

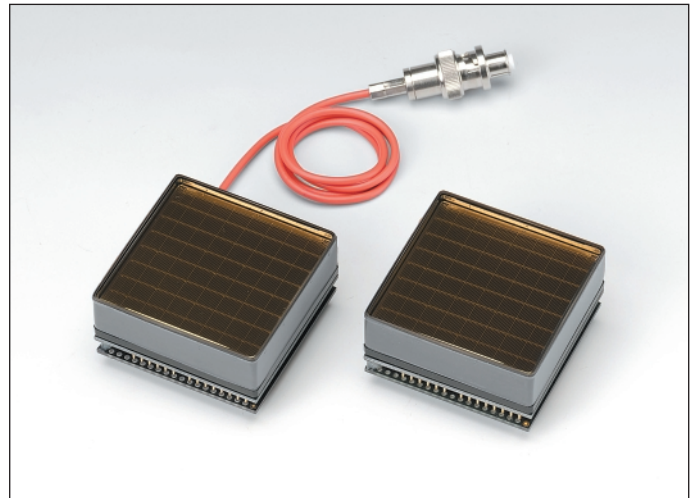
**52 mm Square, Bialkali Photocathode, 12-stage (H8500 Series)
8-stage (H10966 Series), 8 × 8 Multianode, Small Dead Space, Fast Time Response**

FEATURES

- Large Effective Area: 49 mm × 49 mm
- Packing Density: 89 %
- 8 × 8 Multianode, Anode Size: 5.8 mm × 5.8 mm / Anode
- High Quantum Efficiency: 35 % (H10966A-100 / H10966B-100)
- Two Configurations are Available for HV Input
H8500C Series / H10966A Series: Cable Input Type
H8500D Series / H10966B Series: Pin Input Type

APPLICATIONS

- Small Animal Imaging
- Compact Gamma Camera
- Scinti-mammography
- 2D Radiation Monitor



Left: HV cable input type, Right: HV pin input type

Figure 1: Typical Spectral Response

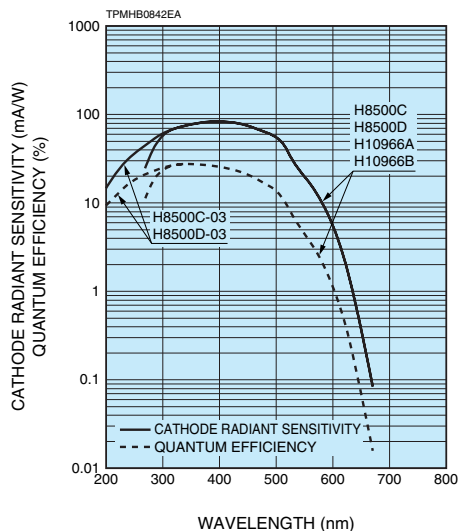
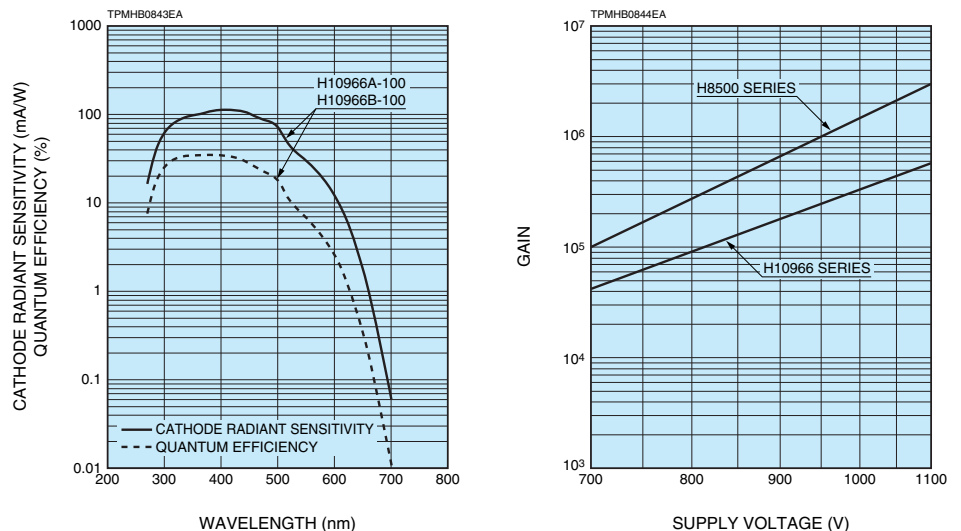


