

**OVERVIEW**

The H9305 series photosensor modules contain a high-voltage power supply circuit and a 13-mm (1/2") diameter side-on photomultiplier tube in a compact aluminum housing. Its photocathode has a reflection mode that delivers high quantum efficiency at wavelengths above 600 nm, an adequate gain of up to  $10^7$  and fast time response. Flexible cables are used for easy installation in equipment.

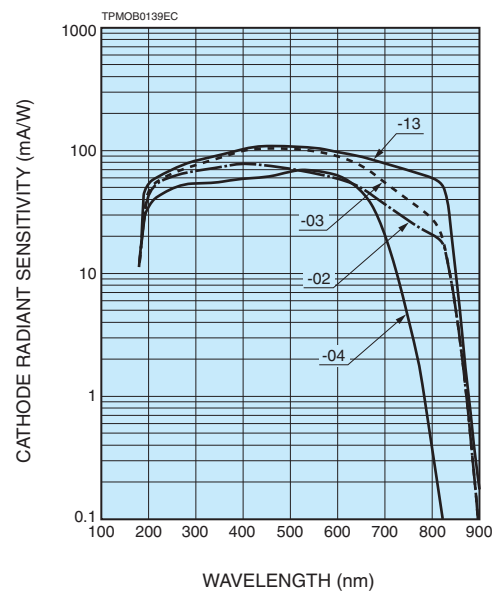
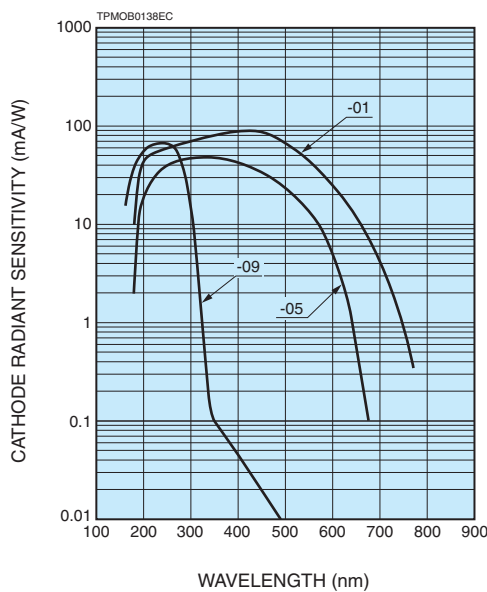


**PRODUCT VARIATIONS**

Type No.	Spectral response	Photocathode	Window material	Features
H9305-01	185 nm to 750 nm	Bialkali	UV glass	High sensitivity in UV to visible range
H9305-02	185 nm to 900 nm	Multialkali	UV glass	For general applications in UV to near IR range
H9305-03	185 nm to 900 nm	Multialkali	UV glass	High sensitivity in UV to near IR range
H9305-13	185 nm to 900 nm	Multialkali	UV glass	High sensitivity in UV to near IR range, Higher sensitivity in near IR range than -03
H9305-04	185 nm to 830 nm	Multialkali	UV glass	Low dark current in UV to near IR range
H9305-05	185 nm to 650 nm	Bialkali	UV glass	For general applications in UV to visible range
H9305-09	160 nm to 320 nm	Cs-Te	Quartz	Solar-blind

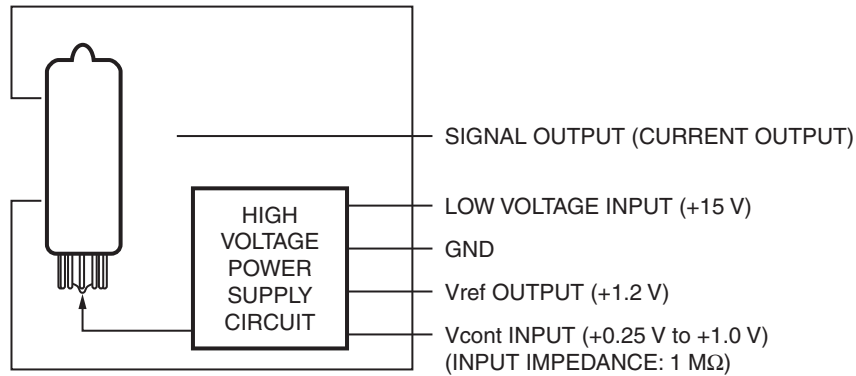
This product can't be used at vacuum environment or reduced pressure environment. Please pay attention when the H9305 series is used for measuring the light below 190 nm.

