130 mm (5") photomultiplier
9275B series data sheet

ET Enterprises electron tubes

1 description

The 9275B is a 130 mm (5") diameter, ruggedised, end window photomultiplier with blue-green sensitive bialkali photocathode and 10 high gain, high stability SbCs dynodes of linear focussed design for good linearity and timing. Intended for scintillation spectroscopy, this is a rugged version of the industry standard, 9390B, constructed to withstand shock and vibration levels above those normally experienced in industrial applications.

2 applications

- scintillation spectroscopy

3 features

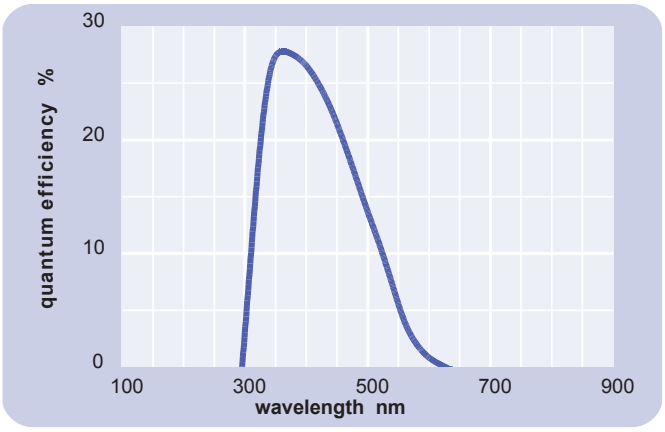
- rugged
- high quantum efficiency (QE)
- good single electron response (SER)
- good linearity
- low rate effect

4 window characteristics

	9275B borosilicate
spectral range* (nm)	300 - 630
K (ppm)	300
Th (ppb)	250
U (ppb)	100

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

5 typical spectral response curves

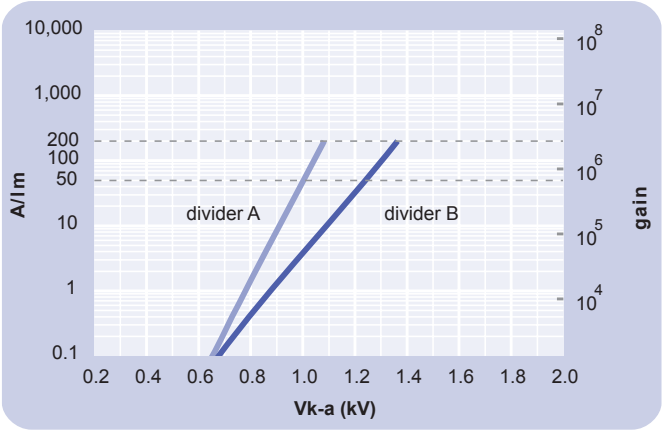


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		115	
quantum efficiency at peak	%		28	
luminous sensitivity	µA/lm		75	
with CB filter		9	12	
with CR filter			2	
dynodes: 10LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		200	
overall V for nominal A/lm	V		1000	1500
overall V for max. rated A/lm	V		1100	
gain at nominal A/lm	x 10^6		0.7	
dark current at 20 °C:				
dc at nominal A/lm	nA		1	20
dc at max. rated A/lm	nA		4	
dark count rate	s^{-1}		1500	
pulsed linearity (-5 % deviation):				
divider A	mA		30	
divider B	mA		100	
pulse height resolution:				
single electron peak to valley	ratio		2	
^{137}Cs with 5 " x 5 " NaI(Tl)	%		7.5	
rate effect (1_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}		1	
temperature coefficient:	% °C^{-1}		± 0.5	
timing:				
multi electron rise time	ns		13	
multi electron (fwhm)	ns		25	
single electron rise time	ns		5	
single electron fwhm	ns		8	
transit time	ns		60	
weight :	g		420	
maximum ratings:				
anode current	µA			100
cathode current	nA			500
gain	x 10^6			2.7
sensitivity	A/lm			200
temperature	°C	-30		60
V (k-a)[1]				2000
V (k-d1)	V			600
V (d-d)[2]	V			350
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 environmental specifications

shock & vibration profile	qualification levels		acceptance levels	
(all 3 axis tested)				
sine vibration:				
frequency (Hz)	20 - 2000			
amplitude (g)	20			
sweep rate (octave/min.)	2			
single sweep				
random vibration:				
freq. band (Hz)	**PSD (g^2/Hz)**	**overall g rms.**	**PSD (g^2/Hz)**	**overall g rms.**
20	0.045		0.0187	
20 - 60 roll on	+6 db/oct		+6 db/oct	
60 - 400	0.4024	20	0.1686	13
400 - 2000 roll off	-3 db/oct		-3 db/oct	
2000	0.0805		0.0337	
1 min. duration in each axis				
impact shock (½ sine):				
peak acceleration (g)	250			
duration (ms)	1			
3 shocks per axis (18 shocks total)				

thermal range: operating - -30 °C to +60 °C
non-operating - -30 °C to +90 °C

pressure: 0 - 1.3 atmospheres absolute

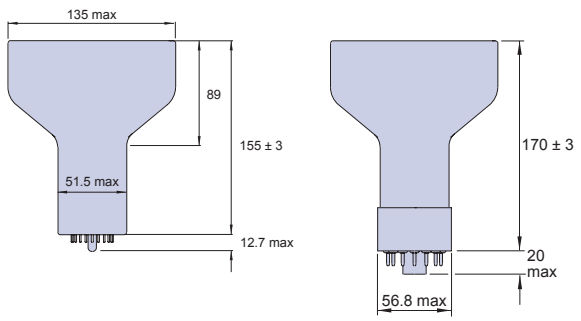
9 voltage divider distribution

	k	d_1	d_2	.....	d_6	d_7	d_8	d_9	d_{10}	a	
A	450V	R		.....	R	R	R	R	R		Standard
B	450V	R		.....	R	2R	3R	4R	3R		High Pulsed Linearity

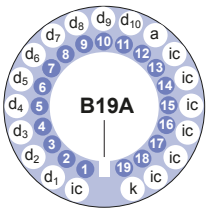
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

10 external dimensions mm

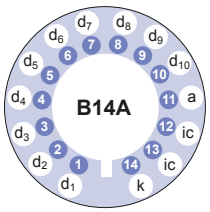
The drawings below show the 9275B in hardpin format and the 9275KB with the B14A cap fitted.



11 base configurations (viewed from below)



B19A hardpin base
(for 9275B)
'ic' indicates an internal connection



B14A cap
(for 9275KB)
'ic' indicates an internal connection

12 sockets

Our range of B19A sockets is available to suit the B19A glass base. The range includes versions with contacts for mounting directly onto printed circuit boards.

13 ordering information

The 9275B is the standard product but selection of electrical parameters to customers' specification can be agreed.

14 voltage dividers

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

9275B	9275KB	k	d_1	d_2	.....	d_6	d_7	d_8	d_9	d_{10}	a
C647G	C636K	6R	R		.....	R	R	R	R	R	
C647H	C636L	6R	R		.....	R	2R	3R	4R	3R	
C647I	C636M	450 V	R		.....	R	R	R	R	R	
C647J	C636N	450 V	R		.....	R	2R	3R	4R	3R	

R = 330k Ω

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