

78 mm (3") photomultiplier

9302B series data sheet

1 description

The 9302B is a 78mm (3") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode and 9 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. **The entire envelope is manufactured in water-resistant, ultra-low background glass.**

2 applications

- high energy physics studies
- scintillation spectroscopy

3 features

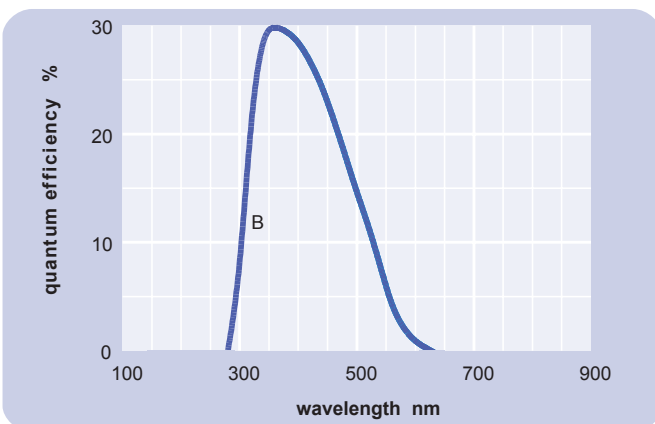
- entire envelope of ultra-low background glass
- very low concentrations of thorium, uranium and potassium for studies of rare events
- good SER
- good pulse height resolution

4 window characteristics

9302B borosilicate	
spectral range*(nm)	285 - 630
refractive index (n_d)	1.49
K (ppm)	60
Th (ppb)	30
U (ppb)	30

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

5 typical spectral response curves

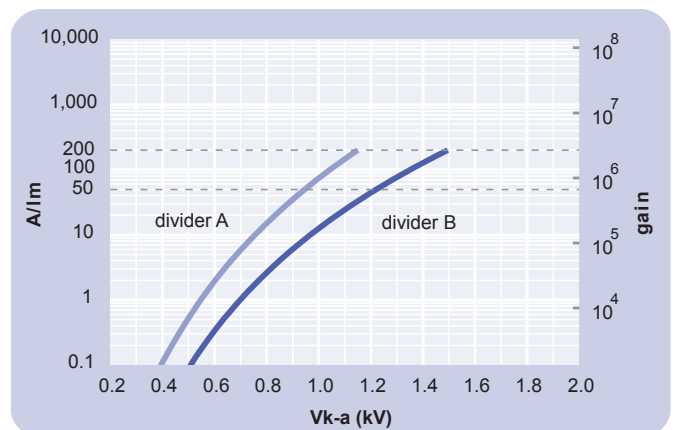


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		70	
quantum efficiency at peak	%		30	
luminous sensitivity	$\mu\text{A}/\text{lm}$		75	
with CB filter		8	12	
with CR filter			2	
dynodes: 9LFSbCs				
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		950	1300
overall V for max. rated A/lm	V		1150	
gain at nominal A/lm	$\times 10^6$		0.7	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.5	5
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	
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	$T \times 10^{-4}$		1.7	
temperature coefficient:				
	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
multi electron rise time	ns		7.5	
multi electron fwhm	ns		15	
transit time	ns		40	
weight:				
	g		125	
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			2100
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



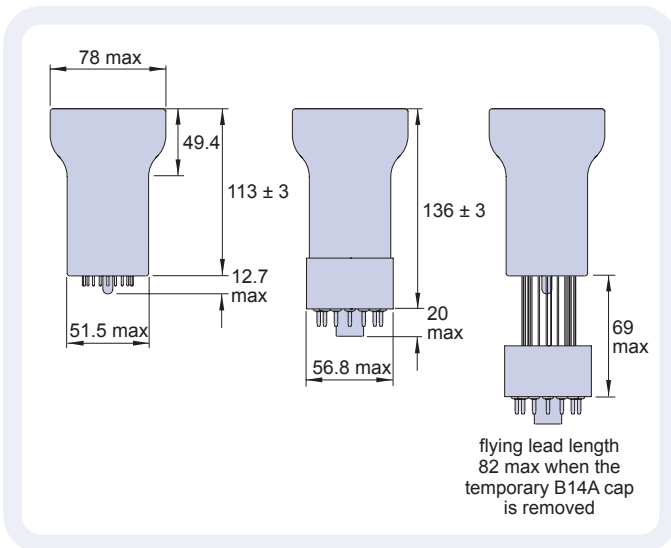
8 voltage divider distribution

	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	a	
A	3R	R	.....		R	R	R	2R	R	Standard
B	3R	R	.....		R	2R	3R	4R	3R	High Pulsed linearity

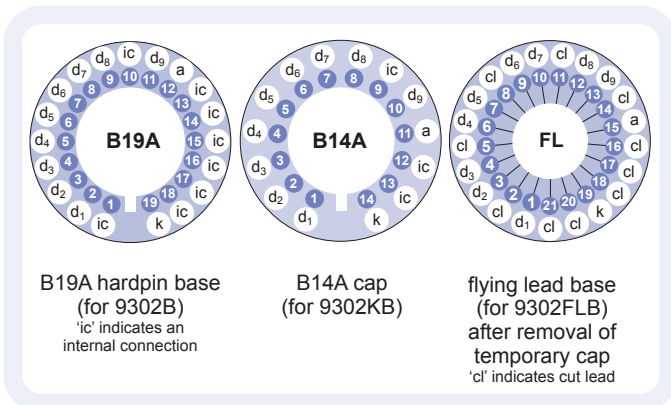
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9302B in hardpin format, the 9302KB with the B14A cap fitted and the 9302FLB in flying lead format with the temporary B14A cap fitted. The cap is attached as agreed with the customer.



10 base configurations (viewed from below)



Our range of B19A sockets is available to suit the B19B hardpin base. Our range of B14A sockets is available to suit the temporary B14A cap when the flying lead base variant is selected. Both socket ranges include versions with our without a mounting flange, and with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9302B 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 9302A. 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.

9302

base options

- K** capped
- KFL** flying lead base with temporary B14A cap

options

- E** electrostatic shielding see drawing below
- M** supplied with spectral response calibration

specification options

- B** as given in data sheet
- A** single order to selected specification

Technical drawing showing options for the 9302B tube:

- conductive coating (for E option):** Indicated by a dot on the top surface.
- insulating sleeve (for E option):** Indicated by a dot on the side of the tube.

Dimensions: 78.8 max mm (top diameter), 52.3 max mm (base diameter).

12 voltage dividers

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

9302			k	d ₁	d ₂	.....	d ₅	d ₆	d ₇	d ₈	d ₉	a
B	KB	FLB										
C648A	C634A	C656A	3R	R	.....		R	R	R	R	R	R
C648B	C634B	C656B	3R	R	.....		R	2R	3R	4R	3R	
C648C	C634C	C656C	450 V	R		R	R	R	R	R	
C648D	C634D	C656D	450 V	R		R	2R	3R	4R	3R	

R = 330 kΩ

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