

29 mm (1.13") photomultiplier

9408B series data sheet

1 description

The 9408B is a 29 mm (1.13") diameter, end window photomultiplier with magnesium fluoride window, S20 infrared sensitive bialkali photocathode and 11 BeCu dynodes of linear focused design for extended linearity.

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 850 nm

3 features

- sensitive to vacuum ultra-violet light

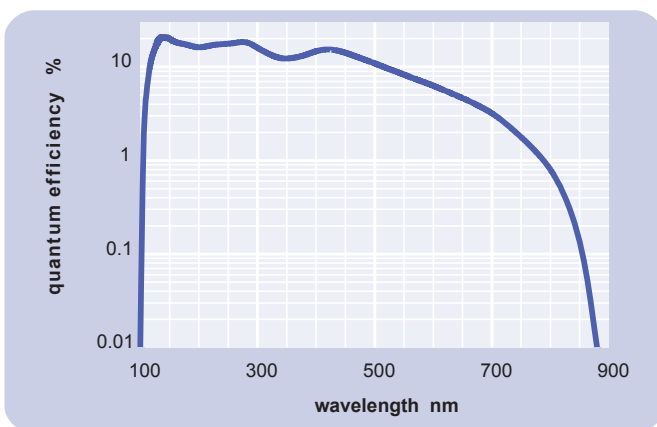
4 window characteristics

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

| 9408B magnesium fluoride | |
|--------------------------------|-----------|
| spectral range (nm)* | 110 - 850 |
| refractive index (n_d) | 1.38 |

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

5 typical spectral response curves

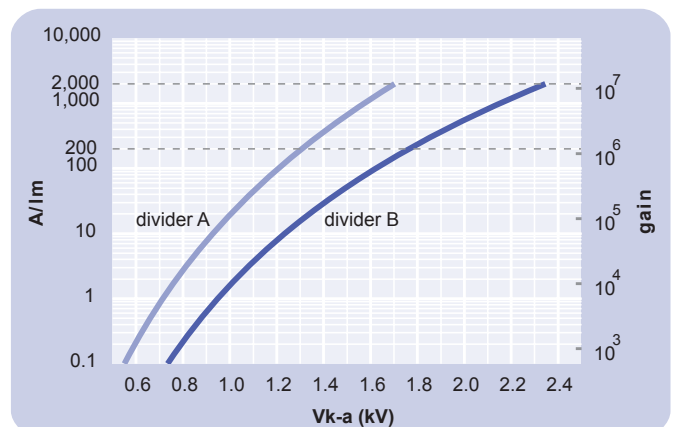


6 characteristics

| | unit | min | typ | max |
|--|-----------------------------------|-----|-----------|------|
| photocathode: S20 | | | | |
| active diameter | mm | | 25 | |
| quantum efficiency at peak | % | | 21 | |
| luminous sensitivity | $\mu\text{A/lm}$ | 90 | 170 | |
| with CB filter | | | 8 | |
| with CR filter | | | 75 | |
| with IR filter | | | 6 | |
| dynodes: 11LFBcCu | | | | |
| anode sensitivity in divider A: | | | | |
| nominal anode sensitivity | A/lm | | 200 | |
| max. rated anode sensitivity | A/lm | | 2000 | 1800 |
| overall V for nominal A/lm | V | | 1300 | |
| overall V for max. rated A/lm | V | | 1700 | |
| gain at nominal A/lm | $\times 10^6$ | | 1 | |
| dark current at 20 °C: | | | | |
| dc at nominal A/lm | nA | | 1 | 10 |
| dc at max. rated A/lm | nA | | 10 | |
| dark count rate | s^{-1} | | 5000 | |
| pulsed linearity (-5% deviation): | | | | |
| divider A | mA | | 50 | |
| divider B | mA | | 150 | |
| rate effect (I_a for $\Delta g/g=1\%$): | μA | | 1 | |
| magnetic field sensitivity: | | | | |
| the field for which the output decreases by 50 % | | | | |
| most sensitive direction | $\text{T} \times 10^{-4}$ | | 1.6 | |
| temperature coefficient: | $\% \text{ } ^\circ\text{C}^{-1}$ | | ± 0.5 | |
| timing: | | | | |
| single electron rise time | ns | | 3.5 | |
| single electron (fwhm) | ns | | 5 | |
| transit time | ns | | 30 | |
| weight: | g | | 50 | |
| maximum ratings: | | | | |
| anode current | μA | | | 100 |
| cathode current | nA | | | 500 |
| gain | $\times 10^6$ | | | 12 |
| sensitivity | A/lm | | | 2000 |
| temperature | $^\circ\text{C}$ | -80 | | 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

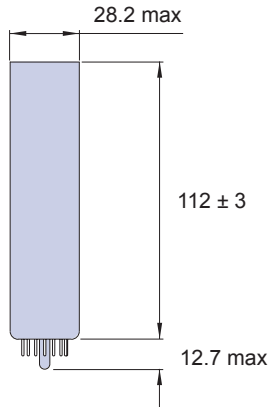


8 voltage divider distribution

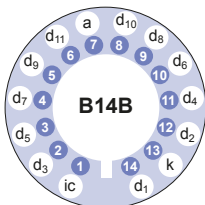
| | k | d ₁ | d ₂ | | d ₈ | d ₉ | d ₁₀ | d ₁₁ | a | |
|---|----|----------------|----------------|-------|----------------|----------------|-----------------|-----------------|---|-----------------------|
| A | 2R | R | | R | R | R | R | R | R | Standard |
| B | 2R | R | | R | 2R | 3R | 4R | 3R | | High 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 9408B 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 9407A. 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.

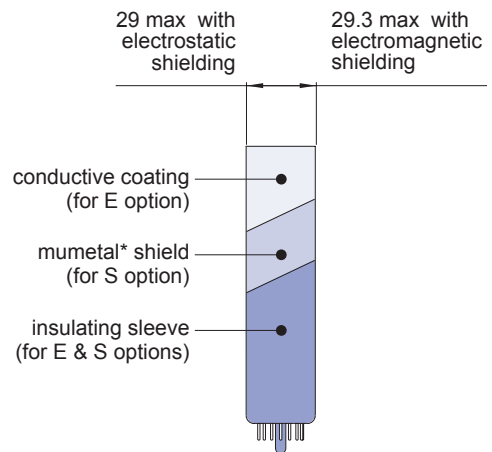
9408

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 | 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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