

25 mm (1") photomultiplier 9111B series data sheet

1 description

The 9111B is a compact 25 mm (1") diameter, end window photomultiplier with plano-concave window, blue-green sensitive bialkali photocathode and 10 high gain, high stability, SbCs dynodes of circular focused design for fast timing. The 9111WB 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
- high energy physics studies

3 features

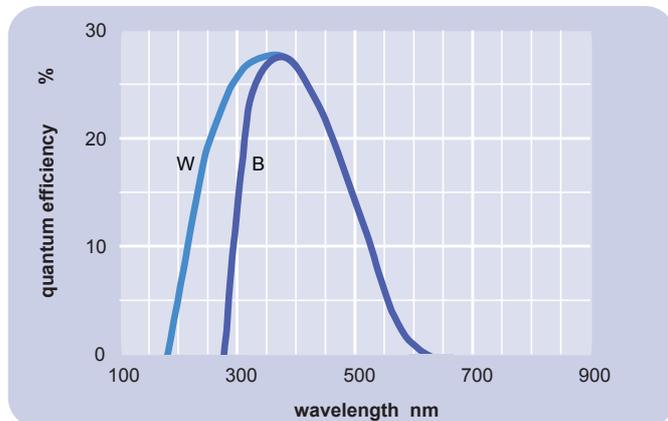
- compact
- fast time response
- low operating voltage

4 window characteristics

	borosilicate	UV glass
spectral range*(nm)	280 - 630	170 - 630
refractive index (n_d)	1.49	1.48
K (ppm)	300	8500
Th (ppb)	250	30
U (ppb)	100	30

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

5 typical spectral response curves

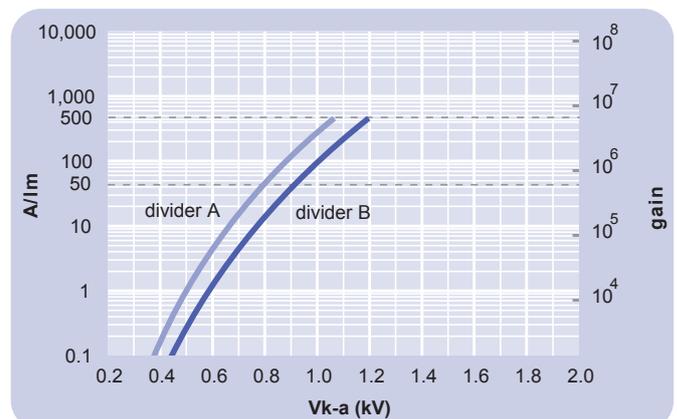


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		22	
quantum efficiency at peak	%		28	
luminous sensitivity	$\mu\text{A}/\text{lm}$		70	
with CB filter		7	11	
with CR filter			2	
dynodes: 10CFSbCs				
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		800	1300
overall V for max. rated A/lm	V		1050	
gain at nominal A/lm	$\times 10^6$		0.7	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.3	1
dc at max. rated A/lm	nA		3	
dark count rate	s^{-1}		100	
afterpulse rate:	%		5	
afterpulse time window	μs	0.1		6.4
pulsed linearity (-5% deviation):				
divider A	mA		2	
divider B	mA		20	
pulse height resolution:				
single electron peak to valley	ratio		1.5	
^{137}Cs with 0.75" x 0.75" NaI(T1)	%		7.5	
^{57}Co with 0.75" x 0.75" NaI(T1)	%		11	
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	$\text{T} \times 10^{-4}$		2.5	
temperature coefficient:	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
single electron rise time	ns		1.8	
single electron fwhm	ns		3.1	
single electron jitter fwhm	ns		1.2	
transit time delay	ns		15	
weight:	g		20	
maximum ratings:				
anode current	μA			100
cathode current	nA			20
gain	$\times 10^6$			7.1
sensitivity	A/lm			500
temperature	$^\circ\text{C}$	-30		60
V (k-a) ⁽¹⁾	V			1900
V (k-d1)	V			450
V (d-d) ⁽²⁾	V			200
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



