

HAMAMATSU

MULTIANODE PHOTOMULTIPLIER TUBE ASSEMBLY H8711 SERIES

PATENT

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

FEATURES

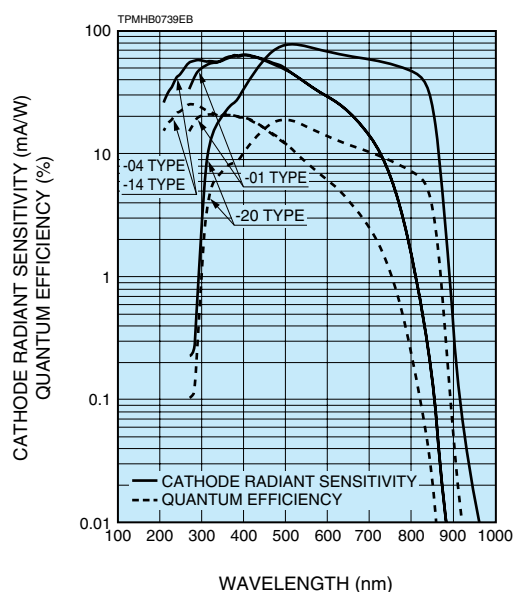
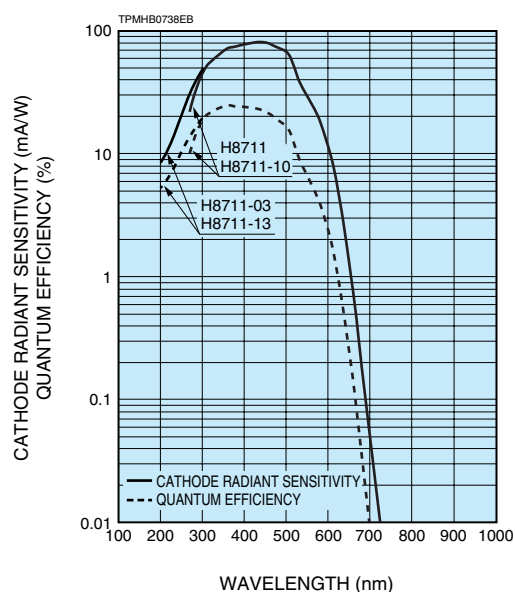
- 4 × 4 Multianode, Anode Size: 4.2 mm × 4.2 mm / Anode
- Effective Area: 18.1 mm × 18.1 mm
- High Speed Response
- Low Cross-talk: 1 % Typ.
- High Cathode Sensitivity
 - Luminous 200 $\mu\text{A}/\text{lm}$ Typ. (-01 Type)
 - Luminous 500 $\mu\text{A}/\text{lm}$ Typ. (-20 Type)
- Weight: Approx. 50 g

APPLICATIONS

- High Energy Physics
- Flow Cytometer (-01, -20 Type)
- DNA Sequencer (-01, -20 Type)



Figure 1: Typical Spectral Response



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Type No.	Spectral Response		Photo-cathode Material	Window Material	Dynode Structure / Stages	Maximum Ratings		Cathode Characteristics				
	Range	Peak Wavelength				Supply Voltage Between Anode and Cathode (V)	Average Anode Output Current in Total (mA)	Luminous		Blue Sensitivity Index (CS 5-58) Typ.	Red/ White Ratio (R-68) Typ.	Radiant
								Min. (μA/lm)	Typ. (μA/lm)			
	(nm)	(nm)										

Normal Divider Type

H8711	300 to 650	420	BA	K	MC/12	-1000	0.017	60	80	9.5	—	80
H8711-01	300 to 880	420	MA	K	MC/12	-1000	0.017	150	200	—	0.25	65
H8711-03	185 to 650	420	BA	U	MC/12	-1000	0.017	60	80	9.5	—	80
H8711-04	185 to 880	420	MA	U	MC/12	-1000	0.017	150	200	—	0.25	65
H8711-20	300 to 920	530	MA	K	MC/12	-1000	0.017	350	500	—	0.4	78

