

## 4 mm × 4 mm Multianode, High Speed Response, Low Cross-talk 30 mm Square, Bialkali Photocathode, 12-stage, Head-on Type

### GENERAL

Parameter		Description/Value	Unit
Spectral Response		300 to 650	nm
Peak Wavelength		420	nm
Photocathode	Material	Bialkali	—
	Minimum Effective Area	18.1 × 18.1	mm
Window Material		Borosilicate glass	—
Dynode	Structure	Metal channel dynode	—
	Number of Stages	12	—
Anode Size		4.2 × 4.2 (center)	mm
Weight		Approx. 50	g
Operating Ambient Temperature		-30 to +50	°C
Storage Temperature		-30 to +50	°C

### MAXIMUM RATINGS (Absolute Maximum Values)

Parameter		Value	Unit
Supply Voltage	Between Anode and Cathode	1000	V
Average Anode Output Current in Total		0.014*	mA

\* The maximum average anode current is defined as 5 % of divider current when standard high voltage is applied.

### CHARACTERISTICS (at 25 °C)

Parameter		Min.	Typ.	Max.	Unit
Cathode Sensitivity	Luminous (2856 K)	60	80	—	μA/lm
	Blue Sensitivity Index (CS 5-58)	6.5	8.5	—	—
Anode Sensitivity	Luminous (2856 K)	80 (20)	280 (70)	—	A/lm
Gain		—	3.5 × 10 <sup>6</sup> (0.9 × 10 <sup>6</sup> )	—	—
Anode Dark Current per Channel (after 30 min storage in darkness)		—	0.8 (0.4)	—	nA
Anode Dark Current in Total (after 30 min storage in darkness)		—	12 (6)	60 (30)	nA
Time Response per Channel	Anode Pulse Rise Time	—	0.83	—	ns
	Electron Transit Time	—	10.9	—	ns
	Transit Time Spread (FWHM)	—	0.3	—	ns
Pulse Linearity per Channel (±5 % deviation)		—	1 (3)	—	mA
Cross-talk (4 mm × 4 mm Aperture)		—	1	—	%
Uniformity Between Each Anode		—	1:3	1:5	—

**NOTE:** Anode characteristics are measured with the voltage distribution ratio shown below.

( ) : Measured with the special voltage distribution ratio (Tapered Divider) shown below.

### VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	...	Dy9	Dy10	Dy11	Dy12	P
H8711	2	2	2	1	1	1...1		1	1	1	1	
H8711-10 (Tapered Divider)	2.4	2.4	2.4	1	1	1...1		1	1	1.2	2.4	

