

200 mm (8") photomultiplier 9354KB series data sheet

6 characteristics

1 description

The 9354KB is a 200mm (8") diameter end window photomultiplier with blue-green sensitive bialkali photocathode on a hemispherical window, and 12 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. **The entire envelope is manufactured in water-resistant, ultra-low background glass, which is made to special order.**

2 applications

- high energy physics studies

3 features

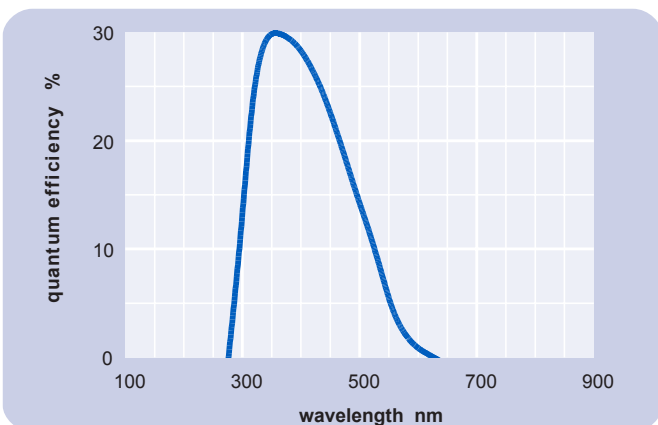
- entire envelope of ultra-low background glass
- 2π detection
- large active area
- low operating voltage
- good SER
- fast time response
- transit time jitter optimised
- high pulsed linearity

4 envelope characteristics

9354KB borosilicate	
spectral range *(nm)	275 - 630
refractive index (n_s)	1.49
K (ppm)	60
Th (ppb)	30
U (ppb)	30

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

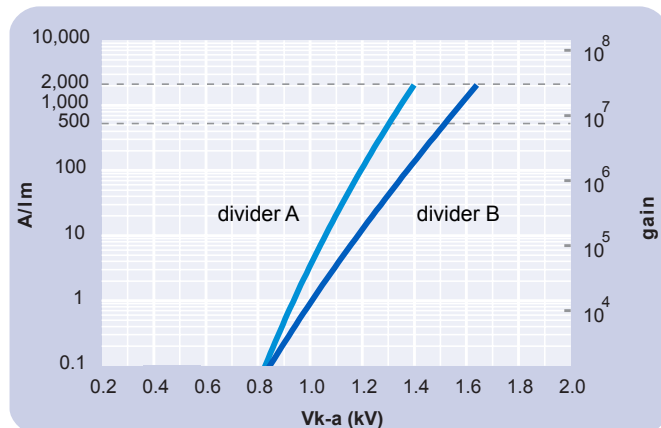
5 typical spectral response curve



	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		190	
active surface area	cm ²		430	
quantum efficiency at peak	%		30	
luminous sensitivity	μA/lm		70	
with CB filter		9	12	
with CR filter			1	
dynodes: 12LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		500	
max. rated anode sensitivity	A/lm		2000	
overall V for nominal A/lm	V		1300	1700
overall V for max. rated A/lm	V		1400	
gain at nominal A/lm	x10 ⁶		7	
volts for 5 x 10 ⁷ gain	V			2800
dark current at 20°C:				
dc at nominal A/lm	nA		10	100
dc at max. rated A/lm	nA		100	
dark count rate	s ⁻¹		4000	10000
afterpulse rate				
afterpulse time window	μs	0.4		12.8
pulsed linearity (-5% deviation):				
divider A	mA		30	
divider B	mA		100	
pulse height resolution:				
single electron peak to valley	ratio	1.5	2	
rate effect (I_a for Δg/g=1%):				
	μA		20	
magnetic field sensitivity:				
the field for which the output decreases by 50%				
most sensitive direction	T x 10 ⁻⁴		0.4	
temperature coefficient:				
	%°C ⁻¹		± 0.5	
timing:				
multi electron rise time	ns		4	
multi electron (fwhm)	ns		6	
single electron rise time	ns		3.5	
single electron (fwhm)	ns		4.5	
single electron jitter (fwhm)	ns		2.7	
transit time	ns		65	
weight:				
	g		700	
maximum ratings:				
anode current	μA			100
cathode current	nA			1500
gain	x 10 ⁶			30
sensitivity	A/lm			2000
temperature	°C	-30		60
V (k-a) ⁽¹⁾	V			2350
V (k-d ₁)	V			600
V (d-d) ⁽²⁾	V			300
ambient pressure (absolute)	kPa			202

