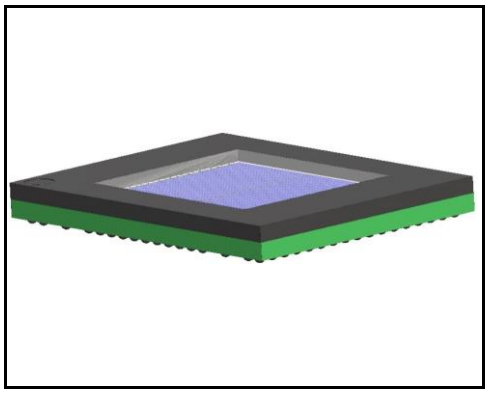
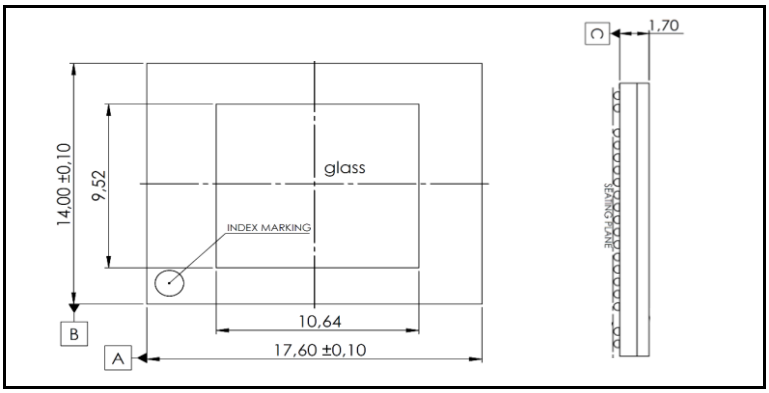
First Sensor

First Sensor APD Array Data Sheet
Part Description 64AA1.2-9 BGA
Order #3005095

Preliminary for Egineering Samples





Features

- 64 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 with on active area of APD glued AR coated glass. Non hermetic, suitable for reflow soldering.

Application

Automotive and industrial LiDAR (AECQ-102 pending)

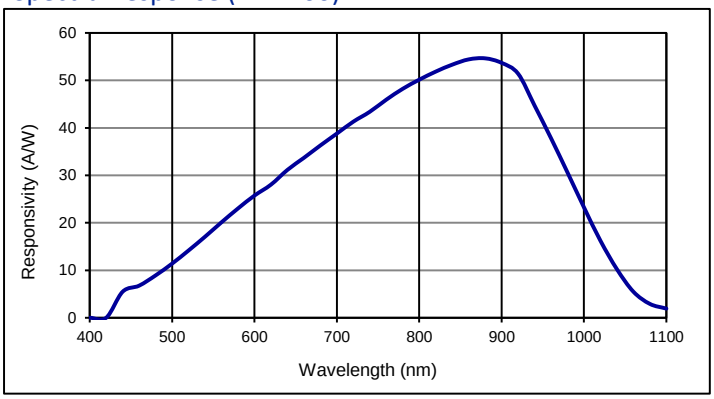
RoHS

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

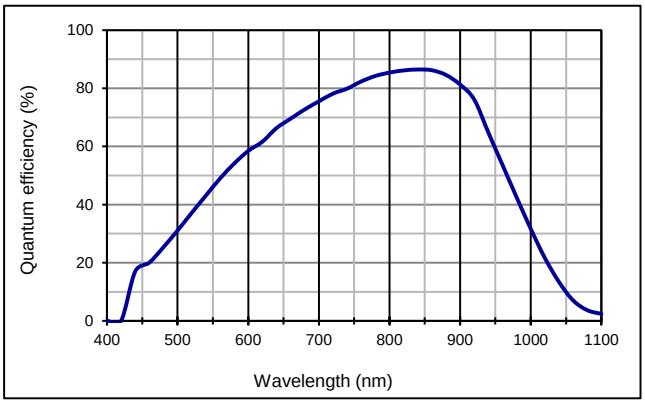
Symbol	Characteristic	Test Condition	Min	Typ	Max	125°C*	Unit
	No of elements			64			
	Active area			240 x 5000			µm
	Gap; Pitch			40 ; 280			µm
I_D	Dark current	M = 50, per element		0.25	1.5	1500	nA
C	Capacitance	M = 50, per element			3		pF
	Responsivity	M = 100; λ = 905 nm	49.5	55			A/W
t_R	Rise time	M = 100; λ = 905 nm; R_L = 50 Ω			1.5		ns
V_{BR}	Breakdown voltage	I_R = 10 µA	180		240	400	V
T_K	Temperature coefficient	Ubr		1.49			V/K
	Cross talk suppression	DC, M=50, λ = 905 nm	40	46			dB
	Gain uniformity	M = 50		± 10	± 30		%
Rabs	ARC on cover glass***	880 nm to 940 nm; AOImax=45°		1	2		%

