

## OVERVIEW

The H14953 series is compact photomultiplier tube modules containing a metal package PMT, a high-voltage power supply circuit and a low-noise amplifier. Despite the size nearly equal to photodiodes, this PMT module provides high gain, wide dynamic range, and high speed response.

The amplifier with a frequency bandwidth of DC to 200 kHz converts the PMT current output to a voltage output so that signal can be easily processed.

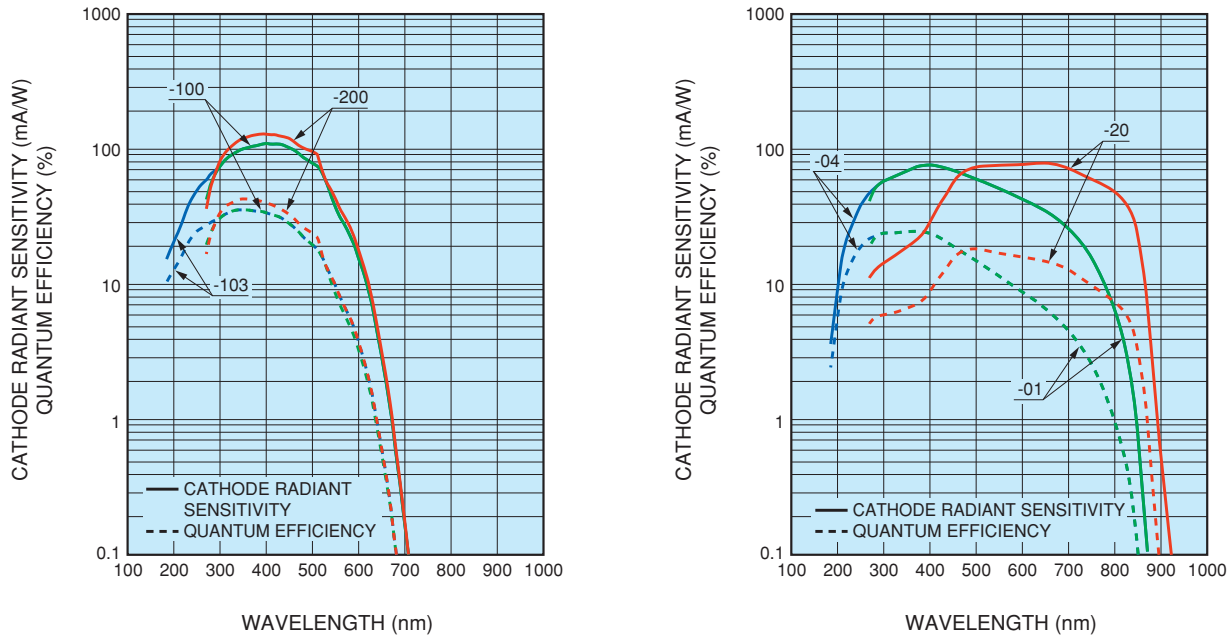


## PRODUCT VARIATIONS

Type No.	Spectral response	Photocathode material	Input window material
H14953-100	300 nm to 650 nm	Super bialkali	Borosilicate glass
H14953-103	185 nm to 650 nm	Super bialkali	UV glass
H14953-200	300 nm to 650 nm	Ultra bialkali	Borosilicate glass
H14953-01	300 nm to 870 nm	Multialkali	Borosilicate glass
H14953-04	185 nm to 870 nm	Multialkali	UV glass
H14953-20	300 nm to 920 nm	Extended red multialkali	Borosilicate glass

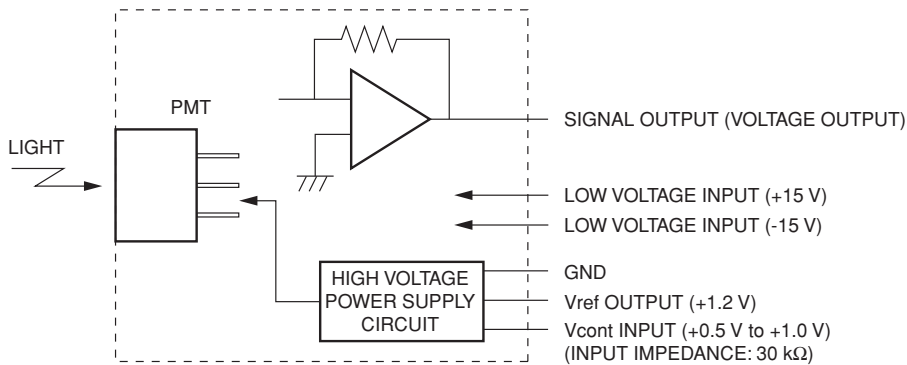
This product can't be used at vacuum environment or reduced pressure environment.

