

# 51 mm (2") photomultiplier 9815B series data sheet

## 1 description

The 9815B is a 51mm (2") diameter, end window photomultiplier with blue-green sensitive bialkali photocathode and 10 BeCu dynodes of linear focused design.

## 2 applications

- high light level
- high energy physics studies

## 3 features

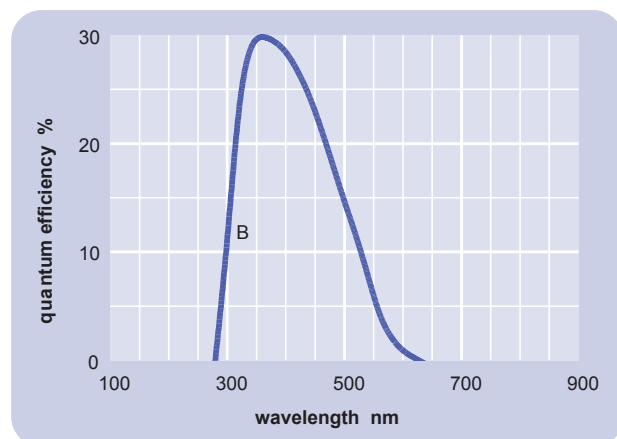
- high pulsed linearity

## 4 window characteristics

9815B borosilicate	
spectral range*(nm)	290 - 630
refractive index ( $n_d$ )	1.49
K (ppm)	300
Th (ppb)	250
U (ppb)	100

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

## 5 typical spectral response curves

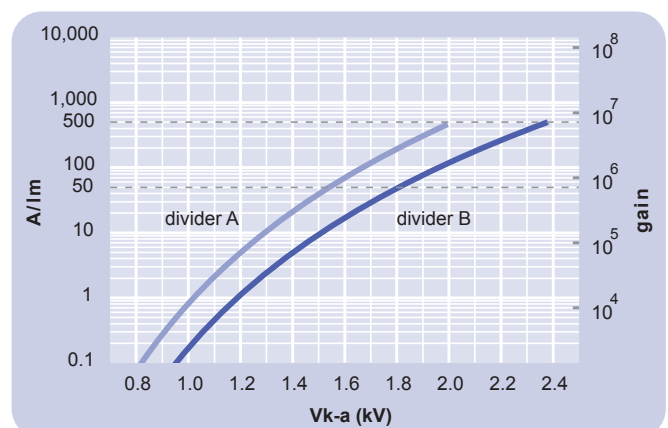


## 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		46	
quantum efficiency at peak	%		30	
luminous sensitivity	$\mu\text{A}/\text{lm}$		70	
with CB filter		8	11.5	
with CR filter			2	
<b>dynodes: 10LFBcCu</b>				
<b>anode sensitivity in divider B:</b>				
nominal anode sensitivity	$\text{A}/\text{lm}$		50	
max. rated anode sensitivity	$\text{A}/\text{lm}$		500	
overall V for nominal $\text{A}/\text{lm}$	V		1800	2300
overall V for max. rated $\text{A}/\text{lm}$	V		2400	
gain at nominal $\text{A}/\text{lm}$	$\times 10^6$		0.7	
<b>dark current at 20 °C:</b>				
dc at nominal $\text{A}/\text{lm}$	nA		0.3	10
dc at max. rated $\text{A}/\text{lm}$	nA		3	
dark count	$\text{s}^{-1}$		300	
<b>pulsed linearity (-5% deviation):</b>				
divider A	mA		50	
divider B	mA		150	
<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>				
	$\mu\text{A}$		1	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	$\text{T} \times 10^{-4}$		2	
<b>temperature coefficient:</b>				
	$\% \text{ } ^\circ\text{C}^{-1}$		$\pm 0.5$	
<b>timing:</b>				
single electron rise time	ns		2	
single electron fwhm	ns		3	
single electron jitter (fwhm)	ns		2.2	
transit time	ns		40	
<b>weight:</b>				
	g		150	
<b>maximum ratings:</b>				
anode current	$\mu\text{A}$			100
cathode current	nA			100
gain	$\times 10^6$			7
sensitivity	$\text{A}/\text{lm}$			500
temperature	$^\circ\text{C}$	-30		60
V (k-a) <sup>(1)</sup>	V			2500
V (k-d1)	V			500
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