Supply Voltage: 800 V, K: Cathode, Dy: Dynode, P: Anode

# MULTIANODE PHOTOMULTIPLIER TUBE ASSEMBLIES H8711, H8711-10

Figure 1: Typical Spectral Response

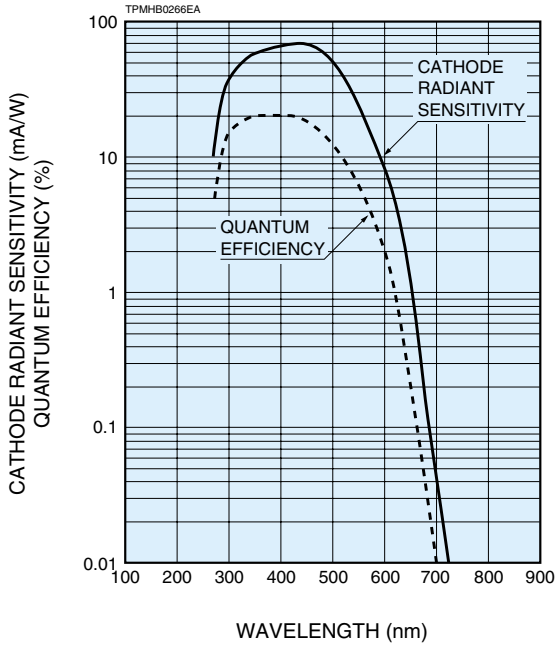


Figure 2: Typical Gain and Anode Dark Current per Channel

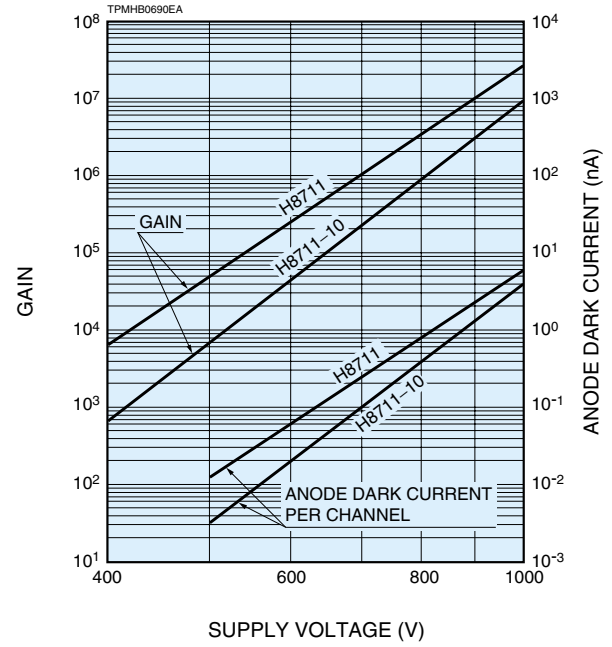


Figure 3: Typical Time Response

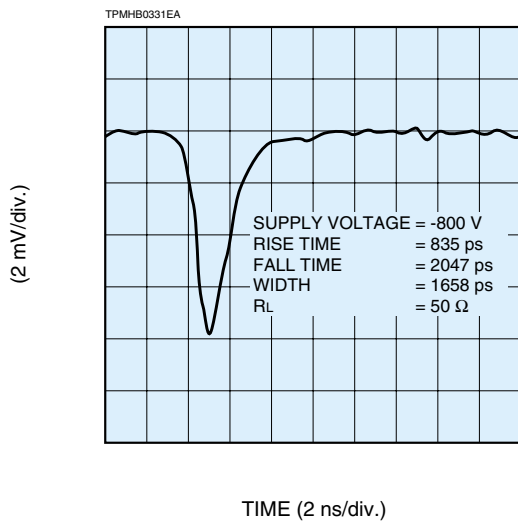


Figure 4: Typical T.T.S. Characteristic

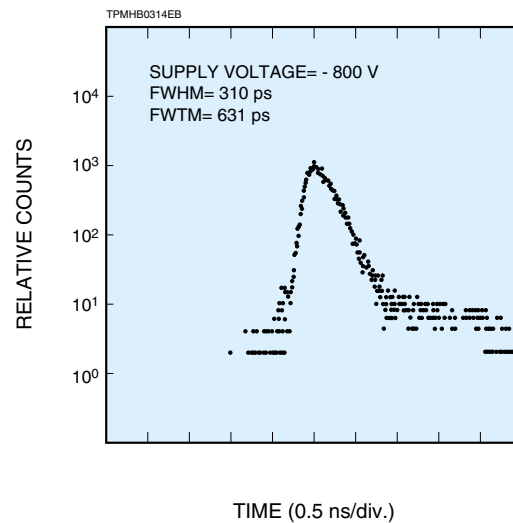
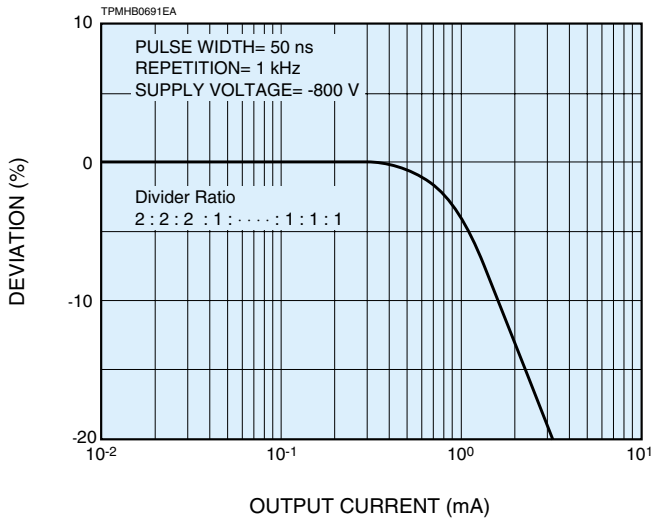
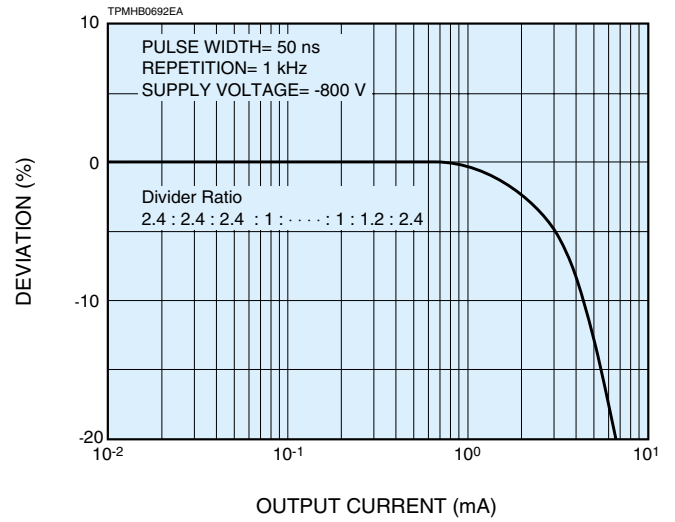