Figure 2: Typical Gain



FLAT PANEL TYPE MULTIANODE PMT ASSEMBLY

H8500 SERIES / H10966 SERIES

Type No.	Spectral Response		Photo-cathode Material	Window Material	Dynode Structure / Stages	Maximum Ratings			Cathode Characteristics			Anode to Cathode Supply Voltage (V)
	Range (nm)	Peak Wavelength (nm)				Supply Voltage Between Anode and Cathode (V)	Average Anode Output Current in Total (μA)	Divider Current at -1100 V (μA)	Luminous [Ⓓ]		Blue Sensitivity Index (CS 5-58) Typ.	
									Min. (μA/lm)	Typ. (μA/lm)		
H8500C	300 to 650	400	BA	K	MC/12	-1100	100	173	50	60	9.5	-1000
H8500D	300 to 650	400	BA	K	MC/12	-1100	100	173	50	60	9.5	-1000
H8500C-03	185 to 650	400	BA	U	MC/12	-1100	100	173	50	60	9.5	-1000
H8500D-03	185 to 650	400	BA	U	MC/12	-1100	100	173	50	60	9.5	-1000
H10966A	300 to 650	400	BA	K	MC/8	-1100	100	245	50	60	9.5	-1000
H10966B	300 to 650	400	BA	K	MC/8	-1100	100	245	50	60	9.5	-1000
H10966A-100	300 to 650	400	SBA	K	MC/8	-1100	100	245	80	95	13.5	-1000
H10966B-100	300 to 650	400	SBA	K	MC/8	-1100	100	245	80	95	13.5	-1000

- NOTE:** Ⓐ BA: Bialkali, SBA: Super Bialkali Ⓑ K: Borosilicate glass, U: UV glass Ⓒ MC: Metal channel
- Ⓓ The light source is a tungsten filament lamp operated at a distribution temperature of 2856 K. Supply voltage is 150 volts between the cathode and all other electrodes connected together as anode.
- Ⓔ The value is cathode output current when a blue filter (coming CS 5-58 polished to 1/2 stock thickness) is interposed between the light source and the tube under the same condition as Note Ⓓ.
- Ⓕ Measured with the same light source as Note Ⓓ and with the anode-to-cathode supply voltage and voltage distribution ratio shown in Table 1 or Table 2 below.
- Ⓖ Measured with the same supply voltage and voltage distribution ratio as Note Ⓕ after 30 minute storage in darkness.
- Ⓗ Those are test data when a signal from a central channel of 64 anodes is used, while all photocathode are illuminated by pulsed light source.
- Ⓙ The rise time is the time for the output pulse to rise from 10 % to 90 % of the peak amplitude when the whole photocathode is illuminated by a delta function light pulse.
- Ⓚ The electron transit time is the interval between the arrival of delta function light pulse at the entrance window of the tube and the time when the anode output reaches the peak amplitude. In measurement, the whole photocathode is illuminated.
- Ⓛ Also called transit time jitter. This is the fluctuation in electron transit time between individual pulses in the single photoelectron event, and defined as the FWHM of the frequency distribution of electron transit time.

