Near-infrared sensitive, 10-stage, 38 mm (1.5") round tube

Applications :	For industrial applications where a good sensitivity in the far red part of the spectrum is required, such as laser detection and pollution monitoring.		
Description :	Window :	Material :	borosilicate glass
		Photocathode :	AgOCs
		Refr. index at 420 nm :	1.48
	Multiplier :	Structure :	linear focused
		Nb of stages :	10
	Mass :	90 g	

Photocathode characteristics

	Spectral range :					270-1050	nm
		Maximum sensitivity at :				800	nm
	Sensitivity ① :						
☑		Luminous :	min.:	15	typ.:	20	µA/lm
		Radiant, at 1060 nm :			typ.:	0.12	mA/W
		Infra-red to white sensitivity ratio :			typ.:	0.1	

Characteristics with voltage divider A

	Gain slope (vs supp. volt., log/log) :					7.5	
	For an anode blue sensitivity of :					10	A/lm
☑	Supply voltage :		max.:	1500	typ.:	1200	V
			min.:	1000			
	Gain :					$5x10^5$	
☑	Anode dark current ② :		max.:	10000	typ.:	2000	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 :				± 0.1	%/K
	Gain halved for a magnetic field						
		perpendicular to axis "n" of :				0.35	mT
		parallel to axis "n" of :				0.15	mT
		parallel to tube axis of :				0.6	mT

Characteristics with voltage divider ④ :

		B	**A**	
	For a supply voltage of :	1550	1200	V
	Gain :	$5x10^5$	$5x10^5$	
	Linearity (2%) of anode current up to :	200	65	mA
	Anode pulse ⑤ :			
	Rise time :	3	3	ns
	Duration at half height :	4	4	ns
	Transit Time :	24	25	ns
	Capacitance anode to all :		5	pF

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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	0.75		(total :11.75)

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		(total :18.25)

K: photocathode D: dynode A: anode

Limiting values

Anode luminous sensitivity :				max.:	100	A/lm
Supply voltage :				max.:	1600	V
Continuous anode current :				max.:	0.2	mA
Voltage between :						
	D1 and photocathode :	min.:	100	max.:	500	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.

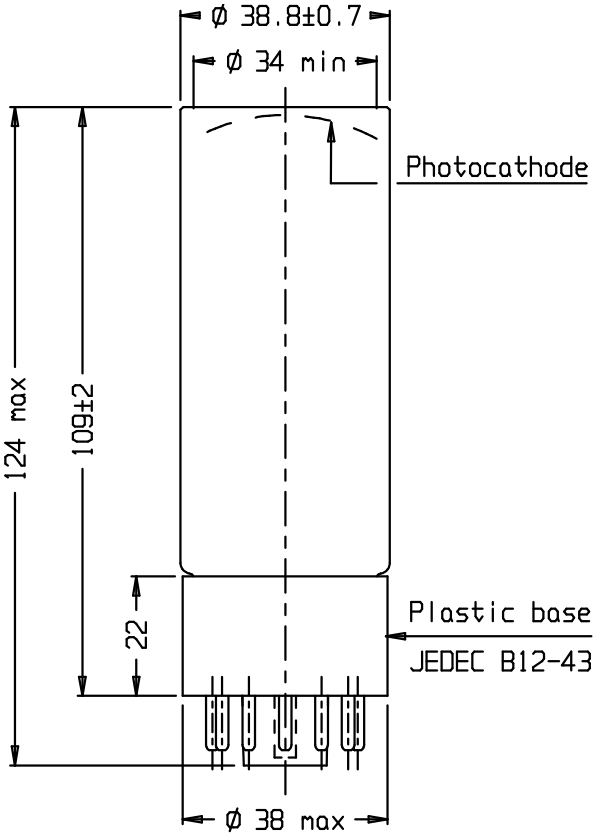
① Luminous sensitivity is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5 K. The blue sensitivity, expressed in A/lmF ("F" as in Filtered) is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5 K. The radiant sensitivity is measured with a tungsten filament lamp with a colour temperature of 2856 ± 5K. Light is transmitted through an interference filter.