Figure 1: Typical spectral response



# PHOTOMULTIPLIER TUBE MODULE H14953 SERIES

Figure 2: Schematic diagram



## SPECIFICATIONS

(at +25 °C)

Parameter		H14953 series					Unit
Suffix		-100, -103	-200	-01, -04	-20	—	
Input voltage		±11.5 to ±15.5					V
Max. input voltage		±18					V
Max. input current *1*2		+11.5 / -1.5					mA
Max. output signal voltage *1		+10 (Load resistance 10 kΩ)					V
Max. control voltage		+1.0 (Input impedance 30 kΩ)					V
Recommended control voltage adjustment range		+0.5 to +1.0 (Input impedance 30 kΩ)					V
Effective area		φ8					mm
Peak sensitivity wavelength		400					nm
Cathode	Luminous sensitivity	Min.	80	100	100	350	μA/lm
		Typ.	105	135	200	500	
	Blue sensitivity index (Blue filter)	Typ.	13.5	15.5	—	—	—
	Red/White ratio	Typ.	—	—	0.25	0.45	—
	Radiant sensitivity *3	Typ.	110	130	77	78	mA/W
Anode	Luminous sensitivity *1	Min.	3.0 × 10 <sup>6</sup>	4.0 × 10 <sup>6</sup>	4.0 × 10 <sup>6</sup>	1.4 × 10 <sup>7</sup>	V/lm
		Typ.	1.1 × 10 <sup>7</sup>	1.4 × 10 <sup>7</sup>	2.0 × 10 <sup>7</sup>	5.0 × 10 <sup>7</sup>	
	Radiant sensitivity *1*3	Typ.	11	13	7.7	7.8	V/nW
	Voltage output depending or PMT dark current *1*4	Typ.	0.05	0.05	0.1	1	mV
	Max.	0.5	0.5	1	10		
Frequency bandwidth (-3 dB)		DC to 200 kHz					—
Current-to-voltage conversion factor		0.1					V/μA
Output offset voltage		Typ.	±1			mV	
Ripple noise *1*5		Max.	1.5			mV	
Settling time *6		Max.	0.2			s	
Operating ambient temperature *7		+5 to +50					°C
Storage temperature *7		-20 to +50					°C
Weight		46					g

\*1: Input voltage=±15.0 V, Control voltage=+0.9 V

\*2: Control voltage=+0.9 V

\*3: Measured at the peak sensitivity wavelength

\*4: After 30 min storage in darkness. The actual output value in darkness is the sum of dark current and offset voltage.

\*5: Cable RG-178B/U, Cable length 450 mm, Load resistance=1 MΩ, Load capacitance=14 pF

\*6: The time required for the output to reach a stable level following a change in the control voltage from +0.9 V to +0.5 V.

