HAMAMATSU

PHOTON IS OUR BUSINESS

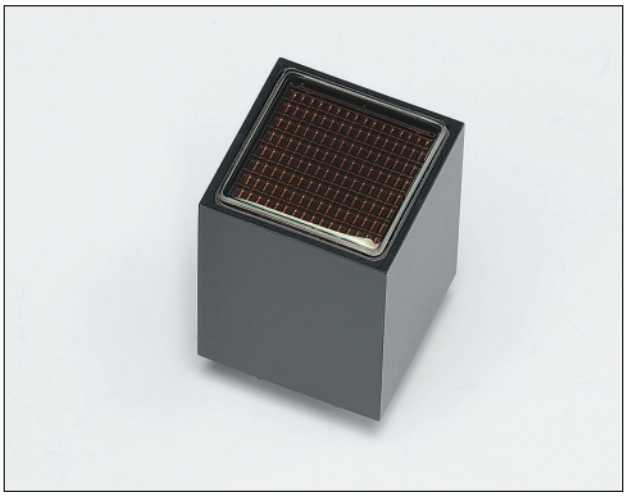
MULTIANODE PHOTOMULTIPLIER TUBE ASSEMBLY
H12428 SERIES

PATENT

8 × 8 Multianode, High Speed Response, High Collection Efficiency 30 mm Square, Super Bialkali and Ultra Bialkali Photocathode 12-stage, Head-on Type

FEATURES

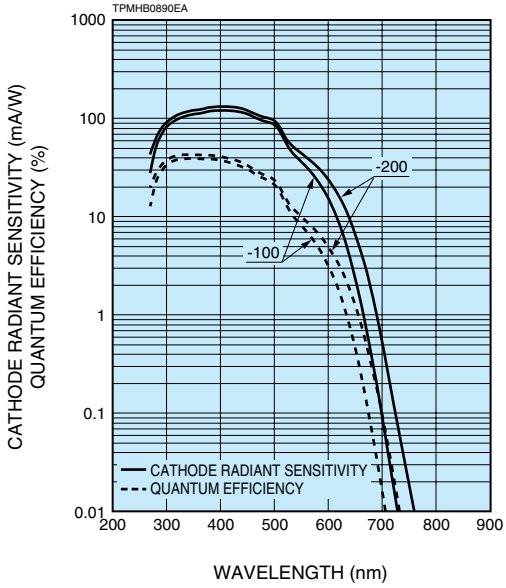
- ●High Quantum Efficiency
- ●Compact
- ●8 × 8 Multianode
- ●Effective Area: 23 mm × 23 mm
- ●High Speed Response
- ●High Cathode Sensitivity
  - Luminous 105 μA/lm Typ. (-100/-103 Type)
  - Luminous 135 μA/lm Typ. (-200/-203 Type)
- ●Weight: Approx. 62 g

