

78 mm (3") photomultiplier

9274B series data sheet

1 description

A 78 mm (3") diameter, ruggedised, end window photomultiplier with blue-green sensitive bialkali photocathode and ten high gain linear focussed dynodes. Intended for scintillation spectroscopy, this is a rugged version of the industry standard, 9305B, constructed to withstand shock and vibration levels above those normally experienced in industrial applications.

2 applications

- scintillation spectroscopy

3 features

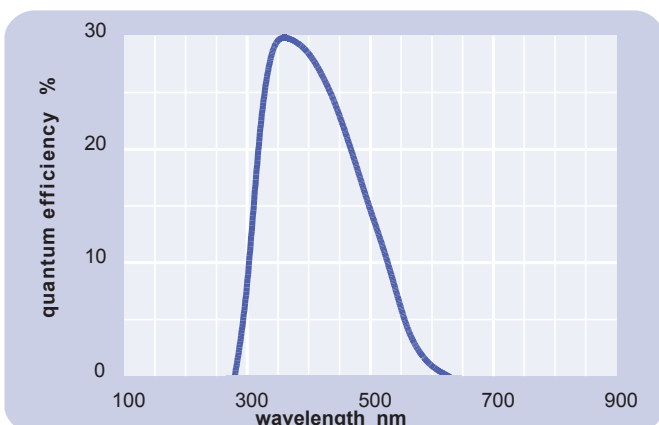
- rugged
- high quantum efficiency (QE)
- good single electron response (SER)
- good linearity
- low rate effect

4 window characteristics

9274B	
spectral range*	295 - 630
K (ppm)	300
Th (ppb)	250
U (ppb)	100

* nm (1% of peak)

5 typical spectral response curves

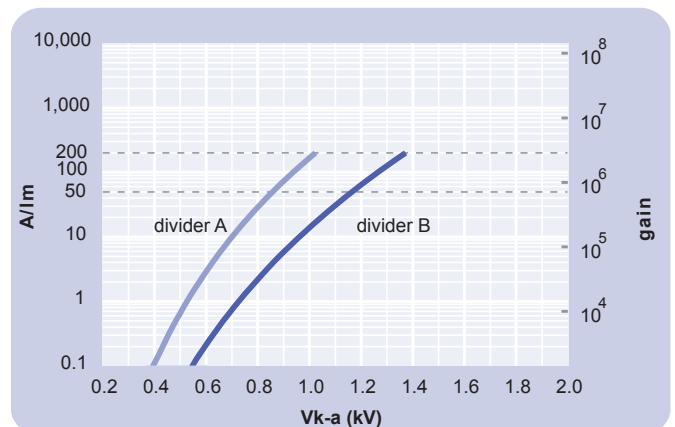


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		70	
quantum efficiency at peak	%		30	
luminous sensitivity	$\mu\text{A/lm}$		75	
with CB filter		8	12	
dynodes: 10LFSbCs				
anode sensitivity in divider A:				
overall voltage for 50 A/lm	V		850	1700
gain at 50 A/lm	$\times 10^6$		0.6	
overall voltage for 500 A/lm	V		1200	
dark current at 20 °C:				
DC at 50 A/lm	nA		0.5	10
dark rate	cps		500	
pulsed linearity (-5 % deviation):				
divider A	mA		30	
divider B	mA		100	
rate effect:				
<1 % change in gain for Ia (μA):				10
resolution:				
single electron peak to valley			2	
^{137}Cs with 3" x 3" NaI(Tl)	%		7.5	
^{57}Co with 3" x 3" NaI(Tl)	%		10.5	
temperature coefficient:	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing: multi-electron				
rise time	ns		7.5	
pulse width (fwhm)	ns		15	
transit time delay	ns		42	
weight :	g		150	
maximum ratings:				
anode current	μA			100
cathode current	nA			100
gain	$\times 10^6$			7
sensitivity	A/lm			500
V (k-a) ⁽¹⁾				2000
V (k-d1)	V			300
V (d-d) ⁽²⁾	V			300

⁽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 (g²/Hz)	overall g rms.	PSD (g²/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

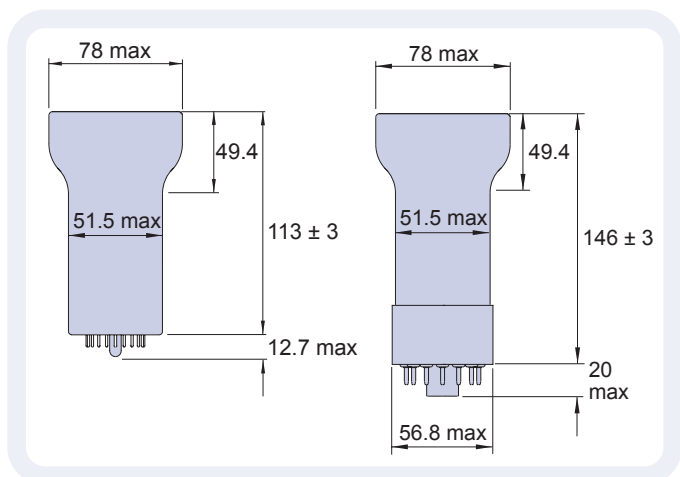
9 voltage divider distribution

	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	d ₁₀	a	
A	3R	R	.....		R	R	R	R	R		Standard
B	3R	R	.....		R	2R	3R	4R	3R		High Pulsed Linearity

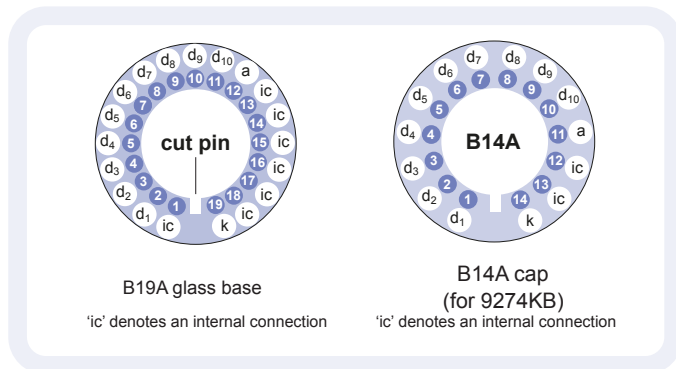
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

10 external dimensions mm

The drawings below show the 9274B in hardpin format and the 9274KB with the B14A cap fitted.



11 base configurations (viewed from below)



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 9274B 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:

9274B	9274KB	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	d ₁₀	a
C647P	C636P	3R	R	.....		R	R	R	R	R	
C647R	C636R	3R	R		R	2R	3R	4R	3R	
C647S	C636S	200 V	R		R	R	R	R	R	
C647T	C636T	200 V	R		R	2R	3R	4R	3R	

R = 330k Ω

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