29 mm (1.13") photomultiplier
9406B series data sheet

ET Enterprises electron tubes

1 description

The 9406B is a 29 mm (1.13") diameter, end window photomultiplier with magnesium fluoride window, blue-green sensitive bialkali photocathode and 11 high gain, high stability, SbCs dynodes of linear focused design.

It is supplied with spectral response data at specific wavelengths in the vacuum ultra-violet and with photon counting plateau curves showing the recommended voltage for photon counting applications.

2 applications

- fluorescence studies from 110 nm to 630 nm

3 features

- sensitive to vacuum ultra-violet light
- high gain
- good SER
- low operating voltage

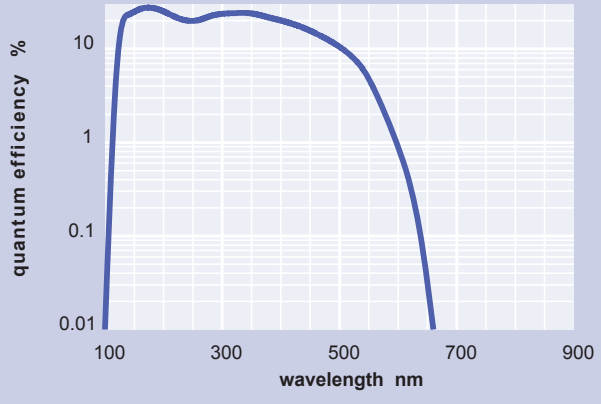
4 window characteristics

The plane of the window is cut perpendicular to its optical axis.

	9406B borosilicate
spectral range (nm)*	110 - 630
refractive index (n_d)	1.38

* wavelength range over which quantum efficiency exceeds 1 % of peak

5 typical spectral response curves

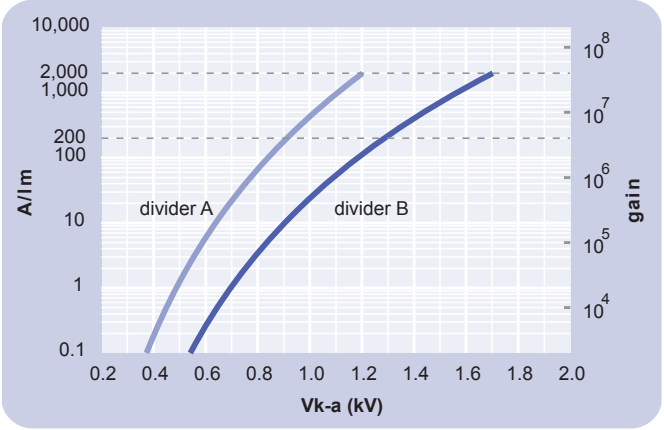


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		25	
quantum efficiency at peak	%		28	
luminous sensitivity	µA/lm		50	
with CB filter		6	8	
with CR filter			1	
dynodes: 11LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		200	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		900	1150
overall V for max. rated A/lm	V		1200	
gain at nominal A/lm	x 10^6		4	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.2	5
dc at max. rated A/lm	nA		2	
dark count rate	s^{-1}		100	
pulsed linearity (-5% deviation):				
divider A	mA		25	
divider B	mA		100	
rate effect (I_a for Δ g/g=1%):	µA		20	
magnetic field sensitivity: the field for which the output decreases by 50 %				
most sensitive direction	T x 10^{-4}		1.6	
temperature coefficient:	% $°C^{-1}$		± 0.5	
timing:				
single electron rise time	ns		4.5	
single electron (fwhm)	ns		7.5	
single electron jitter (fwhm)	ns		4	
transit time	ns		33	
weight:	g		50	
maximum ratings:				
anode current	µA			100
cathode current	nA			50
gain	x 10^6			40
sensitivity	A/lm			2000
temperature	°C	-30		60
V (k-a)(1)	V			2000
V (k-d1)	V			300
V (d-d)(2)	V			300
ambient pressure (absolute)	kPa			202

(1) subject to not exceeding max. rated sensitivity (2) subject to not exceeding max rated V(k-a)

7 typical voltage gain characteristics

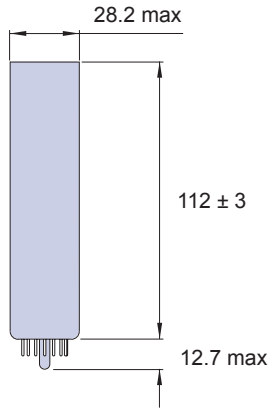


8 voltage divider distribution

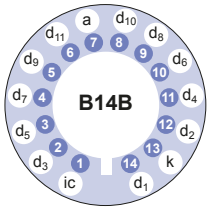
	k	d_1	d_2	.....	d_8	d_9	d_{10}	d_{11}	a	
A	2R	R		.....	R	R	R	R	R	Standard
B	2R	R		.....	R	2R	3R	4R	3R	High Pulsed Linearity

Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm



10 base configuration (viewed from below)



'ic' indicates an internal connection

Our range of B14B sockets, available for this series, includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 high voltage caution

To avoid arc discharges between the photocathode and nearby grounded surfaces apply the HV only after hard vacuum has been attained, that is when the pressure is less than 10^{-3} torr. Failure to observe this precaution will destroy the pmt and invalidate the warranty.

12 handling instructions

The window of this pmt has been specially cleaned to give maximum efficiency. It should not be touched with fingers or allowed to come into contact with oil or grease. The window can be cleaned with isopropyl alcohol to remove oil deposits.

13 ordering information

The 9406B meets the specification given in this data sheet. You may order **variants** by adding a suffix to the type number. You may also order **options** by adding a suffix to the type number. You may order product with **specification options** by discussing your requirements with us. If your selection option is for one-off order, then the product will be referred to as 9406A. For a repeat order, ET Enterprises will give the product a two digit suffix after the letter B, for example B21. This identifies your specific requirement.

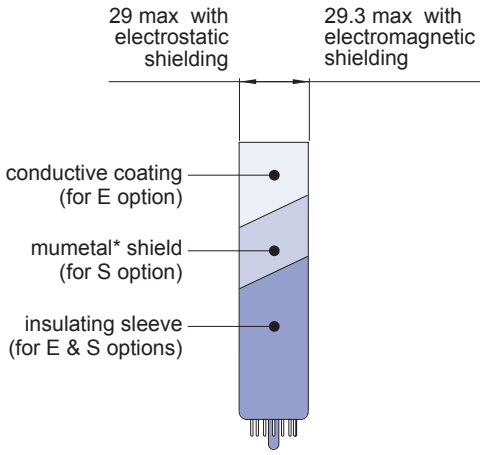
9406 ☐ ☐

options

E	electrostatic shielding see drawing below
S	electromagnetic shielding see drawing below

specification options

B	as given in data sheet
A	single order to selected specification
Bnn	repeat order to selected specification



14 voltage dividers

The standard voltage dividers available for these pmts are tabulated below:

	k	d_1	d_2	.....	d_7	d_8	d_9	d_{10}	d_{11}	a
C637A	2R	R		.....	R	R	R	R	R	
C637B	2R	R		.....	R	2R	3R	4R	3R	
C637C	150 V	R		.....	R	R	R	R	R	
C637D	150 V	R		.....	R	2R	3R	4R	3R	

R = 330kΩ

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choose accessories for this pmt on our website

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