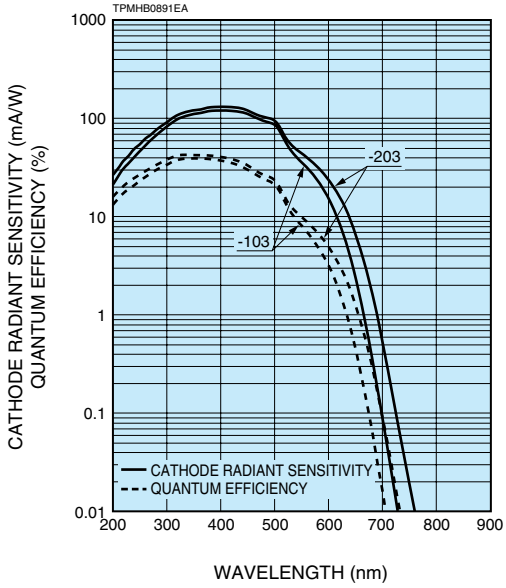


APPLICATIONS

- ●High Energy Physics
- ●Radiation Imaging

Figure 1: Typical Spectral Response





Type No.	Spectral Response		Ⓐ	Ⓑ	Ⓒ	Maximum Ratings		Cathode Characteristics			
	Range (nm)	Peak Wavelength (nm)	Photo-cathode Material	Window Material	Dynode Structure / Stages	Supply Voltage Between Anode and Cathode (V)	Average Anode Output Current in Total (mA)	Luminous Min. (μA/lm)	Luminous Typ. (μA/lm)	Blue Sensitivity Index (CS 5-58) Typ.	Radiant Typ. (mA/W)
H12428-100	300 to 650	400	SBA	K	MC/12	-1100	0.018	90	105	13.5	110
H12428-103	185 to 650	400	SBA	U	MC/12	-1100	0.018	90	105	13.5	110
H12428-200	300 to 650	400	UBA	K	MC/12	-1100	0.018	110	135	15.5	130
H12428-203	185 to 650	400	UBA	U	MC/12	-1100	0.018	110	135	15.5	130

NOTE: Ⓐ SBA: Super Bialkali, UBA: Ultra Bialkali
Ⓑ K: Borosilicate glass, U: UV glass
Ⓒ MC: Metal channel

Figure 2: Typical Gain

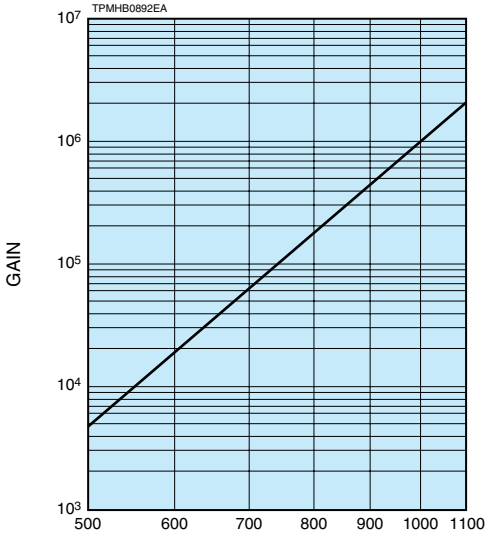


Figure 3: Time Response (Example)

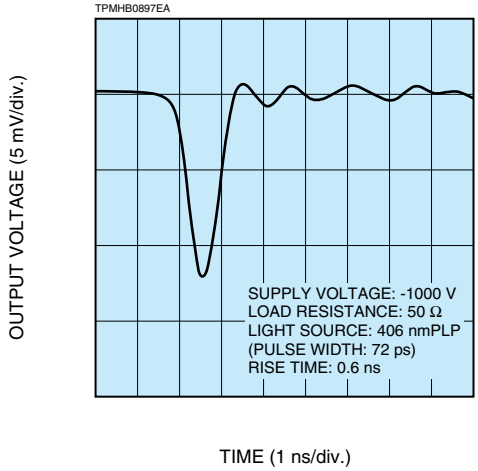
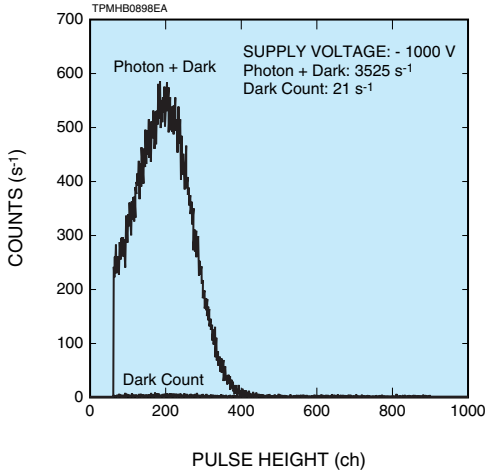


Figure 4: Single Photoelectron PHD per Channel (Example)



Anode to Cathode Supply Voltage (V)	Anode Characteristics									Pulse Linearity per Channel		Uniformity Between Each Anode		Type No.
	Luminous		Gain	Dark Current per Channel (After 30 min)		Time Response				2 % Deviation	5 % Deviation			
	Min. (A/lm)	Typ. (A/lm)	Typ.	Typ. (nA)	Max. (nA)	Rise Time Typ. (ns)	Transit Time Typ. (ns)	TTS Typ. (ns)		(mA)	(mA)	Typ.	Max.	
-1000	25	105	1.0×10^6	0.4	4	0.6	5.1	0.35		0.2	0.4	1: 3	1: 5	**H12428-100**
-1000	25	105	1.0×10^6									1: 3	1: 5	**H12428-103**
-1000	25	135	1.0×10^6									1: 3	1: 5	**H12428-200**
-1000	25	135	1.0×10^6									1: 3	1: 5	**H12428-203**

VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	···	Dy9	Dy10	Dy11	Dy12	GR	P
Ratio	2.3	1.2	1	1	1	1	1···1	1	1	1	1	0.5	

Supply Voltage: -1000 V, K: Cathode, Dy: Dynode, GR: Guard Ring, P: Anode

Figure 5: Pulse Linearity with All Anodes Shorted (Example)

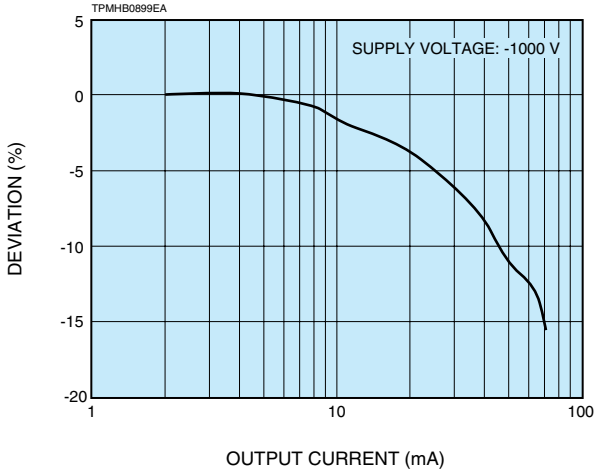
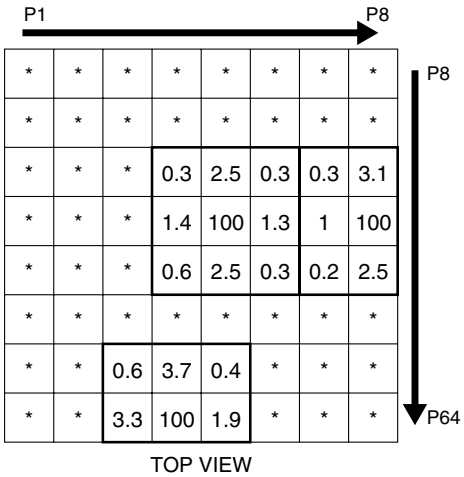


Figure 6: Anode Cross-talk (Example)



*	*	*	*	*	*	*	*	
*	*	*	*	*	*	*	*	
*	*	*	0.3	2.5	0.3	0.3	3.1	
*	*	*	1.4	100	1.3	1	100	
*	*	*	0.6	2.5	0.3	0.2	2.5	
*	*	*	*	*	*	*	*	
*	*	0.6	3.7	0.4	*	*	*	
*	*	3.3	100	1.9	*	*	*	

SUPPLY VOLTAGE: -1000 V
LIGHT SOURCE: TUNGSTEN LAMP with BLUE FILTER (DC LIGHT)
FIBER: ϕ1.0 mm (Kuraray Clear Fiber, NA=0.72)

