

FLAT PANEL TYPE MULTIANODE PMT ARRAY H13974 SERIES

FEATURES

- 2 × 2 array of flat panel PMT
(Need one high voltage power supply)
- Low profile
- Tiling forms a large sensitive area

APPLICATIONS

- Academic reserch (Neutron imaging)
- Medical imaging (Gamma camera, PET, preclinical)



SPECIFICATIONS

GENERAL

Parameter		H13974-00-1616	H13974-03-1616	Unit
Spectral response		300 to 650	185 to 650	nm
Wavelength of maximum response		400		nm
Built-in PMT	Part number	R12699-00-M64	R12699-03-M64	—
	Number of PMTs	4 (2 × 2 array)		—
Photocathode	Material	Bialkali		—
	Effective area [Ⓐ]	100 × 100 (48.5 × 48.5 / PMT)		mm
Glass window	Material	Borosilicate glass	UV glass	—
	Thickness	1.5		mm
Dynode	Structure	Metal channel dynode		—
	Number of stages	10		—
Anode	Number of anodes	256 (16 × 16 matrix)		—
	Anode pitch / in PMT	6		mm
	Anode pitch / Between PMT and PMT	9		mm
Size		105.7 × 105.7 × 32.5		mm
Effective area ratio		84		%
Operating ambient temperature		0 to +50		°C
Storage temperature		-15 to +50		°C

MAXIMUM RATINGS (Absolute maximum values)

Parameter		Value	Unit
Supply voltage	Between anode and cathode	-1100	V dc
Average anode output current in total		0.1 / PMT	mA
Divider current (at -1100 V)		0.225 / PMT	mA

CHARACTERISTICS / PMT (at 25 °C)

Parameter		Min.	Typ.	Max.	Unit
Cathode sensitivity	Luminous (2856 K)	60	95	—	μA/lm
	Blue sensitivity index (CS 5-58)	—	12	—	—
Anode sensitivity	Luminous (2856 K)	—	143	—	A/lm
Gain (current amplification)		5.0 × 10 ⁵	1.5 × 10 ⁶	—	—
Anode dark current per ch		—	0.1	—	nA
Anode dark current in total		—	24	200	nA
Time response	Anode pulse rise time	—	0.52	—	ns
	Transit time	—	4.9	—	ns
	Transit time spread	—	0.35	—	ns
Pulse linearity (per ch) at ±2 % deviation		—	0.8	—	mA

NOTE: [Ⓐ]Including cross shaped dead area 3 mm wide
Anode characteristics are measured with the voltage distribution ratio shown below.
Anode sensitivity between PMT is already adjusted at the factory.

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	GR	P
Ratio	2	1	1	1	1	1	1	1	1	1	1	0.5	

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

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Figure 1: Typical spectral response