Table 1: Voltage Distribution Ratio and Supply Voltage (H8500 series)

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	Dy11	Dy12	GR	P
Distribution Ratio	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.5

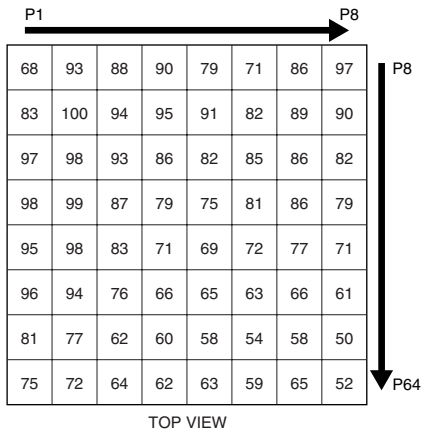
Supply Voltage: -1000 V, K: Cathode, Dy: Dynode, GR: Guard Ring P: Anode

Table 2: Voltage Distribution Ratio and Supply Voltage (H10966 series)

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	GR	P
Distribution Ratio	1	1	1	1	1	1	1	1	1	0.5	

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

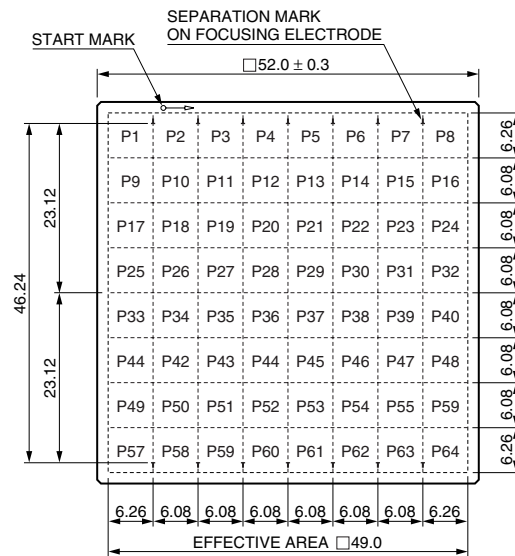
Figure 3: Anode Uniformity (Example)



SUPPLY VOLTAGE: -1000 V
 LIGHT SOURCE: TUNGSTEN LAMP with BLUE FILTER (DC LIGHT)
 SPOT ILLUMINATION (APERTURE SIZE): 6 mm square on each channel

TPMH0697EC

Figure 4: Anode Matrix and Separation Mark



The start mark and the separation marks are put on an electrode plate inside.

TPMH0708EB

Anode Characteristics										Pulse Linearity per Channel [±2 % Deviation] (mA)	Uniformity Between Each Anode		Type No.
Luminous ^F		Gain ^F	Dark Current per Channel ^G		Dark Current in Total ^G		Time Response ^H						
Min. (A/lm)	Typ. (A/lm)		Typ.	Typ.	Max.	Typ.	Max.	Rise Time ^J (ns)	Transit Time ^K (ns)		Transit Time Spread ^L (ns)		
25	90	1.5×10^6	0.1	—	6	50	0.8	6	0.4	1	1: 2	1: 3	H8500C
25	90	1.5×10^6	0.1	—	6	50	0.8	6	0.4	1	1: 2	1: 3	H8500D
25	90	1.5×10^6	0.1	—	6	50	0.8	6	0.4	1	1: 2	1: 3	H8500C-03
25	90	1.5×10^6	0.1	—	6	50	0.8	6	0.4	1	1: 2	1: 3	H8500D-03
5	20	3.3×10^5	0.06	—	4	30	0.4	4	—	1.2	1: 2	1: 3	H10966A
5	20	3.3×10^5	0.06	—	4	30	0.4	4	—	1.2	1: 2	1: 3	H10966B
10	30	3.2×10^5	0.1	—	6	30	0.4	4	—	1.2	1: 2	1: 3	H10966A-100
10	30	3.2×10^5	0.1	—	6	30	0.4	4	—	1.2	1: 2	1: 3	H10966B-100

Figure 5: Anode Cross-talk (Example)

● Measured by using an aperture

APERTURE SIZE: Approx. 5 mm × 5 mm
LIGHT SOURCE: W-LAMP (W/BLUE FILTER)