\*7: No condensation

Figure 3: Sensitivity adjustment method

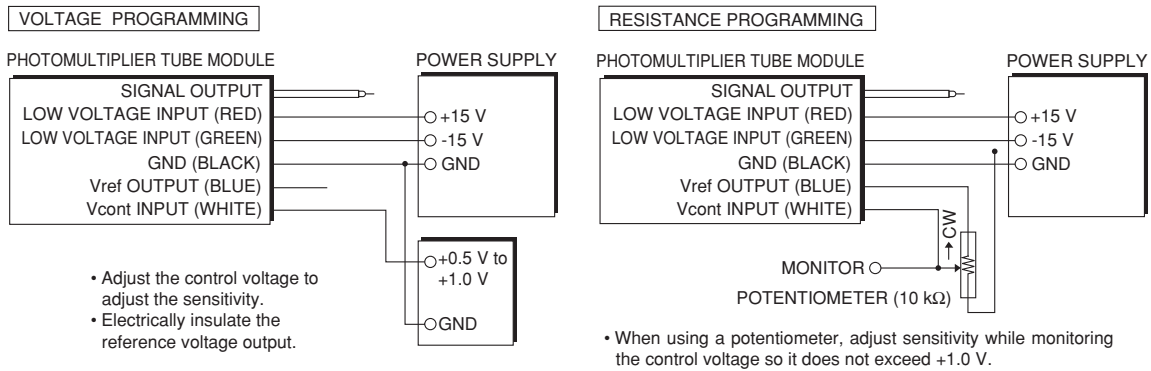


Figure 4: Typical gain

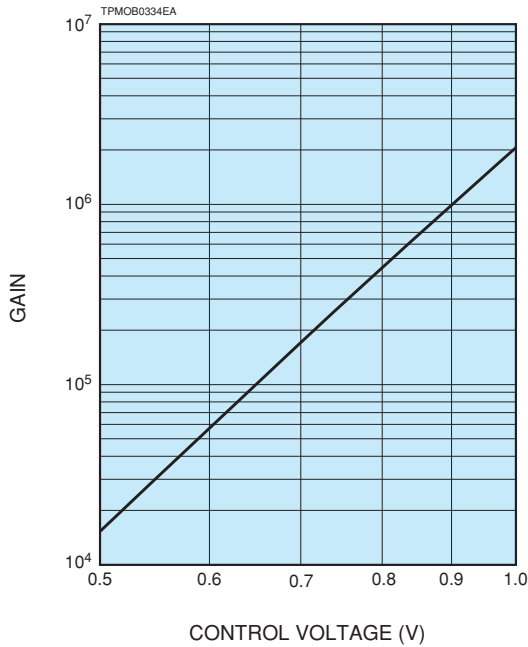


Figure 5: Typical frequency response

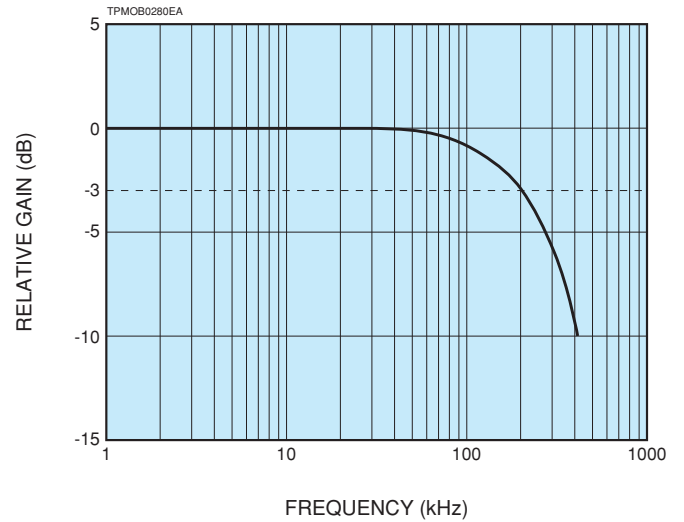


Figure 6: Typical ripple noise

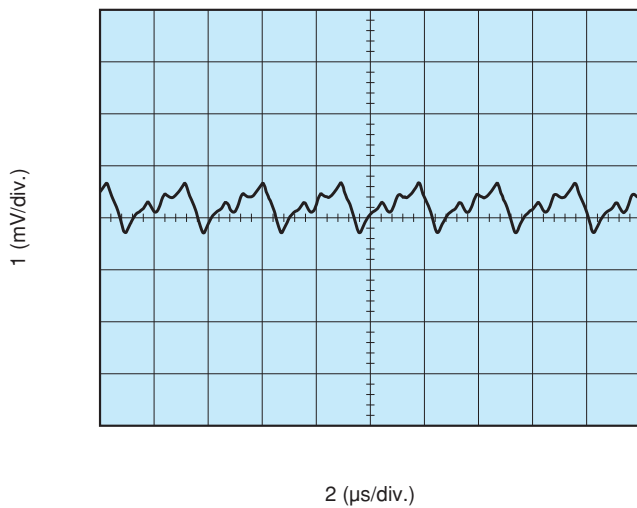
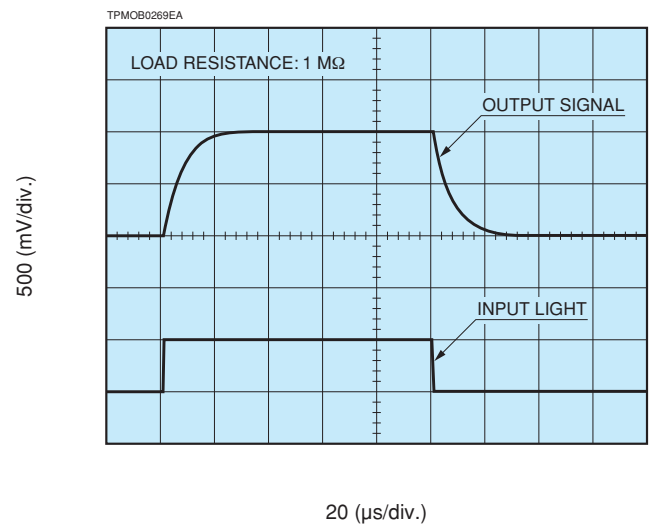
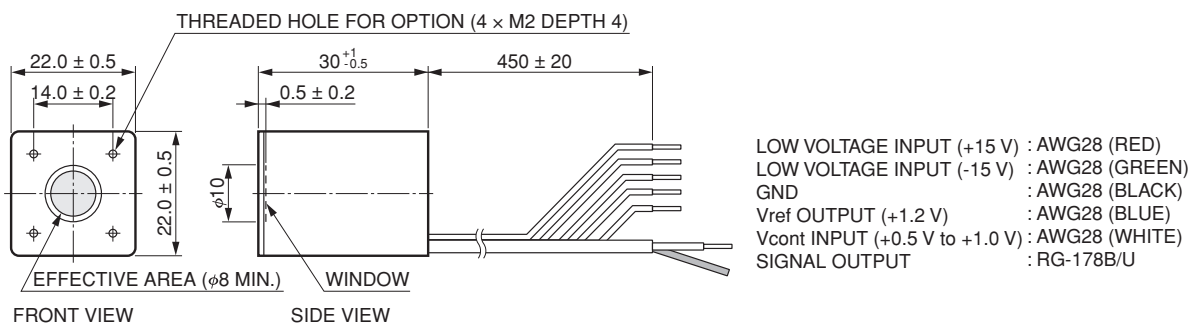