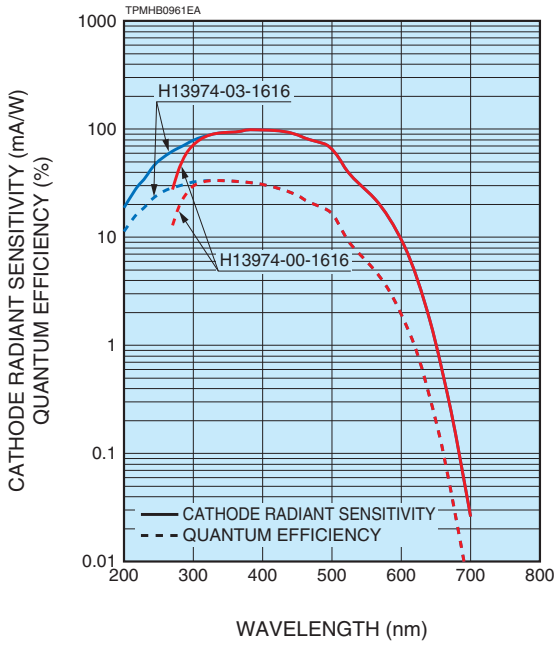


Figure 2: Typical gain

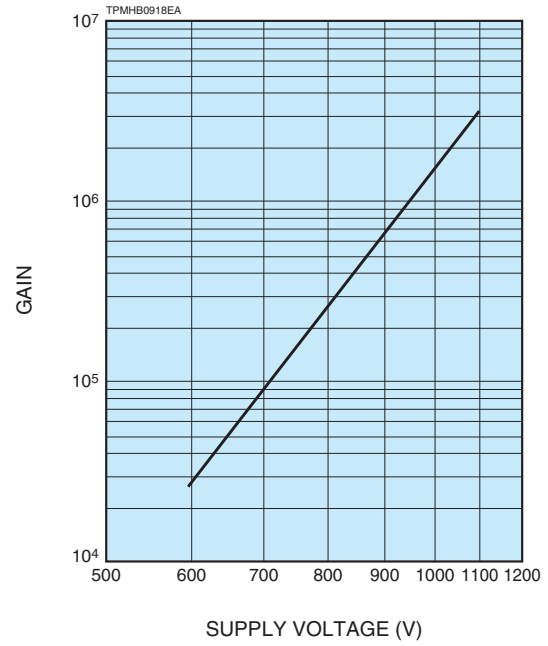


Figure 3: Spatial linearity (position signal linearity)

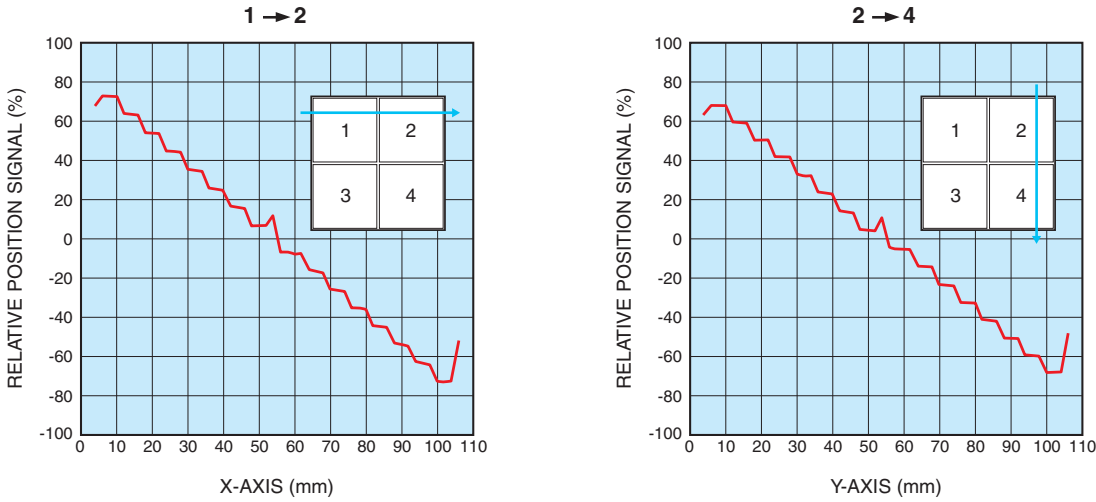


Figure 4: Dimensional outline (Unit: mm)