Figure 5: Pulse Linearity per Channel



**H8711**



**H8711-10**

Figure 6: Anode Uniformity (Example)

92	73	76	90
62	52	50	69
64	53	51	72
79	81	81	100

Supply Voltage: 800 V  
Light Source: Tungsten Lamp (uniform DC light)  
Full Illumination

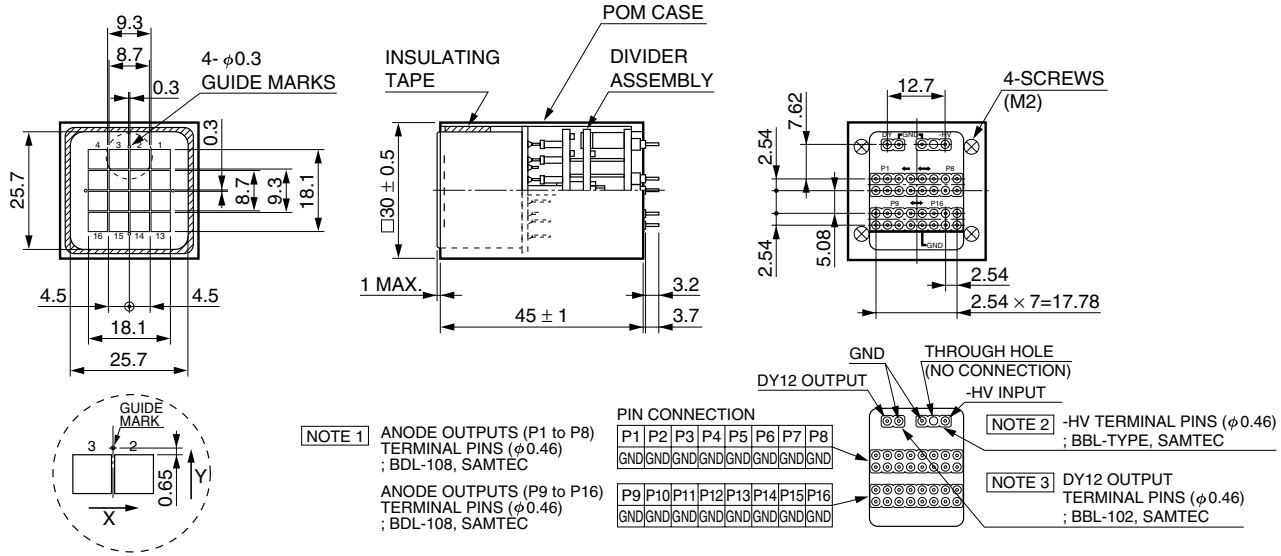
Figure 7: Anode Cross-talk (Example)

