

51 mm (2") photomultiplier

9427B series data sheet

1 description

The 9427B is a 51 mm (2") diameter end window photomultiplier with magnesium fluoride window, S20 infra-red sensitive photocathode and 14 BeCu dynodes of linear focused design for extended linearity.

It is supplied with spectral response data at specific wavelengths in the vacuum ultra-violet and with photon counting plateau curves showing the recommended voltage for photon counting applications.

2 applications

- fluorescence studies down to 110 nm
- measurement of synchrotron radiation down to 110 nm

3 features

- sensitive to vacuum ultra violet
- wide spectral response

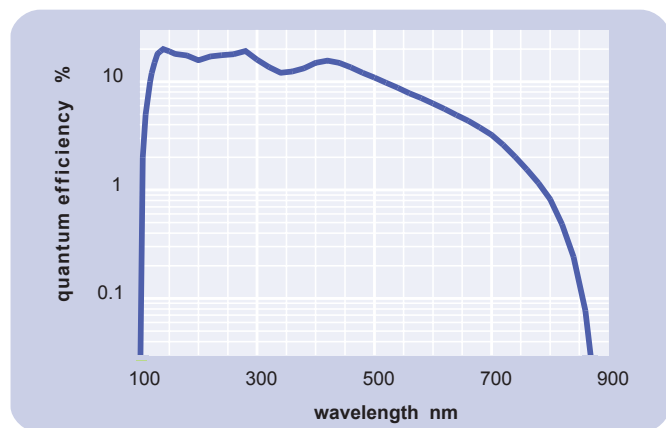
4 window characteristics

The plane of the window is cut perpendicular to its optical axis.

9427B magnesium fluoride	
spectral range (nm)*	110 - 850
refractive index (n_d)	1.38

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

5 typical spectral response curves

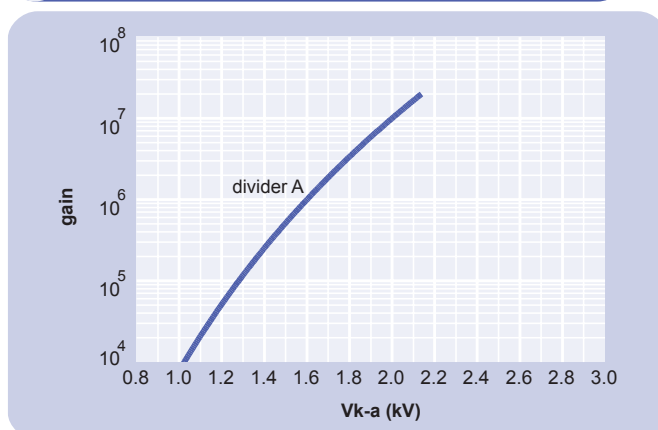


6 characteristics

	unit	min	typ	max
photocathode: S20				
active diameter	mm		46	
quantum efficiency at peak	%	14	20	
luminous sensitivity	$\mu\text{A/lm}$		170	
with CB filter			8	
with CR filter			75	
with IR filter			6	
dynodes: 14LFBcCu				
anode sensitivity in divider A:				
volts for 10^6 gain	V		1600	
volts for 10^7 gain	V		2000	2500
dark current at 20 °C:				
dc at 10^7 gain	nA		30	300
dark count rate	s^{-1}		20000	50000
pulsed linearity (-5% deviation):	mA		50	
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	$\text{T} \times 10^{-4}$		1	
temperature coefficient:	$\% \text{ } ^\circ\text{C}^{-1}$		± 0.5	
timing:				
single electron rise time	ns		2	
single electron (fwhm)	ns		3	
transit time	ns		46	
weight:	g		170	
maximum ratings:				
anode current	μA			200
cathode current	nA			1000
gain	$\times 10^6$			20
temperature	$^\circ\text{C}$	-80		60
V (k-a) ⁽¹⁾	V			3500
V (k-d1)	V			500
V (d-d) ⁽²⁾	V			450
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

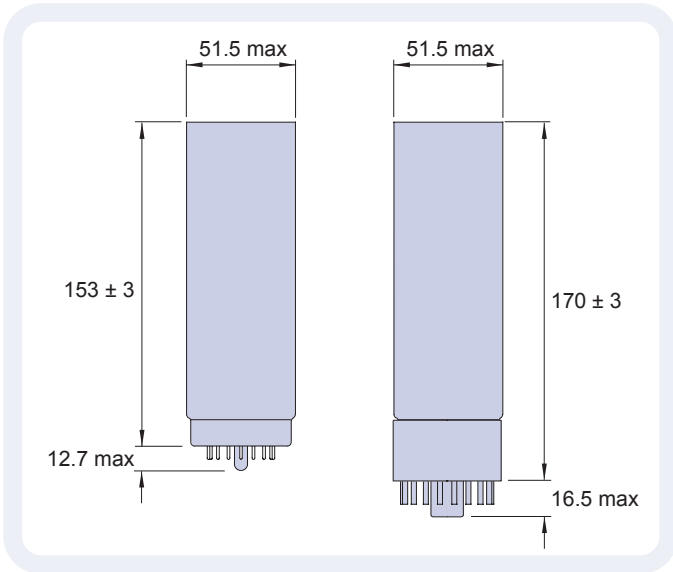
k	d ₁	d ₂	.....	d ₁₁	d ₁₂	d ₁₃	d ₁₄	a
A	2R	R	.....	R	R	R	R	Standard