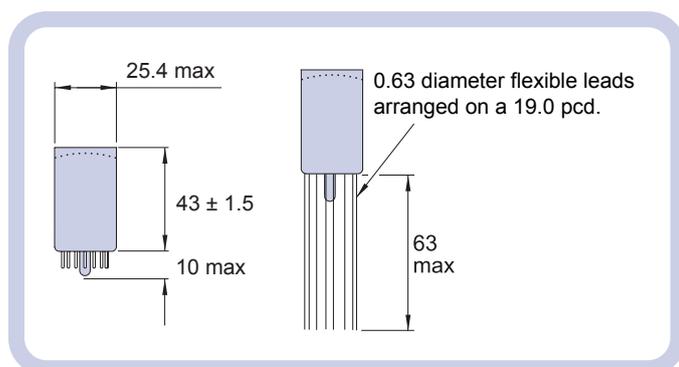
8 voltage divider distribution

	k	d ₁	d ₂	.....	d ₇	d ₈	d ₉	d ₁₀	a	
A	3R	R	.....		R	R	R	R	R	Standard
B	3R	R	.....		R	R	R	2R	4R	High Pulsed Linearity

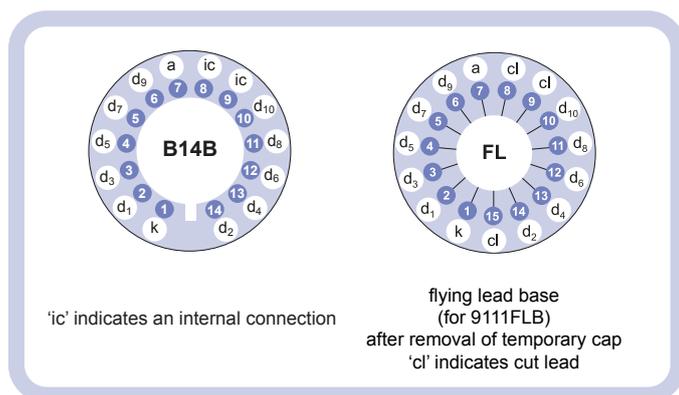
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

The drawings below show the 9111B in hardpin format and the 9111FLB in flying lead format.



10 base configurations (viewed from below)



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 with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9111B 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 9111A. 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.

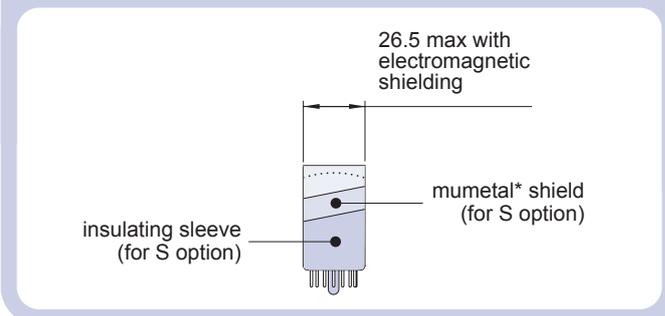
9111 ■ ■ ■ ■

window variant _____
W UV glass

shielding option _____
S electromagnetic shielding
 see drawing below

selection option _____
M supplied with spectral response calibration

specification _____
B as data sheet
A customer specific selection(s) single order
Bnn customer specific selection(s) repeat order



*mumetal is a registered trademark of Magnetic Shield Corporation

12 voltage dividers

The standard voltage dividers available for this pmt are tabulated below:

9111B	9111FLB	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	d ₁₀	a
C673A	C651A	3R	R	.....		R	R	R	R	R	
C673B	C651B	3R	R	.....		R	R	R	2R	4R	
	C651C	150 V	R	.....		R	R	R	R	R	
	C651D	150 V	R	.....		R	R	R	2R	4R	

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@electrontubes.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 Ltd, 2016
 DS_9111B Issue 9 (25/01/16)