Figure 1: Typical spectral response



# PHOTOSENSOR MODULES H9305 SERIES

Figure 2: Schematic diagram



TPMOC0283EA

## SPECIFICATIONS

(at +25 °C)

Parameter		H9305 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		7							mA	
Max. average output signal current *2		10							μA	
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 *3		Typ.	90	77	105	109	70	48	50 *4	mA/W
Anode	Luminous sensitivity *2	Min.	100	400	1000	400	300	50	—	A/lm
		Typ.	700	1200	2000	2600	700	300	—	
	Radiant sensitivity *2 *3	Typ.	5.2 × 10 <sup>5</sup>	3.1 × 10 <sup>5</sup>	4.2 × 10 <sup>5</sup>	4.3 × 10 <sup>5</sup>	2.5 × 10 <sup>5</sup>	3.6 × 10 <sup>5</sup>	2.0 × 10 <sup>5</sup> *4	A/W
Dark current *2 *5		Typ.	1	1	2	3	0.1	0.5	0.5	nA
		Max.	10	10	10	10	1	5	5	
Rise time *2		Typ.	1.4						ns	
Ripple noise *2 *6 (peak to peak)		Max.	0.5						mV	
Settling time *7		Max.	10						s	
Operating ambient temperature *8		+5 to +50							°C	
Storage temperature *8		-20 to +50							°C	
Weight		110						115	g	

