HAMAMATSU

PRELIMINARY DATA
OCT. 2001

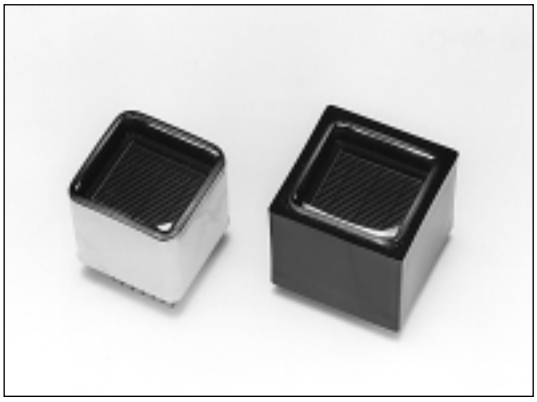
POSITION SENSITIVE PHOTOMULTIPLIER TUBES
R8520-00-C12
R8520U-00-C12

FEATURES

- **6 (X) + 6 (Y) Cross Plate Anode**
- **Flangeless Type**
- **High Speed Response**

APPLICATIONS

- **PET (Positron Emission Tomography)**
- **Compact Gamma Camera**
- **Scintillation Mammography**



GENERAL

Parameter		Description	Unit
Spectral Response		300 to 650	nm
Wavelength of Maximum Response		420	nm
Photocathode	Material	Bialkali	—
	Minimum Effective Area	22×22	mm^2
Window Material		Borosilicate glass	—
Dynode	Structure	Metal channel dynode	—
	Number of Stages	11	—
Anode		6 (X) + 6 (Y) Cross plate anode	—
Weight		Approx. 28	g
Suitable Socket		E678-32B (sold separately)	—

MAXIMUM RATINGS (Absolute Maximum Values)

Parameter		Value	Unit
Supply Voltage	Between Anode and Cathode	1000	V dc
Average Anode Current in Total		0.1	mA

CHARACTERISTICS (at 25 °C)

Parameter		Min.	Typ.	Max.	Unit
Cathode Sensitivity	Luminous (2856 K)	50	70	—	μA/lm
	Blue Sensitivity Index (CS 5-58)	7	8.5	—	—
Anode Sensitivity	Luminous (2856 K)	15	70	—	A/lm
Gain		—	1×10^6	—	—
Anode Dark Current in Total of Anodes (after 30 min storage in darkness)		—	2	10	nA
Time Response	Anode Pulse Rise Time	—	1.4	—	ns

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

VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	G	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	Dy11	P
Ratio	0.5	1.5	2	1	1	1	1	1	1	1	1	1	1	0.5

