

78 mm (3") photomultiplier

9305KB series data sheet

1 description

The 9305KB is a 78mm (3") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode and 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing.

2 applications

- scintillation spectroscopy

3 features

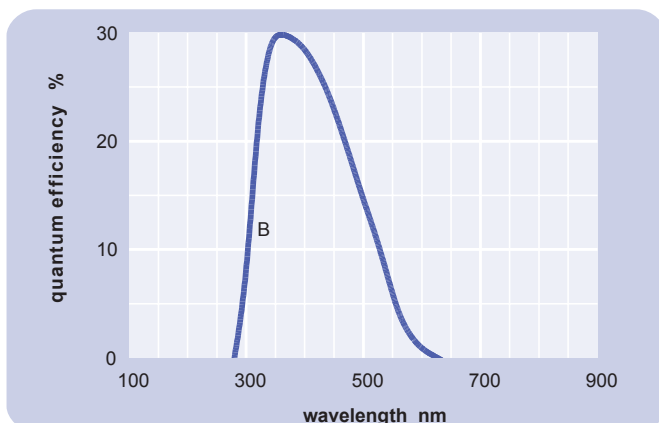
- good pulse height resolution

4 window characteristics

| | | 9305KB/FLB borosilicate |
|----------------------------|--|----------------------------|
| spectral range *(nm) | | 295 - 630 |
| refractive index (n_d) | | 1.49 |
| K (ppm) | | 300 |
| Th (ppb) | | 250 |
| U (ppb) | | 100 |

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

5 typical spectral response curves

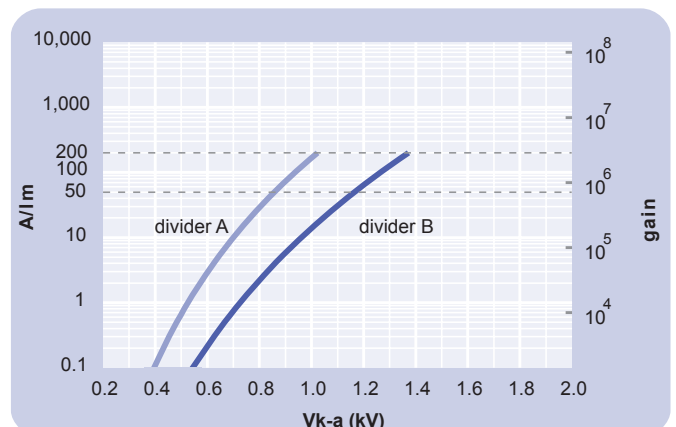


6 characteristics

| | unit | min | typ | max |
|--|-----------------------------------|-----|-----------|------|
| photocathode: bialkali | | | | |
| active diameter | mm | | 70 | |
| quantum efficiency at peak | % | | 30 | |
| luminous sensitivity | $\mu\text{A/lm}$ | | 75 | |
| with CB filter | | 8 | 12 | |
| with CR filter | | | 2 | |
| dynodes: 10LFSbCs | | | | |
| anode sensitivity in divider A: | | | | |
| nominal anode sensitivity | A/lm | | 50 | |
| max. rated anode sensitivity | A/lm | | 200 | |
| overall V for nominal A/lm | V | | 850 | 1700 |
| overall V for max. rated A/lm | V | | 1000 | |
| gain at nominal A/lm | $\times 10^6$ | | 0.7 | |
| dark current at 20 °C: | | | | |
| dc at nominal A/lm | nA | | 0.5 | 10 |
| dc at max. rated A/lm | nA | | 2 | |
| dark count rate | s^{-1} | | 500 | |
| pulsed linearity (-5% deviation): | | | | |
| divider A | mA | | 30 | |
| divider B | mA | | 100 | |
| pulse height resolution: | | | | |
| single electron peak to valley | ratio | | 2 | |
| ¹³⁷ Cs with 3" x 3" NaI(Tl) | % | | 7.3 | |
| rate effect (I_a for $\Delta g/g=1\%$): | μA | | 20 | |
| magnetic field sensitivity: | | | | |
| the field for which the output decreases by 50 % | | | | |
| most sensitive direction | $\text{T} \times 10^{-4}$ | | 1.7 | |
| temperature coefficient: | $\% \text{ } ^\circ\text{C}^{-1}$ | | ± 0.5 | |
| timing: | | | | |
| single electron rise time | ns | | 3 | |
| single electron fwhm | ns | | 4 | |
| multi electron fwhm | ns | | 15 | |
| multi electron rise time | ns | | 7.5 | |
| transit time | ns | | 42 | |
| weight: | g | | 130 | |
| maximum ratings: | | | | |
| anode current | μA | | | 100 |
| cathode current | nA | | | 200 |
| gain | $\times 10^6$ | | | 3 |
| sensitivity | A/lm | | | 200 |
| temperature | $^\circ\text{C}$ | -30 | | 60 |
| V (k-a) ⁽¹⁾ | V | | | 2700 |
| V (k-d1) | V | | | 450 |
| 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



