51 mm (2") photomultiplier
9208B series data sheet

ET Enterprises electron tubes

1 description

The 9208B is a 51mm (2") 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. The entire envelope is manufactured in water-resistant, ultra-low background glass.

2 applications

- high energy physics studies
- scintillation spectroscopy

3 features

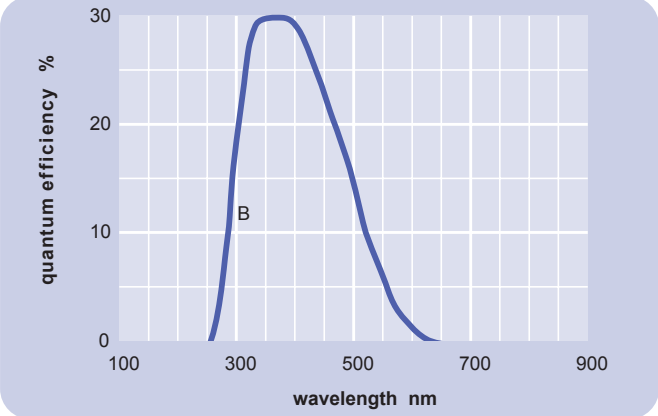
- entire envelope of ultra-low background glass
- very low concentrations of thorium, uranium and potassium for studies of rare events
- good SER
- good pulse height resolution
- envelope is water resistant

4 window characteristics

	9208B borosilicate
spectral range**(nm)	275 - 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

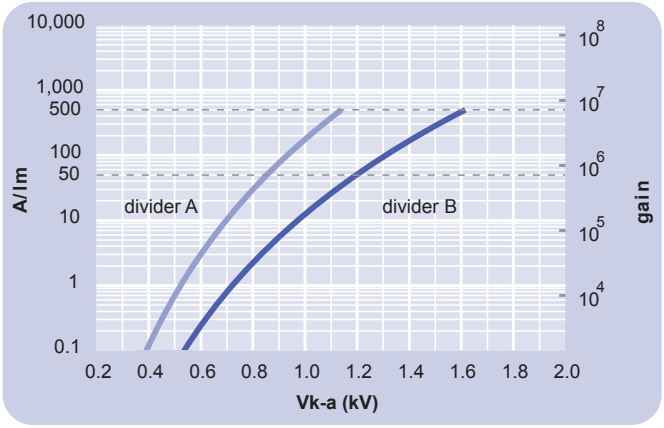


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		48	
quantum efficiency at peak	%		30	
luminous sensitivity	µA/lm		70	
with CB filter		8	11.5	
with CR filter			2	
dynodes: 10LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		500	
overall V for nominal A/lm	V		850	1100
overall V for max. rated A/lm	V		1150	
gain at nominal A/lm	x 10^6		0.6	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.3	1.5
dc at max. rated A/lm	nA		3	
dark count rate	s^{-1}		300	
pulsed linearity (-5% deviation):				
divider A	mA		30	
divider B	mA		100	
pulse height resolution:				
single electron peak to valley	ratio		2	
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 x 10^{-4}		1.3	
temperature coefficient:	% $°C^{-1}$		± 0.5	
timing:				
single electron rise time	ns		2	
single electron fwhm	ns		3.2	
single electron jitter	ns		6	
multi electron rise time	ns		4	
multi electron fwhm	ns		6.5	
transit time	ns		40	
weight:	g		100	
maximum ratings:				
anode current	µA			100
cathode current	nA			100
gain	x 10^6			7
sensitivity	A/lm			500
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



