

Compact Side-on PMT

Photosensor Modules H7711/H7712/H8568/H8569 Series



The H7711/H7712/H8568/H8569 series photosensor modules incorporate a 13-mm (1/2") diameter side-on photomultiplier tube, a high-voltage power supply circuit and a low noise amplifier. Two types of amplifiers are available with a current-to-voltage conversion coefficient of 1 V/μA or 0.1 V/μA and a frequency bandwidth of 20 kHz or 200 kHz. Because of different characteristics of the power supply circuit, the H7711/H7712 series features low power consumption, while the H8568/H8569 series offers fast settling time. Five types of photomultiplier tubes are provided as standard lineups to meet various needs for spectral response range.

Product Variations

Type No.					Current-to-Voltage Conversion Factor	Frequency Bandwidth	Features
185 nm to 750 nm	185 nm to 900 nm	185 nm to 900 nm	185 nm to 830 nm	185 nm to 650 nm			
H7711-11	H7711-12	H7711-13	H7711-14	H7711-15	1 V/μA	DC to 20 kHz	Low power consumption
H7712-11	H7712-12	H7712-13	H7712-14	H7712-15	0.1 V/μA	DC to 200 kHz	
H8568-01	H8568-02	H8568-03	H8568-04	H8568-05	1 V/μA	DC to 20 kHz	Fast settling time
H8569-01	H8569-02	H8569-03	H8569-04	H8569-05	0.1 V/μA	DC to 200 kHz	

Specifications

Parameter		H7711 / H7712 / H8568 / H8569 Series					Unit	
Suffix	H7711/H7712 Series	-11	-12	-13	-14	-15	—	
	H8568/H8569 Series	-01	-02	-03	-04	-05		
Input Voltage		±11.5 to ±15.5					V	
Max. Input Voltage		±18					V	
Max. Input Current		H7711/H7712 Series: +7/-1 H8568/H8569 Series: +25/-1					mA	
Max. Control Voltage		+1.2 (Input Impedance H7711/H7712 Series: 1 MΩ, H8568/H8569 Series: 100 kΩ)					V	
Recommended Control Voltage Adjustment Range		+0.25 to +1.0					V	
Effective Area		3.7 × 13.0					mm	
Sensitivity Adjustment Range		1: 10 ⁴					—	
Peak Sensitivity Wavelength		420	400	450	530	340	nm	
Cathode	Luminous Sensitivity	Min.	80	200	350	140	20	μA/lm
		Typ.	120	300	500	200	40	
	Blue Sensitivity Index (CS 5-58)		10	—	—	—	5	—
	Red/White Ratio		—	0.3	0.4	0.15	—	—
Radiant Sensitivity *1		90	77	105	70	48	mA/W	
H7711/H8568 Series (with internal 20 kHz amp)								
Anode	Luminous Sensitivity *2	Min.	1.0 × 10 ⁸	4.0 × 10 ⁸	1.0 × 10 ⁹	3.0 × 10 ⁸	5.0 × 10 ⁷	V/lm
		Typ.	7.0 × 10 ⁸	2.0 × 10 ⁹	2.0 × 10 ⁹	7.0 × 10 ⁸	3.0 × 10 ⁸	
	Radiant Sensitivity *1 *2		520	520	420	250	360	V/nW
Voltage Output Depending on PMT Dark Current *2 *3	Typ.	1	1	2	0.1	0.5	mV	
	Max.	10	10	10	1	5		
Max. Output Signal Voltage		+10 (Load resistance 10 kΩ)					V	
Current-to-Voltage Conversion Factor		1					V/μA	
H7712/H8569 Series (with internal 200 kHz amp)								
Anode	Luminous Sensitivity *2	Min.	1.0 × 10 ⁷	4.0 × 10 ⁷	1.0 × 10 ⁸	3.0 × 10 ⁷	5.0 × 10 ⁶	V/lm
		Typ.	7.0 × 10 ⁷	2.0 × 10 ⁸	2.0 × 10 ⁸	7.0 × 10 ⁷	3.0 × 10 ⁷	
	Radiant Sensitivity *1 *2		52	52	42	25	36	V/nW
Voltage Output Depending on PMT Dark Current *2 *3	Typ.	0.1	0.1	0.2	0.01	0.05	mV	
	Max.	1	1	1	0.1	0.5		
Max. Output Signal Voltage		+1 (Load resistance 10 kΩ)					V	
Current-to-Voltage Conversion Factor		0.1					V/μA	
		H7711 Series	H7712 Series	H8568 Series	H8569 Series			
Offset Voltage *2	Typ.	±3					mV	
Ripple Noise *2 *4 (peak to peak)	Max.	1	3	1	3		mV	
Settling Time *5		10		0.2			s	
Operating Ambient Temperature		+5 to +50		+5 to +45			°C	
Storage Temperature		-20 to +50					°C	
Weight		100					g	

