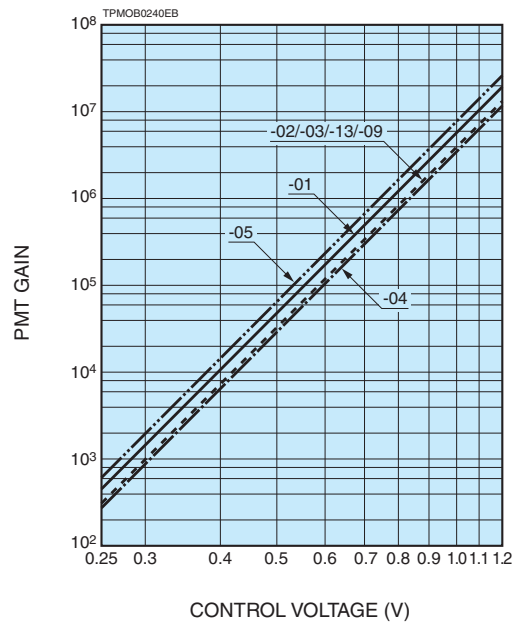


Figure 5: Frequency characteristics

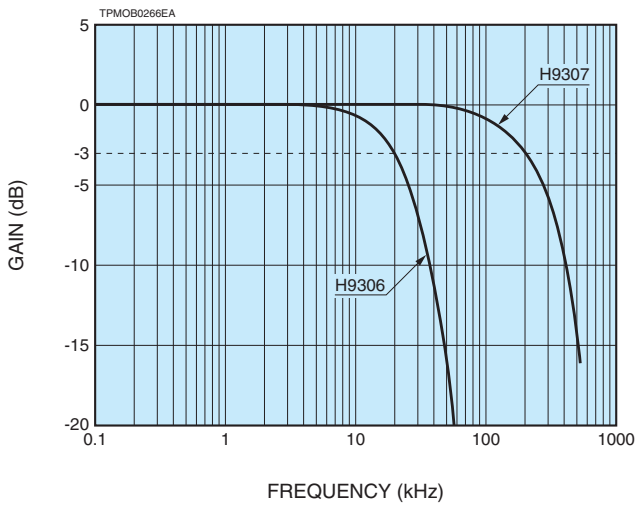


Figure 6: Ripple noise

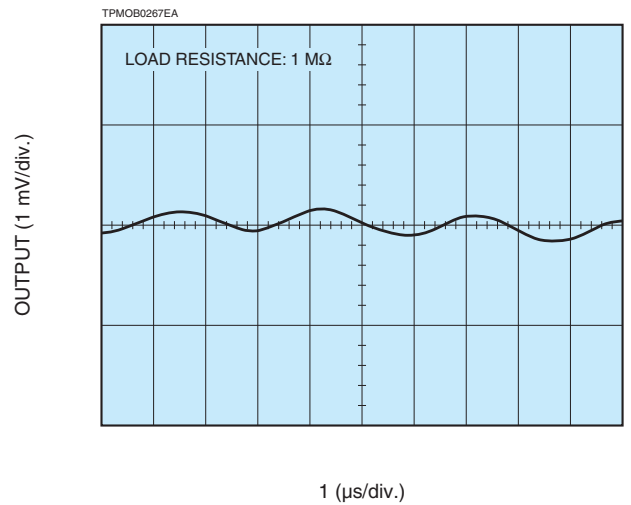
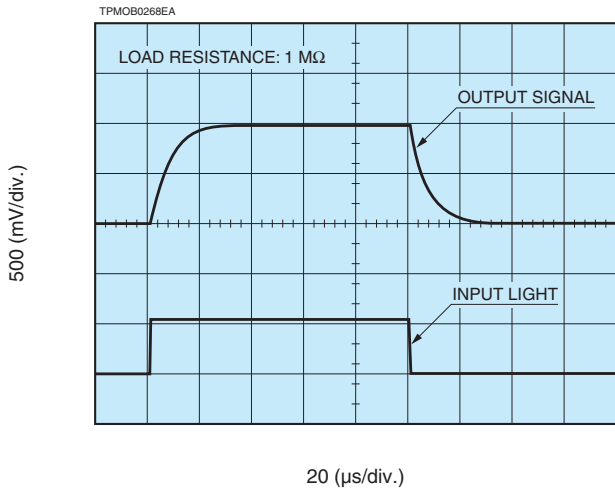
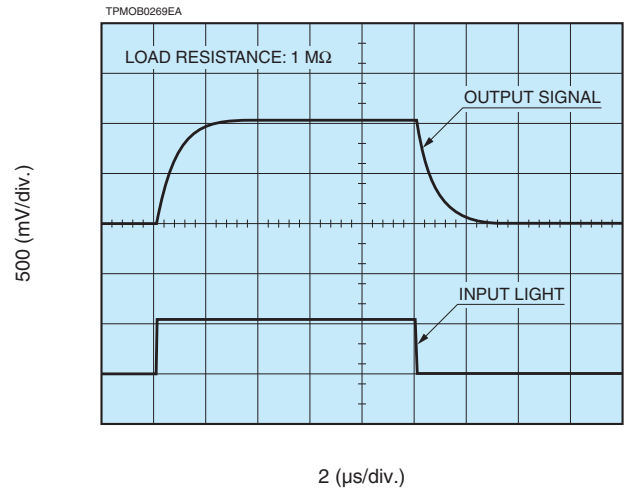


