

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. The H9306 / H9307 series uses a Cockcroft-Walton circuit with low power consumption. Flexible cables are used for easy installation in equipment.



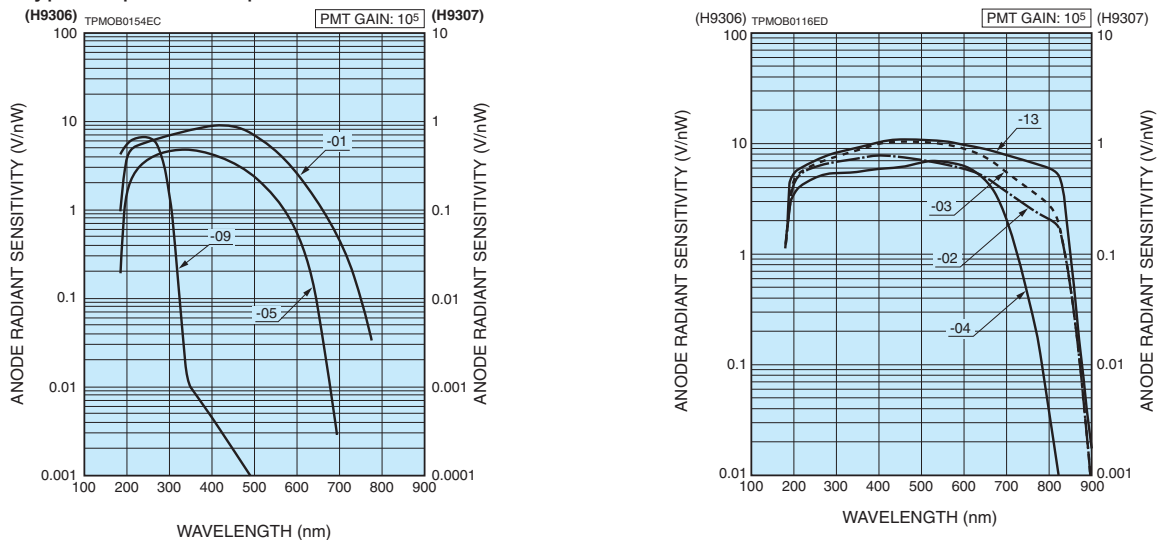
PRODUCT VARIATIONS

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	185 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	185 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.

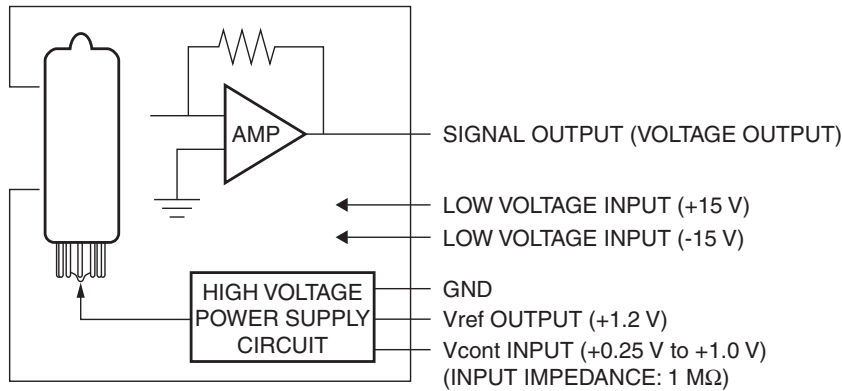
Figure 1: Typical spectral response



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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 × 10 ⁸	4.0 × 10 ⁸	1.0 × 10 ⁹	4.0 × 10 ⁸	3.0 × 10 ⁸	5.0 × 10 ⁷	—	V/lm
		Typ.	7.0 × 10 ⁸	1.2 × 10 ⁹	2.0 × 10 ⁹	2.6 × 10 ⁹	7.0 × 10 ⁸	3.0 × 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 × 10 ⁷	4.0 × 10 ⁷	1.0 × 10 ⁸	4.0 × 10 ⁷	3.0 × 10 ⁷	5.0 × 10 ⁶	—	V/lm
		Typ.	7.0 × 10 ⁷	1.2 × 10 ⁸	2.0 × 10 ⁸	2.6 × 10 ⁸	7.0 × 10 ⁷	3.0 × 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

