

51 mm (2") photomultiplier

9216B series data sheet (provisional)

1 description

The 9216B is a compact 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.

2 applications

- wide range of applications
- x-ray and gamma-ray
- scintillation
- photon counting

3 features

- high quantum efficiency
- good SER
- high pulsed linearity
- low rate effect
- compact length

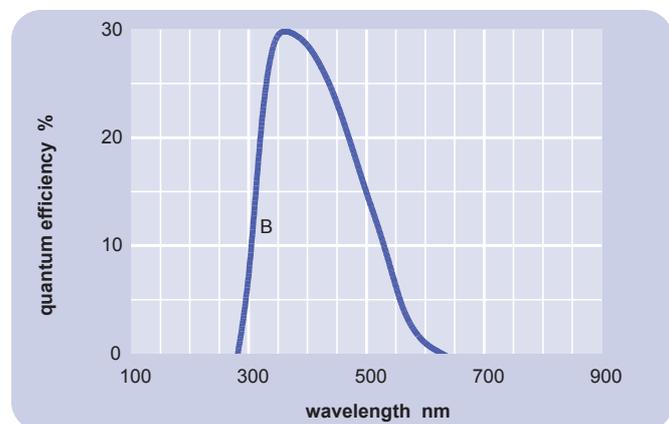
4 window characteristics

	9216B borosilicate
spectral range**(nm)	290 - 630
refractive index (n_d)	1.49
K (ppm)	300
Th (ppb)	250
U (ppb)	100

* note that the sidewall of the envelope contains graded seals of high K content

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

5 typical spectral response curves

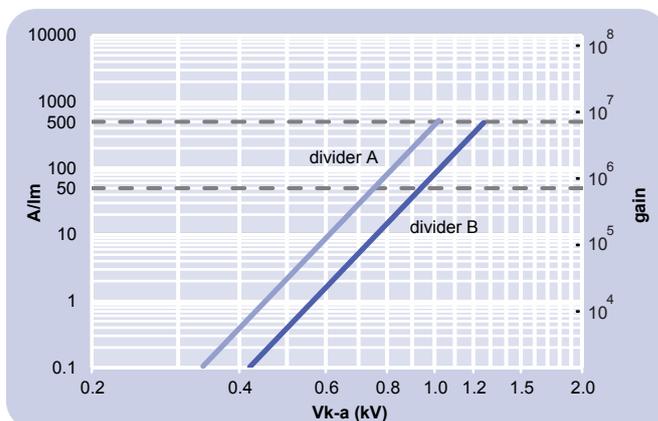


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		48	
quantum efficiency at peak	%		30	
luminous sensitivity	$\mu\text{A/lm}$		70	
with CB filter		8	11.5	
with CR filter			1	
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		750	1200
overall V for max. rated A/lm	V		1050	
gain at nominal A/lm	$\times 10^6$		1	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.3	5
dc at max. rated A/lm	nA		5	
dark count rate	s^{-1}		300	
pulsed linearity (-5% deviation)				
divider A	mA		25	
divider B	mA		100	
rate effect (I_a for $\Delta g/g=1\%$):				
magnetic field sensitivity:				
the field for which the output decreases by 50%				
most sensitive direction	$\text{T} \times 10^{-4}$		1.3	
temperature coefficient	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
multi electron rise time	ns		5	
multi electron fwhm	ns		12	
single electron rise time	ns		3	
single electron fwhm	ns		5	
transit time	ns		40	
weight:				
hard pin	g		90	
capped	g		120	
maximum ratings:				
anode current	μA			100
cathode current	nA			100
gain	$\times 10^6$			7
sensitivity	A/lm			500
temperature	$^\circ\text{C}$	-30		60
V (k-a) ⁽¹⁾	V			1800
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



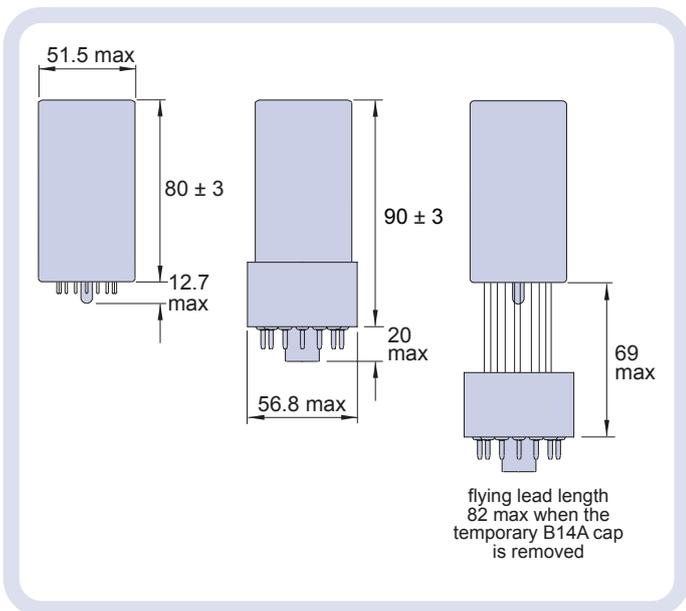
8 voltage divider distribution

	k	d ₁	d ₂	.....	d ₇	d ₈	d ₉	d ₁₀	a	
A	2R	R	.....	R	R	R	R	R	R	Standard
B	2R	R	.....	R	1.25R	1.5R	2R	3R		High Pulsed linearity

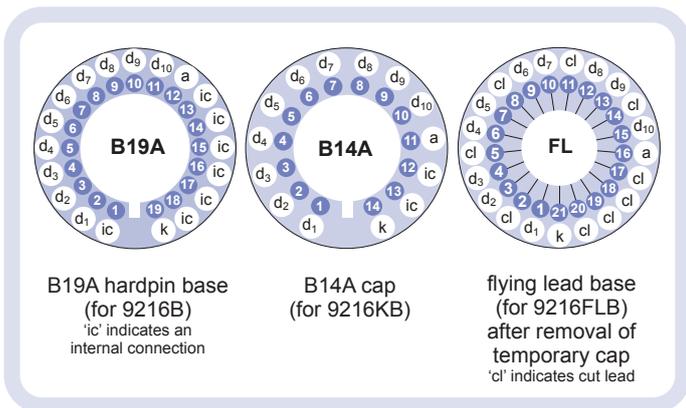
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9216B in hardpin format, the 9216KB with the B14A cap fitted and the 9216FLB 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)



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

11 ordering information

The 9216B 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 9216A. 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.

9216

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 all variants of these pmts are tabulated below:

		9216										
B	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	R	R
C647U	C636U	C655U	2R	R	...	R	1.25R	1.5R	2R	3R		
C647C	C636C	C655C	150 V	R	...	R	R	R	R	R	R	R
C647V	C636V	C655V	150 V	R	...	R	1.25R	1.5R	2R	3R		

R = 330 kΩ