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

Figure 1: Typical Spectral Response

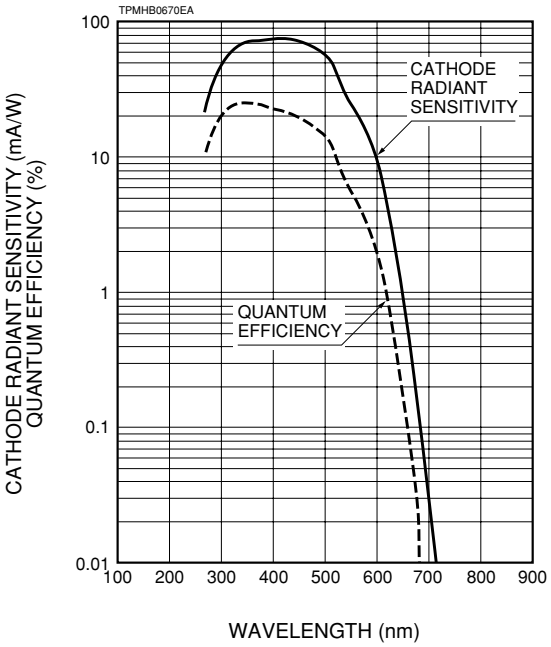


Figure 2: Typical Gain and Anode Dark Current

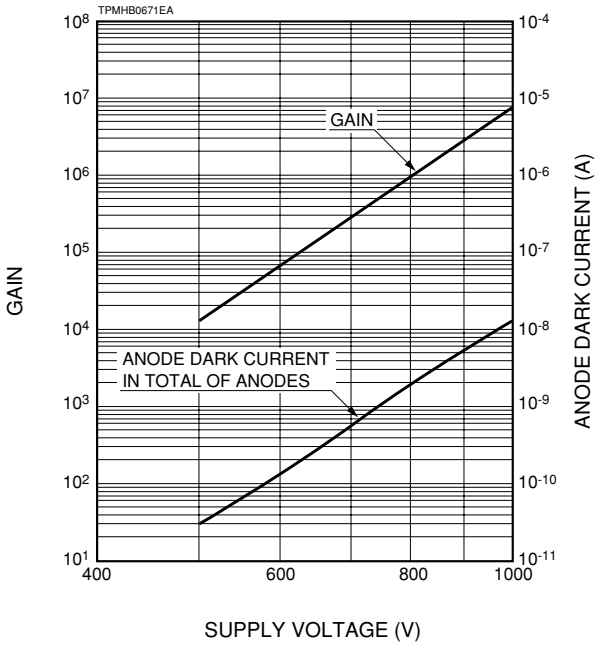
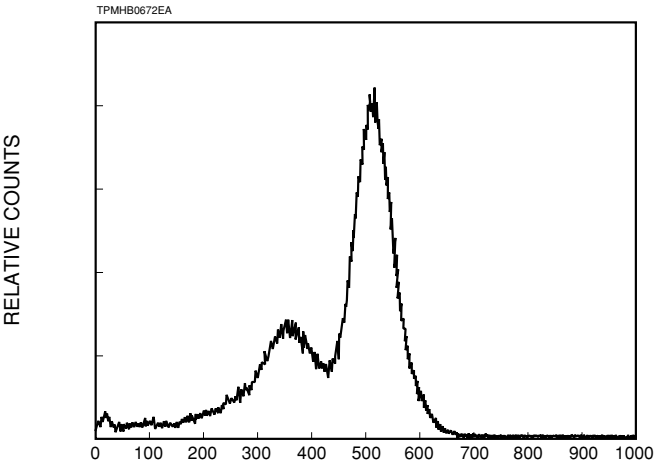
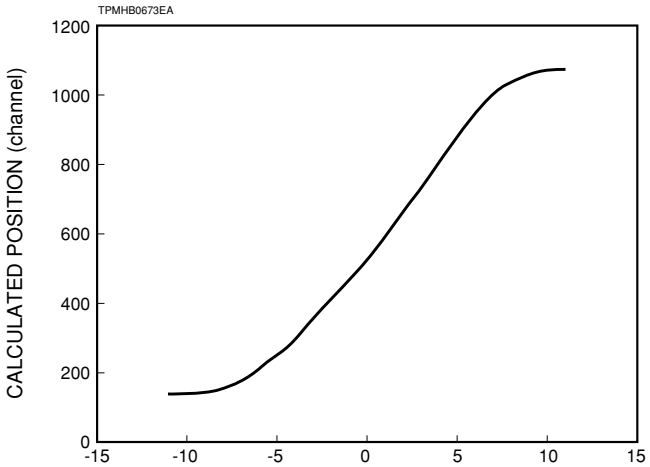


