

# 78 mm (3") photomultiplier 9311KB series data sheet

## 1 description

The 9311KB is a 78mm (3") diameter, end window photomultiplier with infra-red sensitive S20 photocathode and 10 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing.

## 2 applications

- scintillation spectroscopy

## 3 features

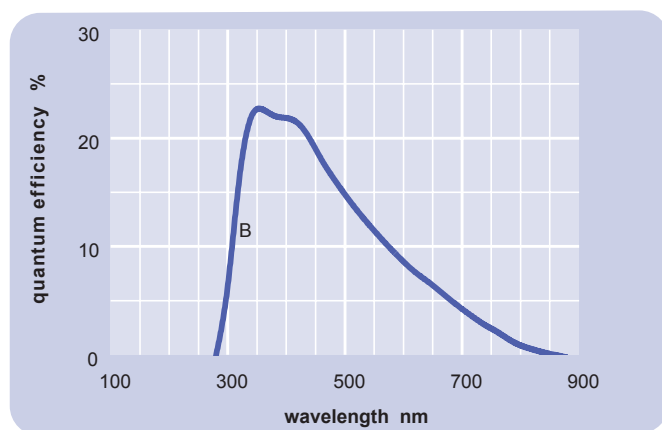
- high cathode current capability

## 4 window characteristics

	9311KB/FLB borosilicate
spectral range *(nm)	295 - 870
refractive index ( $n_d$ )	1.49
K (ppm)	350
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		70	
quantum efficiency at peak	%		23	
luminous sensitivity	$\mu\text{A}/\text{lm}$	120	220	
with CB filter			10	
with CR filter			95	
with IR filter			10	
<b>dynodes: 10LFSbCs</b>				
<b>anode sensitivity in divider A:</b>				
nominal anode sensitivity	$\text{A}/\text{lm}$		50	
max. rated anode sensitivity	$\text{A}/\text{lm}$		200	
overall V for nominal $\text{A}/\text{lm}$	V		800	1400
overall V for max. rated $\text{A}/\text{lm}$	V		1000	
gain at nominal $\text{A}/\text{lm}$	$\times 10^6$		0.25	
<b>dark current at 20°C:</b>				
dc at nominal $\text{A}/\text{lm}$	nA		2	20
dc at max. rated $\text{A}/\text{lm}$	nA		8	
dark count rate	$\text{s}^{-1}$		35000	
<b>pulsed linearity (-5% deviation):</b>				
divider A	mA		30	
divider B	mA		100	
<b>rate effect (<math>I_a</math> for <math>\Delta g/g=1\%</math>):</b>				
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50%				
most sensitive direction	$\text{T} \times 10^{-4}$		1.7	
<b>temperature coefficient:</b>				
	$\%^\circ\text{C}^{-1}$		$\pm 0.5$	
<b>timing:</b>				
single electron rise time	ns		7.5	
single electron (fwhm)	ns		15	
transit time	ns		40	
<b>weight:</b>				
	g		125	
<b>maximum ratings:</b>				
anode current	$\mu\text{A}$			100
cathode current	nA			2000
gain	$\times 10^6$			1
sensitivity	$\text{A}/\text{lm}$			200
temperature	$^\circ\text{C}$	-60		60
V (k-a) <sup>(1)</sup>	V			2100
V (k-d1)	V			450
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

