

**A red sensitive, 10-stage, 51mm (2") tube**

<b>Applications :</b>	For industrial applications such as laser reading and flying spot cameras.		
<b>Description :</b>	Window :	Material :	borosilicate glass
		Photocathode :	trialkali
		Refr. index at 420 nm :	1.48
	Multiplier:	Structure:	linear focused
		Nb of stages:	10
	Mass:		110 g

**Photocathode characteristics**

Spectral range : 270-850 nm  
Maximum sensitivity at : 420 nm

Sensitivity ① :

Luminous :  
Radiant, at 700 nm : min.: 10 typ.: 165  $\mu$ A/lm  
mA/W

**Characteristics with voltage divider A**

Gain slope (vs supp. volt., log/log) : 7

For an anode sensitivity of : 60 A/lm  
 Supply voltage : max.: 1500 typ.: 1350 V  
min.: 1100

Gain :  $3.5 \times 10^5$   
 Anode dark current ② : max.: 50 typ.: 3 nA

Mean anode sensitivity deviation ③ :  
long term (16 h) : 1 %  
after change of count rate : 1 %  
vs temperature between 0 and +40 °C at 420 nm : - 0.2 %/K

Gain halved for a magnetic field of :  
perpendicular to axis "n" : 0.2 mT  
parallel to axis "n" : 0.1 mT

**Characteristics with voltage divider ④ :**

For a supply voltage of : 1700 1700 V

Gain :  $4.6 \times 10^5$   $1.8 \times 10^6$

Linearity (2%) of anode current up to : 200 100 mA

Anode pulse ⑤ :

Rise time : 3.5 ns

Duration at half height : 7 ns

Transit Time : 35 ns

Capacitance anode to all : 5 pF

product specification

Recommended voltage divider

Type A for maximum gain

K	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A	
2	1	1	1	1	1	1	1	1	1	1	1	(total :12)

Type B for best timing / linearity compromise

K	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	A	
2	1	1	1	1.25	1.25	1.5	2.25	2.25	2.5	2.25	2.25	(total :18.25)

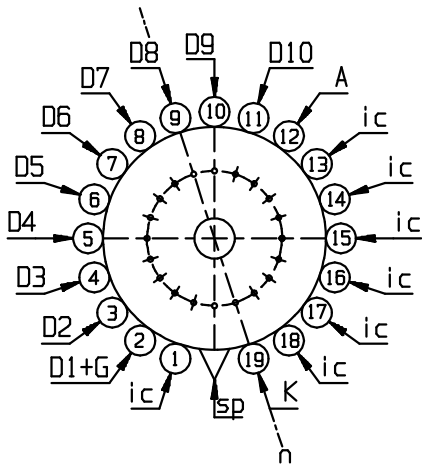
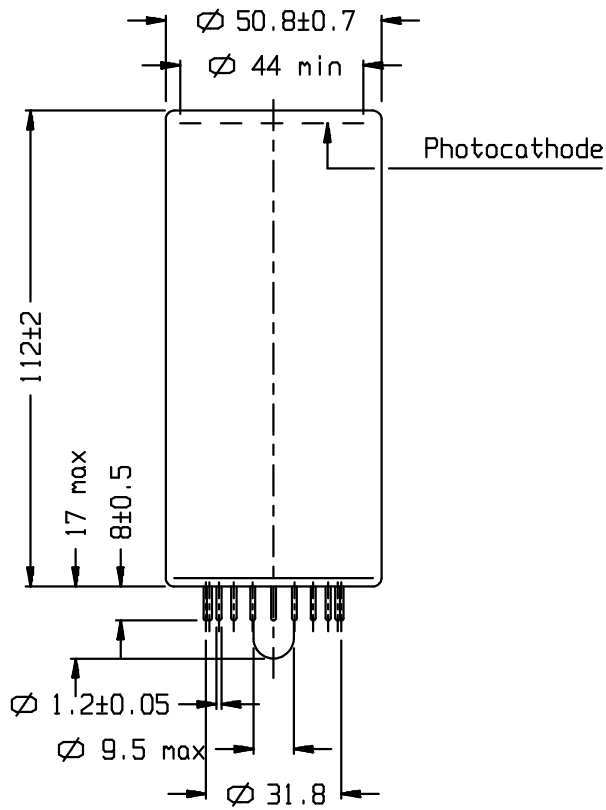
K: photocathode    Dn: dynode    A: anode

Limiting values

Anode luminous sensitivity :		max.:	600	A/lm		
Supply voltage :		max.:	1800	V		
Continuous anode current :		max.:	0.2	mA		
Voltage between :						
	D1 and photocathode :	min.:	150	max.:	600	V
	consecutive dynodes :			max.:	300	V
	anode and D10 :	min.:	30	max.:	300	V
Ambient temperature :						
	short operation (< 30 mn) :	min.:	-30	max.:	+80	°C
	continuous operation & storage :	min.:	-30	max.:	+50	°C