	P1	P2	P3	P4	P5	P6	P7	P8	
P1	100	2.8	—	—	—	—	—	—	P8
P9	3.5	0.4	—	—	—	—	—	—	P16
P17	—	—	0.1	0.8	0.1	—	0.2	1.5	P24
P25	—	—	0.7	100	0.9	—	0.9	100	P32
P33	—	—	0.1	1.0	0.1	—	0.1	1.3	P40
P41	—	—	—	—	—	—	—	—	P48
P49	—	—	—	0.2	1.4	0.3	—	—	P56
P57	—	—	—	1.7	100	3.1	—	—	P64
	P57	P58	P59	P60	P61	P62	P63	P64	

● Measured by using a fiber

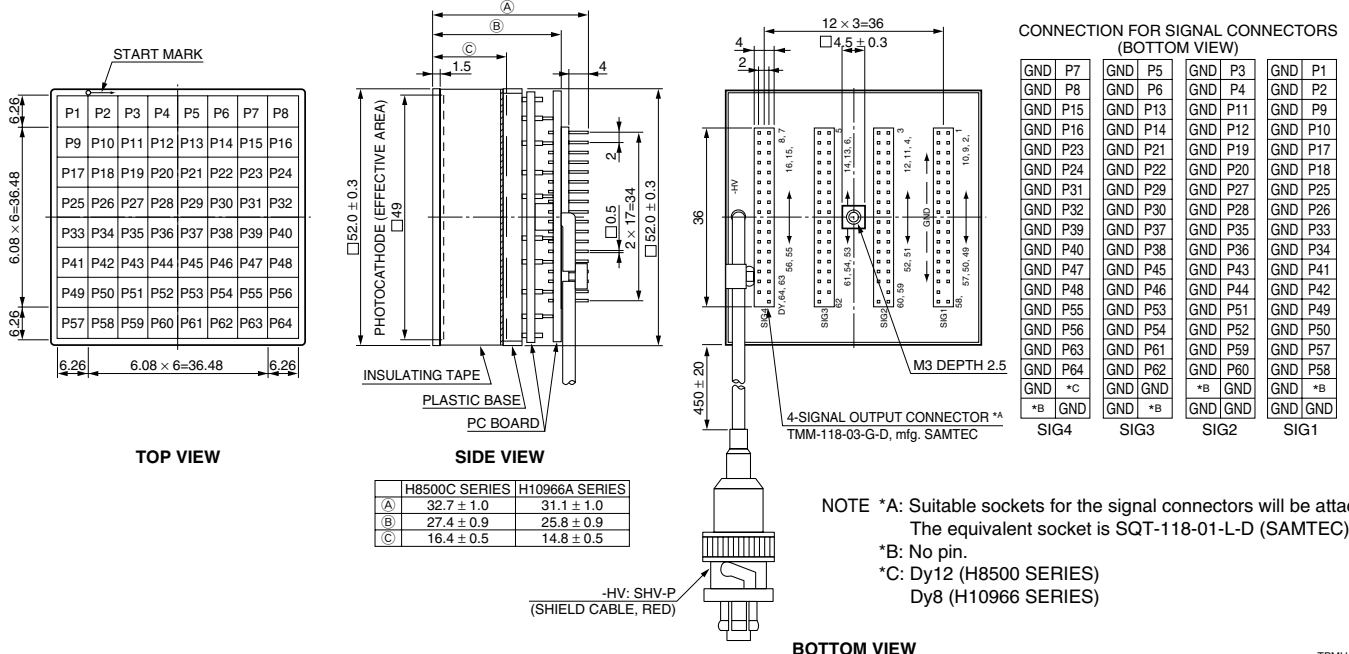
FIBER SIZE: 1.0 mm Dia. (Kuraray: Clear Fiber NA=0.72)
LIGHT SOURCE: W-LAMP (W/BLUE FILTER)

