29 mm (1.13") photomultiplier
9142B series data sheet

ET Enterprise electron tubes

1 description

The 9142B is a 29 mm (1.13”) diameter end window photomultiplier with plano-concave, blue-green sensitive bialkali photocathode and 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. The 9142WB and 9142QB are variants for applications requiring uv sensitivity.

2 applications

- high energy physics studies

3 features

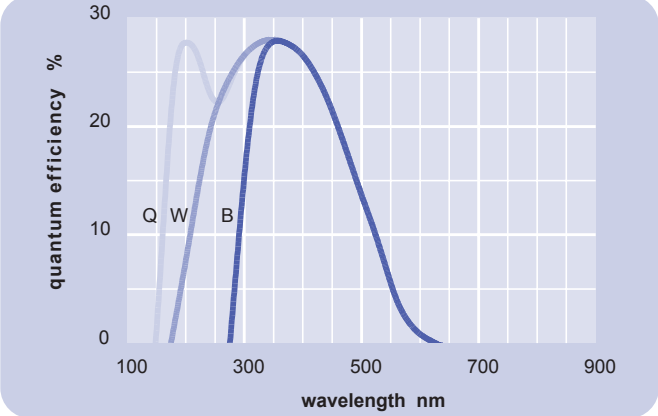
- low operating voltage
- good SER
- fast time response
- high pulsed linearity
- low afterpulse rate

4 window characteristics

	9142B borosilicate	9142WB uv glass	9142QB* fused silica
spectral range**(nm)	280 - 630	170 - 630	160 - 630
refractive index (n_d)	1.49	1.48	1.46
K (ppm)	300	8500	<10
Th (ppb)	250	30	<10
U (ppb)	100	30	<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

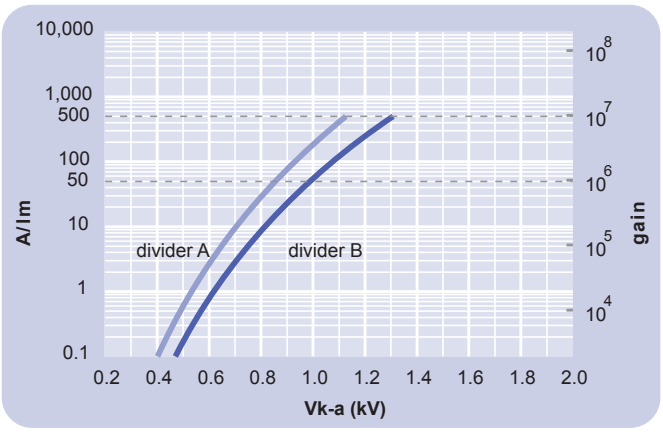


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		25	
quantum efficiency at peak	%		28	
luminous sensitivity	µA/lm		65	
with CB filter		7	11	
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		850	1200
overall V for max. rated A/lm	V		1100	
gain at nominal A/lm	x 10^6		0.8	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.1	1
dc at max. rated A/lm	nA		1	
dark count rate	s^{-1}		100	
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 Δ g/g=1%):	µA		20	
magnetic field sensitivity:				
the field for which the output decreases by 50%				
most sensitive direction	T x 10^{-4}		2.4	
pulse height resolution:				
single electron peak to valley	ratio		1.8	
temperature coefficient:	% $°C^{-1}$		± 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	x 10^6			7.7
sensitivity	A/lm			500
temperature	°C	-30		60
V (k-a)[1]	V			1500
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

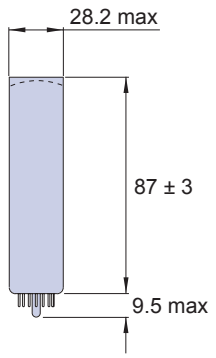


8 voltage divider distribution

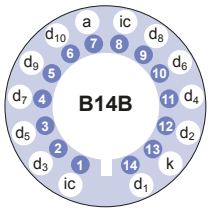
	k	d_1		d_6	d_7	d_8	d_9	d_{10}	a	
A	2R	R		R	R	R	2R	R		Standard
B	2R	R		R	2R	3R	4R	3R		High Pulsed Linearity

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

9 external dimensions mm



10 base configuration (viewed from below)



indicates an internal connection

Our range of B14B sockets is available to suit the B14B hardpin base. The range includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

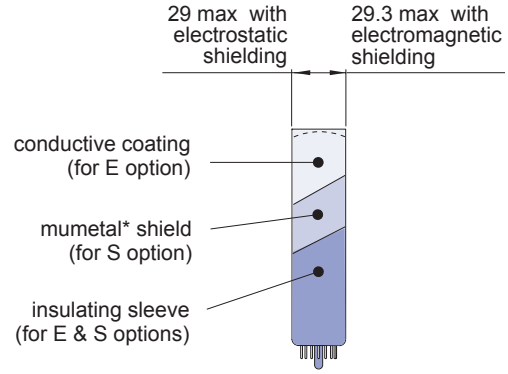
The 9427B meets the specification given in this data sheet. You may order **variants** by adding a suffix to the type number. You may also order **options** by adding a suffix to the type number. You may order product with **specification options** by discussing your requirements with us. If your selection option is for a one-off order, then the product will be referred to as 9142A. 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.

9142

window options
W uv glass
Q fused silica

options
E electrostatic shielding see drawing below
S electromagnetic shielding see drawing below
M supplied with spectral response calibration

specification
B as given 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:

	k	d_1	d_2	. . . . .	d_6	d_7	d_8	d_9	d_{10}	a
C620A	2R	R		. . . . .	R	R	R	2R	R	
C620B	2R	R		. . . . .	R	2R	3R	4R	3R	
C620C	150V	R		. . . . .	R	R	R	2R	R	
C620D	150V	R		. . . . .	R	2R	3R	4R	3R	

Note: The 9142 can also be used with the C637A 11 stage divider and is equivalent to the C620A above.

R = 300kΩ

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