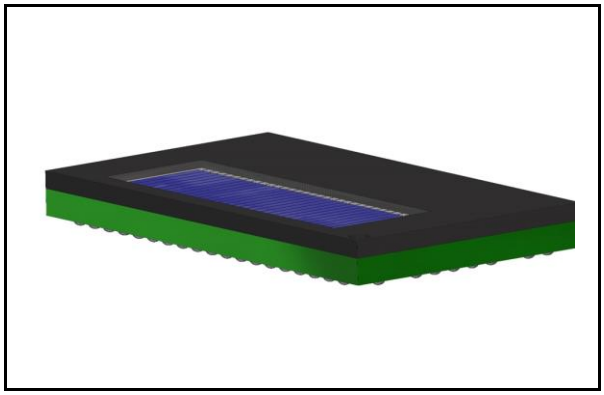
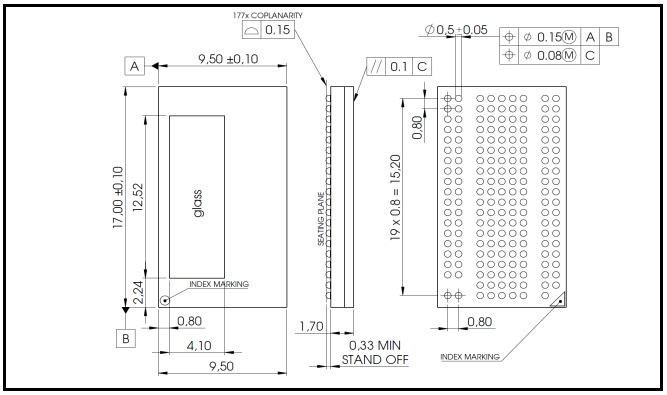
First Sensor

First Sensor APD Array Data Sheet
Part Description 32AA1.2-9 BGA
Order # 3005791

Engineering Samples





Features

- 32 element APD array
- High QE >80% for λ = 760-910 nm
- High speed, low noise

Description

Matrix APD array for NIR detection. PCB based BGA package. AR coated glass glued on active area of the APD. Non hermetic, suitable for reflow soldering.

Application

Automotive and industrial LiDAR (AECQ-102 pending)

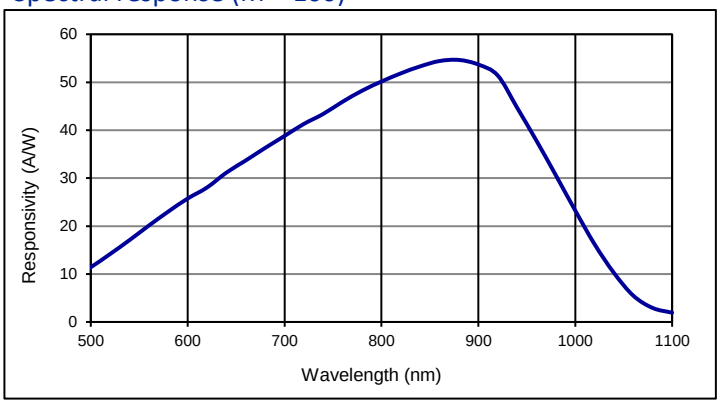
RoHS

2011/65/EU

Absolute maximum ratings

Symbol	Parameter	Min	Max	Unit
T_{STG}	Storage temp	-40	125	°C
T_{OP}	Operating temp	-40	125	°C
M_{max}	Gain (I_{P0} = 1 nA)	200		
I_{PEAK}	Peak DC current (linearity)		0.25	mA

Spectral response (M = 100)