Figure 3: Pulse Height Distribution



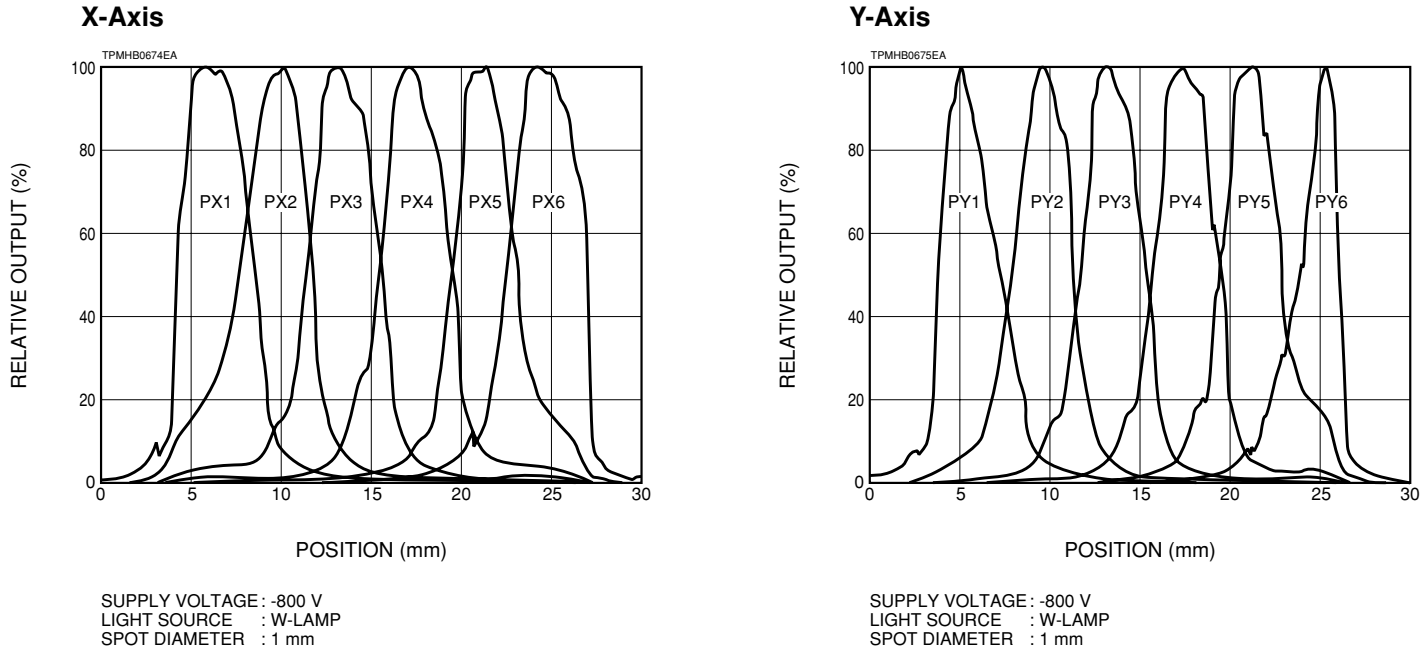
SUPPLY VOLTAGE : -800 V
CRYSTAL : 1" CUBE NaI (Tl)
SOURCE : ^{57}Co (122 keV)
P.H.R. : 16.9 %