Taper Divider Type

H8711-10	300 to 650	420	BA	K	MC/12	-1000	0.017	60	80	9.5	—	80
H8711-11	300 to 880	420	MA	K	MC/12	-1000	0.017	150	200	—	0.25	65
H8711-13	185 to 650	420	BA	U	MC/12	-1000	0.017	60	80	9.5	—	80
H8711-14	185 to 880	420	MA	U	MC/12	-1000	0.017	150	200	—	0.25	65

NOTE: (A) BA: Bialkali, MA: Multialkali

(B) K: Borosilicate glass, U: UV glass

(C) MC: Metal channel

(D) The maximum average anode current is defined as 5 % of divider current when standard high voltage is applied.

Figure 2: Typical Gain

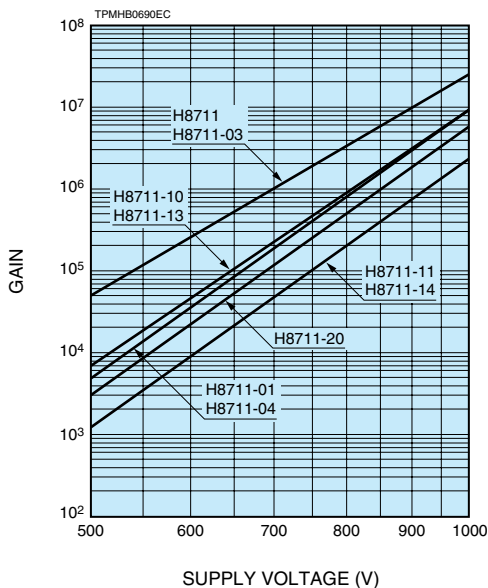


Figure 3: Time Response (Example)

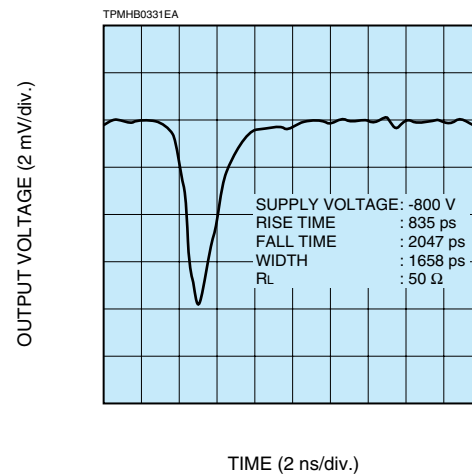
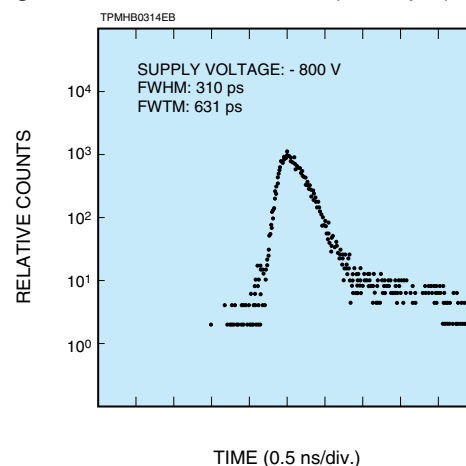


Figure 4: TTS Characteristic (Example)



Anode to Cathode Supply Voltage (V)	Anode Characteristics								Pulse Linearity per Channel		Uniformity Between Each Anode		Type No.
	Luminous		Gain Typ.	Dark Current per Channel (After 30 min)		Time Response							
	Min. (A/lm)	Typ. (A/lm)				Rise Time	Transit Time	TTS	2 % Deviation (mA)	5 % Deviation (mA)			
				Typ. (nA)	Max. (nA)	Typ. (ns)	Typ. (ns)	Typ. (ns)			Typ. (mA)	Max. (mA)	