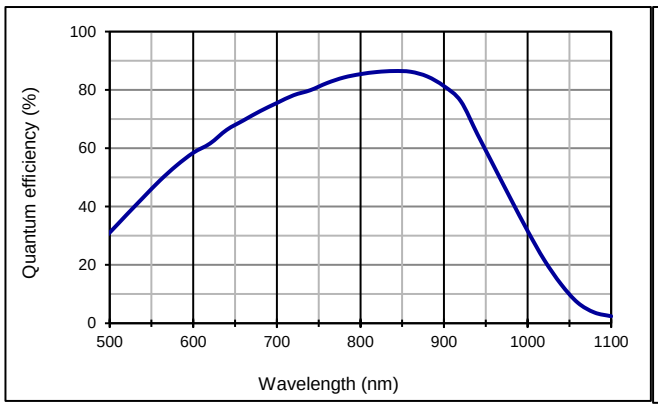
Electro-optical characteristics @ 23°C

Symbol	Characteristic	Test Condition	Min	Typ	Max	125°C*	Unit
	No of elements			32			
	Active area			340 x 3600			µm
	Gap; Pitch			40 ; 380			µm
I_D	Dark current	M = 50, per element		0.25	1.5	1500	nA
C	Capacitance	M = 50, per element			3		pF
	Responsivity	M = 100; λ = 905 nm	49.5	55			A/W
t_R	Rise time	M = 100; λ = 905 nm; R_L = 50 Ω			1.5		ns
V_{BR}	Breakdown voltage	I_R = 10 µA	160		240	400	V
	Temperature coefficient	Ubr		1.49			V/K
	Cross talk suppression**	DC, M=50, λ = 905 nm	50				dB
	Gain uniformity	M = 50		± 10	± 30		%
	Excess Noise factor	M=100		2.5			
t	Cover glass thickness			300			µm
Tabs	ARC on cover glass	880 nm to 940 nm; AOImax=45°	98	99			%

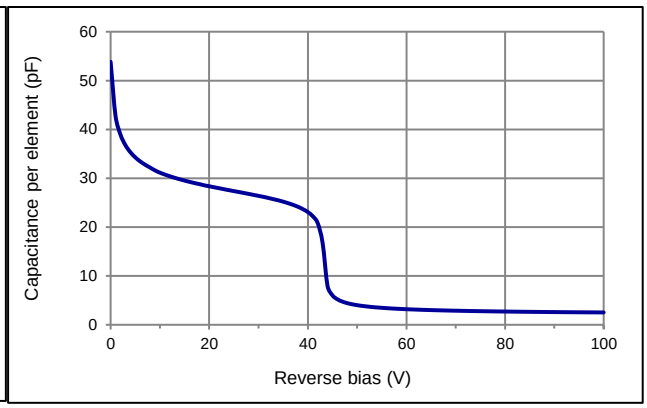
* maximal value

** middle of pixel, spot size = 10 µm diameter, optical power = 1 µW/mm²

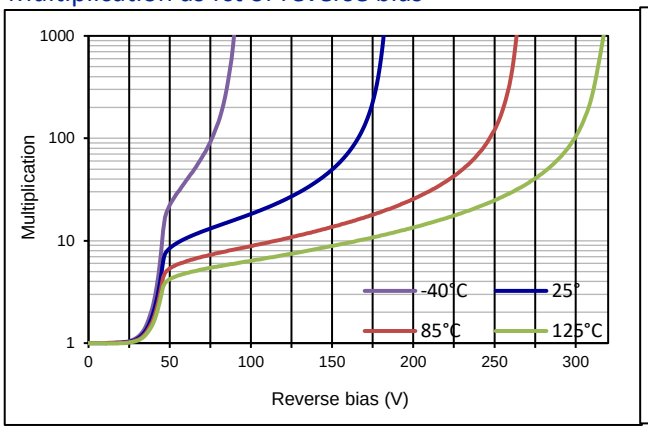
Quantum efficiency (23 °C)



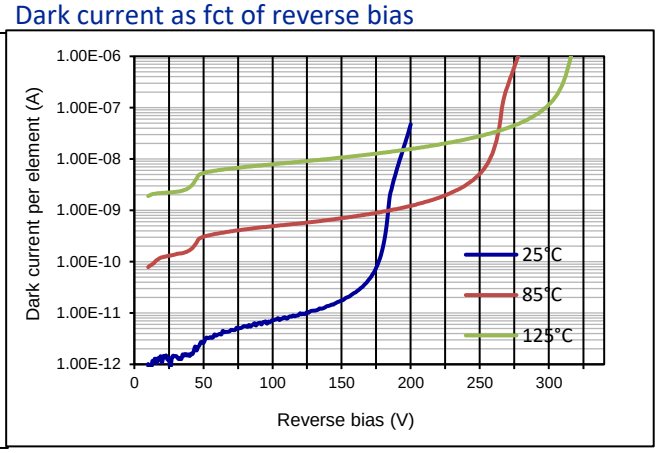
Capacitance as fct of reverse bias (23 °C)



