

Metal package PMT with gate function

Photosensor modules H11706 series



The H11706 series is an optical sensor module containing a metal package photomultiplier tube, a high-voltage power supply circuit, and a gate circuit. The gate circuit electrically protects the photomultiplier tube from excessive light such as excitation light that illuminates samples.

The H11706 series offers a choice of photomultiplier tubes with different photocathodes: multialkali photocathodes with sensitivity extending to the near infrared region or enhanced red sensitivity and GaAsP photocathodes with high sensitivity in the visible region. The H11706 series also includes "P type" with high gain and low dark count specifically selected for photon counting applications.

Product variations

Type No.	Spectral response	Features
H11706-01	230 nm to 870 nm	For UV to near IR range
H11706-20	230 nm to 920 nm	Infrared-extended multialkali photocathode with enhanced sensitivity, for UV to near IR range
H11706-40	300 nm to 720 nm	GaAsP photocathode, QE 40 % at peak wavelength
H11706P-01	230 nm to 870 nm	For UV to near IR range, for photon counting
H11706P-40	300 nm to 720 nm	GaAsP photocathode, for photon counting

This product can't be used at vacuum environment or reduced pressure environment.

Specifications

(at +25 °C)

Parameter		H11706-01 H11706P-01	H11706-20	H11706-40 H11706P-40	Unit	
Input voltage		+14.5 to +15.5			V	
Max. input voltage		+16			V	
Max. input current *1*2		10			mA	
Max. average output signal current*2		100		2	μA	
Max. control voltage		+1.1		+0.9	V	
Recommended control voltage adjustment range		+0.5 to +1.1		+0.5 to +0.8	V	
Control voltage input impedance		30			kΩ	
Effective area		φ8			mm	
Peak sensitivity wavelength		400	630	580	nm	
Cathode	Luminous sensitivity	Min.	100	350	μA/lm	
		Typ.	200	500		
	Red / White ratio	Typ.	0.2	0.45	—	
	Radiant sensitivity	Typ.	77 (400 nm)	78 (630 nm)	176 (550 nm)	mA/W
Anode	Standard type	Luminous sensitivity *2	Min.	100	350	A/lm
			Typ.	400	1000	
	Radiant sensitivity *2	Typ.	1.5 × 10 ⁵ (400 nm)	1.5 × 10 ⁵ (630 nm)	8.8 × 10 ⁴ (550 nm)	A/W
		Dark current *2*3	Typ.	1	10	5
	Max.		10	100	—	
	P type	Radiant sensitivity *2	Typ.	1.5 × 10 ⁵ (400 nm)	—	17.6 × 10 ⁴ (550 nm)
Dark count *2*3		Typ.	600	—	6000	s ⁻¹
	Max.	1000	—	18000		
Rise time *2		0.57			ns	
Ripple noise *2*4 (peak to peak)		Max.	0.8		mV	
Settling time		Max.	0.2 *5	0.2 *6	s	
Operating ambient temperature *7		+5 to +50		+5 to +35	°C	
Storage temperature *7		-20 to +50			°C	
Weight		125		135	g	

*1: At +15 V input voltage, output current equal to dark current, and without gate signal input

*2: H11706-01/-20: Control voltage = +1.0 V, H11706-40: Control voltage = +0.8 V

*3: After 30 minutes storage in darkness, output of dark current.

*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.

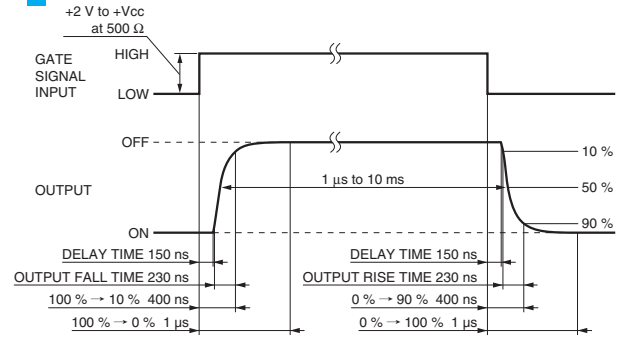
*6: The time required for the output to reach a stable level following a change in the control voltage from +0.8 V to +0.5 V.

