

78 mm (3") photomultiplier

9273B series data sheet

1 description

The 9273B is a 78mm (3") diameter, ruggedised, end window photomultiplier with blue-green sensitive bialkali photocathode and 9 high gain, high stability, SbCs dynodes of linear focused design for good linearity and timing. This is a rugged version of the industry standard, 9265B, constructed to withstand shock and vibration levels above those normally experienced in industrial applications.

2 applications

- x-ray and gamma-ray spectroscopy
- aerospace

3 features

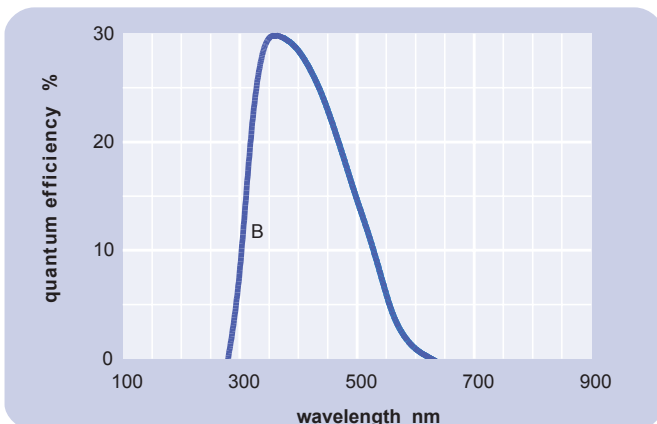
- low operating voltage
- rugged

4 window characteristics

		9273B borosilicate
spectral range*(nm)		295 - 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

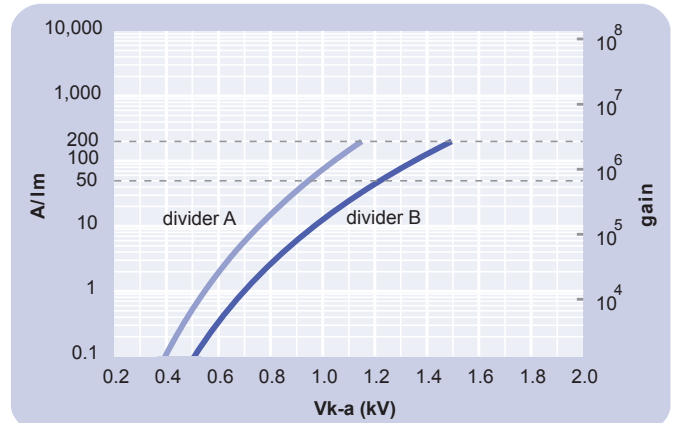


6 characteristics

	unit	min	typ	max
photocathode: bialkali				
active diameter	mm		70	
quantum efficiency at peak	%		30	
luminous sensitivity	μA/lm		75	
with CB filter		8	12	
with CR filter			2	
dynodes: 9LFSbCs				
anode sensitivity in divider A:				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		200	
overall V for nominal A/lm	V		950	1300
overall V for max. rated A/lm	V		1150	
gain at nominal A/lm	x 10 ⁶		0.7	
dark current at 20 °C:				
dc at nominal A/lm	nA		0.5	5
dc at max. rated A/lm	nA		2	
pulsed linearity (-5% deviation):				
divider A	mA		30	
divider B	mA		100	
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		1.7	
temperature coefficient:	% °C ⁻¹		± 0.5	
timing:				
single electron rise time	ns		7.5	
single electron fwhm	ns		15	
transit time	ns		40	
weight:	g		125	
maximum ratings:				
anode current	μA			100
cathode current	nA			200
gain	x 10 ⁶			3
sensitivity	A/lm			200
temperature	°C	-30		60
V (k-a) ⁽¹⁾	V			2100
V (k-d1)	V			450
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 environmental specifications

qualification shock and vibration levels (all 3 axes, non-operating)

random vibration:

20 Hz	0.045 g ² /Hz
20 to 60 Hz roll on	6 dB/octave
60 to 400 Hz	0.4024 g ² /Hz
400 to 2000 Hz roll off	-3 dB/octave
composite duration	20 g rms
	1 min/axis

sine vibration:

amplitude	20 g
frequency range	20 to 2000 Hz
sweep rate	2 octaves/min (single sweep)

shock (half sine wave):

1 ms duration	250 g peak
shocks per axis	3 (18 shocks total)

random vibration levels (all 3 axes, operating)

random vibration:

20 Hz	0.0187
20 to 60 Hz roll on	6 dB/octave
60 to 400 Hz	0.1686 g ² /Hz
400 to 2000 Hz roll off	-3 dB/octave
composite duration	13 g rms
	1 min/axis

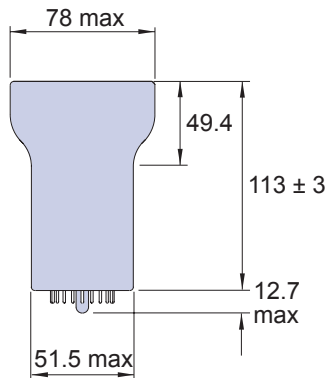
thermal range:	operating	-	-30 °C to +60 °C
	non-operating	-	-30 °C to +90 °C

9 voltage divider distribution

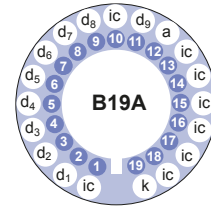
	k	d ₁	d ₂	.....	d ₆	d ₇	d ₈	d ₉	a	
A	3R	R	.....	R	R	R	2R	R		Standard
B	3R	R	.....	R	2R	3R	4R	3R		High Pulsed linearity

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

10 external dimensions mm



11 base configurations (viewed from below)



B19A hardpin base
(for 9273B)
'ic' indicates an internal connection

Our range of B19A sockets is available to suit the B19B hardpin base. The socket range includes versions with our without a mounting flange, and versions with contacts for mounting directly onto printed circuit boards.

13 ordering information

The 9273B 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 9273A. 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.

9273

specification options

B	as given in data sheet
A	single order to selected specification
Bnn	repeat order to selected specification

14 voltage dividers

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

	k	d ₁	d ₂	.....	d ₅	d ₆	d ₇	d ₈	d ₉	a
C648A	3R	R	R	R	R	R	R		
C648B	3R	R	R	2R	3R	4R	3R		
C648C	450V	R	R	R	R	R	R		
C648D	450V	R	R	2R	3R	4R	3R		

R = 330 kΩ

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