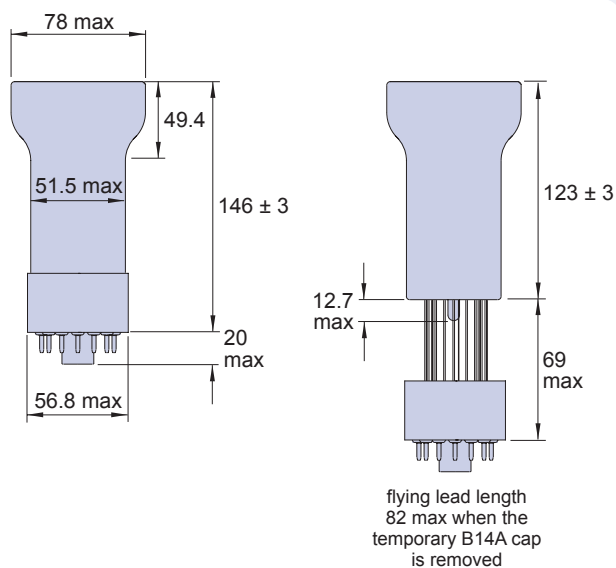
8 voltage divider distribution

| | k | d ₁ | d ₂ | | d ₇ | d ₈ | d ₉ | d ₁₀ | a | |
|---|----|----------------|----------------|-------|----------------|----------------|----------------|-----------------|---|--------------------------|
| A | 3R | R | | R | R | R | R | R | R | Standard |
| B | 3R | R | | R | 2R | 3R | 4R | 3R | | High Pulsed linearity |

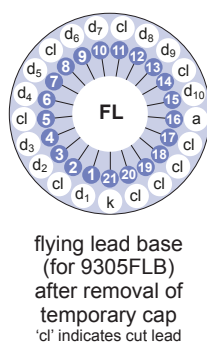
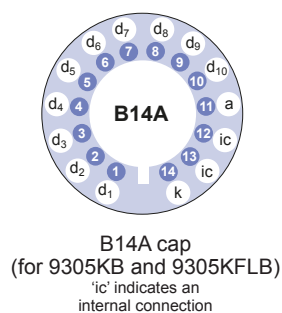
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9305KB with the B14A cap fitted, and the 9305KFLB in flying lead format with the temporary B14A cap fitted. The cap is attached as agreed.



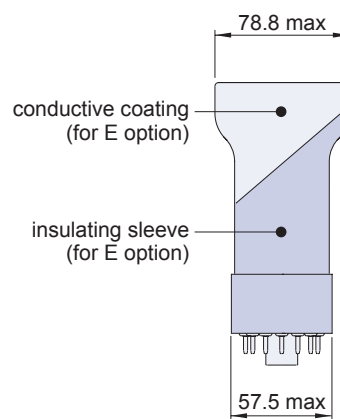
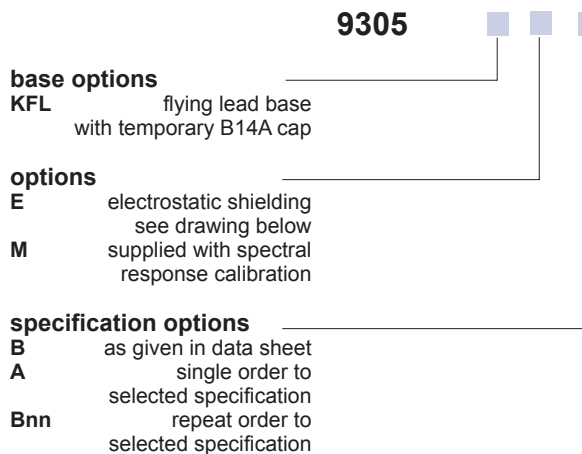
10 base configurations (viewed from below)



Our range of B14A sockets is available to suit the B14A cap. The socket range includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9305KB 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 9305KA. 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.



12 voltage dividers

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

| 9305KB | 9305FLB | k | d ₁ | d ₂ | | d ₆ | d ₇ | d ₈ | d ₉ | d ₁₀ | a |
|--------|---------|-------|----------------|----------------|-------|----------------|----------------|----------------|----------------|-----------------|---|
| C636P | C655P | 3R | R | | R | R | R | R | R | R | |
| C636R | C655R | 3R | R | | R | 2R | 3R | 4R | 3R | | |
| C636S | C655S | 150 V | R | | R | R | R | R | R | | |
| C636T | C655T | 150 V | R | | R | 2R | 3R | 4R | 3R | | |

R = 330kΩ

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