

## FEATURES

- For low temperature operation down to -110 °C
- Large effective area: 48.5 mm × 48.5 mm
- 2 × 2 multianode, pixel size: 24.25 mm × 24.25 mm / anode
- High UV sensitivity
- Low profile
- Low radioactivity

## APPLICATIONS

- Academic research (Dark matter detection)
- Nuclear medicine equipment (PET)

## SPECIFICATIONS

### GENERAL

Parameter		Description	Unit
Spectral response		160 to 650	nm
Peak wavelength		400	nm
Photocathode material		Bialkali	—
Window	Material	Silica glass	—
	Thickness	2.5	mm
Dynode	Structure	Metal channel dynode	—
	Number of stages	10	—
Anode	Number of pixels	4 (2 × 2 matrix)	—
	Pixel size / pitch at center	24.25 × 24.25	mm
Effective area		48.5 × 48.5	mm
Dimensional outline (W × H × D)		56 × 56 × 14.8	mm
Packing density (Effective area / External size)		75	%
Weight		104	g
Operating ambient temperature		-110 to +50	°C
Storage temperature		-110 to +50	°C

### MAXIMUM RATINGS (ABSOLUTE MAXIMUM VALUES)

Parameter		Value	Unit
Supply voltage	Between anode and cathode	1100	V
Average anode output current in total		0.1	mA

### CHARACTERISTICS at 25 °C

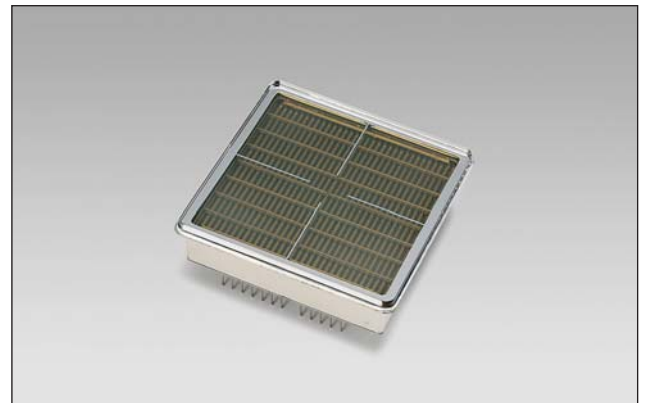
Parameter		Min.	Typ.	Max.	Unit
Cathode sensitivity	Luminous (2856 K)	70	95	—	μA/lm
	Blue sensitivity index	—	10	—	—
	Quantum efficiency at 175 nm	—	33	—	%
Anode sensitivity	Luminous (2856 K)	—	140	—	A/lm
Gain		$0.5 \times 10^6$	$1.5 \times 10^6$	—	—
Anode dark current	per channel	—	1.5	—	nA
	in total	—	6	50	nA
Time response	Rise time	—	1.2	—	ns
	Transit time	—	5.9	—	ns
	Transit time spread (FWHM)	—	0.41	—	ns
Pulse linearity per channel (2 % deviation)		—	8	—	mA
Pulse linearity per channel (5 % deviation)		—	20	—	mA
Uniformity ratio between anodes		—	1: 1.5	1: 2	—

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

### VOLTAGE DISTRIBUTION RATIO AND SUPPLY VOLTAGE

Electrodes	K	Dy1	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	GR	P
Distribution ratio	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