-800	80	280	3.5×10^6	0.8	4	0.83	12.0	0.33	0.5	1	1: 2.5	1: 4	H8711
-800	50	150	0.8×10^6								1: 3	1: 5	H8711-01
-800	80	280	3.5×10^6								1: 2.5	1: 4	H8711-03
-800	50	150	0.8×10^6								1: 3	1: 5	H8711-04
-800	50	250	0.5×10^6								1: 3	1: 5	H8711-20

-800	20	70	0.9×10^6	0.4	2	0.83	12.0	0.33	1.5	3	1: 2.5	1: 4	H8711-10
-800	10	35	0.2×10^6								1: 3	1: 5	H8711-11
-800	20	70	0.9×10^6								1: 2.5	1: 4	H8711-13
-800	10	35	0.2×10^6								1: 3	1: 5	H8711-14

VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	...	Dy9	Dy10	Dy11	Dy12	P
Normal Divider Type	2	2	2	1	1	1...1		1	1	1	1	
Tapered Divider Type	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

Figure 5: Pulse Linearity per Channel (Example)

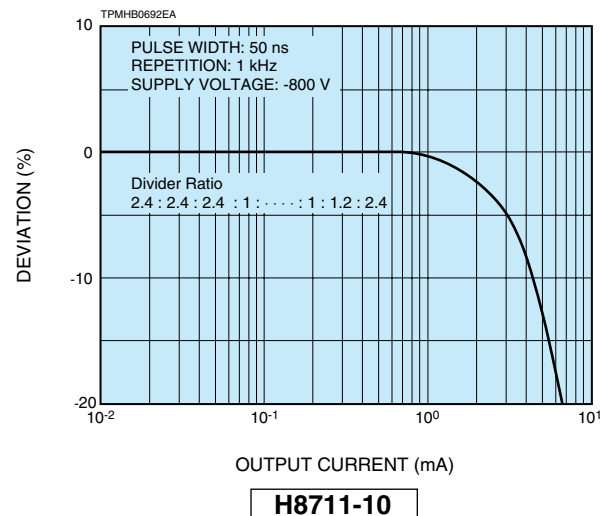
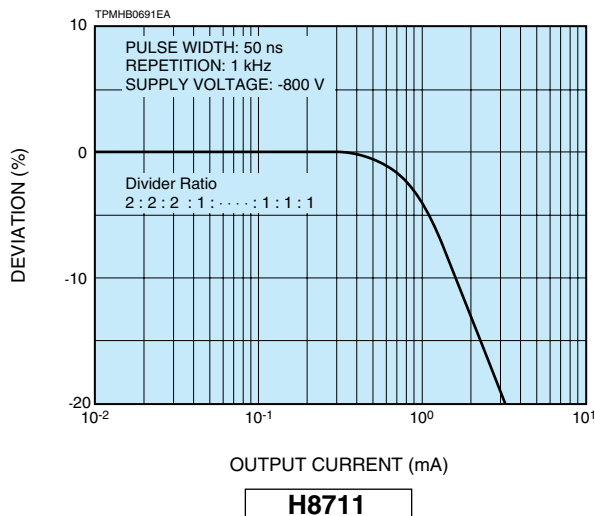


Figure 6: Anode Cross-talk (Example)

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

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Figure 7: Dimensional Outline and Basing Diagram (Unit: mm)