	P1	P2	P3	P4	P5	P6	P7	P8	
P1	100	1.3	—	—	—	—	—	—	P8
P9	1.4	0.3	—	—	—	—	—	—	P16
P17	—	—	0.1	0.8	0.2	—	0.2	1.2	P24
P25	—	—	0.5	100	0.7	—	0.7	100	P32
P33	—	—	0.1	0.9	0.2	—	0.2	1.2	P40
P41	—	—	—	—	—	—	—	—	P48
P49	—	—	—	0.3	1.3	0.3	—	—	P56
P57	—	—	—	2.0	100	2.0	—	—	P64
	P57	P58	P59	P60	P61	P62	P63	P64	

Supply Voltage: -1000 V Light Source: Tungsten filament lamp + blue filter (corning CS 5-58 polished to 1/2 stock thickness)
One anode is illuminated through the aperture and the output of the adjacent anodes are calculated as relative value, with 100 % being equal to the output of the illuminated anode. The cross-talk is the relative value of the adjacent anodes expressed in %.

Figure 6: Dimensional Outline (Unit: mm)

● Cable Output Type (H8500C Series / H10966A Series)

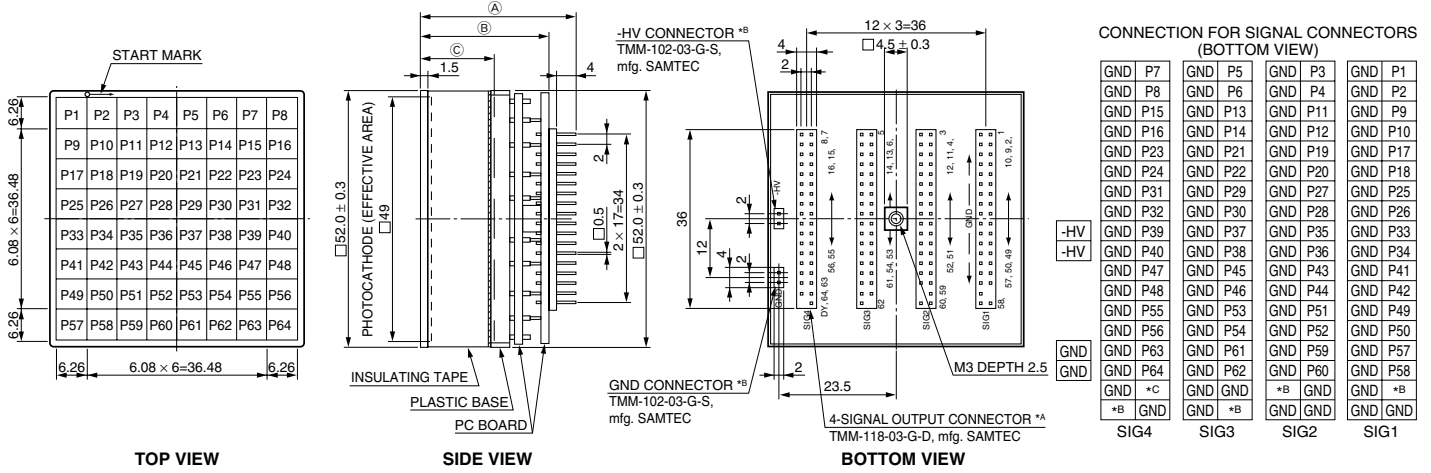


FLAT PANEL TYPE MULTIANODE PMT ASSEMBLY

H8500 SERIES / H10966 SERIES

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

● Pin Output Type (H8500D Series / H10966B Series)