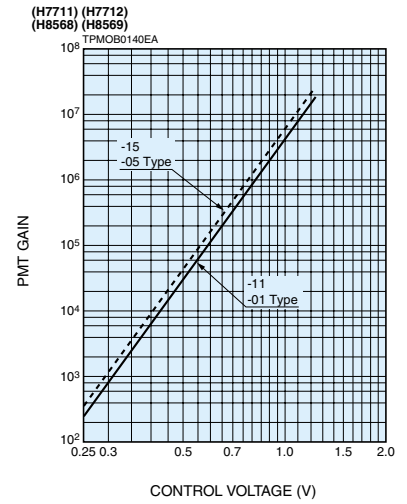
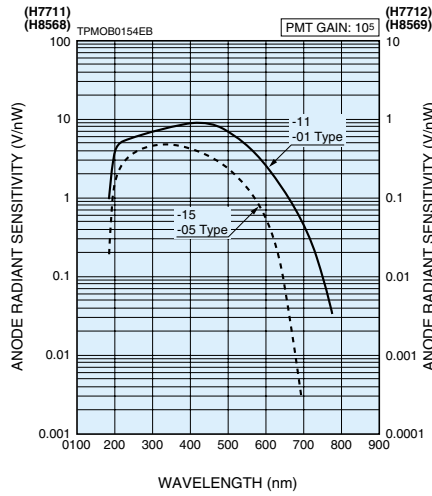
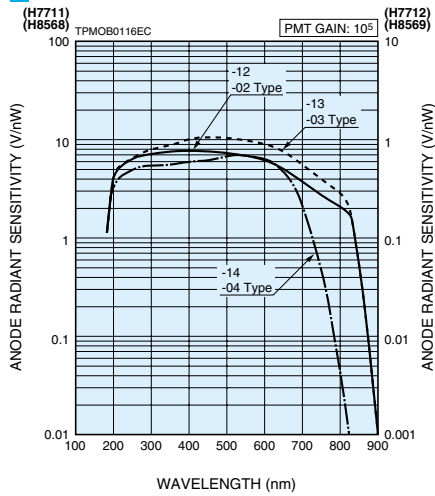
*1: Measured at the peak sensitivity wavelength *2: Control voltage = +1.0 V *3: After 30 minute storage in darkness

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

*5: 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.

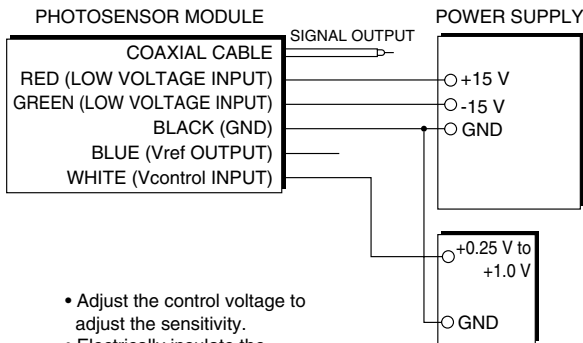
Voltage Output Type Photosensor Modules

Characteristics (Anode radiant sensitivity, PMT gain)



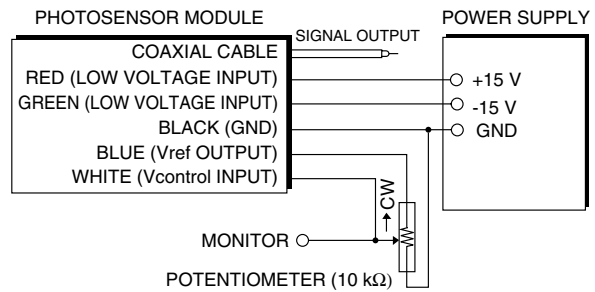
Sensitivity Adjustment Method

VOLTAGE PROGRAMMING



- Adjust the control voltage to adjust the sensitivity.
- Electrically insulate the reference voltage output.

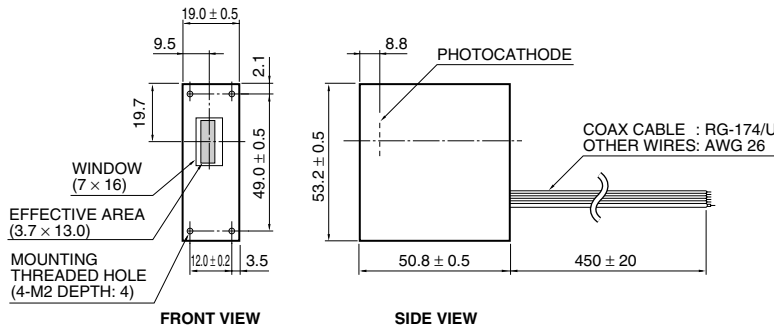
RESISTANCE PROGRAMMING



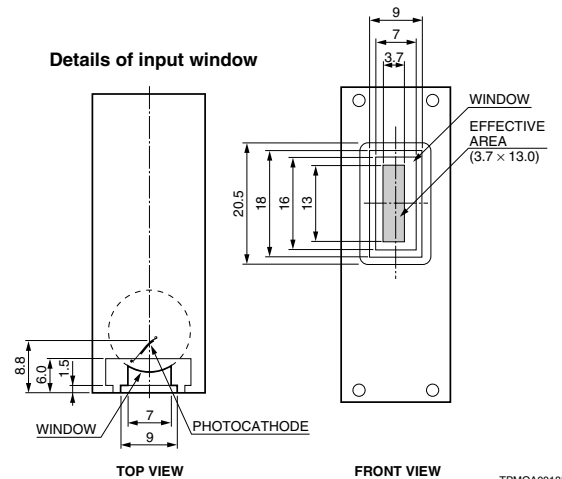
When using a potentiometer, adjust sensitivity while monitoring the control voltage.

TPMOC0147EC

Dimensional Outlines (Unit: mm)



TPM OA0013ED



TPM OA0018ED