note: Connect focus to d1

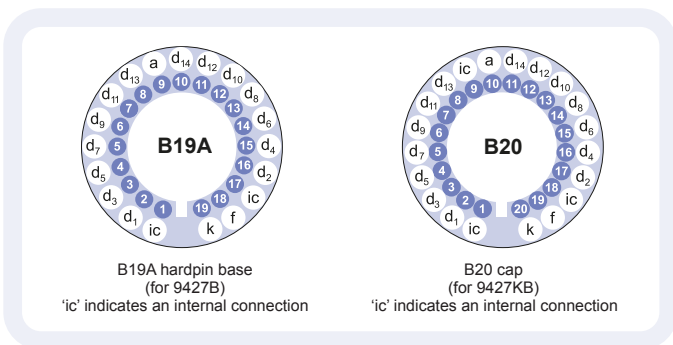
Characteristics contained in this data sheet refer to this divider unless otherwise stated.

9 external dimensions mm

The drawings below show the 9427B in hardpin format and the 9427KB with the B20 cap fitted.



10 base configuration (viewed from below)



Our range of B19A sockets is available to suit the B19A 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 high voltage caution

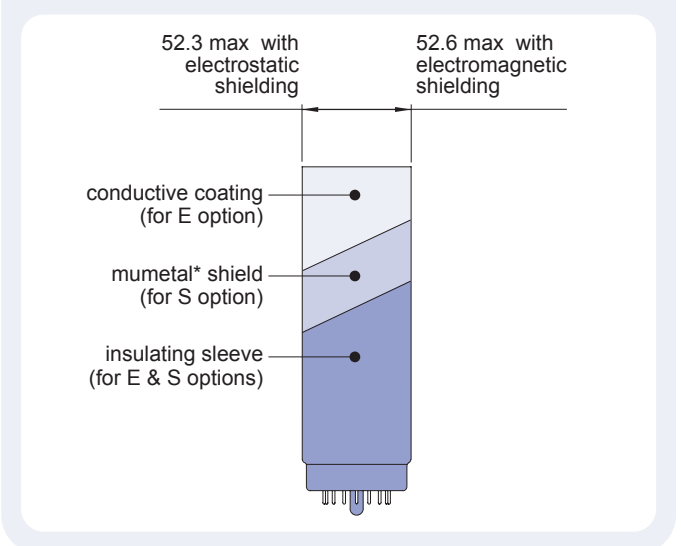
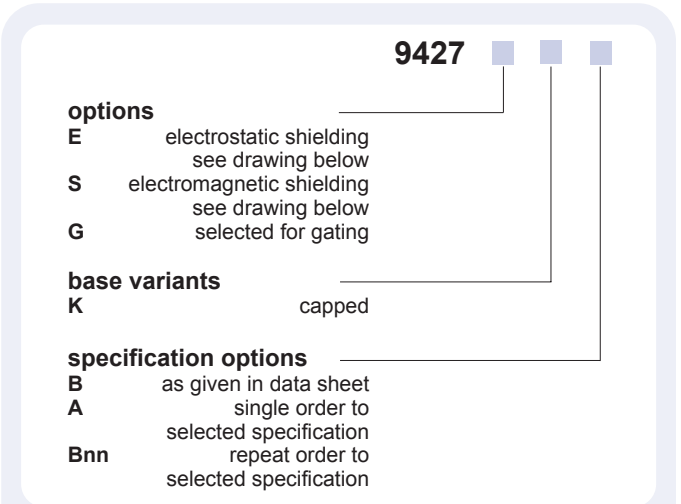
To avoid arc discharges between the photocathode and nearby grounded surfaces apply the HV only after hard vacuum has been attained, that is when the pressure is less than 10^{-3} torr. Failure to observe this precaution will destroy the pmt and invalidate the warranty.

12 handling instructions

The window of this pmt has been specially cleaned to give maximum efficiency. It should not be touched with fingers or allowed to come into contact with oil or grease. The window can be cleaned with isopropyl alcohol to remove oil deposits.

13 ordering information

The 9427B 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 9427A. 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.



14 voltage dividers

The standard voltage divider available for types with a hardpin base is tabulated below:

	k	d ₁	d ₂	d ₁₀	d ₁₁	d ₁₂	d ₁₃	d ₁₄	a
C638A	3R	R		R	R	R	R	R	
C638B	3R	R		R	R	R	2R	4R	

note: connect focus to d1
R = 1 MΩ

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