Figure 7: Output characteristics

●H9306



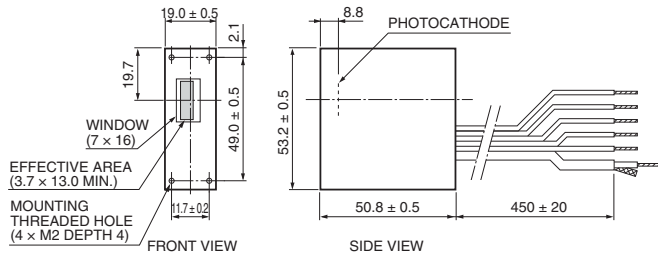
●H9307



# PHOTOSENSOR MODULES H9306/H9307 SERIES

Figure 8: Dimensional outlines (Unit: mm)

●H9306-01/-02/-03/-13/-04/-05  
H9307-01/-02/-03/-13/-04/-05

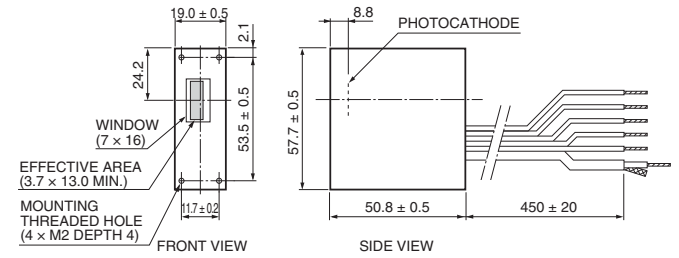


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)  
LOW VOLTAGE INPUT (-15 V) : UL1430 AWG26 (GREEN)  
GND : UL1430 AWG26 (BLACK)  
Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)  
Vcont INPUT (+0.25 V to +1.0 V) : UL1430 AWG26 (WHITE)  
SIGNAL OUTPUT : RG-174/U

Weight: 110 g

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●H9306-09  
H9307-09

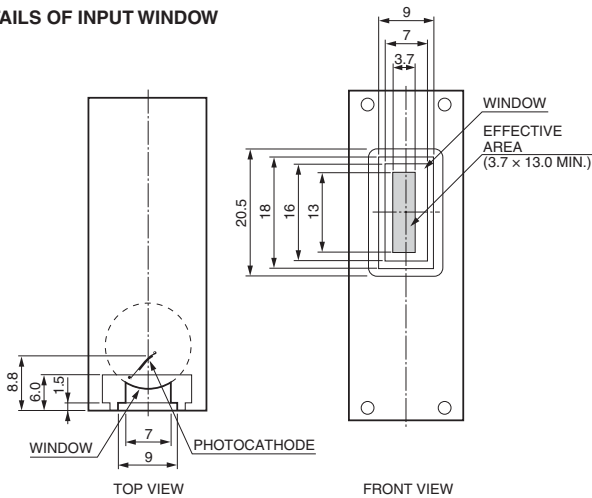


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)  
LOW VOLTAGE INPUT (-15 V) : UL1430 AWG26 (GREEN)  
GND : UL1430 AWG26 (BLACK)  
Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)  
Vcont INPUT (+0.25 V to +1.0 V) : UL1430 AWG26 (WHITE)  
SIGNAL OUTPUT : RG-174/U

Weight: 115g

TPMOA0113EA

## DETAILS OF INPUT WINDOW



TPMOA0018E

## RELATED PRODUCT

### POWER SUPPLY FOR PHOTOMULTIPLIER TUBE MODULES C7169

The C7169 is the power supply for photomultiplier tube modules with 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 <sup>(A)</sup> (variable voltage range)	+0.25 to +1.8	V
Terminal connection method	Binding post	—
Input voltage	AC100 to AC240	V
Operating ambient temperature	+5 to +50	°C
Dimensions (W × H × D) <sup>(B)</sup>	147 × 61 × 200	mm
Weight	Approx. 1.2	kg



**NOTE:** <sup>(A)</sup>Adjust within the recommended control voltage range for the photomultiplier tube module being used. <sup>(B)</sup>Excluding protuberance

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