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

7 typical voltage gain characteristics



8 voltage divider distribution

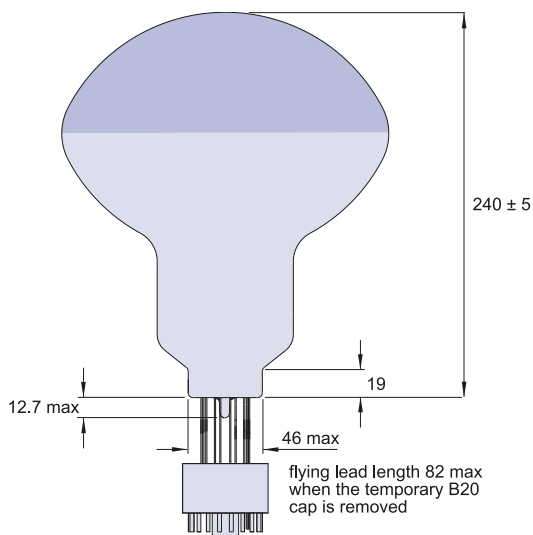
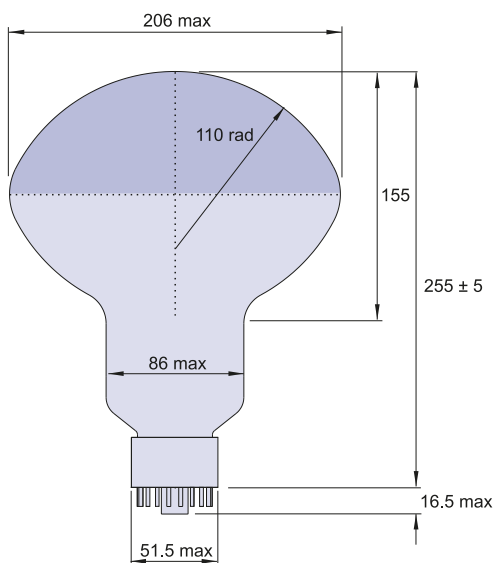
	k	d ₁	d ₂	d ₃	d ₄	...	d ₈	d ₉	d ₁₀	d ₁₁	d ₁₂	a
A	600V	2R	1.5R	R	...		R	R	R	R	R	Standard
B	600V	2R	1.5R	R	...		R	2R	3R	4R	3R	High Pulsed linearity

note: focus connected to d₃

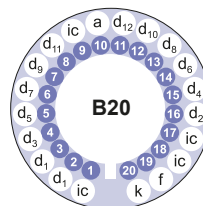
Characteristics contained in this data sheet refer to divider A unless stated otherwise.

9 external dimensions mm

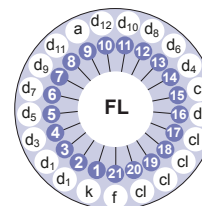
The drawings below show the 9354KB with the B20 cap fitted, and the 9354KFLB in flying lead format with a temporary B20 cap fitted. This temporary cap is attached as agreed with the customer.



10 base configuration (viewed from below)



B20 cap
(for 9354KB & 9354KFLB)



flying lead base
(for 9354FLB after removal of temporary cap)

'ic' indicates an internal connection

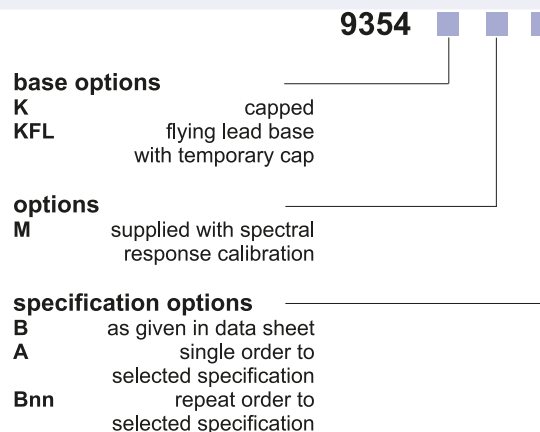
'ic' indicates an internal connection

note: focus connected to d₃

Our range of B20 sockets is available to suit the B20 cap. The socket range includes versions with or without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

11 ordering information

The 9354KB 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 9354KA. 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:

9354		k	d ₁	d ₂	d ₃	d ₄	...	d ₈	d ₉	d ₁₀	d ₁₁	d ₁₂	a
C640H	C690H	600V	2R	1.5R	R	...		R	R	R	R	R	
C640I	C690I	600V	2R	1.5R	R	...		R	2R	3R	4R	3R	

note: focus connected to d₃

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