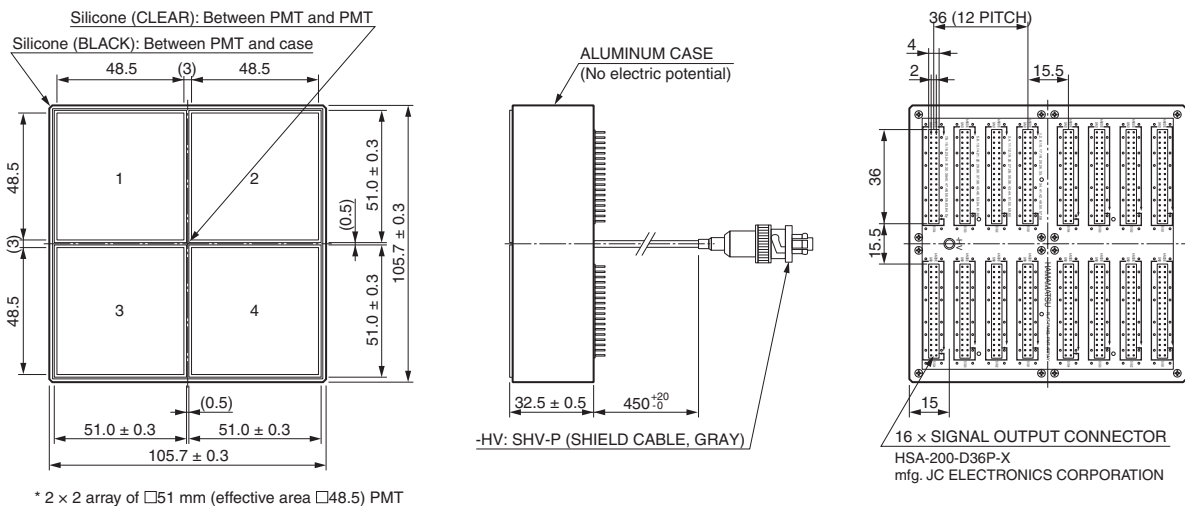
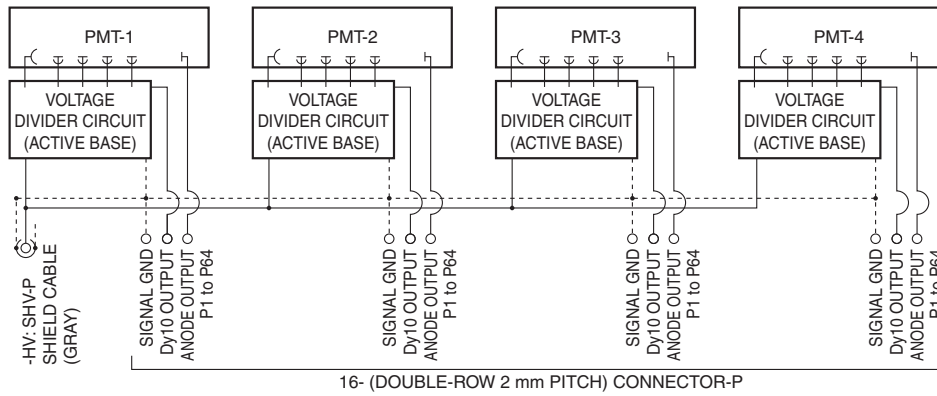
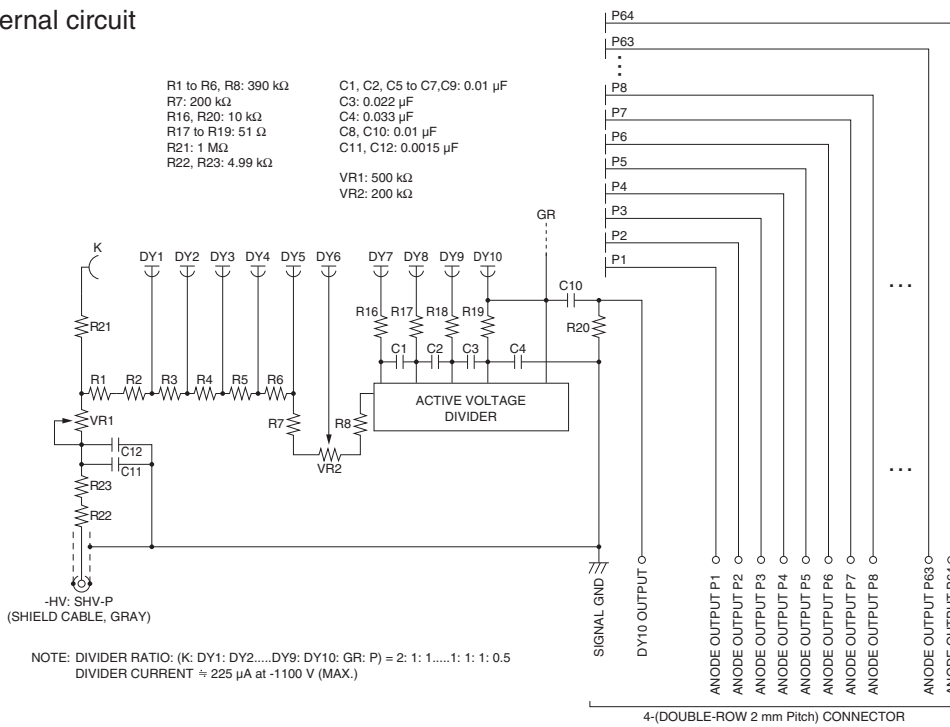