# FLAT PANEL TYPE MULTIANODE PHOTOMULTIPLIER TUBE R12699-406-M4

Figure 1: Typical spectral response

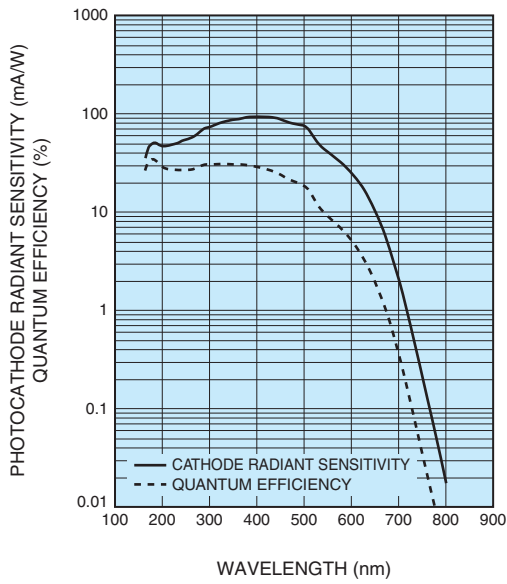


Figure 2: Typical gain

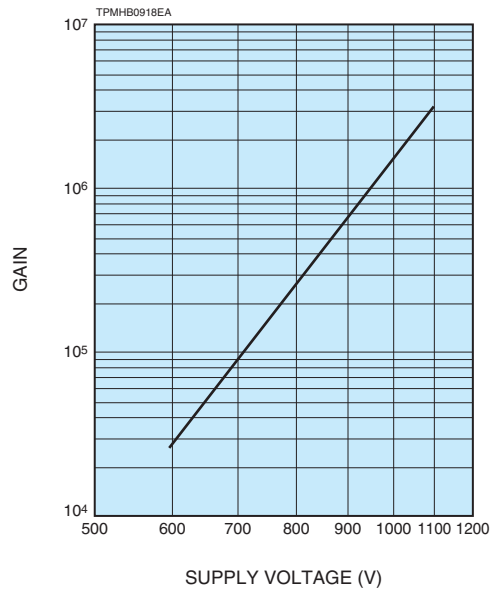
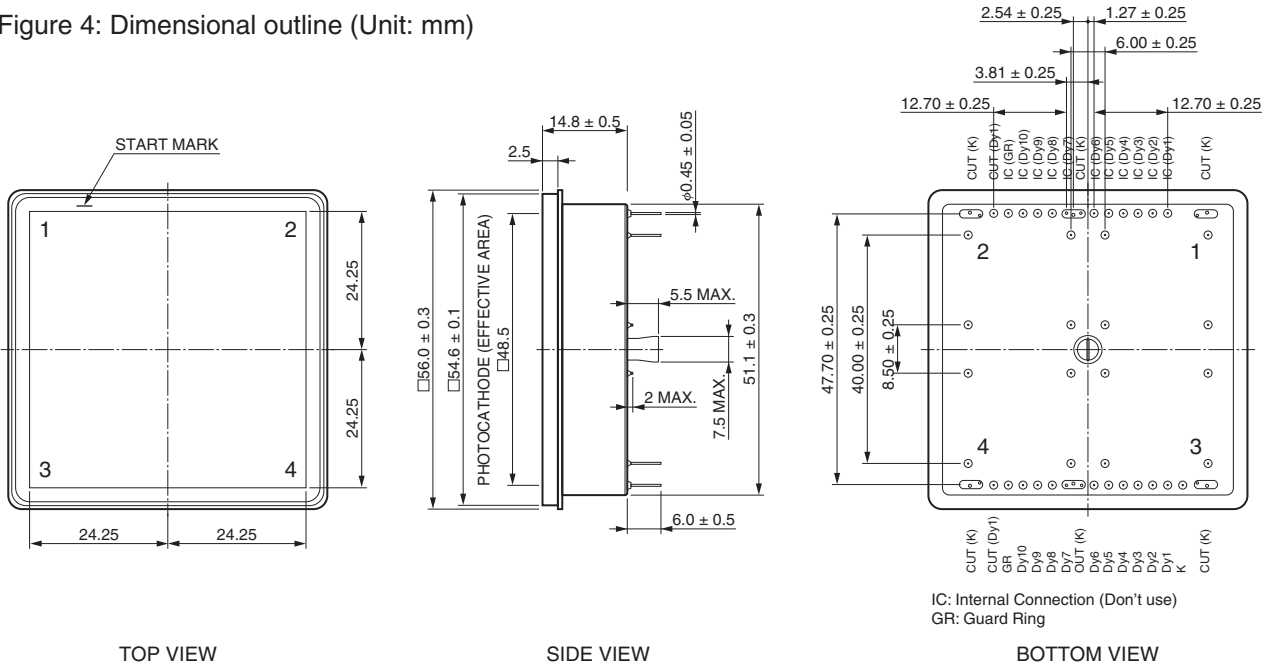


Figure 3: Anode cross-talk (Example)

P1		P2	
100 %	0.61 %	0.02 %	0.07 %
0.22 %	0.02 %	0.14 %	100 %
P3		P4	

SUPPLY VOLTAGE: 1000 V  
LIGHT SOURCE: TUNGSTEN LAMP (DC LIGHT)  
SPOT ILLUMINATION: 24.25 mm × 24.25 mm

Figure 4: Dimensional outline (Unit: mm)



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