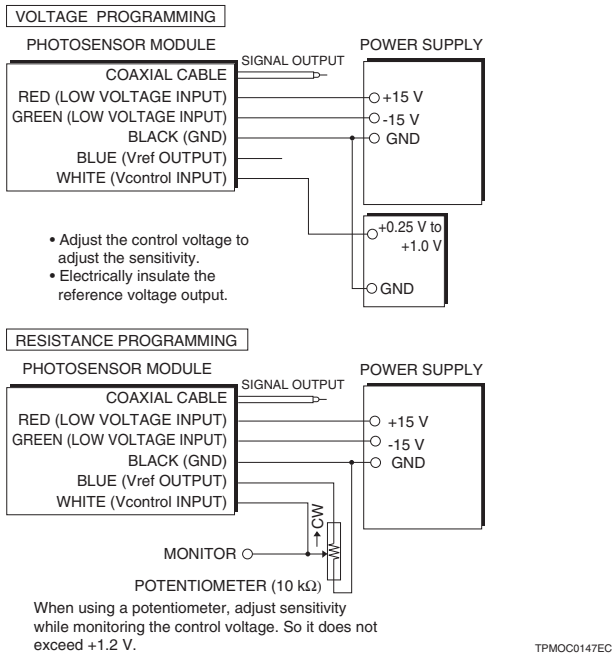


Figure 4: Gain

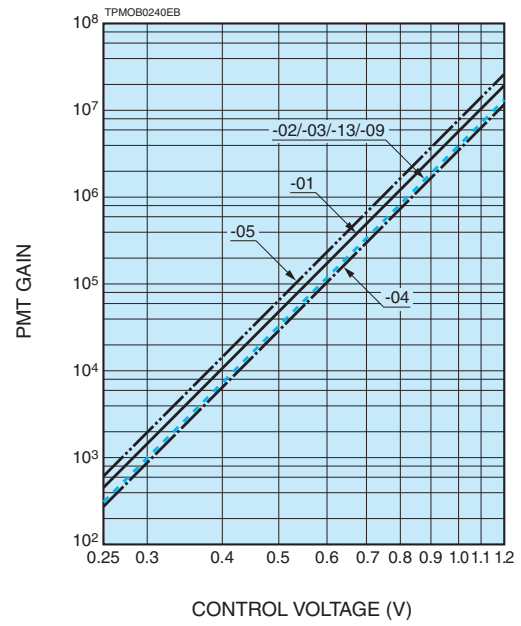


Figure 5: Frequency characteristics

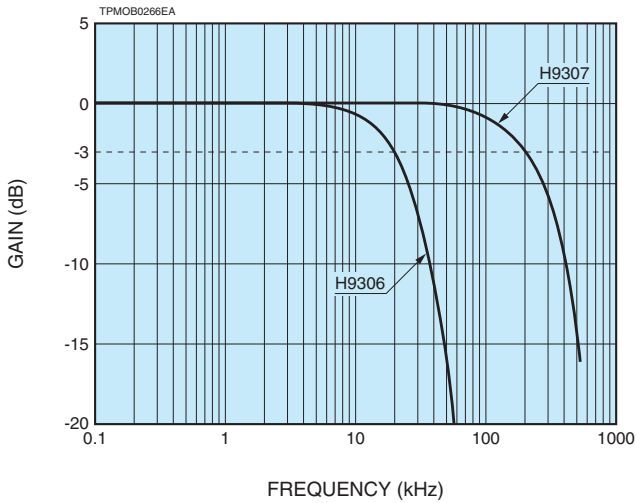


Figure 6: Ripple noise

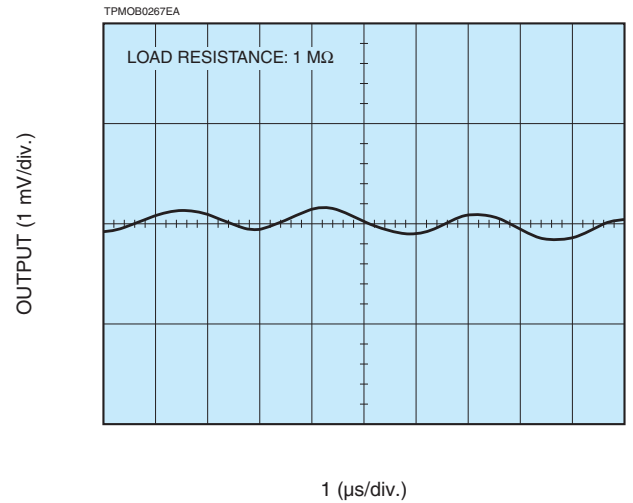
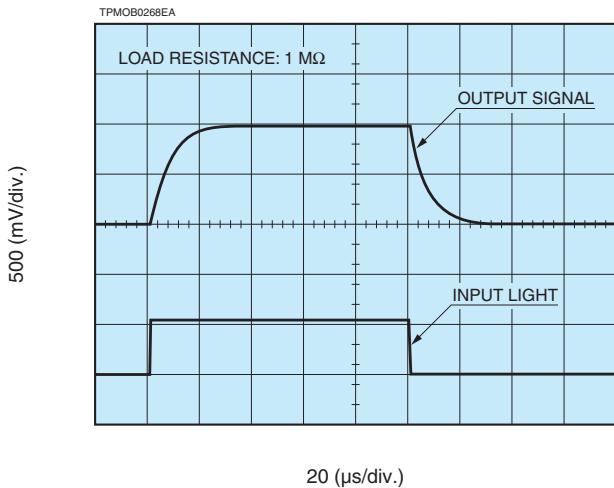
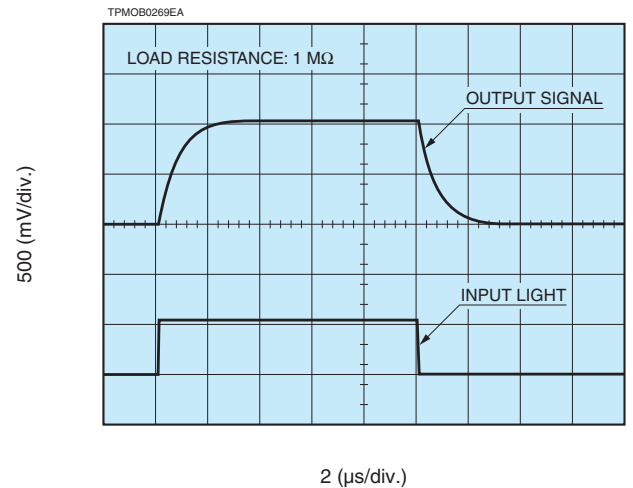


