

# 51 mm (2") photomultiplier

## 9423B series data sheet

### 1 description

The 9423B is a 51 mm (2") diameter end window photomultiplier with magnesium fluoride window, caesium iodide 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
- measurement of uv light in the presence of visible light

### 3 features

- sensitive to vacuum ultra-violet
- does not respond to visible light (solar blind)

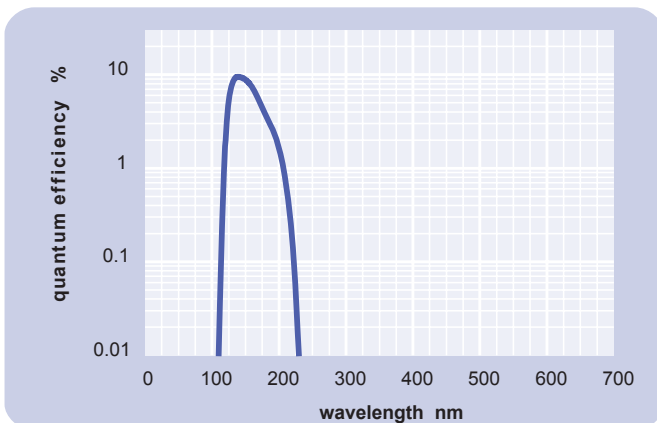
### 4 window characteristics

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

9423B magnesium fluoride	
spectral range (nm)*	110 - 230
refractive index ( $n_d$ )	1.38

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

### 5 typical spectral response curves

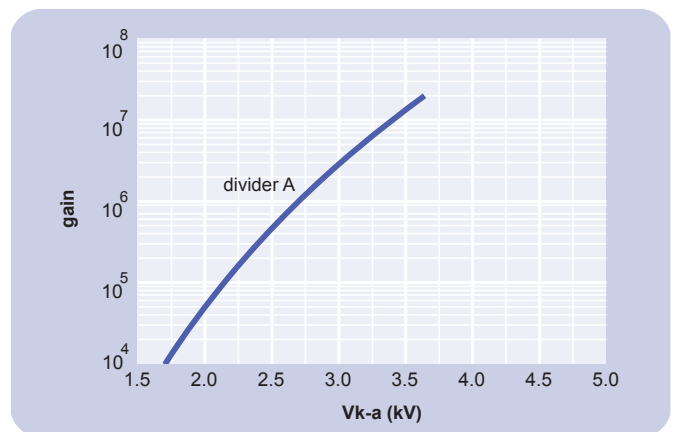


### 6 characteristics

	unit	min	typ	max
<b>photocathode: CsI</b>				
active diameter	mm		46	
quantum efficiency at peak	%	7	10	
<b>dynodes: 14LFBeCu</b>				
<b>anode sensitivity in divider A:</b>				
volts for $10^6$ gain	V		2700	
volts for $10^7$ gain	V		3400	4500
<b>dark current at 20 °C:</b>				
dc at $10^7$ gain	nA		0.1	1
dark count rate	$s^{-1}$		20	100
<b>pulsed linearity (-5% deviation):</b>	mA		50	
<b>rate effect (<math>I_a</math> for <math>\Delta g/g=1\%</math>):</b>	$\mu A$		1	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	$T \times 10^{-4}$		1	
<b>temperature coefficient:</b>	$\% \text{ } ^\circ C^{-1}$		$\pm 0.5$	
<b>timing:</b>				
single electron rise time	ns		2	
single electron (fwhm)	ns		3	
transit time	ns		46	
<b>weight:</b>	g		170	
<b>maximum ratings:</b>				
anode current	$\mu A$			200
cathode current	nA			10
gain	$\times 10^6$			20
temperature	$^\circ C$	-180		60
V (k-a) <sup>(1)</sup>	V			5000
V (k-d1)	V			700
V (d-d) <sup>(2)</sup>	V			450
ambient pressure (absolute)	kPa			202

<sup>(1)</sup> subject to not exceeding max. rated sensitivity <sup>(2)</sup> subject to not exceeding max rated V(k-a)