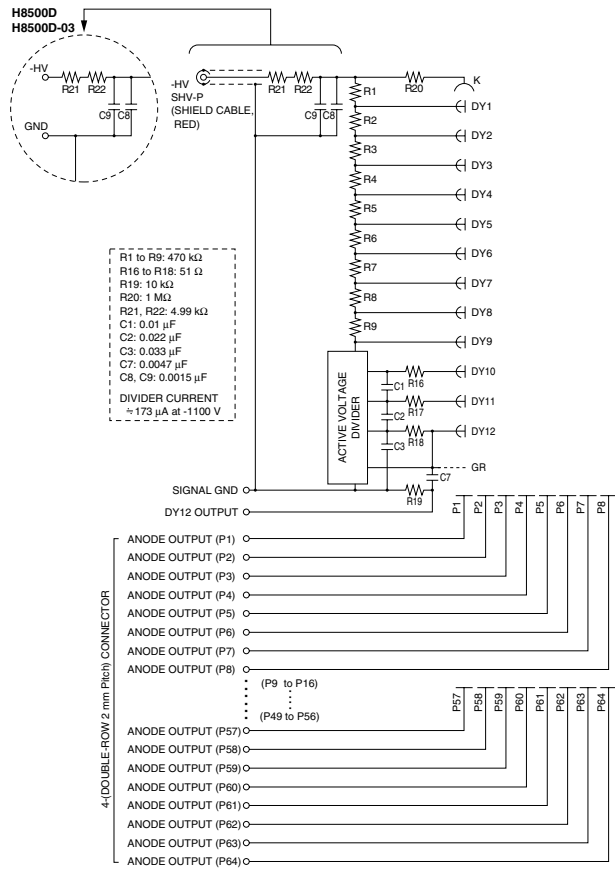


	H8500D SERIES	H10966B SERIES
(A)	32.7 ± 1.0	31.1 ± 1.0
(B)	27.4 ± 0.9	25.8 ± 0.9
(C)	16.4 ± 0.5	14.8 ± 0.5

NOTE *A: Suitable sockets for the signal connectors will be attached. The equivalent socket for signal output is SQT-118-01-L-D (SAMTEC). The equivalent socket for -HV, GND is SQT-102-01-L-S (SAMTEC).
 *B: No pin.
 *C: Dy12 (H8500 SERIES)
 Dy8 (H10966 SERIES)

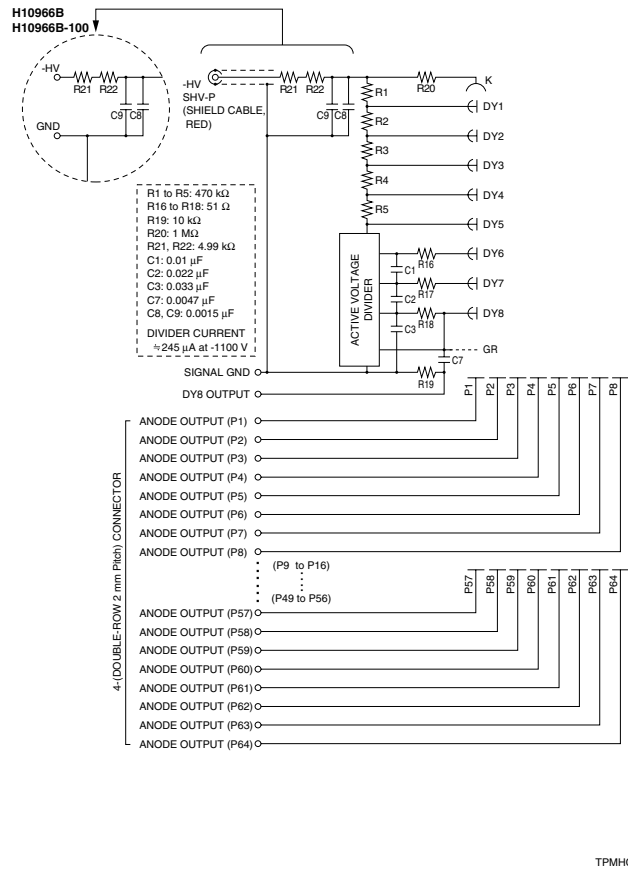
TPMHA0572EA

Figure 8: Internal Circuit (H8500 Series)



TPMHC0243EA

Figure 9: Internal Circuit (H10966 Series)



TPMHC0244EA

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HAMAMATSU PHOTONICS K.K., 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, 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

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

France: Hamamatsu Photonics France S.A.R.L.: 19, 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: info@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

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

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

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