Figure 4: Position Response Using PX-anodes



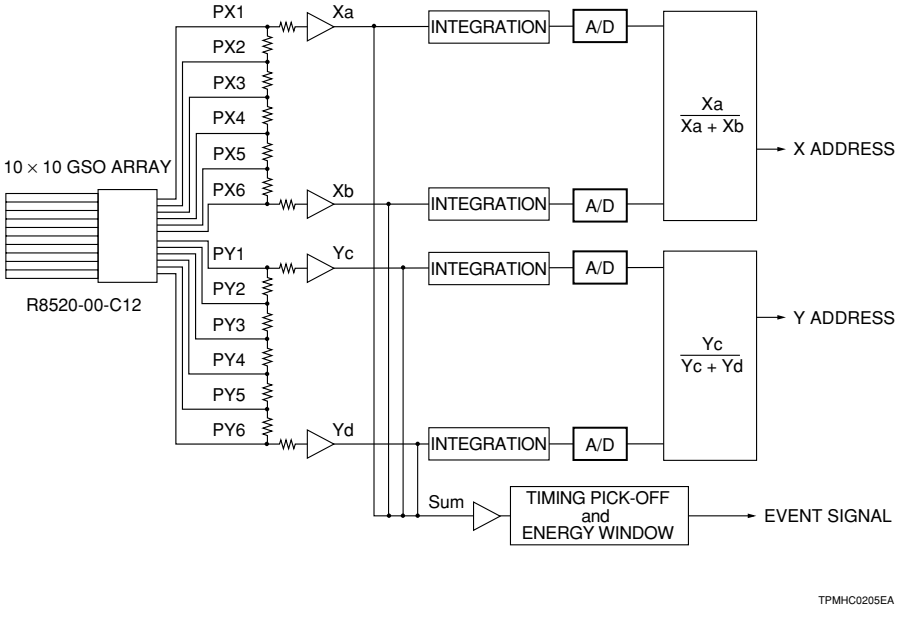
SUPPLY VOLTAGE : -800 V
LIGHT SOURCE : 2 mm × 2 mm × 20 mm BGO CRYSTAL (irradiated by ^{137}Cs)
A STEP OF SCANNING : 0.5 mm

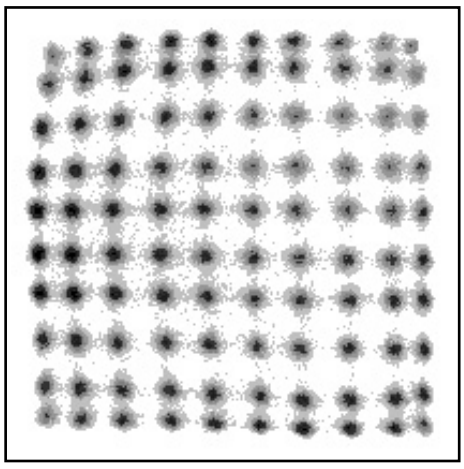
Figure 5: Spatial Resolution



* Output of each anode under a light spot scanning at a center.

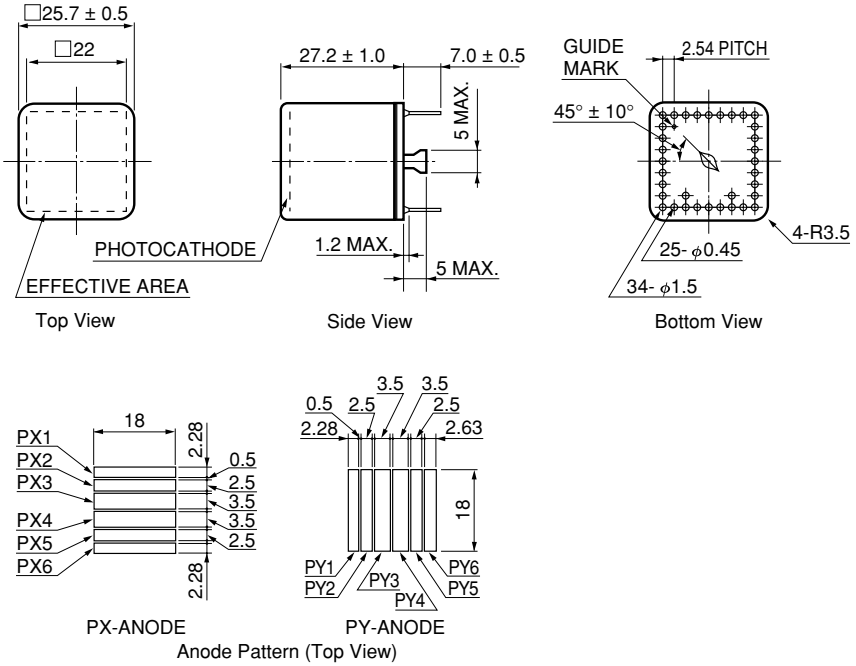
Figure 6: Circuit Diagram Example and Positioning Histogram



