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

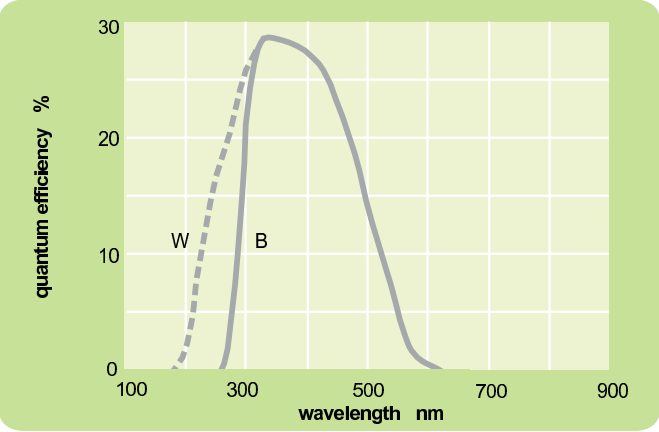
- compact
- fast time response
- low operating voltage

4 window characteristics

	9111B borosilicate	9111WB 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	µA/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	x 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	T x 10^{-4}		2.5	
temperature coefficient:	% °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	x 10^6			7.1
sensitivity	A/lm			500
temperature	°C	-30		60
V (k-a)[1]				1500
V (k-d1)	V			300
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)