

**For Liquid Scintillation Counting, Photon Counting Application
51mm (2 Inch) Diameter, Bialkali Photocathode, 12 Stages, Head-On Type**

SPECIFICATIONS

GENERAL

Parameter		Description / Value	Unit
Spectral Response		300 to 650	nm
Wavelength of Maximum Response		420	nm
Photocathode	Material	Bialkali	—
	Minimum Effective Area	φ46	mm
Window Material	Material	Low K content borosilicate glass (Frosted)	—
	Shape	Concave-Convex	—
Dynode	Structure	Linear focused	—
	Number of Stages	12	—
Direct Interelectrode Capacitances	Anode to Last Dynode	2	pF
	Anode to All Other Electrodes	2.5	pF
Base		21-pin glass base	—
Suitable Socket		E678-21C (supplied)	—
Weight		150	g
Operation Ambient Temperature		-30 to +50	°C
Storage Temperature		-80 to +50	°C

MAXIMUM RATINGS (Absolute Maximum Values)

Parameter		Value	Unit
Supply Voltage	Between Anode and Cathode	2500	V
	Between Anode and Last Dynode	500	V
Average Anode Current		0.2	mA

CHARACTERISTICS (at 25 °C)

Parameter		Min.	Typ.	Max.	Unit
Cathode Sensitivity	Luminous (2856K)	60	90	—	μA/lm
	Blue Index (CS 5-58 filter)	9.0	10.5	—	—
	Quantum Efficiency at Peak Wavelength	—	25	—	%
Anode Sensitivity	Luminous (2856K)	30	120	—	A/lm
	Radiant at Peak Wavelength	—	1.1 × 10 ⁵	—	A/W
Gain		—	1.3 × 10 ⁶	—	—
Anode Dark Current (after 30 min storage in darkness)		—	10	50	nA
Dark Counts		—	1000	2000	s ⁻¹
Background Noise*		—	18	27	m ⁻¹
Time Response	Anode Pulse Rise Time	—	2.6	—	ns
	Electron Transit Time	—	48	—	ns
	Transit Time Spread (FWHM)	—	1.1	—	ns
Pulse Linearity	2 % Deviation	—	15	—	mA
	5 % Deviation	—	30	—	mA

* Background noise is the noise count measured as a pair at Hamamatsu Photonics K.K. with coincident resolving time (τ) of 25 ns. It includes noise counts by natural radiation and chance coincident counts per minute is calculated by (2 × N1 × N2 × τ) × 60 where N1 and N2 are dark counts per second of each PMT used as a pair.

VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	G	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	Dy11	Dy12	P
Ratio	4	0	1	1.4	1	1	1	1	1	1	1	1	1	1	1

Supply Voltage: 1500 V, K: Cathode, Dy: Dynode, P: Anode, G: Grid * Shield should be connected to Dy5