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

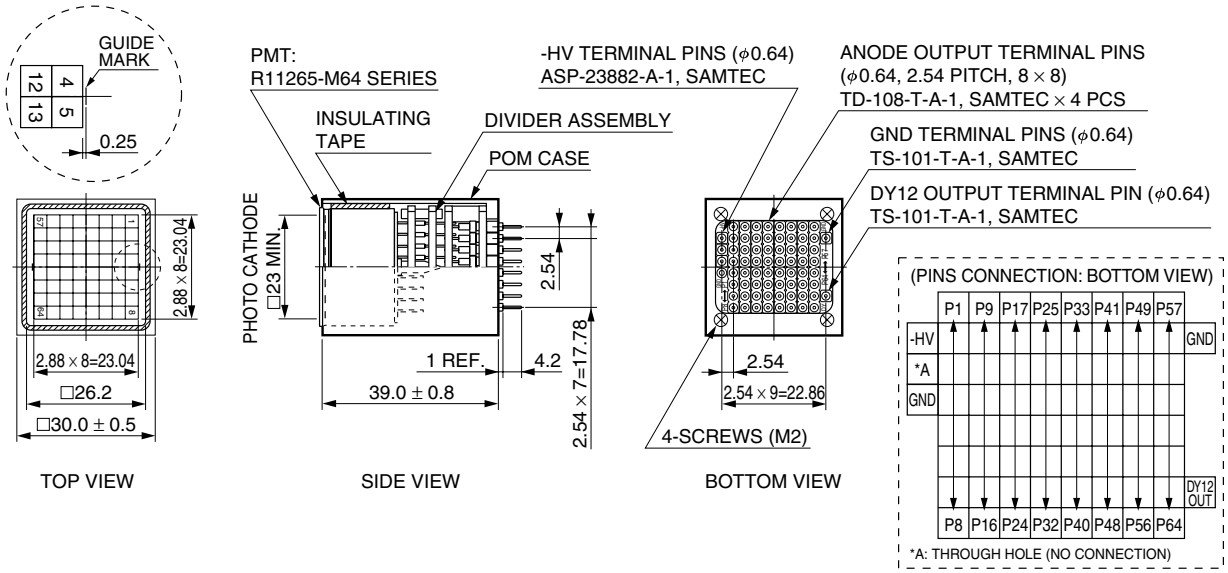


Figure 8: Internal Circuit

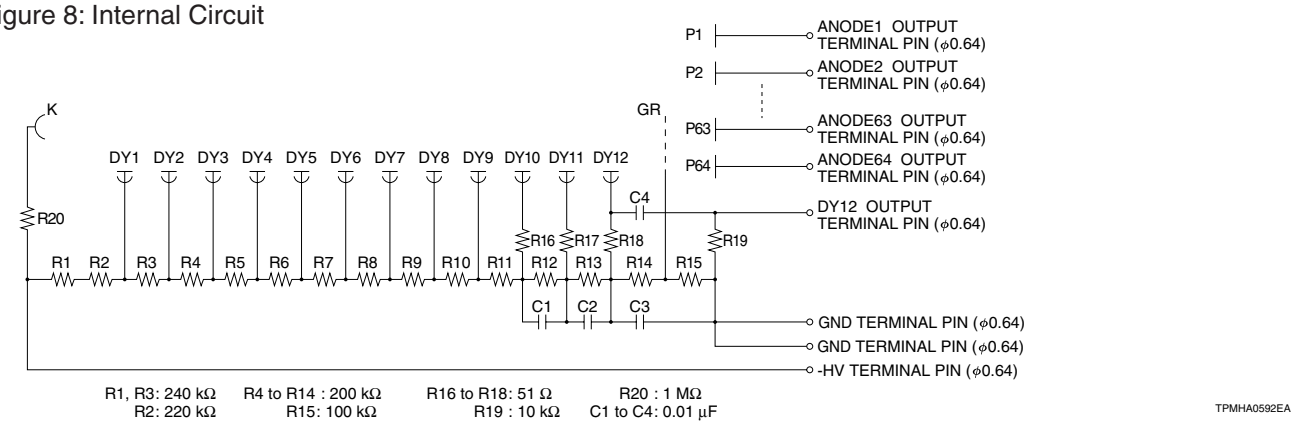


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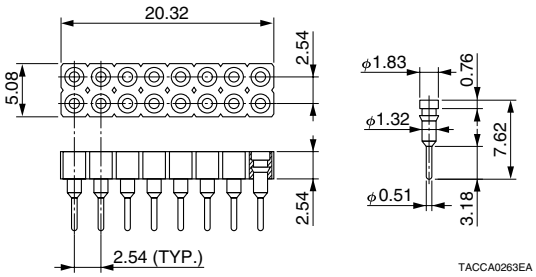
Figure 9: Suitable Sockets (Unit:mm) Supplied

SD-108-T-22 × 4 pcs
(for Anode Output Pins)



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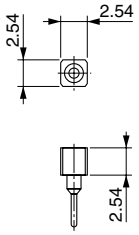
SS-101-T-22 × 2 pcs
(for for GND, DY12 Pin)



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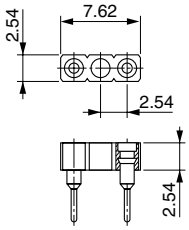
ASP-24307-02
(for GND, -HV Pin)



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* HAMAMATSU aloso provides C10940 series compact high voltage power supply module.

⚠ 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.

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