

**OVERVIEW**

The H13320 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.

These modules are suitable for integration to portable devices because they are low power consumption and can be operated by dry batteries.

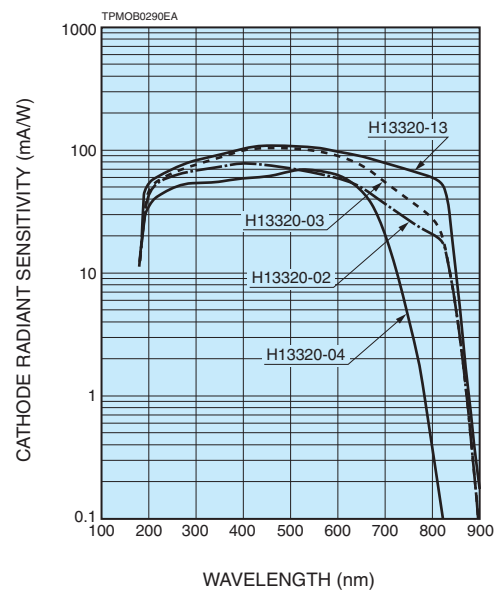
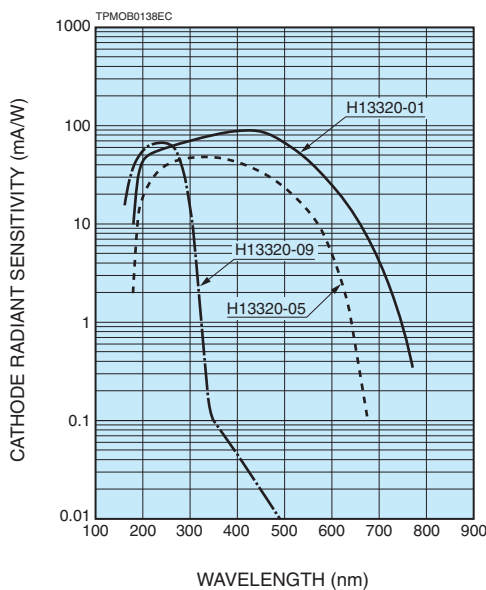


**PRODUCT VARIATIONS**

Type No.	Spectral response	Photocathode	Window material	Features
H13320-01	185 nm to 750 nm	Bialkali	UV glass	High sensitivity in UV to visible range
H13320-02	185 nm to 900 nm	Multialkali	UV glass	For general applications in UV to near IR range
H13320-03	185 nm to 900 nm	Multialkali	UV glass	High sensitivity in UV to near IR range
H13320-13	185 nm to 900 nm	Multialkali	UV glass	High sensitivity in UV to near IR range, Higher sensitivity in near IR range than -03
H13320-04	185 nm to 830 nm	Multialkali	UV glass	Low dark current. For UV to near IR range
H13320-05	185 nm to 650 nm	Bialkali	UV glass	For general applications in UV to visible range
H13320-09	185 nm to 320 nm	Cs-Te	Silica glass	Solar-blind

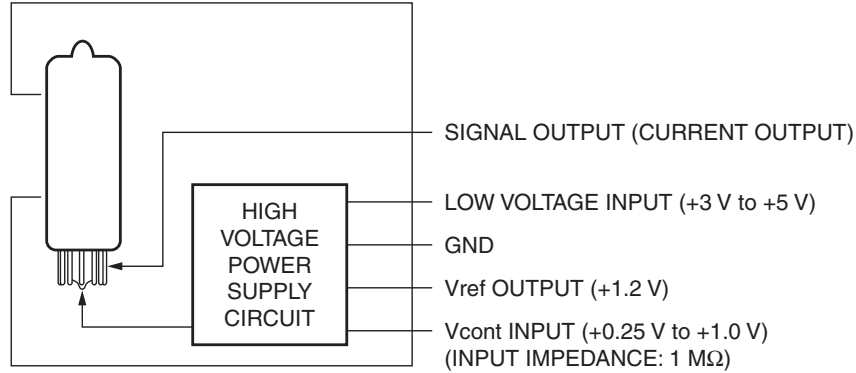
This product can't be used at vacuum environment or reduced pressure environment. Please pay attention when the H13320 series is used for measuring the light below 190 nm.

