

29 mm (1.13") photomultiplier 9924B series data sheet

1 description

The 9924B 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 box and grid design. The 9924QB 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

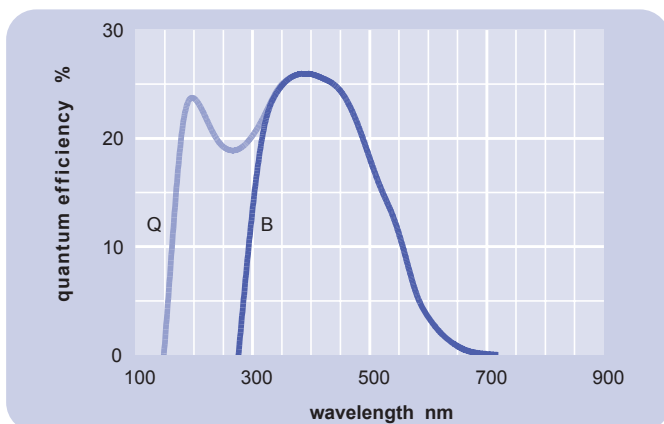
- high gain
- low operating voltage
- good SER

4 window characteristics

	9924B borosilicate	9924QB* fused silica
spectral range**(nm)	280 - 680	160 - 680
refractive index (n_d)	1.49	1.46
radiopurity:		
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

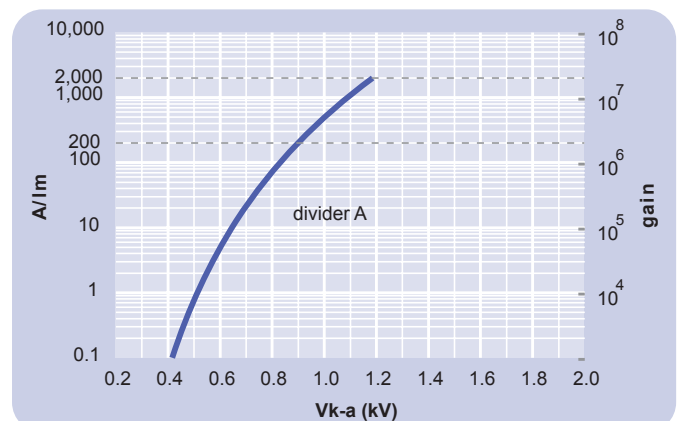


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		25	
quantum efficiency at peak	%		26	
luminous sensitivity	$\mu\text{A}/\text{lm}$		95	
with CB filter		8	12	
with CR filter			7.5	
dynodes: 11BGSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		200	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		900	1050
overall V for max. rated A/lm	V		1200	
gain at nominal A/lm	$\times 10^6$		2	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.2	5
dc at max. rated A/lm	nA		2	
dark count rate	s^{-1}		200	
pulsed linearity (-5% deviation):				
divider A	mA		0.1	
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	
temperature coefficient:				
	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
single electron rise time	ns		15	
single electron (fwhm)	ns		30	
transit time	ns		85	
weight:	g		55	
maximum ratings:				
anode current	μA			100
cathode current	nA			25
gain	$\times 10^6$			21
sensitivity	A/lm			2000
temperature	$^\circ\text{C}$	-30		60
V (k-a) ⁽¹⁾	V			2000
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

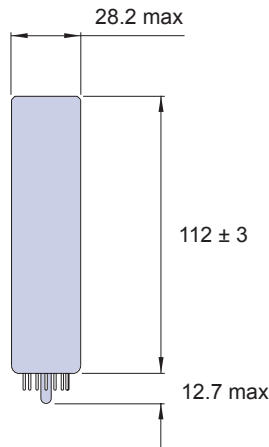


8 voltage divider distribution

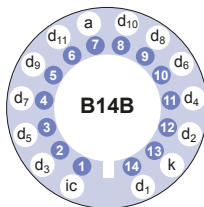
k	d ₁	d ₂	.....	d ₈	d ₉	d ₁₀	d ₁₁	a	
A	150V	R	.....	R	R	R	2R	R	Standard

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, available for this series, includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9924B 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 9924A. 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.

9924

window variants

Q fused silica

options

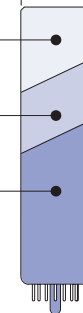
E electrostatic shielding
see drawing below
S electromagnetic shielding
see drawing below
M supplied with spectral
response calibration

specification options

B as given in data sheet
A single order to
selected specification
Bnn repeat order to
selected specification

29 max with electrostatic shielding 29.3 max with electromagnetic shielding

conductive coating
(for E option)
mumetal* shield
(for S option)
insulating sleeve
(for E & S options)



*mumetal is a registered trademark of Magnetic Shield Corporation

12 voltage dividers

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

	k	d ₁	d ₂	.....	d ₇	d ₈	d ₉	d ₁₀	d ₁₁	a
C637E	2R	R	.....	R	R	R	2R	R		
C737G	150V	R	.....	R	R	R	2R	R		

R = 330 kΩ

ET Enterprises Limited
45 Riverside Way
Uxbridge UB8 2YF
United Kingdom
tel: +44 (0) 1895 200880
fax: +44 (0) 1895 270873
e-mail: sales@et-enterprises.com
web site: www.et-enterprises.com

ADIT Electron Tubes
300 Crane Street
Sweetwater TX 79556 USA
tel: (325) 235 1418
toll free: (800) 399 4557
fax: (325) 235 2872
e-mail: sales@electron tubes.com
web site: www.electrontubes.com

choose accessories for this pmt on our website

an ISO 9001 and ISO 14001 registered company

The company reserves the right to modify these designs and specifications without notice. Developmental devices are intended for evaluation and no obligation is assumed for future manufacture. While every effort is made to ensure accuracy of published information the company cannot be held responsible for errors or consequences arising therefrom.

ET Enterprises
electron tubes

© ET Enterprises Ltd, 2014
DS_ 9924B Issue 6 (26/02/14)