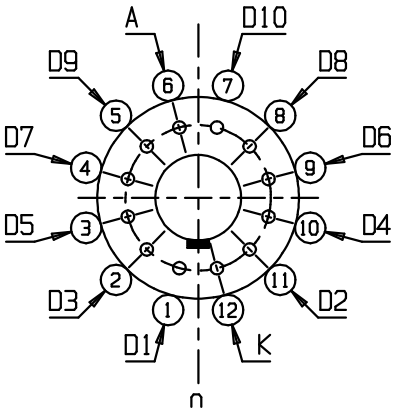
② Dark current is measured at ambient temperature, after the tube has been in darkness for approximately 1 min. Lower value can be obtained after a longer stabilisation period in darkness (approx. 30 min.).

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}Cs source at a distance from the scintillator such that the count rate is ~ 10^4 c/s, corresponding to an anode current of ~ 300 nA. The mean pulse amplitude deviation after change of count rate is measured with a ^{137}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 ~ 1 µA and 0.1 µA 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 1 ns., 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 Vht as (Vht)-½.

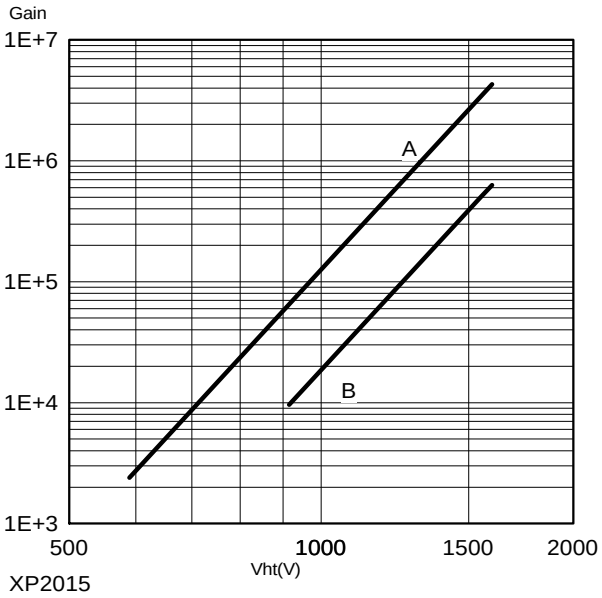




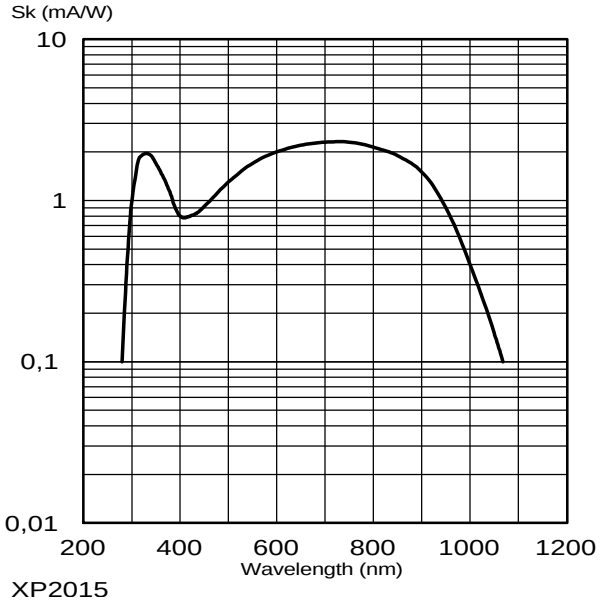
ref.: 15200143
n: plane of symmetry of the multiplier

K: cathode Dn: dynode
A: anode

Typical gain curve



Typical spectral characteristics



Accessories

Socket :	FE1012
Mu-metal shield :	MS170
Voltage divider :	VD200K

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