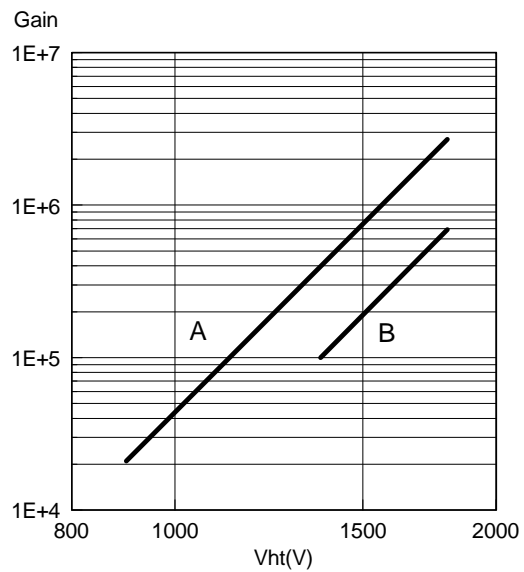
Notes

- Characteristic measured and mentioned on the test ticket of each tube.
- ① Luminous sensitivity is measured with a tungsten filament lamp with a colour temperature of  $2856 \pm 5$  K. The blue sensitivity, expressed in A/lmF ("F" as in Filtered) is measured with a tungsten filament lamp with a colour temperature of  $2856 \pm 5$  K. Light is transmitted through an interference filter.
- ② Dark current is measured at ambient temperature, after the tube has been in darkness for approximately 1 min. Lower value can be obtained after a longer stabilisation period in darkness (approx. 30 min.).
- ③ The mean pulse amplitude deviation is measured by coupling a NaI(Tl) scintillator to the window of the tube. Long term (16h) deviation is measured by placing a  $^{137}\text{Cs}$  source at a distance from the scintillator such that the count rate is  $\sim 10^4$  c/s, corresponding to an anode current of  $\sim 300$  nA. The mean pulse amplitude deviation after change of count rate is measured with a  $^{137}\text{Cs}$  source at a distance from the scintillator such that the count rate can be changed from  $10^4$  to  $10^3$  c/s, corresponding to an anode current of  $\sim 1$   $\mu\text{A}$  and  $0.1$   $\mu\text{A}$  respectively. Both tests are carried out according to ANSI-N42-9-1972 of IEEE recommendations.
- ④ To obtain a peak pulse current greater than that obtainable with divider A, it is necessary to increase the inter-dynode voltage progressively. Divider circuit C is an example of a progressive divider, giving a compromise between gain, speed and linearity. other dividers can be conceived to achieve other compromises. It is generally recommended that the voltage ratio between two successive stages is less than 2.
- ⑤ Measured with a pulse light source, with a pulse duration (FWHM) of approximately 1ns., the cathode being completely illuminated. The rise time is determined between 10 % and 90 % of the anode pulse amplitude. The signal transit time is measured between the instant at which the illuminating pulse of the cathode becomes maximum, and the instant at which the anode pulse reaches its maximum. Rise time, pulse duration and transit time vary with respect to high tension supply voltage  $V_{ht}$  as  $(V_{ht})^{-1/2}$ .



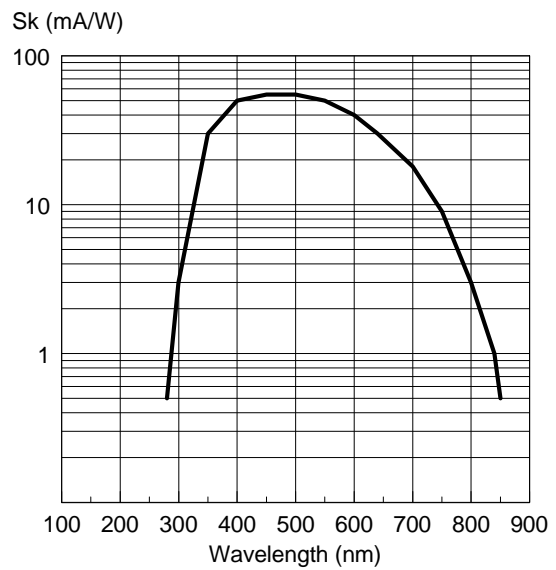
ref.: 95600004  
 sp: short pin  
 ic: internal connection  
 n: plane of symmetry of the multiplier  
  
 K: cathode      Dn: dynode  
 A: anode

Typical gain curve



XP2203

Typical spectral characteristics



XP2203

Accessories

Socket: FE2019  
 Mu-metal shield: MS152