0.1	0.8	0.1	*
0.5	100	0.3	*
0.1	0.3	0.1	*
*	*	*	*

Supply Voltage: 800 V  
Light Source: Tungsten Lamp (uniform DC light)  
Spot Illumination: 4 mm × 4 mm

# MULTIANODE PHOTOMULTIPLIER TUBE ASSEMBLIES H8711, H8711-10

Figure 8: Dimensional Outline and Circuit Diagram (Unit: mm)



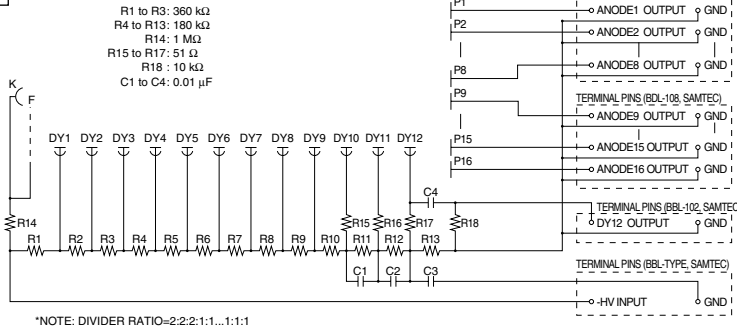
\* Suitable sockets for all terminal pins are attached.

**NOTE 1** The suitable socket for anode output terminal pins is "SD-108-T-22 (SAMTEC U.S.A)" which is commercially available.

**NOTE 2** The suitable socket for high voltage terminal pins is "SS-102-T-22 (SAMTEC U.S.A)" which is commercially available.

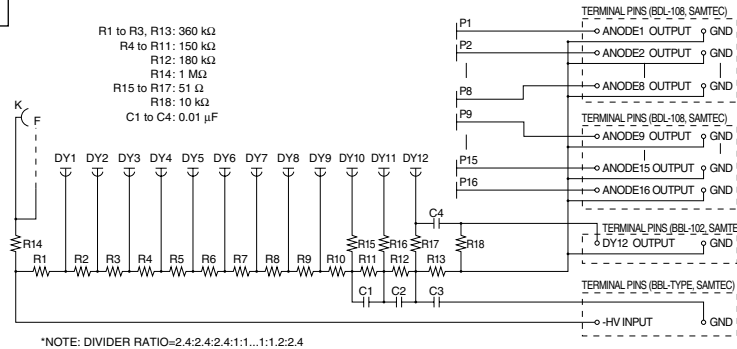
**NOTE 3** The suitable socket for DY12 output terminal pins is "ASP-24307-02 (SAMTEC U.S.A)" which is commercially available.

## H8711



TPMHA0496EA

## H8711-10



TPMHA0497EA

### ⚠ WARNING ~ High Voltage ~

The product is operated at high voltage potential. Further, the metal housing of the product is connected to the photocathode (potential) so that it becomes a high voltage potential when the product is operated at a negative high voltage (anode grounded). Accordingly, extreme safety care must be taken for the electrical shock hazard to the operator or the damage to the other instruments.

\* PATENT: USA Pat. No. 5410211

PATENTE PENDING: JAPAN 11, USA 1, EUROPE 2

# HAMAMATSU

WEB SITE <http://www.hamamatsu.com>

HAMAMATSU PHOTONICS K.K., Electron Tube Center

314-5, Shimokanzo, Toyooka-village, Iwata-gun, Shizuoka-ken, 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P. O. Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: [usa@hamamatsu.com](mailto:usa@hamamatsu.com)

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-2658 E-mail: [info@hamamatsu.de](mailto:info@hamamatsu.de)

France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, 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: [infos@hamamatsu.fr](mailto:infos@hamamatsu.fr)

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road Welwyn Garden City Hertfordshire AL7 1BW, United Kingdom, Telephone: 44-(0)1707-294888, Fax: 44(0)1707-325777 E-mail: [info@hamamatsu.co.uk](mailto:info@hamamatsu.co.uk)

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171-41 SOLNA, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: [info@hamamatsu.se](mailto:info@hamamatsu.se)

Italy: Hamamatsu Photonics Italia: S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741 E-mail: [info@hamamatsu.it](mailto:info@hamamatsu.it)

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