Figure 1: Typical spectral response



# PHOTOSENSOR MODULES H13320 SERIES

Figure 2: Schematic diagram



## SPECIFICATIONS

(at +25 °C)

Parameter		H13320 series							Unit	
Suffix		-01	-02	-03	-13	-04	-05	-09	—	
Input voltage		+2.8 to +5.5							V	
Max. input voltage		+5.5							V	
Max. input current *1		2.7							mA	
Max. 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.	14						s	
	Operating ambient temperature *8	+5 to +50							°C	
	Storage temperature *8	-20 to +50							°C	
	Weight	104					115		g	

\*1: Input voltage = +5 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

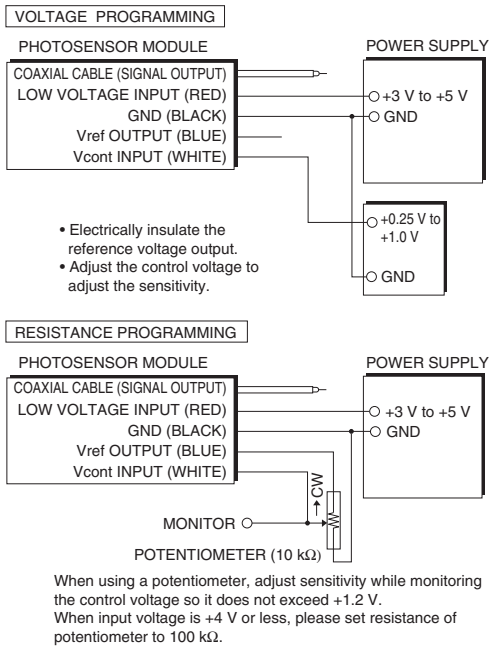


Figure 4: Gain

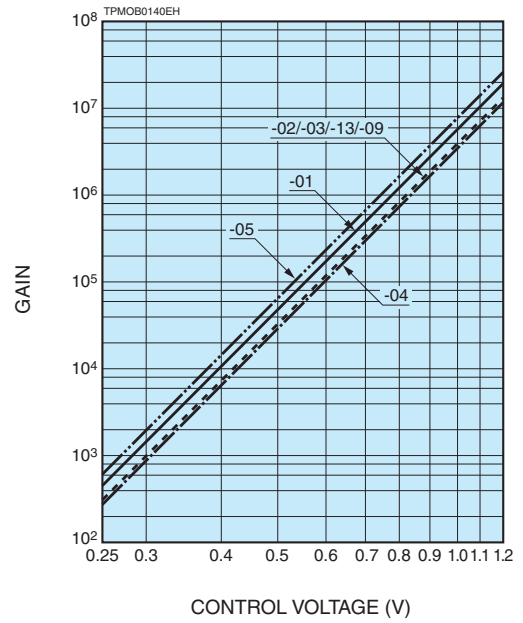


Figure 5: Output signal current vs. input current

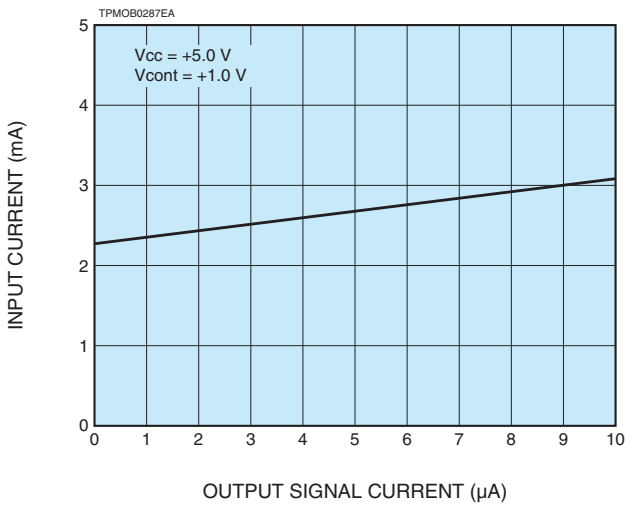


Figure 6: Ripple noise

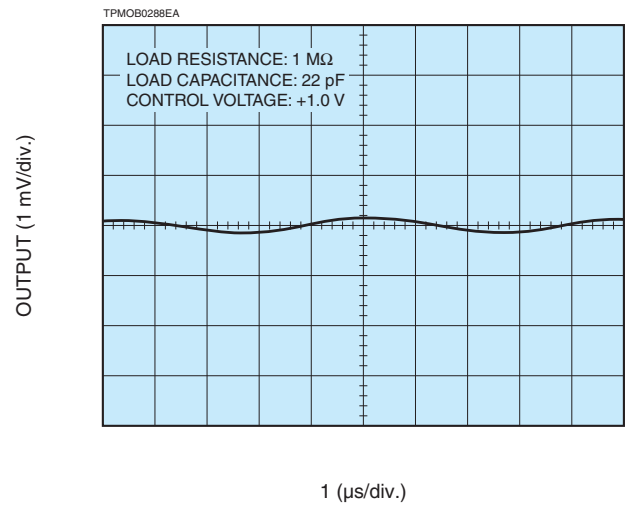


