

# 51 mm (2") photomultiplier

## 9954B series data sheet

### 1 description

The 9954B is a 51mm (2") diameter end window photomultiplier, with enhanced green sensitive bialkali photocathode, and 12 BeCu dynodes of linear focused design for good linearity and timing.

### 2 applications

- high energy physics studies

### 3 features

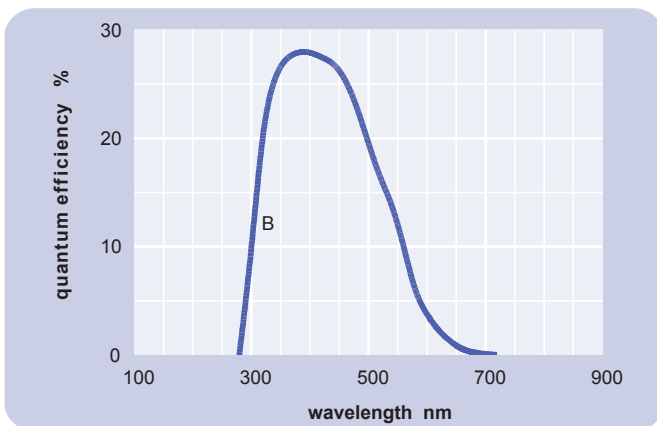
- good SER
- lower cost option of 9954B

### 4 window characteristics

	9954B borosilicate
spectral range *(nm)	290 - 680
refractive index (n <sub>d</sub> )	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

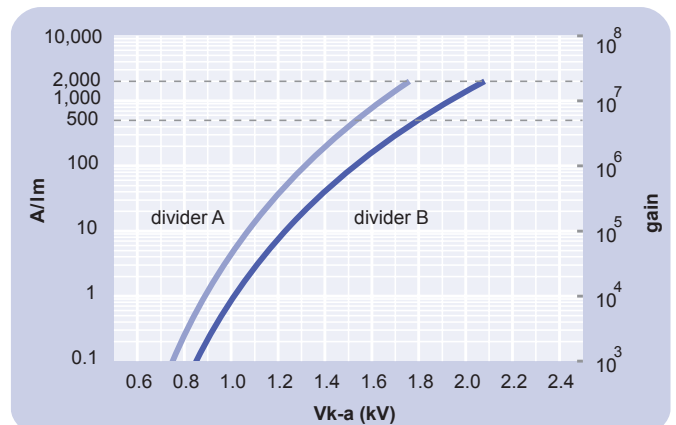


### 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		46	
quantum efficiency at peak	%		28	
luminous sensitivity	μA/lm		110	
with CB filter		8	12	
with CR filter			9	
<b>dynodes: 12LFBBeCu</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	A/lm		500	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		1800	2300
overall V for max. rated A/lm	V		2100	
gain at nominal A/lm	x 10 <sup>6</sup>		5	
<b>dark current at 20 °C:</b>				
dc at nominal A/lm	nA		2	20
dc at max. rated A/lm	nA		8	
dark count rate	s <sup>-1</sup>		800	
<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	
rate effect (I <sub>a</sub> for Δg/g=1%):	μA		1	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50 %				
most sensitive direction	T x 10 <sup>-4</sup>		1	
temperature coefficient:	% °C <sup>-1</sup>		± 0.5	
<b>timing:</b>				
single electron rise time	ns		2	
single electron fwhm	ns		3	
transit time	ns		41	
weight:	g		150	
<b>maximum ratings:</b>				
anode current	μA			100
cathode current	nA			100
gain	x 10 <sup>6</sup>			18
sensitivity	A/lm			2000
temperature	°C	-30		60
V (k-a) <sup>(1)</sup>	V			2800
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