Figure 7: Typical output characteristics



# PHOTOMULTIPLIER TUBE MODULE H14953 SERIES

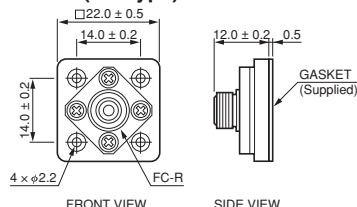
Figure 8: Dimensional outlines (Unit: mm)



## OPTION

### OPTICAL FIBER ADAPTER E5776 / E5776-51

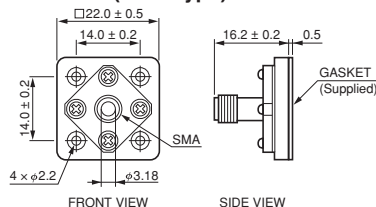
#### E5776 (FC Type)



\* Supplied with M2 screws(4 pcs) for fixing to module

TACCA0055EB

#### E5776-51 (SMA Type)

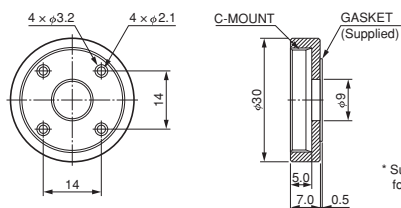


\* Supplied with M2 screws(4 pcs) for fixing to module

TACCA0239EB

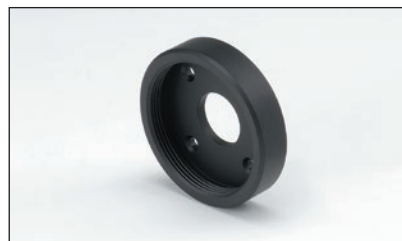


### C-MOUNT ADAPTER A9865



\* Supplied with M2 screws(4pcs) for fixing to module

TPMOA0056EB



Note: Optical blocks are available for these photomultiplier tube modules to make compact optical systems without light leakage.

## RELATED PRODUCT

### POWER SUPPLY FOR PHOTOMULTIPLIER TUBE MODULES C7169

The C7169 is the power supply for photomultiplier tube modules which has 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
Input voltage	AC100 to AC240	V

**NOTE:** <sup>(A)</sup>Adjust within the recommended control voltage range for the photomultiplier tube module being used.

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

### 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, 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 Traup, 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: Torshamsgatan 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, 20044 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, Jiaming Center, 27 Dongsanhuan Beltu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2868 E-mail: hpc@hamamatsu.com.cn

Taiwan: HAMAMATSU PHOTONICS TAIWAN CO., LTD.: 8F-3, No.158, Section 2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

TPMO1119E01  
AUG. 2022 IP