

78 mm (3") photomultiplier

9821B series data sheet

1 description

The 9821B is a 78mm (3") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode on a plano-concave window, and 12 BeCu dynodes of linear focused design for good linearity and timing.

2 applications

- high energy physics studies
- scintillation spectroscopy

3 features

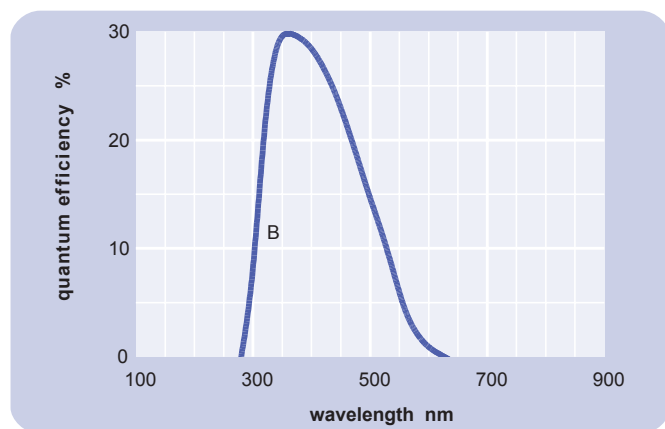
- good SER
- high pulsed linearity
- fast time response

4 window characteristics

9821B borosilicate	
spectral range *(nm)	285 - 630
refractive index (n _e)	1.47
K (ppm)	300
Th (ppb)	550
U (ppb)	450

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

5 typical spectral response curves

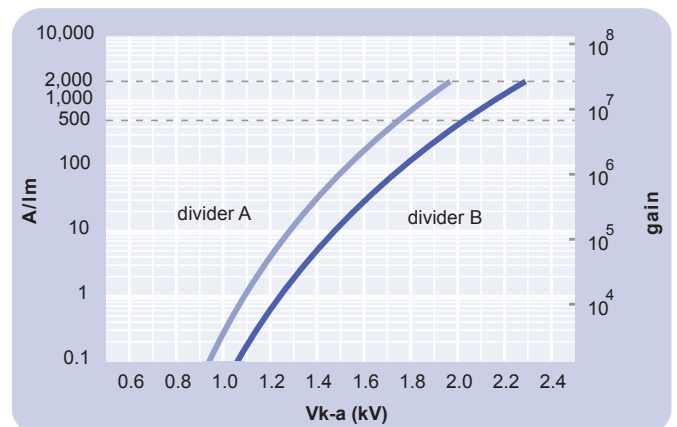


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		67	
quantum efficiency at peak	%		30	
luminous sensitivity	μA/lm		75	
with CB filter		8	12	
with CR filter			2	
dynodes: 12LFBcCu				
anode sensitivity in divider B:				
nominal anode sensitivity	A/lm		500	
max. rated anode sensitivity	A/lm		2000	2600
overall V for nominal A/lm	V		2000	
overall V for max. rated A/lm	V		2250	
gain at nominal A/lm	x 10 ⁶		7	
dark current at 20 °C:				
dc at nominal A/lm	nA		10	50
dc at max. rated A/lm	nA		40	
dark count	s ⁻¹		500	
pulsed linearity (-5% deviation):				
divider A	mA		50	
divider B	mA		150	
pulse height resolution:				
single electron peak to valley	ratio		2	
rate effect (I_a for Δg/g=1%):				
	μA		1	
magnetic field sensitivity:				
the field for which the output decreases by 50 %				
most sensitive direction	T x 10 ⁻⁴			
temperature coefficient:	% °C ⁻¹		± 0.5	
timing:				
single electron rise time	ns		2.1	
single electron fwhm	ns		3.2	
single electron jitter (fwhm)	ns		2.2	
transit time	ns		42	
weight:				
	g		260	
maximum ratings:				
anode current	μA			100
cathode current	nA			200
gain	x 10 ⁶			27
sensitivity	A/lm			2000
temperature	°C	-30		60
V (k-a) ⁽¹⁾	V			2900
V (k-d1)	V			600
V (d-d) ⁽²⁾	V			450
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

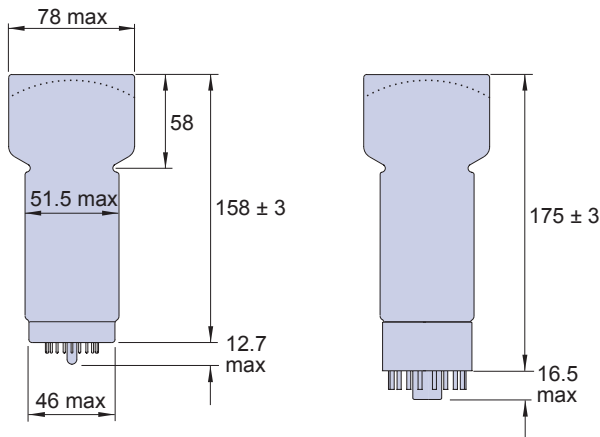
	k	d ₁	d ₂	.....	d ₈	d ₉	d ₁₀	d ₁₁	d ₁₂	a	
A	450V	R				R	R	R	R	R	Standard
B	450V	R				R	1.25R	1.5R	2R	3R	High Pulsed linearity

note: focus connected to d₁

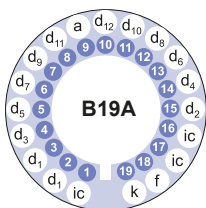
Characteristics contained in this data sheet refer to divider B unless stated otherwise.

9 external dimensions mm

The drawings below show the 9821B in hardpin format and the 9821KB with the B20 cap fitted.



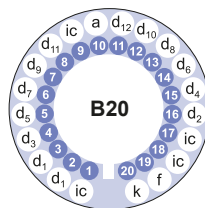
10 base configuration (viewed from below)



B19A hardpin base
(for 9821B)

'ic' indicates an internal connection

note: connect f to d₁



B20 cap
(for 9821KB)

'ic' indicates an internal connection

note: connect f to d₁

Our range of B19A sockets is available to suit the hardpin base. Our range of B20 sockets is available to suit the B20 cap. Both socket ranges include versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9821B 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 9816A. 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.

9821

base options

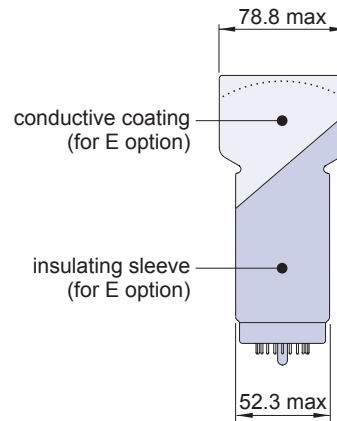
K capped

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
Bnn repeat order to
selected specification



12 voltage dividers

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

9821B	9821KB	k	d ₁	d ₂	.....	d ₈	d ₉	d ₁₀	d ₁₁	d ₁₂	a
C638P	C640P	3R	R	.....		R	R	R	R	R	
C638R	C640R	3R	R	.....		R	1.25R	1.5R	2R	3R	
C638S	C640S	450 V	R		R	R	R	R	R	
C638T	C640T	450 V	R		R	1.25R	1.5R	2R	3R	

R = 330 kΩ note: focus connected to d₁

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