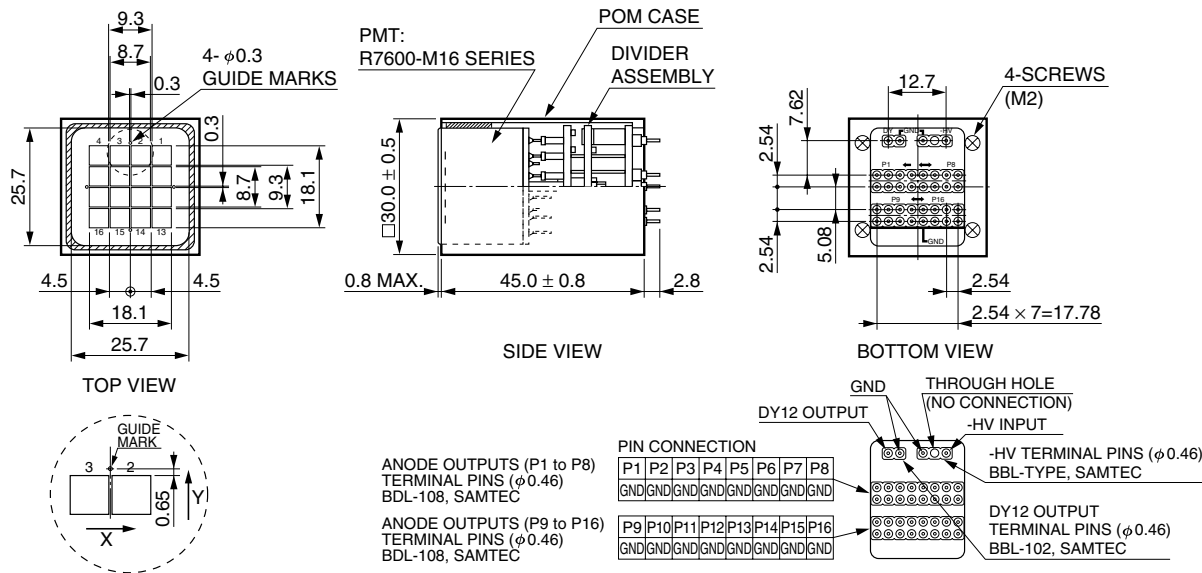


Figure 8: Internal Circuit

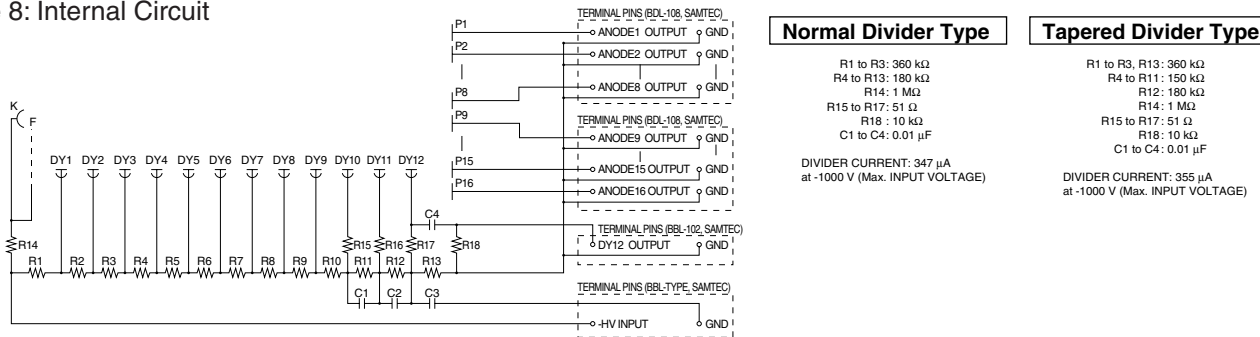
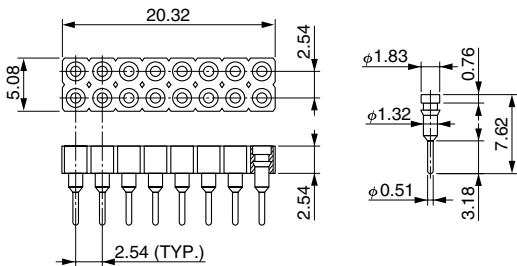


Figure 9: Suitable Sockets (Unit: mm)

Supplied

SD-108-T-22 ×2 pcs
(for Anode Output Pins)



TACCA0263EA

TACCA0265EA

TACCA0266EA

⚠ 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: 5410211 and other(9), GBR: 551767 and other(9), DEU: 69209809 and other(9), FRA: 551767 and other(9), JPN: 3078905 and other(9)

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