

# 51 mm (2") photomultiplier

## 9863/350B series data sheet

### 1 description

The 9863/350B is a 51mm (2") diameter, end window photomultiplier with infra-red sensitive S20 photocathode, electrostatically reduced to 9mm diameter, and 14 BeCu dynodes of linear focused design for fast timing and extended linearity.

### 2 applications

- LIDAR
- particle counting
- particle sizing
- general photon counting applications

### 3 features

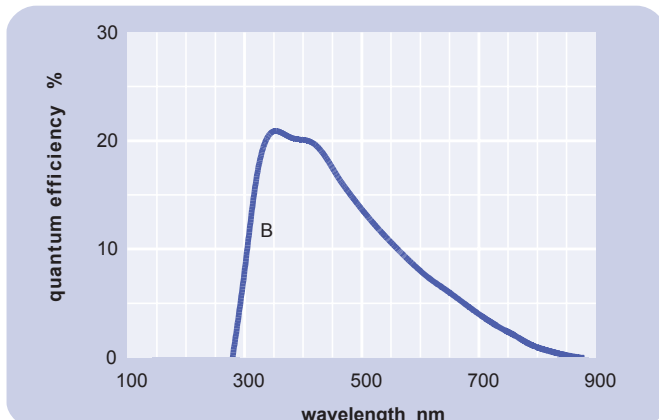
- electrostatically reduced photocathode area (9 mm active diameter)
- high gain
- fast time response
- low dark count rate
- low afterpulse rate for time correlated studies

### 4 window characteristics

	9863/350B borosilicate
spectral range *(nm)	290 - 850
refractive index (n <sub>e</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

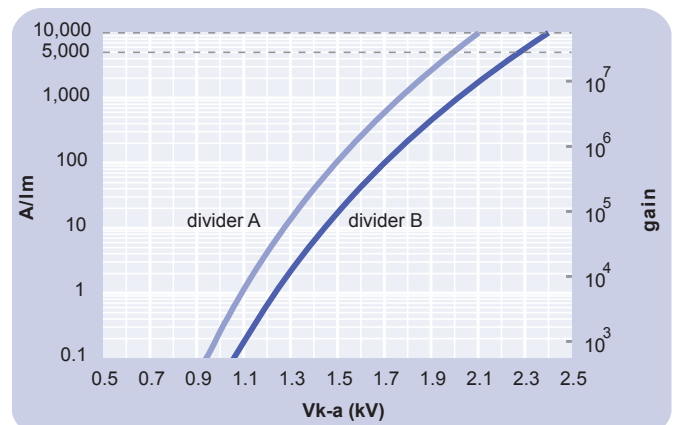


### 6 characteristics

	unit	min	typ	max
<b>photocathode: S20</b>				
active diameter	mm		9	
quantum efficiency at peak	%		21	
luminous sensitivity	μA/lm	125	180	
with CB filter			9	
with CR filter			75	
with IR filter			6	
<b>dynodes: 14LFBcCu</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	A/lm		5000	
max. rated anode sensitivity	A/lm		10000	
overall V for nominal A/lm	V		2000	2500
overall V for max. rated A/lm	V		2100	
gain at nominal A/lm	x 10 <sup>6</sup>		30	
<b>dark current at 20 °C:</b>				
dc at nominal A/lm	nA		2	20
dc at max. rated A/lm	nA		4	
dark count rate	s <sup>-1</sup>		300	1200
<b>after pulse rate:</b>				
afterpulse time window	μs	0.1	0.3	3.2
<b>pulsed linearity (-5 % deviation):</b>				
divider A	mA		50	
divider B	mA		150	
<b>rate effect (I<sub>a</sub> for Δg/g=1%):</b>				
	μA		1	
<b>temperature coefficient:</b>				
	% °C <sup>-1</sup>		± 0.5	
<b>timing:</b>				
single electron rise time	ns		2	
single electron fwhm	ns		3	
single electron jitter (fwhm)	ns		2.3	
transit time	ns		45	
<b>weight:</b>				
	g		190	
<b>maximum ratings:</b>				
anode current	μA			100
cathode current	nA			50
gain	x 10 <sup>6</sup>			60
sensitivity	A/lm			10000
temperature	°C	-80		60
V (k-a) <sup>(1)</sup>	V			3000
V (k-d1)	V			450
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