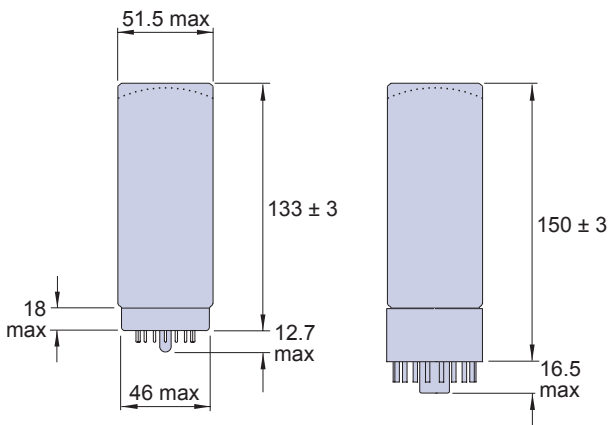
	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>11</sub>	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub>	a	
A	300V	R	.....		R	R	R	R	R	Standard
B	300V	R	.....		R	1.25R	1.5R	2R	3R	High Pulsed linearity

note: focus connected to d<sub>1</sub>

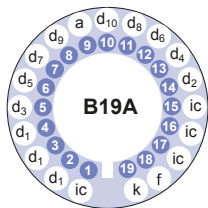
Characteristics contained in this data sheet refer to divider B unless stated otherwise.

## 9 external dimensions mm

The drawings below show the 9815B in hardpin format and the 9815KB with the B20 cap fitted.



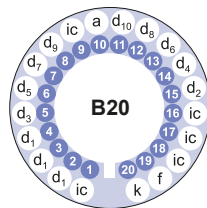
## 10 base configuration (viewed from below)



B19A hardpin base  
(for 9815B)

'ic' indicates an internal connection

note: connect f to d<sub>1</sub>



B20 cap  
(for 9815KB)

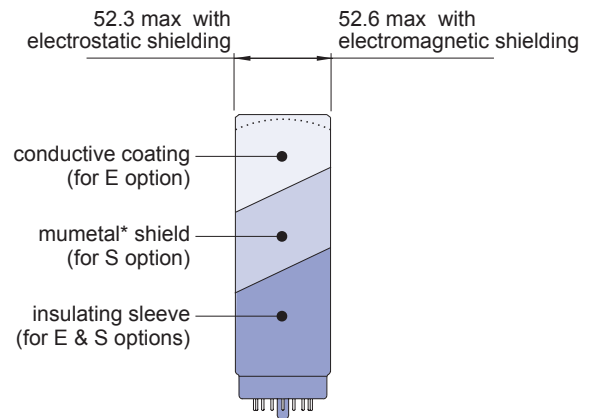
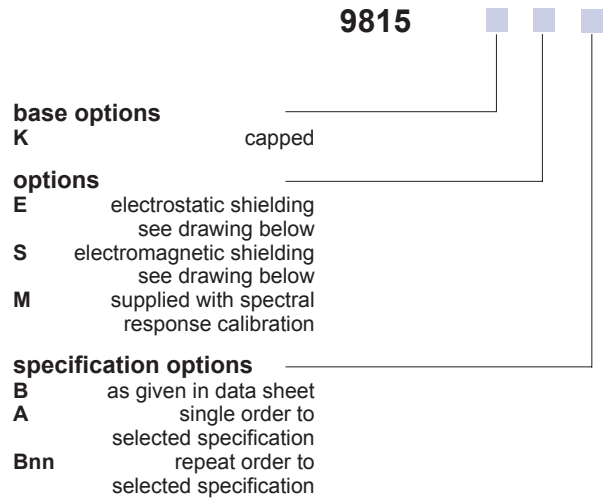
'ic' indicates an internal connection

note: connect f to d<sub>1</sub>

Our range of B19A sockets is available to suit the 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 ordering information

The 9815B 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 9815A. 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.



## 12 voltage dividers

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

9815B	9815KB	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	a
C638A	C644A	3R	R	.....		R	R	R	R	R	
C638B	C644B	3R	R	.....		R	1.25R	1.5R	2R	3R	
C638C	C644C	300 V	R	.....		R	R	R	R	R	
C638D	C644D	300 V	R	.....		R	1.25R	1.5R	2R	3R	

R = 330 kΩ note: focus connected to d<sub>1</sub>

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DS\_9815B Issue 10 (03/04/12)