### 7 typical voltage gain characteristics



### 8 voltage divider distribution

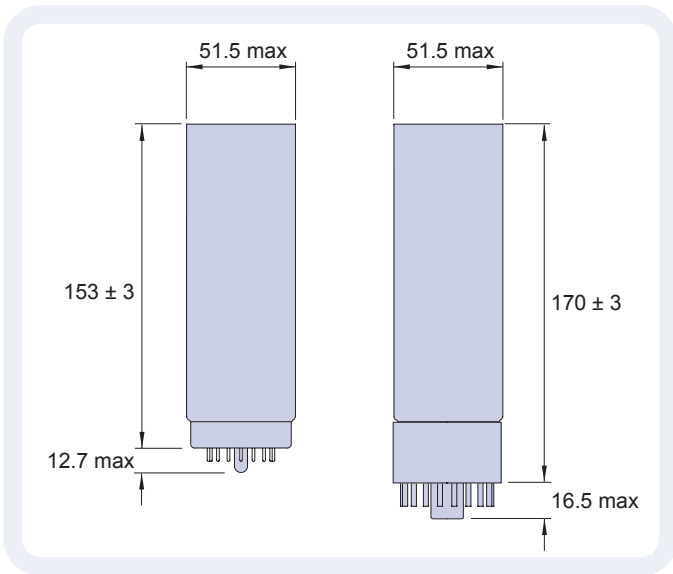
k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub>	a
A	2R	R	.....	R	R	R	R	Standard

note: Connect focus to d1

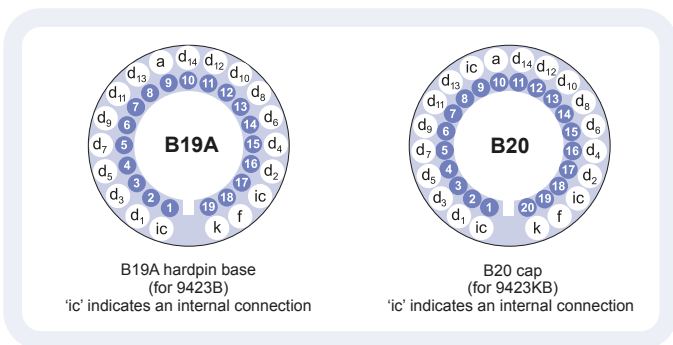
Characteristics contained in this data sheet refer to this divider unless otherwise stated.

## 9 external dimensions mm

The drawings below show the 9423B in hardpin format and the 9423KB 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

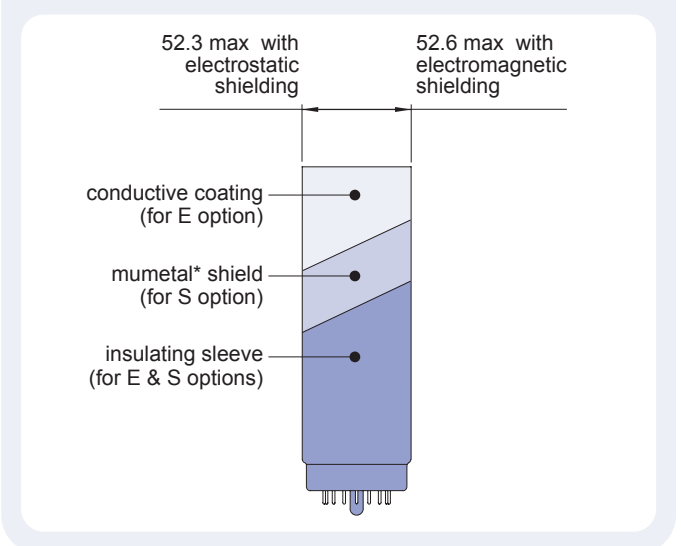
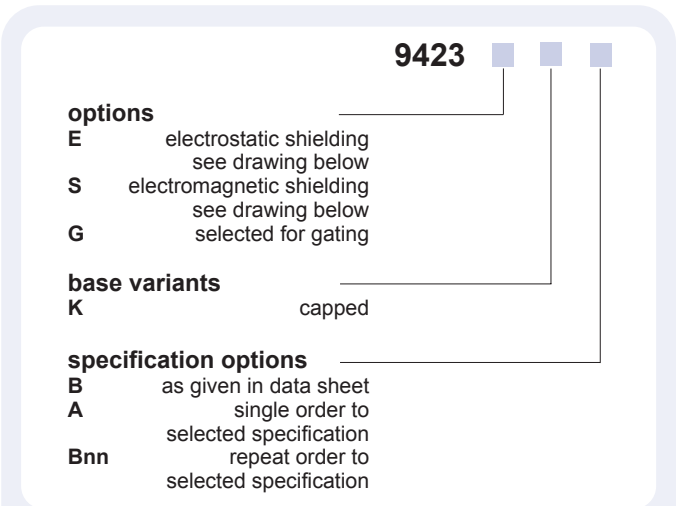
To avoid arc discharges between the photocathode and nearby grounded surfaces apply the HV only after hard vacuum has been attained, that is when the pressure is less than  $10^{-3}$  torr. Failure to observe this precaution will destroy the pmt and invalidate the warranty.

## 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 9423B 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 9423A. 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 <sub>1</sub>	d <sub>2</sub>	.....	d <sub>10</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub>	a
C638G	3R	R	.....	R	R	R	R	R	R	
C638H	3R	R	.....	R	R	R	2R	4R		

note: connect focus to d1  
R = 1 MΩ

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