130 mm (5") photomultiplier
9823B series data sheet

ET Enterprises electron tubes

1 description

The 9823B is a 130mm (5″) diameter end-window photomultiplier with blue-green sensitive bialkali photocathode on a plano-concave window. It has 14 BeCu dynodes of linear focused design for good linearity and timing. The 9823QB is a variant for applications requiring uv sensitivity.

2 applications

- high energy physics studies

3 features

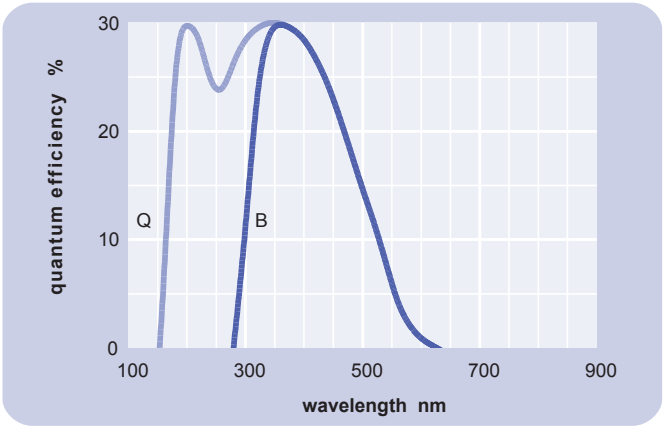
- high gain
- high pulsed linearity
- large active area

4 window characteristics

	9823B borosilicate	9823QB* fused silica
spectral range**(nm)	290 - 630	165 - 630
refractive index (n_d)	1.47	1.46
radiopurity:		
K (ppm)	300	<10
Th (ppb)	550	<10
U (ppb)	450	<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

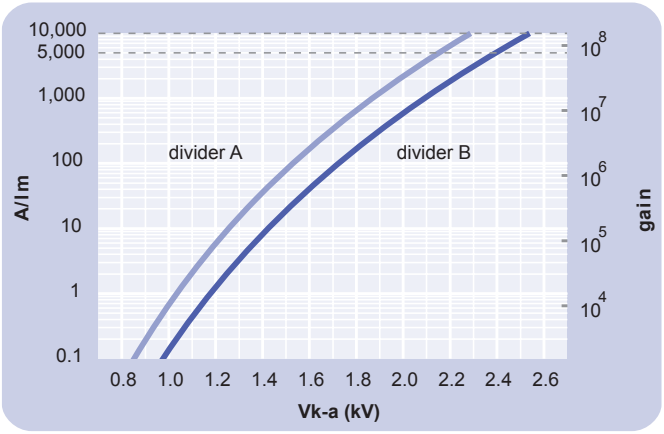


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		110	
quantum efficiency at peak	%		30	
luminous sensitivity	µA/lm		65	
with CB filter		7	11	
with CR filter			1	
dynodes: 14LFBeCu				
anode sensitivity in divider B:				
nominal anode sensitivity	A/lm		5000	
max. rated anode sensitivity	A/lm		10000	
overall V for nominal A/lm	V		2400	3000
overall V for max. rated A/lm	V		2550	
gain at nominal A/lm	x 10^6		80	
dark current at 20 ºC:				
dc at nominal A/lm	nA		100	1000
dc at max. rated A/lm	nA		200	
dark count	s^{-1}		1500	
pulsed linearity (-5% deviation):				
divider A	mA		50	
divider B	mA		150	
rate effect (I_a for $\Delta g/g=1\%$):	µA		1	
magnetic field sensitivity: the field for which the output decreases by 50 %				
most sensitive direction	T x 10^{-4}		0.8	
temperature coefficient:	% $ºC^{-1}$		± 0.5	
timing:				
multi electron rise time	ns		3.5	
multi electron fwhm	ns		6	
single electron rise time	ns		2.7	
single electron fwhm	ns		3.6	
single electron jitter (fwhm)	ns		2.4	
transit time	ns		55	
weight:	g		1000	
maximum ratings:				
anode current	µA			100
cathode current	nA			500
gain	x 10^6			150
sensitivity	A/lm			10000
temperature	°C	-30		60
V (k-a)(1)	V			2500
V (k-d1)	V			650
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

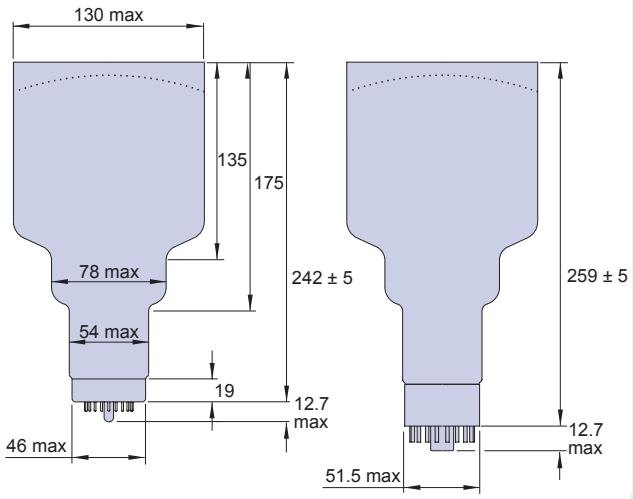
	k	f	d_1	d_2	d_3	....	d_{11}	d_{12}	d_{13}	d_{14}	a	
A	2.8R	1.2R	R	2R	R	....	R	R	R	R	R	Standard
B	2.8R	1.2R	R	2R	R	....	R	1.25R	1.5R	2R	3R	High Pulsed linearity

note: V (f-d_1) = 30% of V (k-d_1)

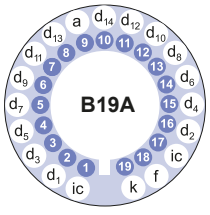
Characteristics contained in this data sheet refer to divider B unless stated otherwise.

9 external dimensions mm

The drawings below show the 9823B in hardpin format and the 9823KB with the B20 cap fitted.

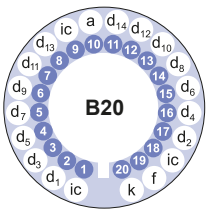


10 base configuration (viewed from below)



B19A hardpin base
(for 9823B)
'ic' indicates an internal connection

note: V (f-d_1) = 30% of V (k-d_1)



B20 cap
(for 9823KB)
'ic' indicates an internal connection

note: V (f-d_1) = 30% of V (k-d_1)

Our range of B19A sockets is available to suit the hardpin base. Our range of B20 sockets is available to suit the B20 cap. Both socket ranges include versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9823B 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 9823A. 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.

9823 □ □ □ □

window variants

Q fused silica

base options

K capped

options

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

12 voltage dividers

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

9823B	9823KB	k	f	d_1	d_2	d_3	d_4	...	d_{10}	d_{11}	d_{12}	d_{13}	d_{14}	a
C638K	C643K	2.8R	1.2R	R	2R	R		...	R	R	R	R	R	
C638L	C643L	2.8R	1.2R	R	2R	R		...	R	1.25R	1.5R	2R	3R	
C638M	C643M	300V	150V	R	2R	R		...	R	R	R	R	R	
C638N	C643N	300V	150V	R	2R	R		...	R	1.25R	1.5R	2R	3R	

R = 330 kΩ
note: V (f-d_1) = 30% of V (k-d_1)
300 V and 150 V zener stabilised

*mumetal is a registered trademark of Magnetic Shield Corporation

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 registered company