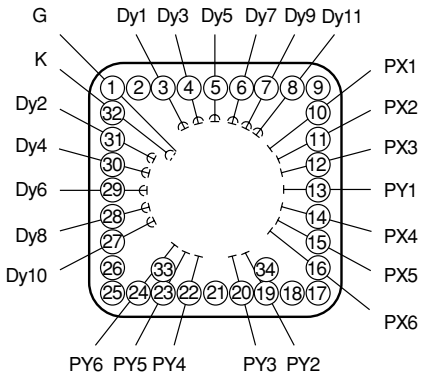


Positioning histogram of a 10 × 10 array of 2.0 mm × 2.0 mm × 20 mm GSO elements for 511 keV γ-rays.
(crystal pitch is 2.2 mm)

Figure 7: R8520-00-C12 Dimensional Outline and Basing Diagram (Unit: mm)



Basing Diagram



Bottom View
Basing Diagram

K : Photocathode
Dy : Dynode (Dy1-Dy11)
P : Anode (PX1-PX6)
(PY1-PY6)
G : Grid

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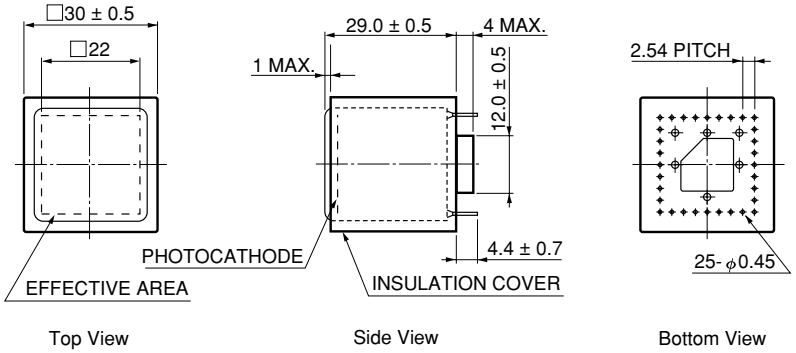
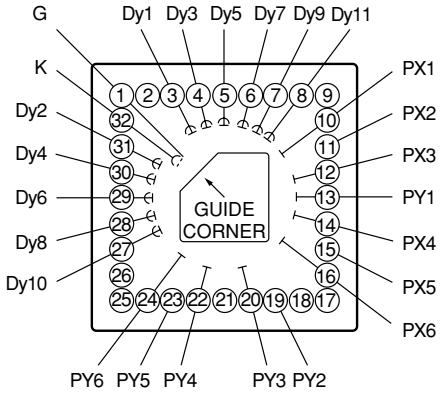
Figure 8: R8520U-00-C12 Dimensional Outline and Basing Diagram (Unit: mm)
(R8520-00-C12 with an Insulation Cover)



Basing Diagram



Bottom View
Basing Diagram

K : Photocathode
Dy : Dynode (Dy1-Dy11)
P : Anode (PX1-PX6)
(PY1-PY6)
G : Grid

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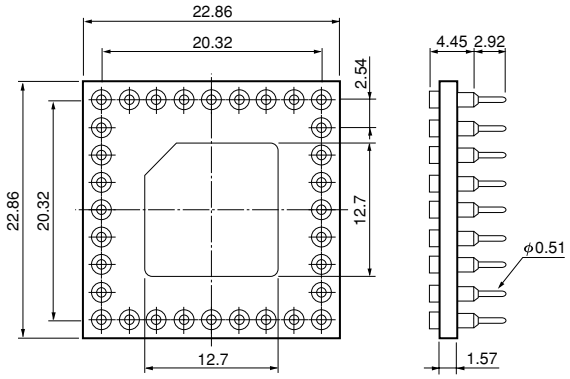
[ACCESSORIES] (Unit: mm)

