

29 mm (1.13") photomultiplier

9442B series data sheet

1 description

The 9442B is a 29 mm (1.13") diameter end window photomultiplier with plano-concave window, enhanced green sensitive bialkali photocathode and 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. The 9442QB is a variant for applications requiring uv sensitivity.

2 applications

- high energy physics studies

3 features

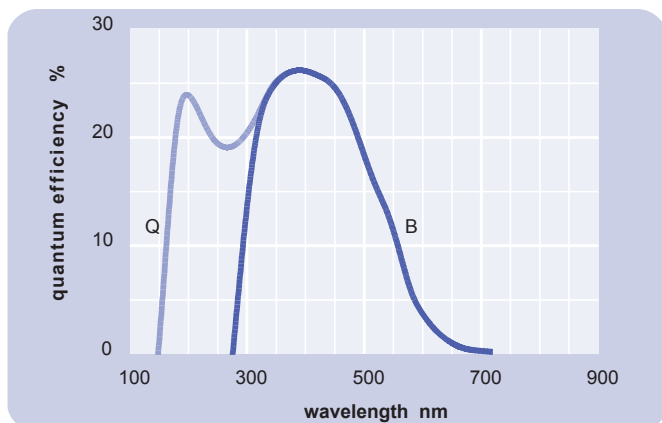
- low operating voltage
- good SER
- fast time response
- high pulsed linearity
- low afterpulse rate

4 window characteristics

	9442B borosilicate	9442QB* fused silica
spectral range**(nm)	280 - 630	160 - 630
refractive index (n_d)	1.49	1.46
K (ppm)	300	<10
Th (ppb)	250	<10
U (ppb)	100	<10

* 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

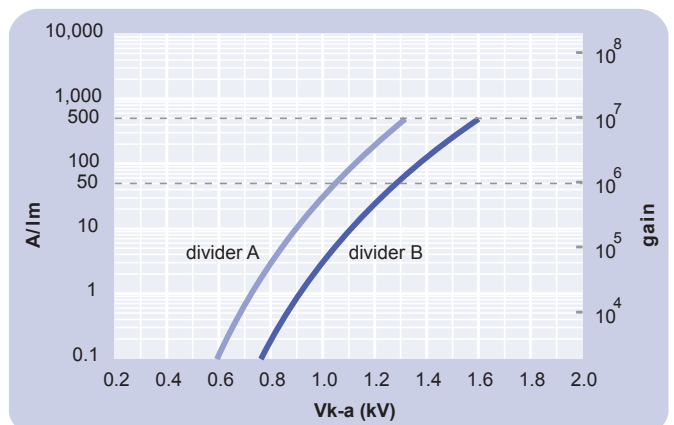


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		25	
quantum efficiency at peak	%		26	
luminous sensitivity	$\mu\text{A}/\text{lm}$		90	
with CB filter		7	11	
with CR filter			5	
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		1050	1400
overall V for max. rated A/lm	V		1600	
gain at nominal A/lm	$\times 10^6$		0.6	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.1	2
dc at max. rated A/lm	nA		1	
dark count rate	s^{-1}		200	
afterpulse rate:	%		1	
afterpulse time window	μs	0.1		6.4
pulsed linearity (-5 % deviation):				
divider A	mA		10	
divider B	mA		70	
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	$\text{T} \times 10^{-4}$		2.4	
pulse height resolution:				
single electron peak to valley	ratio		1.8	
temperature coefficient:	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
multi electron rise time	ns		2	
multi electron fwhm	ns		3	
single electron rise time	ns		1.5	
single electron fwhm	ns		2	
single electron jitter (fwhm)	ns		1.5	
transit time delay	ns		19	
weight:	g		35	
maximum ratings:				
anode current	μA			100
cathode current	nA			50
gain	$\times 10^6$			6
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			250
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

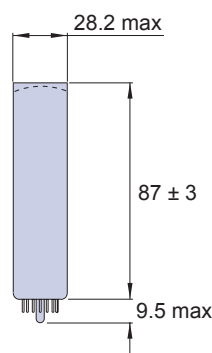


8 voltage divider distribution

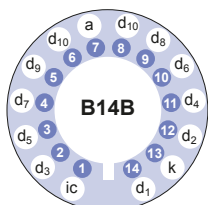
	k	d ₁	.....	d ₆	d ₇	d ₈	d ₉	d ₁₀	a	
A	2R	R	.....	R	R	R	2R	R		Standard
B	2R	R	.....	R	1.5R	2R	4R	2R		High Pulsed Linearity

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

9 external dimensions mm



10 base configuration (viewed from below)

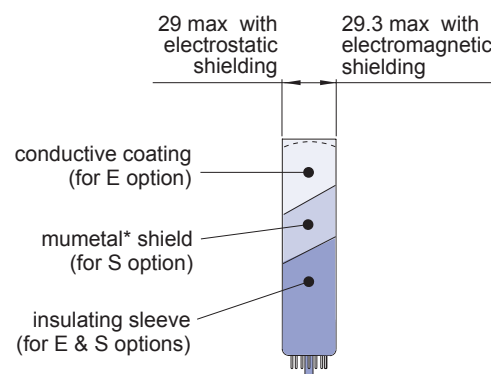
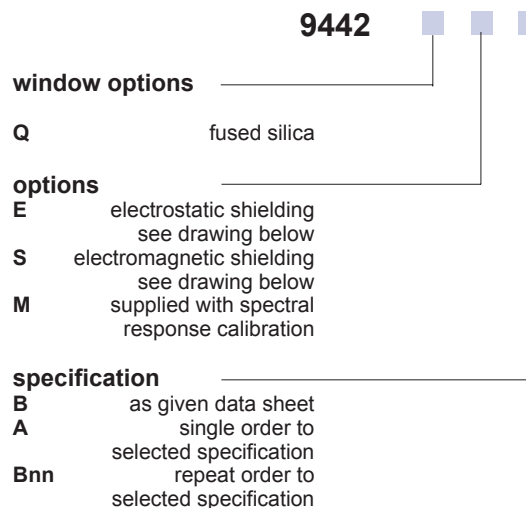


'ic' indicates an internal connection

Our range of B14B sockets is available to suit the B14B hardpin base. 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 9442B 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 9442A. 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:

	k	d ₁	d ₂	d ₆	d ₇	d ₈	d ₉	d ₁₀	a
C620A	2R	R	R	R	R	R	R		
C620B	2R	R	R	2R	3R	4R	3R		

R = 330k Ω

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