PHOTOMULTIPLIER TUBE R331-05

Figure 1: Typical Spectral Response

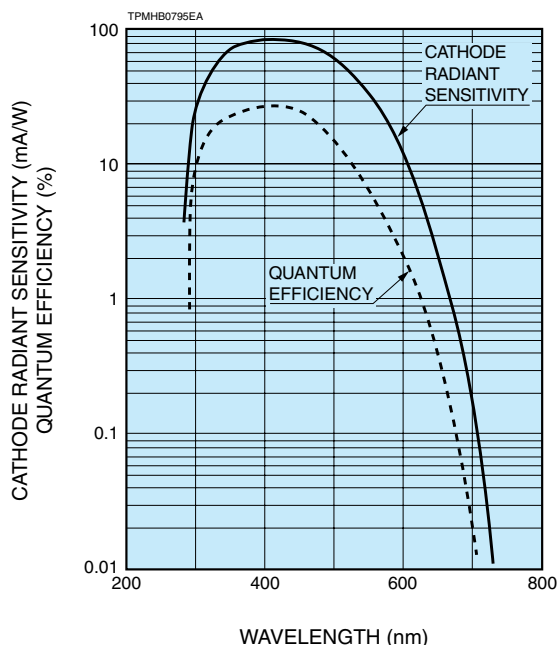


Figure 2: Typical Anode Luminous Sensitivity and Gain

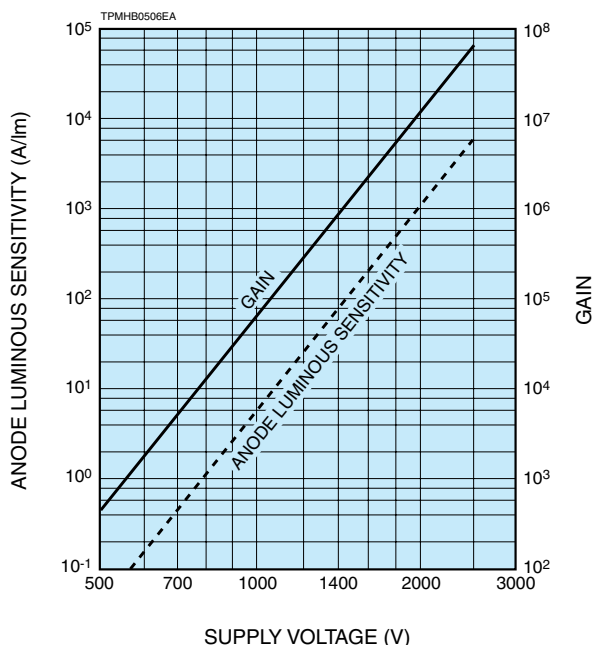


Figure 3: Dimensional Outline and Basing Diagram (Unit: mm)

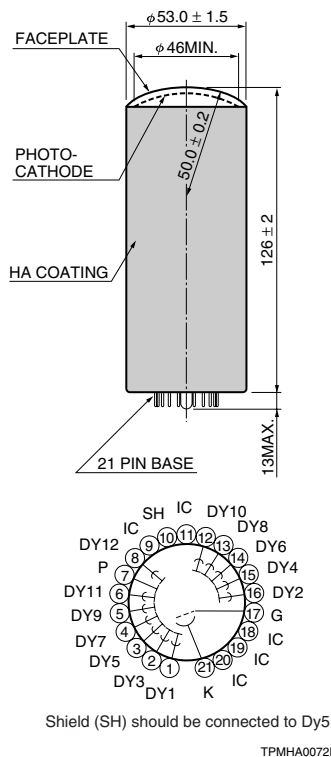
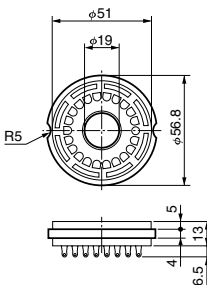
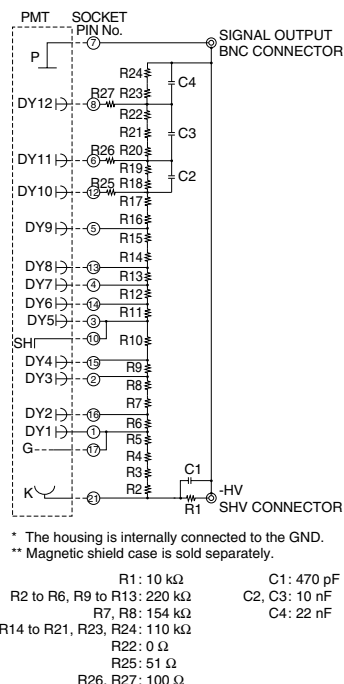
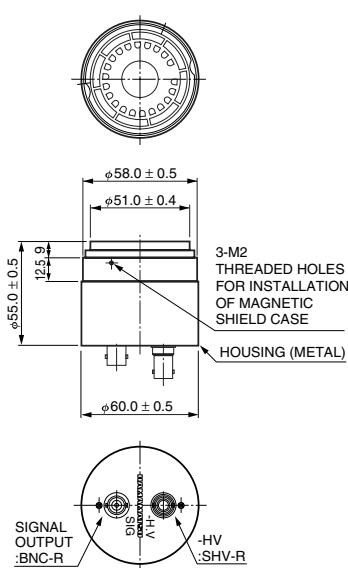


Figure 4: Accessories (Unit: mm)

● Socket E678-21C (Supplied)



● D-type Socket Assembly E5859-01 (Sold separately)



* The housing is internally connected to the GND.
 ** Magnetic shield case is sold separately.

R1: 10 k Ω C1: 470 pF
 R2 to R6, R9 to R13: 220 k Ω C2, C3: 10 nF
 R7, R8: 154 k Ω
 R14 to R21, R23, R24: 110 k Ω
 R22: 0 Ω
 R25: 51 Ω
 R26, R27: 100 Ω

* HAMAMATSU also provides bench-top type high voltage power supplies C9727 series.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

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