Figure 5: Block diagram



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Figure 6: Internal circuit



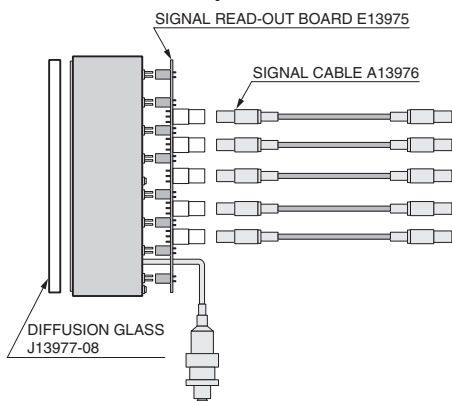
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ACCESSORIES (sold separately)

- Diffusion glass: J13977-08^{*1}
- Signal read-out board: E13975
- Signal cable: A13976^{*2}

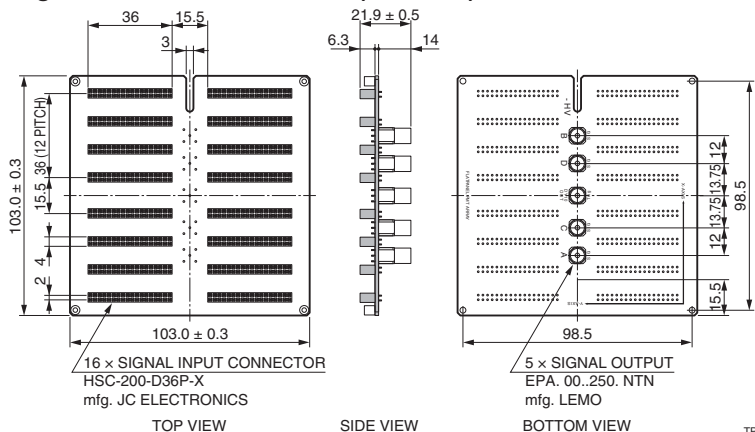
*1: Coupling with H13974 to be done by customers
*2: For signal output, for trigger signal output

Connection example



TPMHC0270EA

Signal read-out board E13975 (Unit: mm)

