

# 29 mm (1.13") photomultiplier 9124B series data sheet

## 1 description

The 9124B is a 29 mm (1.13") diameter, end window photomultiplier with enhanced green sensitive bialkali photocathode and 11 high gain, high stability, SbCs dynodes of linear focused design. The 9124QB is a variant for applications requiring uv sensitivity.

## 2 applications

- wide range of applications
- x-ray & gamma-ray spectroscopy
- photon counting of bio- and chemi-luminescent samples

## 3 features

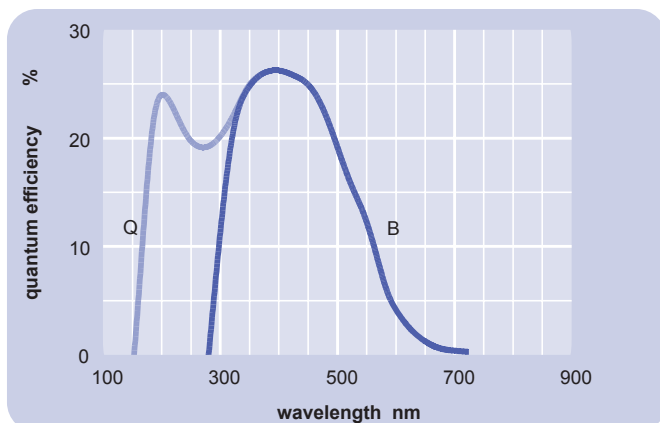
- high gain
- high pulsed linearity
- good SER
- good pulse height resolution

## 4 window characteristics

	9124B borosilicate	9124QB fused silica
spectral range**(nm)	280 - 680	160 - 680
refractive index (n <sub>d</sub> )	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

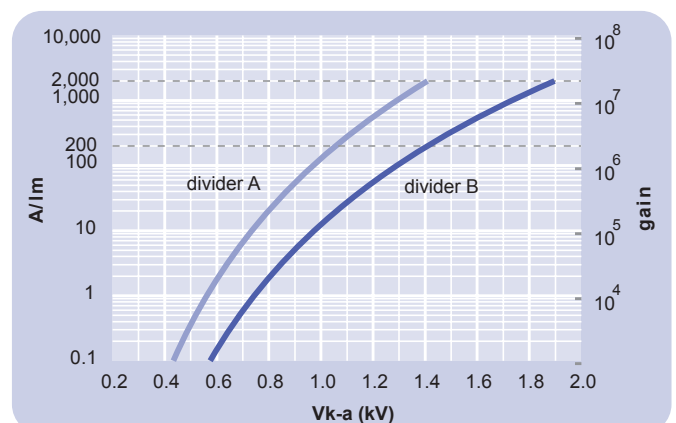


## 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		25	
quantum efficiency at peak	%		26	
luminous sensitivity	μA/lm		90	
with CB filter		7	11	
with CR filter			5	
<b>dynodes: 11LFSbCs</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	A/lm		200	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		1050	1300
overall V for max. rated A/lm	V		1400	
gain at nominal A/lm	x 10 <sup>6</sup>		2	
<b>dark current at 20 °C:</b>				
dc at nominal A/lm	nA		0.3	5
dc at max. rated A/lm	nA		3	
dark count rate	s <sup>-1</sup>		200	
<b>afterpulse rate:</b>				
afterpulse time window	μs	0.1		6.4
<b>pulsed linearity (-5% deviation):</b>				
divider A	mA		25	
divider B	mA		100	
<b>pulse height resolution:</b>				
single electron peak to valley	ratio		1.7	
<sup>137</sup> Cs with 1" x 1" NaI(Tl)			7.5	
rate effect (I <sub>a</sub> for Δg/g=1%):	μA		20	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	T x 10 <sup>-4</sup>		2	
temperature coefficient:	% °C <sup>-1</sup>		± 0.5	
<b>timing:</b>				
single electron rise time	ns		3	
single electron (fwhm)	ns		5	
single electron jitter (fwhm)	ns		4	
transit time	ns		33	
weight:	g		50	
<b>maximum ratings:</b>				
anode current	μA			100
cathode current	nA			100
gain	x 10 <sup>6</sup>			22
sensitivity	A/lm			2000
temperature	°C	-30		60
V (k-a) <sup>(1)</sup>	V			2000
V (k-d1)	V			300
V (d-d) <sup>(2)</sup>	V			300
ambient pressure (absolute)	kPa			202

