

# 51 mm (2") photomultiplier

## 9235B series data sheet

### 1 description

The 9235B is a 51mm (2") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode and 13 high gain, high stability, SbCs dynodes of linear focused design. The 9235QB is a variant for applications requiring uv sensitivity.

### 2 applications

- low light level detection

### 3 features

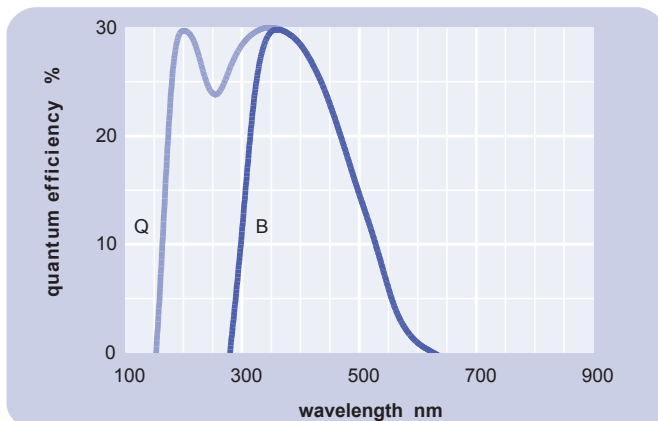
- high gain
- low operating voltage
- good SER

### 4 window characteristics

	9235B borosilicate	9235QB* fused silica
spectral range**(nm)	290 - 630	160 - 630
refractive index ( $n_e$ )	1.49	1.46
K (ppm)	300	<10
Th (ppb)	250	<10
U (ppb)	100	<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

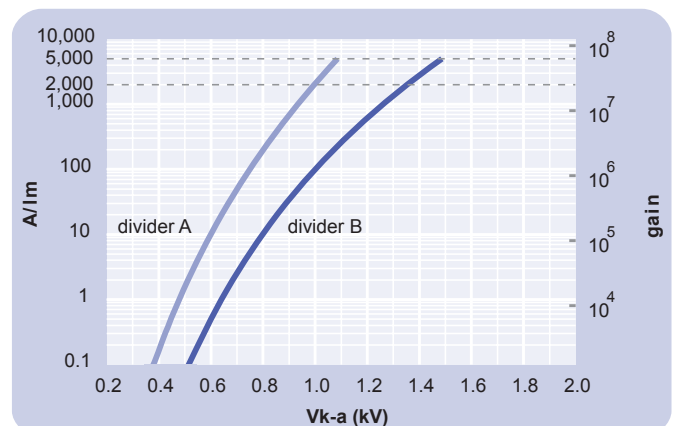


### 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		48	
quantum efficiency at peak	%		30	
luminous sensitivity	$\mu\text{A/lm}$		80	
with CB filter		9	12.5	
with CR filter			2	
<b>dynodes: 13LFSbCs</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	A/lm		2000	
max. rated anode sensitivity	A/lm		5000	
overall V for nominal A/lm	V		1000	1400
overall V for max. rated A/lm	V		1100	
gain at nominal A/lm	$\times 10^6$		25	
<b>dark current at 20 °C:</b>				
dc at nominal A/lm	nA		6	50
dc at max. rated A/lm	nA		15	
dark count rate	$\text{s}^{-1}$		300	
<b>afterpulse rate:</b>				
afterpulse time window	$\mu\text{s}$	0.1		6.4
<b>pulsed linearity (-5% deviation):</b>				
divider A	mA		30	
divider B	mA		100	
<b>pulse height resolution:</b>				
single electron peak to valley	ratio		2	
<b>rate effect (<math>I_a</math> for <math>\Delta g/g=1\%</math>):</b>				
	$\mu\text{A}$		20	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	$\text{T} \times 10^{-4}$			
<b>temperature coefficient:</b>	$\% \text{ } ^\circ\text{C}^{-1}$		$\pm 0.5$	
<b>timing:</b>				
single electron rise time	ns		3	
single electron fwhm	ns		5	
single electron jitter (fwhm)	ns		6	
multi electron rise time	ns		4	
multi electron fwhm	ns		6.5	
transit time	ns		50	
<b>weight:</b>	g		100	
<b>maximum ratings:</b>				
anode current	$\mu\text{A}$			200
cathode current	nA			100
gain	$\times 10^6$			63
sensitivity	A/lm			5000
temperature	$^\circ\text{C}$	-30		60
V (k-a) <sup>(1)</sup>	V			2300
V (k-d1)	V			300
V (d-d) <sup>(2)</sup>	V			300
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

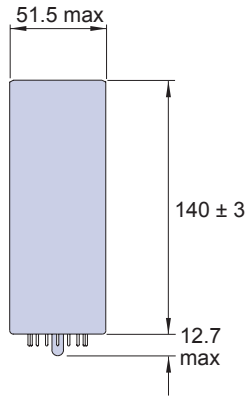


## 8 voltage divider distribution

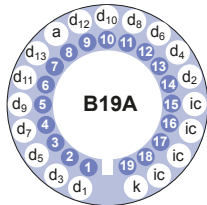
	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>10</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	a	
A	2R	R	.....	R	R	R	R	R		Standard
B	2R	R	.....	R	2R	3R	4R	3R		High Pulsed linearity

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

## 9 external dimensions mm



## 10 base configuration (viewed from below)



'ic' indicates an internal connection

Our range of B19A sockets, available for this series includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

## 11 ordering information

The 9235B 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 9235A. 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.

### 9235

#### window variants

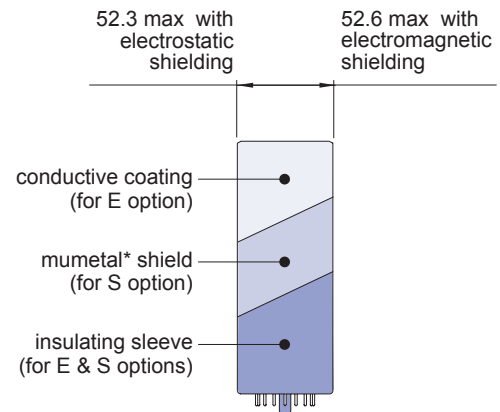
**Q** fused silica

#### options

**E** electrostatic shielding  
see drawing below  
**S** electromagnetic shielding  
see drawing below  
**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 all variants of this pmt are tabulated below:

	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	a
C679A	2R	R	.....	R	R	R	R	R		
C679B	2R	R	.....	R	2R	3R	4R	3R		
C679C	300 V	R	.....	R	R	R	R	R		
C679D	300 V	R	.....	R	2R	3R	4R	3R		

R = 330 kΩ  
note: 300 V is zener stabilised

\*mumetal is a registered trademark of Magnetic Shield Corporation

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choose accessories for this pmt on our website

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