Multiplication as fct of reverse bias***

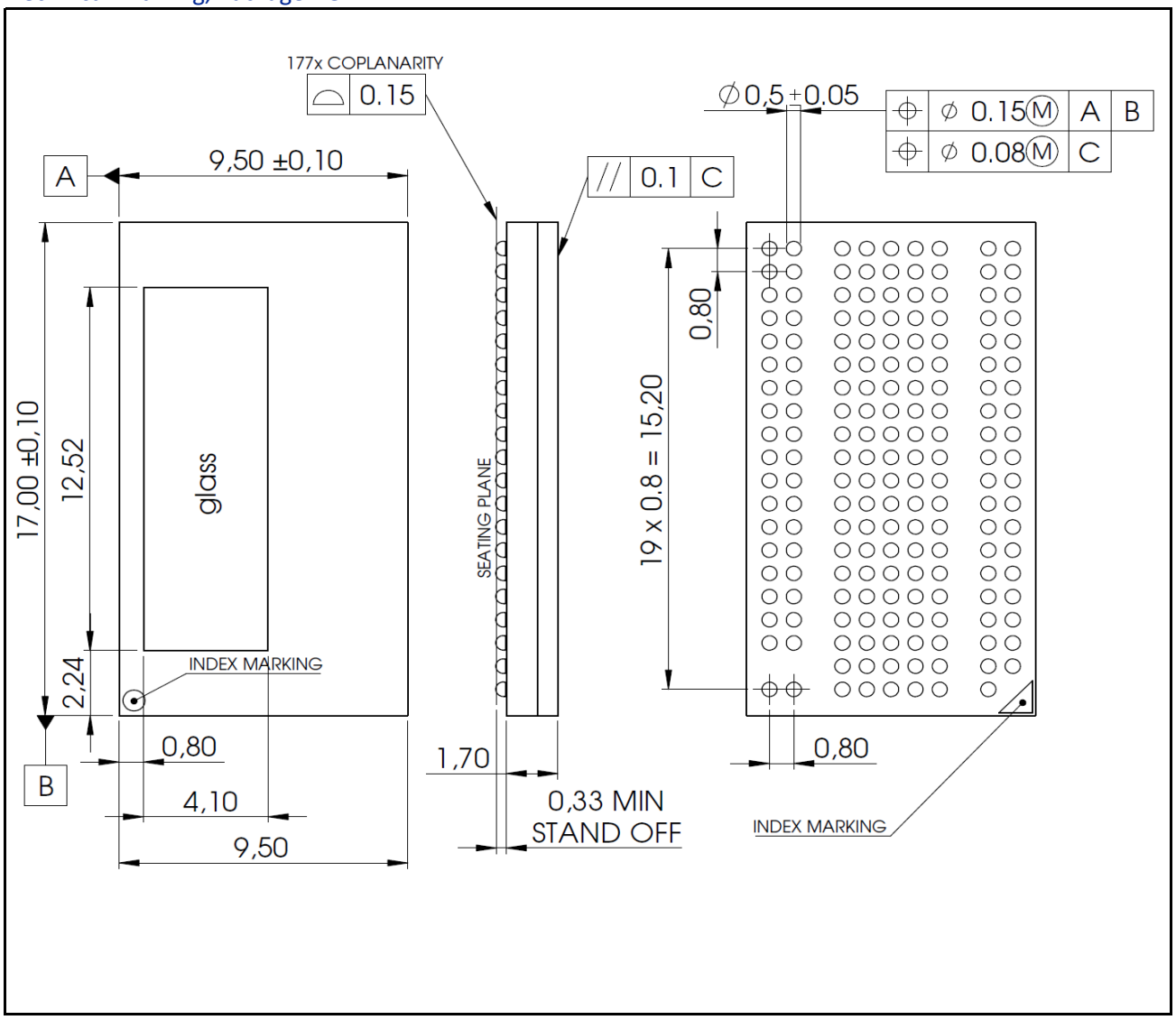


Dark current as fct of reverse bias



*** Illumination with 10 nW optical power

Technical Drawing, Package BGA



Pinning (bottom view)

	11	10	9	8	7	6	5	4	3	2	1
T	n.c.	n.c.		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
S	Gnd	G		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
R	C32	C31		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
Q	C30	C29		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
P	C28	C27		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
O	C26	C25		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
N	C24	C23		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
M	C22	C21		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
L	C20	C19		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
K	C18	C17		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
J	C16	C15		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
I	C14	C13		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
H	C12	C11		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
G	C10	C9		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
F	C8	C7		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
E	C6	C5		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
D	C4	C3		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
C	C2	C1		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
B				n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	n.c.
A	A	A		n.c.	n.c.	n.c.	n.c.	n.c.		n.c.	

A	Anode
C	Cathode
N.C.	not connected
G	Guard
Gnd	Ground

Package dimension

For small quantities chip trays are available.

Handling:

Please refer to document "Instructions for handling and processing"

Application hints:

Please refer to document: "application-note-apd-array"