Figure 7: Output characteristics

●H9306



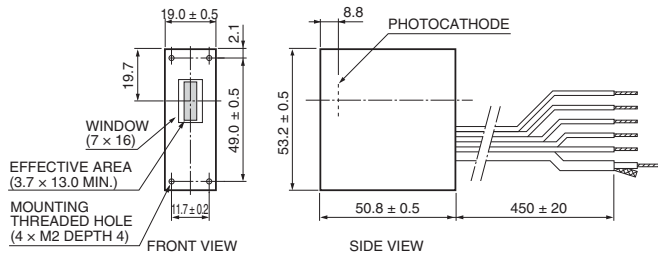
●H9307



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

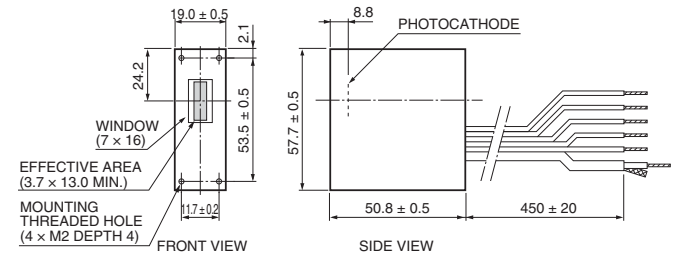


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)
LOW VOLTAGE INPUT (-15 V) : UL1430 AWG26 (GREEN)
GND : UL1430 AWG26 (BLACK)
Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)
Vcont INPUT (+0.25 V to +1.0 V) : UL1430 AWG26 (WHITE)
SIGNAL OUTPUT : RG-174/U*

* Option: Available with BNC / SMA connector

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●H9306-09
H9307-09

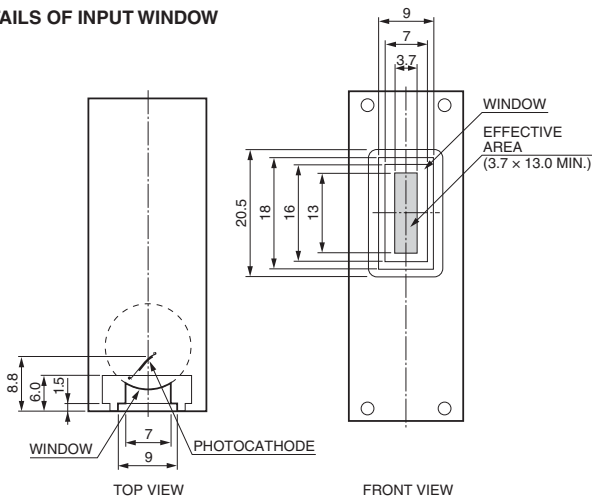


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)
LOW VOLTAGE INPUT (-15 V) : UL1430 AWG26 (GREEN)
GND : UL1430 AWG26 (BLACK)
Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)
Vcont INPUT (+0.25 V to +1.0 V) : UL1430 AWG26 (WHITE)
SIGNAL OUTPUT : RG-174/U*

* Option: Available with BNC / SMA connector

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DETAILS OF INPUT WINDOW



TPMOA0018EE

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 ^(A) (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) ^(B)	147 × 61 × 200	mm
Weight	Approx. 1.2	kg



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

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