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

\*2: Control voltage = +1.0 V

\*3: Measured at the peak sensitivity wavelength

\*4: Measured at 254 nm

\*5: After 30 minutes storage in darkness

\*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

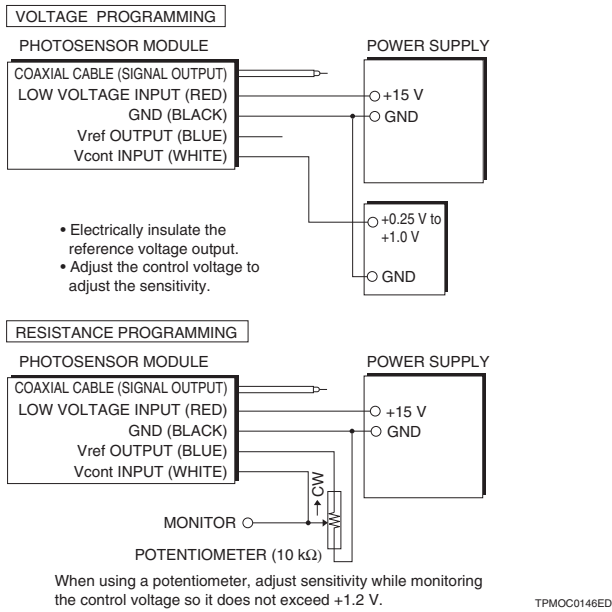


Figure 4: Gain

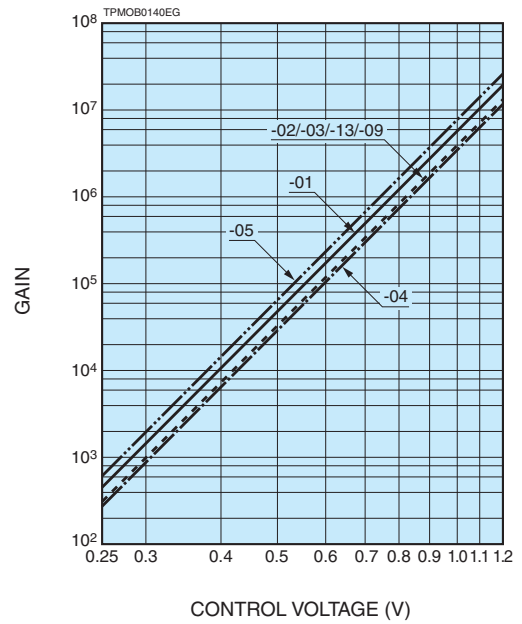


Figure 5: Output signal current vs. input current

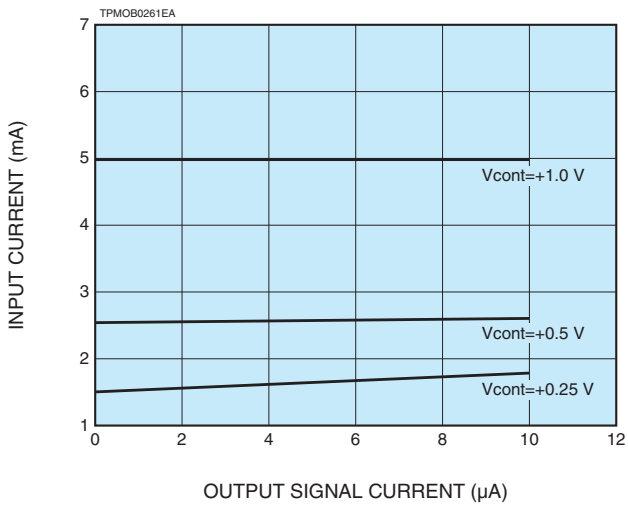


Figure 6: Ripple Noise

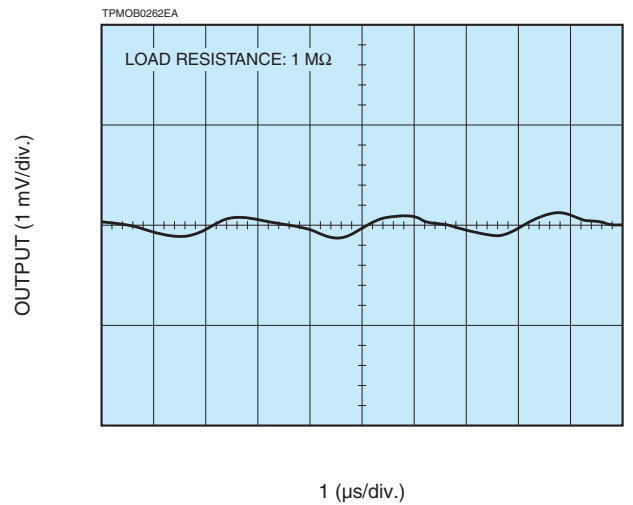


Figure 7: DC Linearity

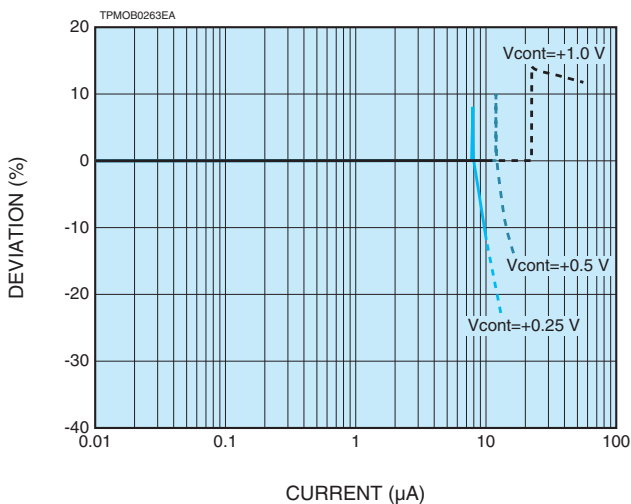
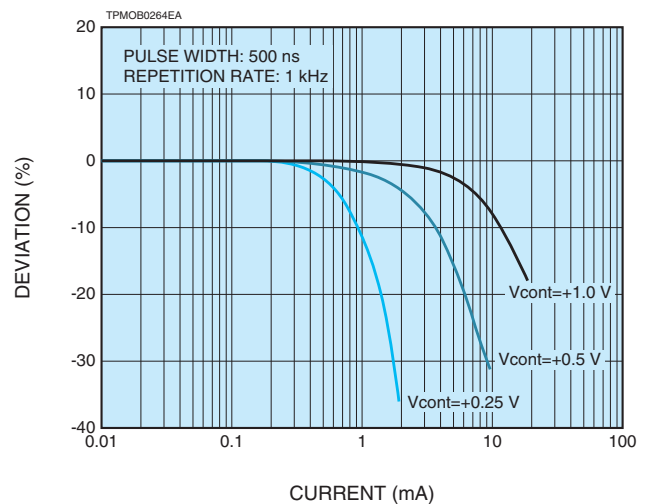