<sup>(1)</sup> subject to not exceeding max. rated sensitivity <sup>(2)</sup> subject to not exceeding max rated V(k-a)

## 7 typical voltage gain characteristics

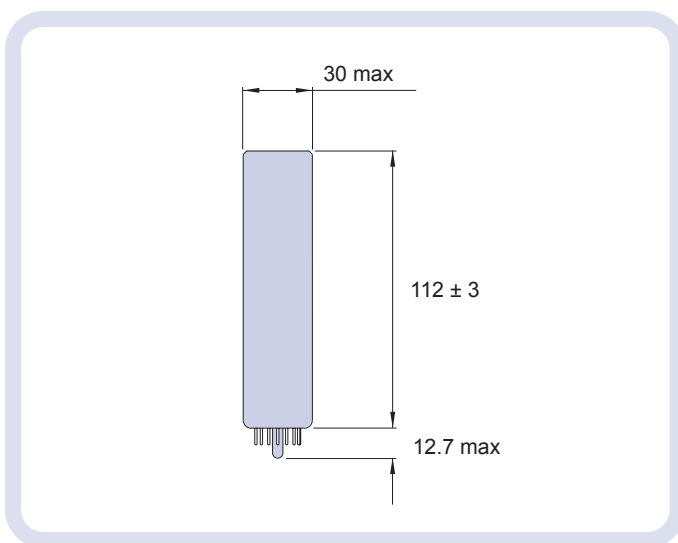


## 8 voltage divider distribution

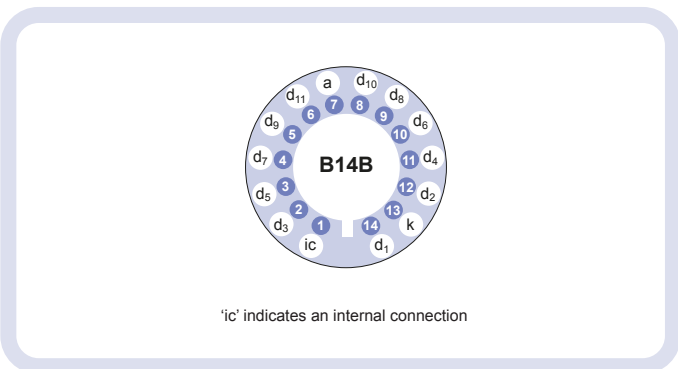
	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	a	
A	2R	R	.....		R	R	R	R	R	Standard
B	2R	R	.....		R	2R	3R	4R	3R	High Pulsed Linearity

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

## 9 external dimensions mm



## 10 base configuration (viewed from below)



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 9124B 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 9124A. 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.

**9124** [ ] [ ] [ ]

**window variants**

**Q** fused silica

**options**

**S** electromagnetic shielding  
see drawing below

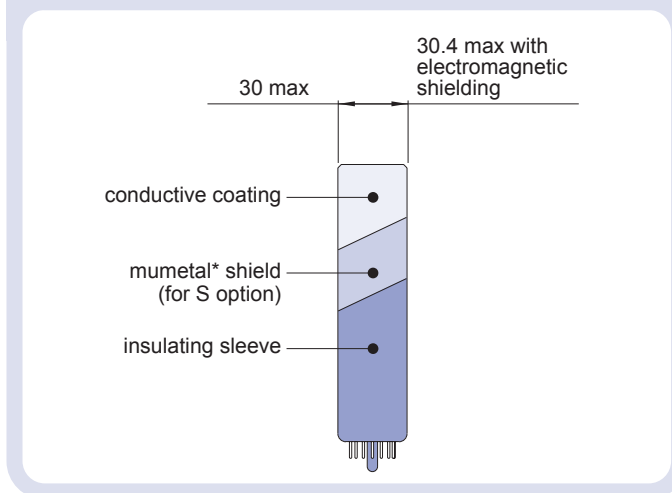
**M** supplied with spectral response calibration

**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 this pmt are tabulated below:

	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	a
C637A	2R	R	.....		R	R	R	R	R	
C637B	2R	R	.....		R	2R	3R	4R	3R	
C637C	150 V	R	.....		R	R	R	R	R	
C637D	150 V	R	.....		R	2R	3R	4R	3R	

R = 330kΩ

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