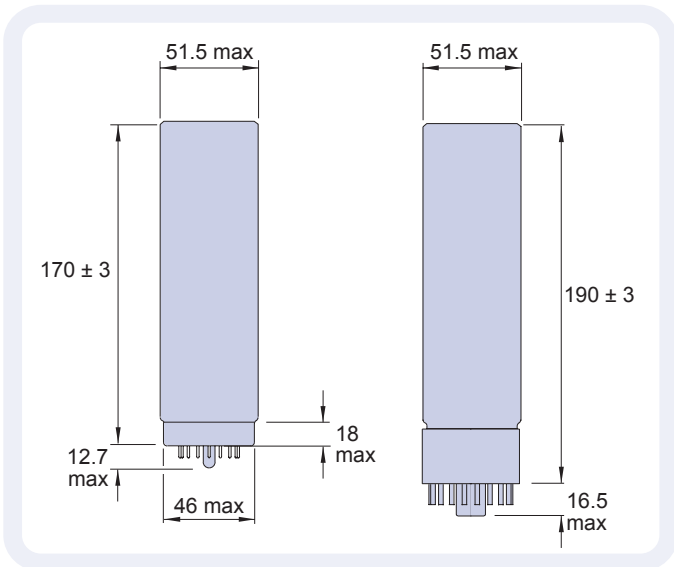
## 8 voltage divider distribution

	k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>10</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	R	R	Standard
B	300V	R	R	.....	R	1.25R	1.5R	2R	3R		Extended linearity

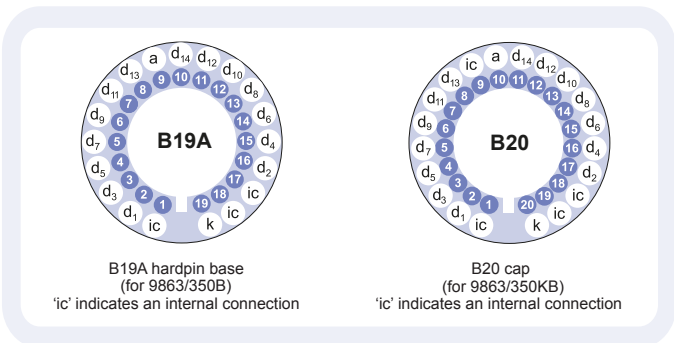
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

## 9 external dimensions mm

The drawings below show the 9863/350B in hardpin format and the 9863/350KB 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 includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

## 11 magnetic sensitivity

The location of the active area will move if a magnetic field is applied. Even when operating in the earth's field it is recommended that the S option is chosen for this type (see section 12).

## 12 ordering information

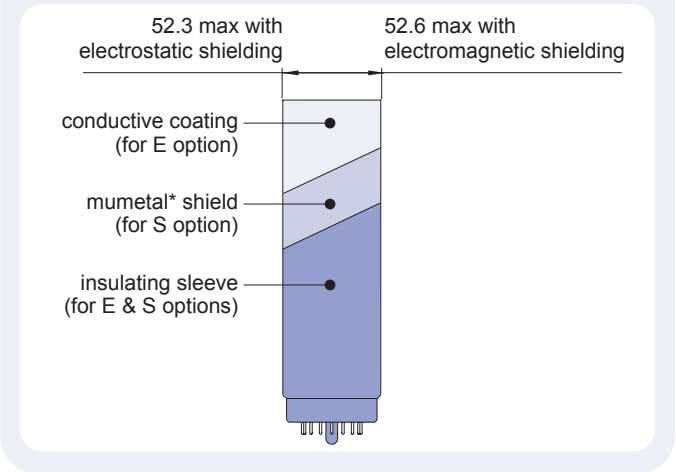
The 9863/350B meets the specification given in this data sheet. You may order **variants** by adding a suffix to the type number. You may also order **options** by adding a suffix to the type number. You may order product with **specification options** by discussing your requirements with us. If your selection option is for a one-off order, then the product will be referred to as 9863/350A. 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.

**9863/350**

**base options**  
**K** capped

**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 these pmts are tabulated below:

9863/350		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
B	KB										
C638C	C641C	300 V	R	.....		R	R	R	R	R	
C638D	C641D	300 V	R	.....		R	1.25R	1.5R	2R	3R	

R = 330 kΩ

\*mumetal is a registered trademark of Magnetic Shield Corporation