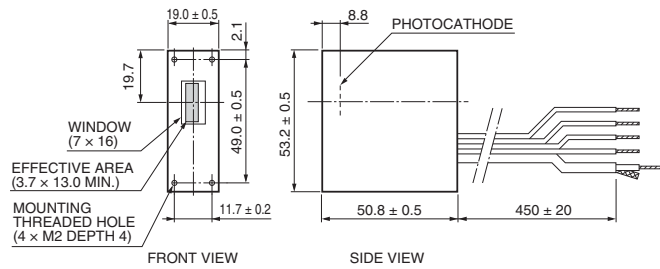
Figure 8: Pulse Linearity



# PHOTOSENSOR MODULES H9305 SERIES

Figure 9: Dimensional outlines (Unit: mm)

## ●H9305-01/-02/-03/-13/-04/-05

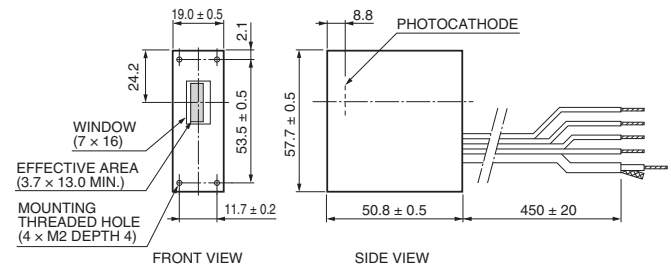


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)  
 GND : UL1430 AWG26 (BLACK)  
 Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)  
 Vcont INPUT (+0.25 V to +1.0 V): UL1430 AWG26 (WHITE)  
 SIGNAL OUTPUT : RG-174/U

Weight: 110 g

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## ●H9305-09

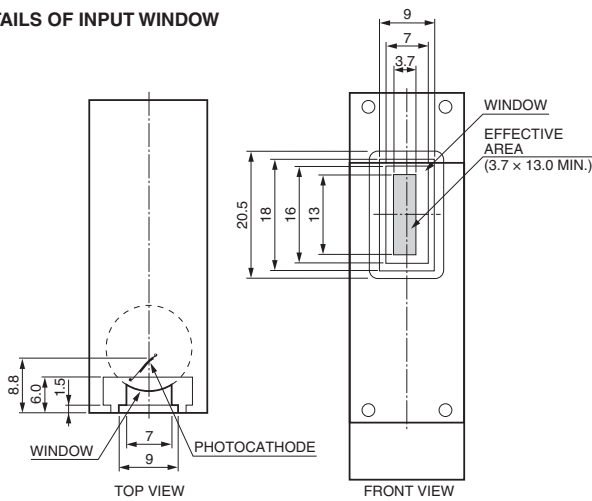


LOW VOLTAGE INPUT (+15 V) : UL1430 AWG26 (RED)  
 GND : UL1430 AWG26 (BLACK)  
 Vref OUTPUT (+1.2 V) : UL1430 AWG26 (BLUE)  
 Vcont INPUT (+0.25 V to +1.0 V): UL1430 AWG26 (WHITE)  
 SIGNAL OUTPUT : RG-174/U

Weight: 115 g

TPMOA0112EA

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

## HAMAMATSU PHOTONICS K.K. [www.hamamatsu.com](http://www.hamamatsu.com)

HAMAMATSU PHOTONICS K.K., Electron Tube Division

314-5, Shimokanzo, Iwata City, Shizuoka Pref., 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: info@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jianning Center, 27 Dongsanhuan Bellu, Chaoyang District, 100020 Beijing, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)03-659-0081 E-mail: info@hamamatsu.com.tw

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