*7: No condensation

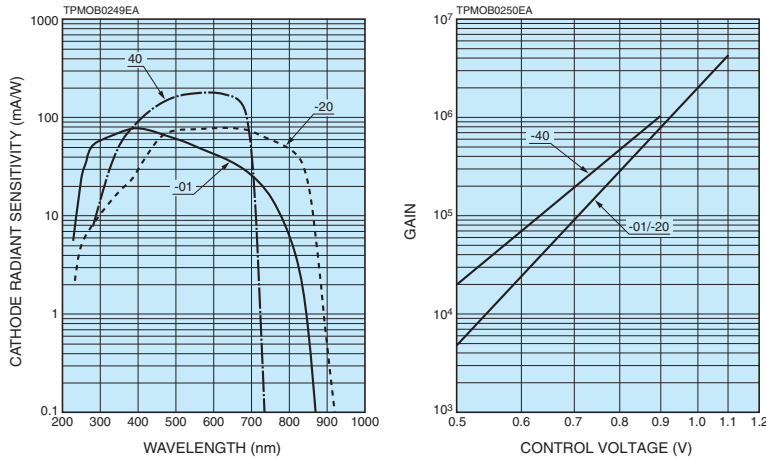
(at +25 °C)

Parameter		Description / Value	Unit
Gate mode	Mode	Nomally ON	—
	Gate width (FWHM)	1 μ s to 10 ms	—
	Rise time	Typ. 230	ns
	Fall time	Typ. 230	ns
	Repetition rate	Max. 10	kHz
	Switching ratio	Typ. 10^3	—
	Delay time	Typ. 150	ns
Gate signal	Input LOW level	Min. 0 Max. +0.4	V
	Input HIGH level	Min. +2.0 Max. Vcc	V
	Input impedance	500	Ω

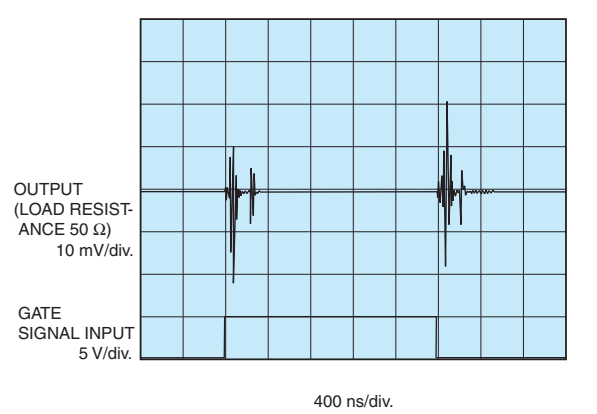
Gate characteristics



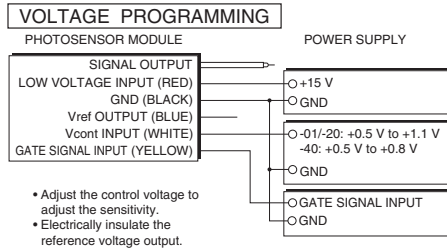
Characteristics (Cathode radiant sensitivity, Gain)



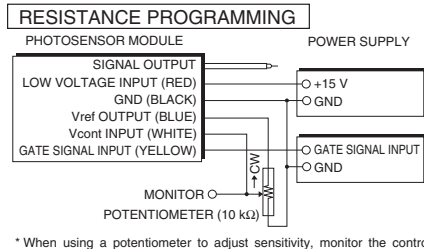
Switching noise



Sensitivity adjustment method



TPMOC0252EA

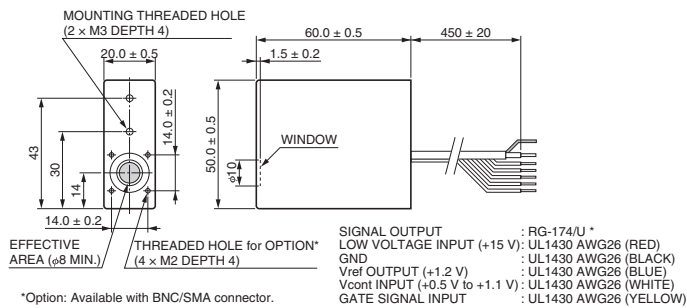


* When using a potentiometer to adjust sensitivity, monitor the control voltage so it does not exceed +1.1 V (-01/-20) / +0.9 V (-40).

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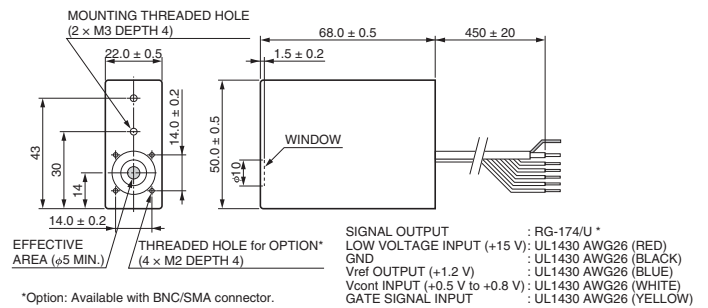
Dimensional outlines (Unit: mm)

●H11706-01/-20



TPMOA0081EB

●H11706-40



TPMOA0082EB