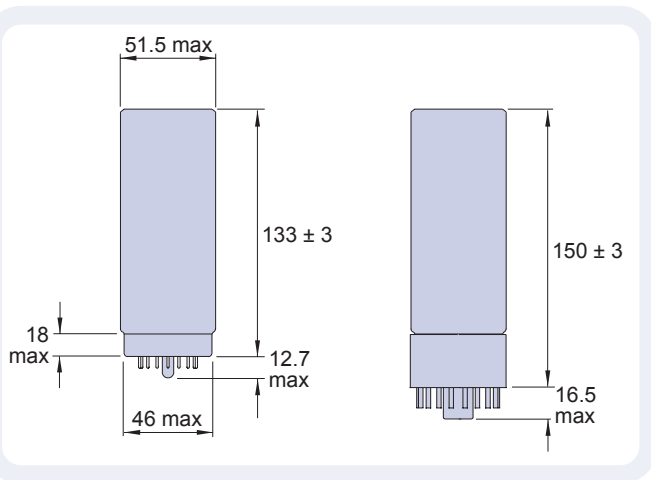
## 8 voltage divider distribution

	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	d <sub>12</sub>	a	
A	300V	R	.....		R	R	R	R	R	Standard
B	300V	R	.....		R	1.25R	1.5R	2R	3R	High Pulsed linearity

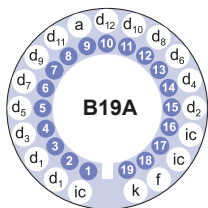
note: focus connected to d<sub>1</sub>  
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

## 9 external dimensions mm

The drawings below show the 9954B in hardpin format and the 9954KB with the B20 cap fitted.



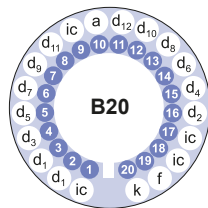
## 10 base configuration (viewed from below)



B19A hardpin base  
(for 9954B)

'ic' indicates an internal connection

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



B20 cap  
(for 9954KB)

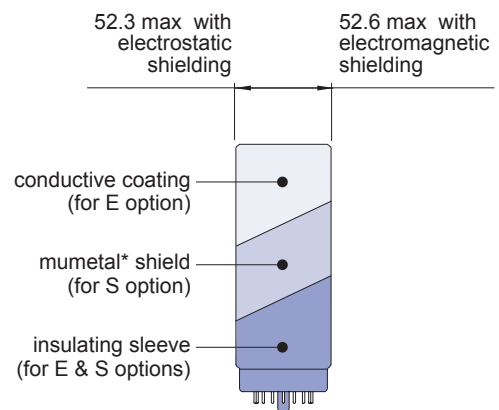
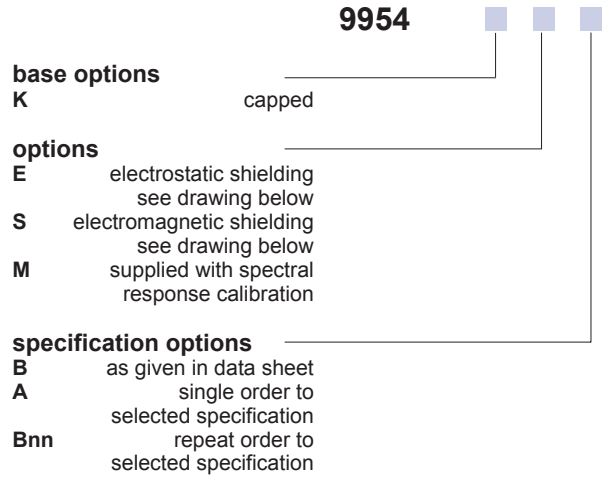
'ic' indicates an internal connection

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

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 ordering information

The 9954B 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 9954A. 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 hardpin variants of these pmts are tabulated below:

9954B	9954KB	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	d <sub>11</sub>	d <sub>12</sub>	a
C638A	C640A	3R	R	.....		R	R	R	R	R	
C638B	C640B	3R	R	.....		R	1.25R	1.5R	2R	3R	
C638C	C640C	300 V	R	.....		R	R	R	R	R	
C638D	C640D	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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