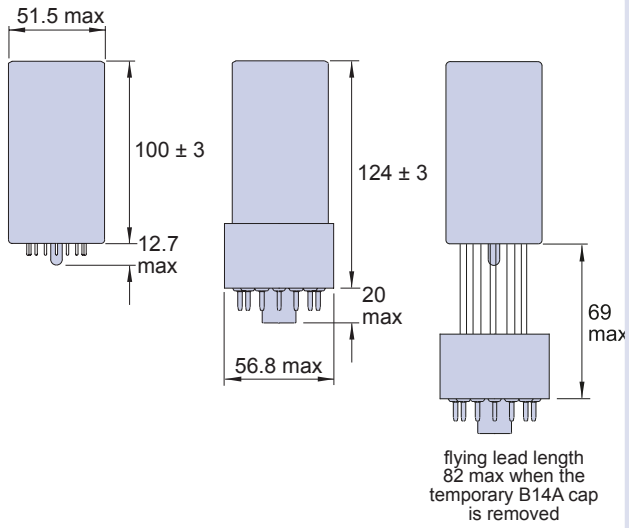
8 voltage divider distribution

	k	d_1	d_2	.....	d_7	d_8	d_9	d_{10}	a	
A	2R	R		.....	R	R	R	R	R	Standard
B	2R	R		.....	R	2R	3R	4R	3R	High Pulsed linearity

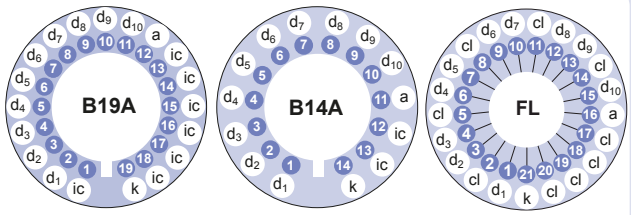
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9208B in hardpin format, the 9208KB with the B14A cap fitted and the 9208FLB in flying lead format with the temporary B14A cap fitted. The cap is attached as agreed with the customer.



10 base configuration (viewed from below)



B19A hardpin base (for 9208B)
'ic' indicates an internal connection

B14A cap (for 9208KB)

flying lead base (for 9208FLB) after removal of temporary cap
'cl' indicates cut lead

Our range of B19A sockets is available to suit the B19A 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 or without a mounting flange, and with contacts for mounting directly onto printed circuit boards.

11 ordering information

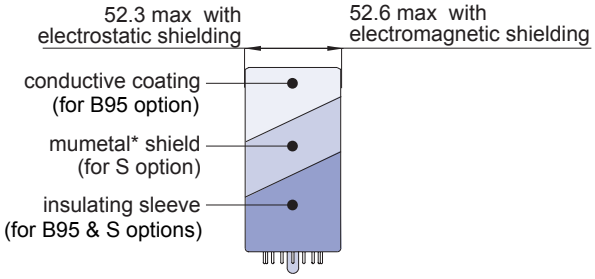
The 9208B meets the specification given in this data sheet. You may order **variants** by adding a suffix to the type number. You may also order **options** by adding a suffix to the type number. You may order product with **specification options** by discussing your requirements with us. If your selection option is for a one-off order, then the product will be referred to as 9208A. For a repeat order, ET Enterprises Limited will give the product a two digit suffix after the letter B, for example B21. This identifies your specific requirement.

9208 □ □ □

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

options
- **B95** electrostatic shielding see drawing below
- **S** electromagnetic shielding see drawing below
- **M** supplied with spectral response calibration

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



*mumetal is a registered trademark of Magnetic Shield Corporation

12 voltage dividers

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

9208 B/XXXB	KB	FLB	k	d_1	d_2	.....	d_6	d_7	d_8	d_9	d_{10}	a
C647A	C636A	C655A	2R	R		.....	R	R	R	R	R	
C647B	C636B	C655B	2R	R		.....	R	2R	3R	4R	3R	
C647C	C636C	C655C	150 V	R		.....	R	R	R	R	R	
C647D	C636D	C655D	150 V	R		.....	R	2R	3R	4R	3R	

R = 330 kΩ

ET Enterprises Limited
45 Riverside Way
Uxbridge UB8 2YF
United Kingdom
tel: +44 (0) 1895 200880
fax: +44 (0) 1895 270873
e-mail: sales@et-enterprises.com
web site: www.et-enterprises.com

ADIT Electron Tubes
300 Crane Street
Sweetwater TX 79556 USA
tel: (325) 235 1418
toll free: (800) 399 4557
fax: (325) 235 2872
e-mail: sales@electrontubes.com
web site: www.electrontubes.com

choose accessories for this pmt on our website

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