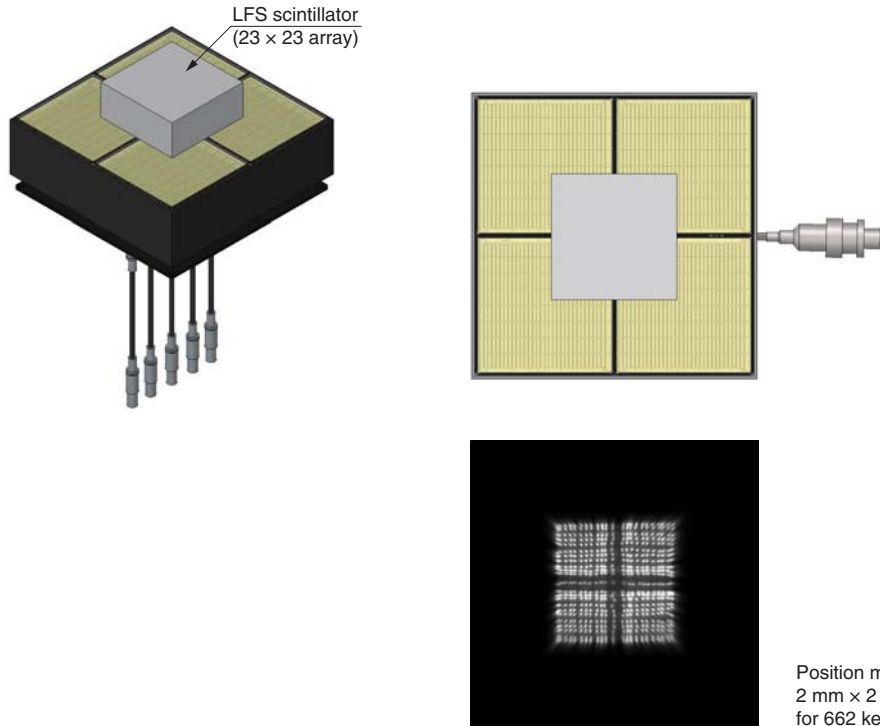


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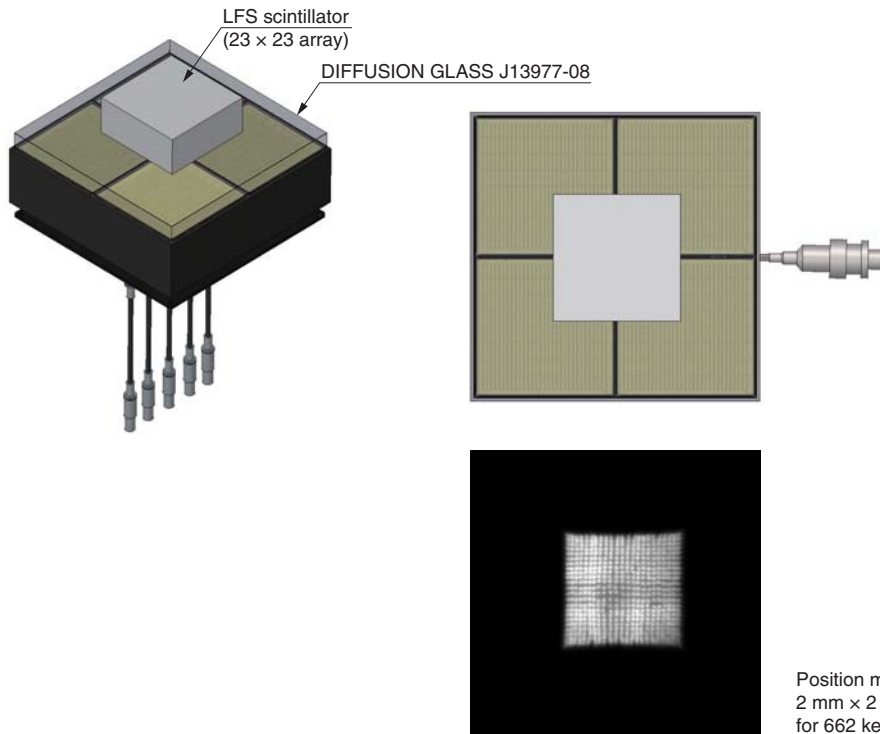
Figure 8: Position map examples

●H13974 + LFS* scintillator + signal read-out board E13975 * LFS: Lutetium fine silicate



Position map of a 23 x 23 array of 2 mm x 2 mm x 20 mm LFS scintillator for 662 keV γ -rays.

●H13974 + LFS scintillator + diffusion glass J13977-08 + signal read-out board E13975



Position map of a 23 x 23 array of 2 mm x 2 mm x 20 mm LFS scintillator for 662 keV γ -rays.

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