Figure 7: DC linearity

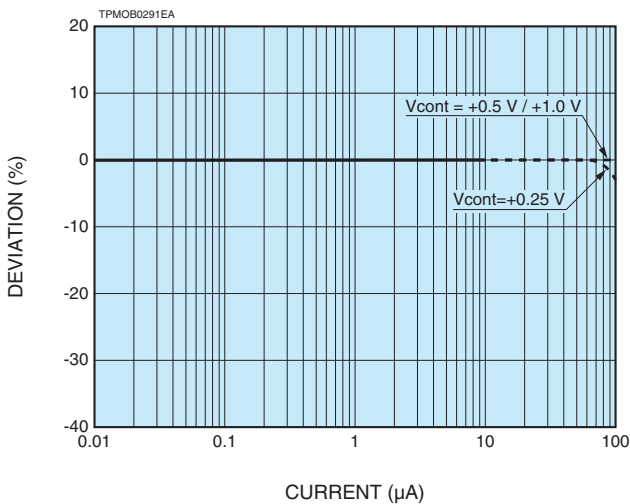
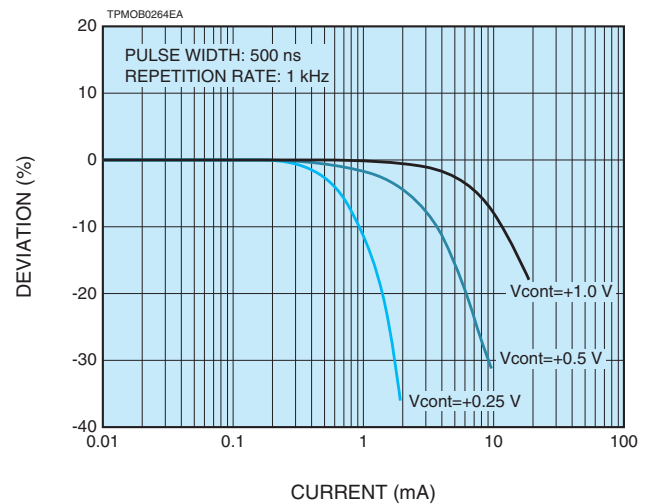


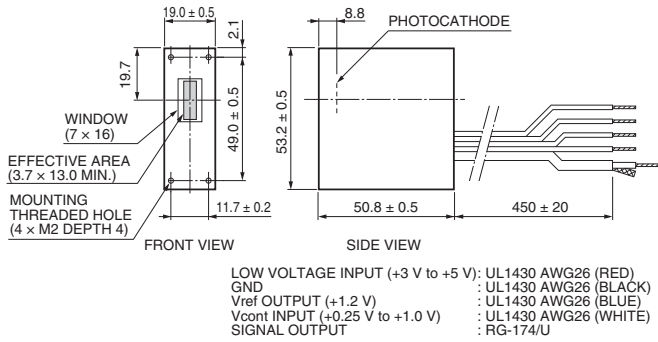
Figure 8: Pulse linearity



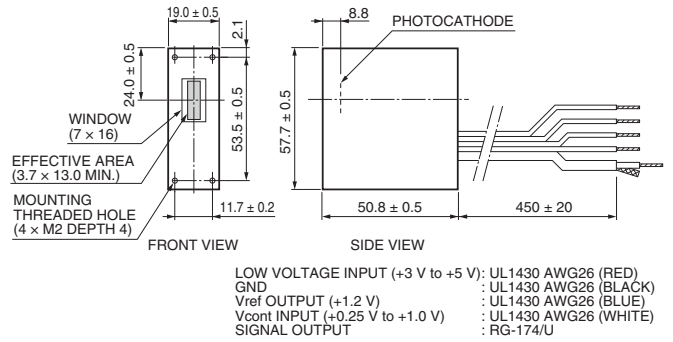
# PHOTOSENSOR MODULES H13320 SERIES

Figure 9: Dimensional outlines (Unit: mm)

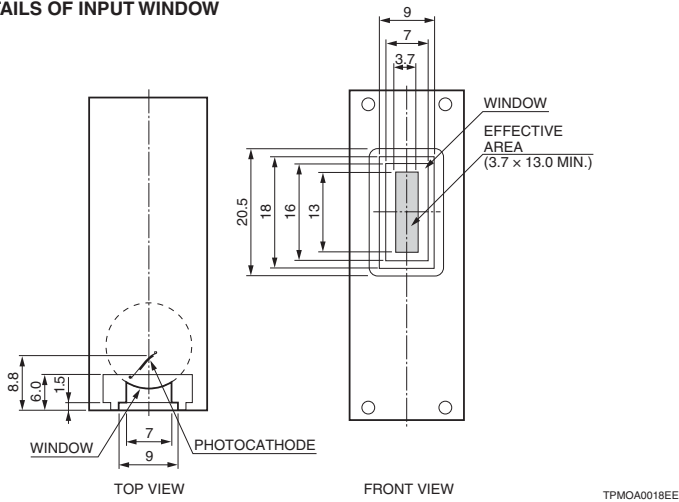
## ●H13320-01/-02/-03/-13/-04/-05



## ●H13320-09



## DETAILS OF INPUT WINDOW



## RELATED PRODUCT

### POWER SUPPLY FOR PHOTOMULTIPLIER TUBE MODULES C10709

The C10709 is a power supply for photomultiplier tube modules with 5 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	±5	V
Output current	Max. 2.0 (+5 V), 0.2 (-5 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	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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