● **Socket E678-32B** **SOLD SEPARATELY**



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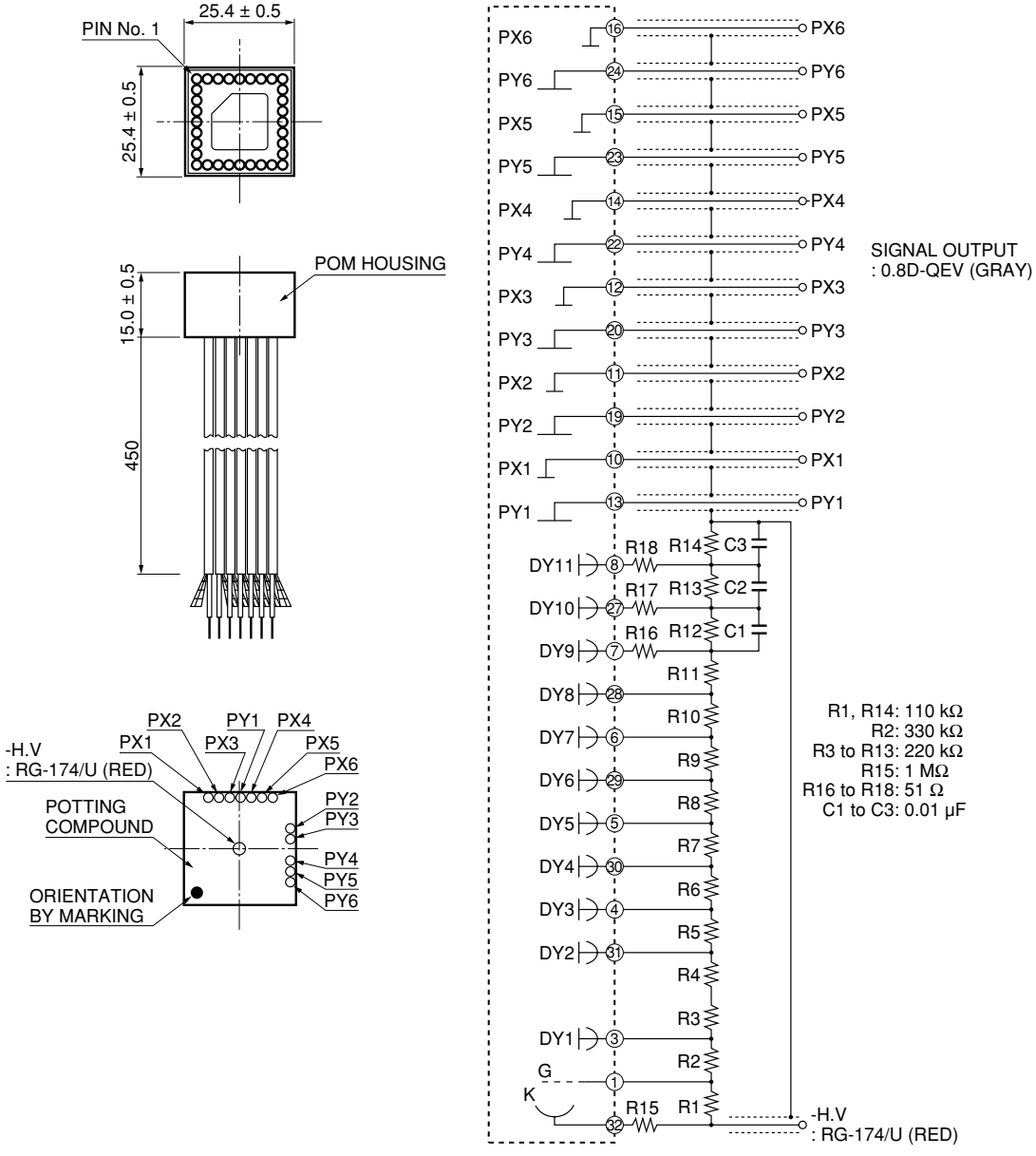
● **D Type Socket Assembly E7514** **SOLD SEPARATELY**



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⚠ 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.

HAMAMATSU HOMEPAGE URL http://www.hamamatsu.com

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