* maximal value

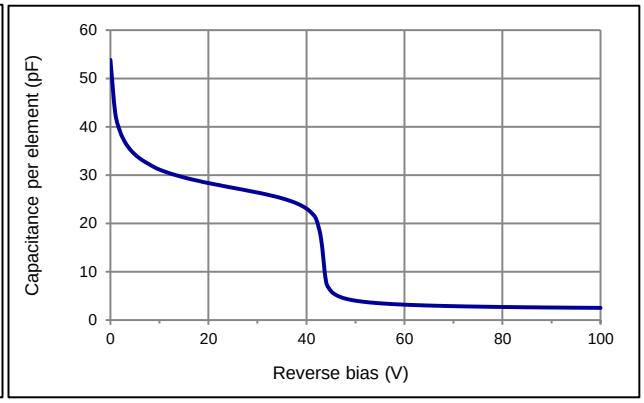
** middle of pixel, spot size = 10 µm diameter

*** sinlge sided, non transparent at visible wavelength (black ARC)

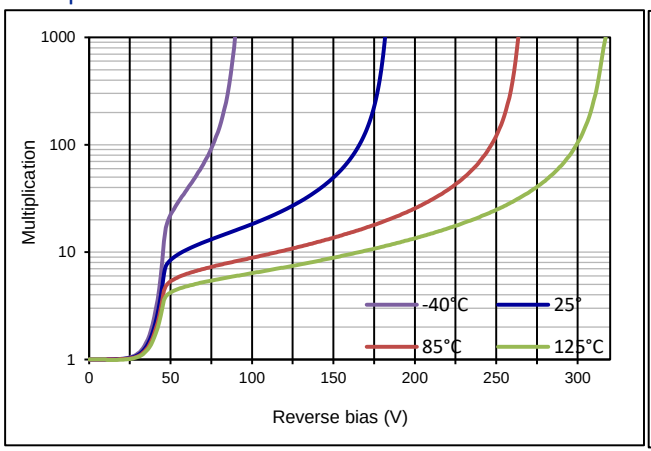
Quantum efficiency (23 °C)



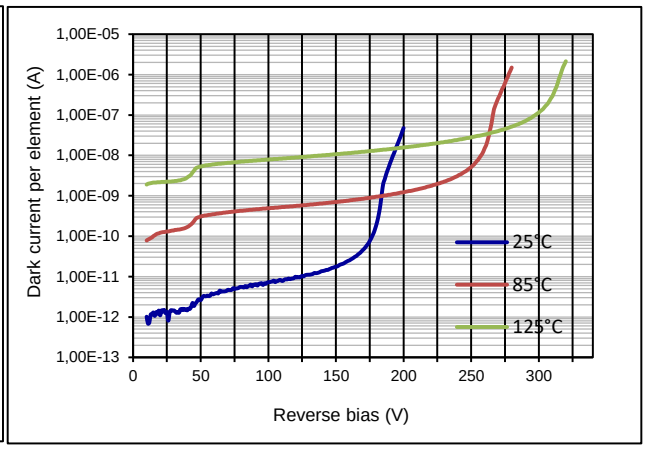
Capacitance as fct of reverse bias (23 °C)



Multiplication as fct of reverse bias****

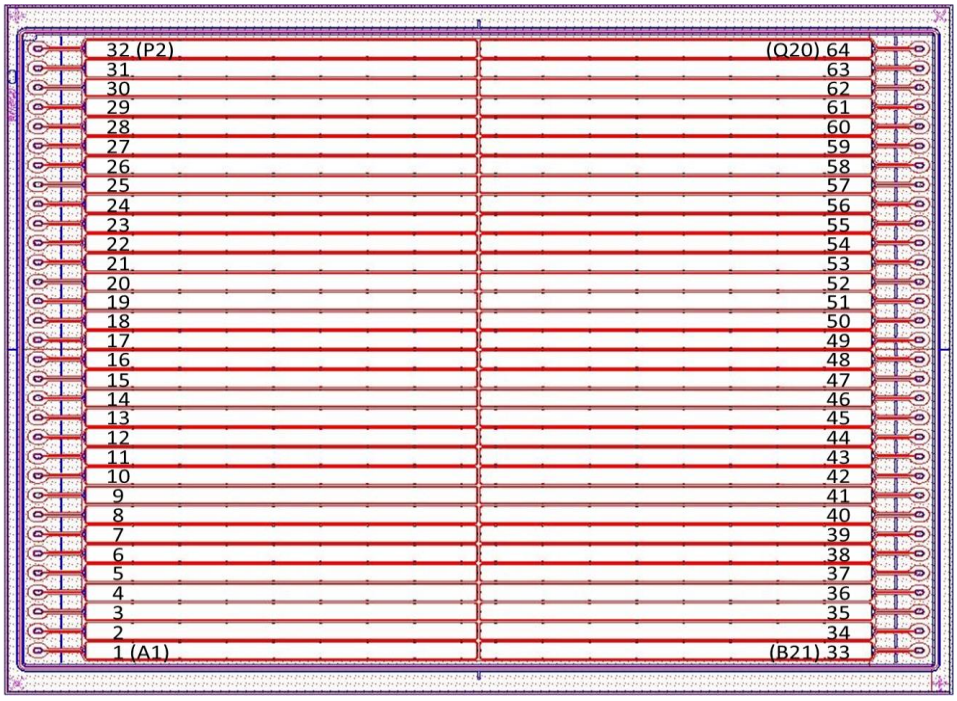


Dark current as fct of reverse bias

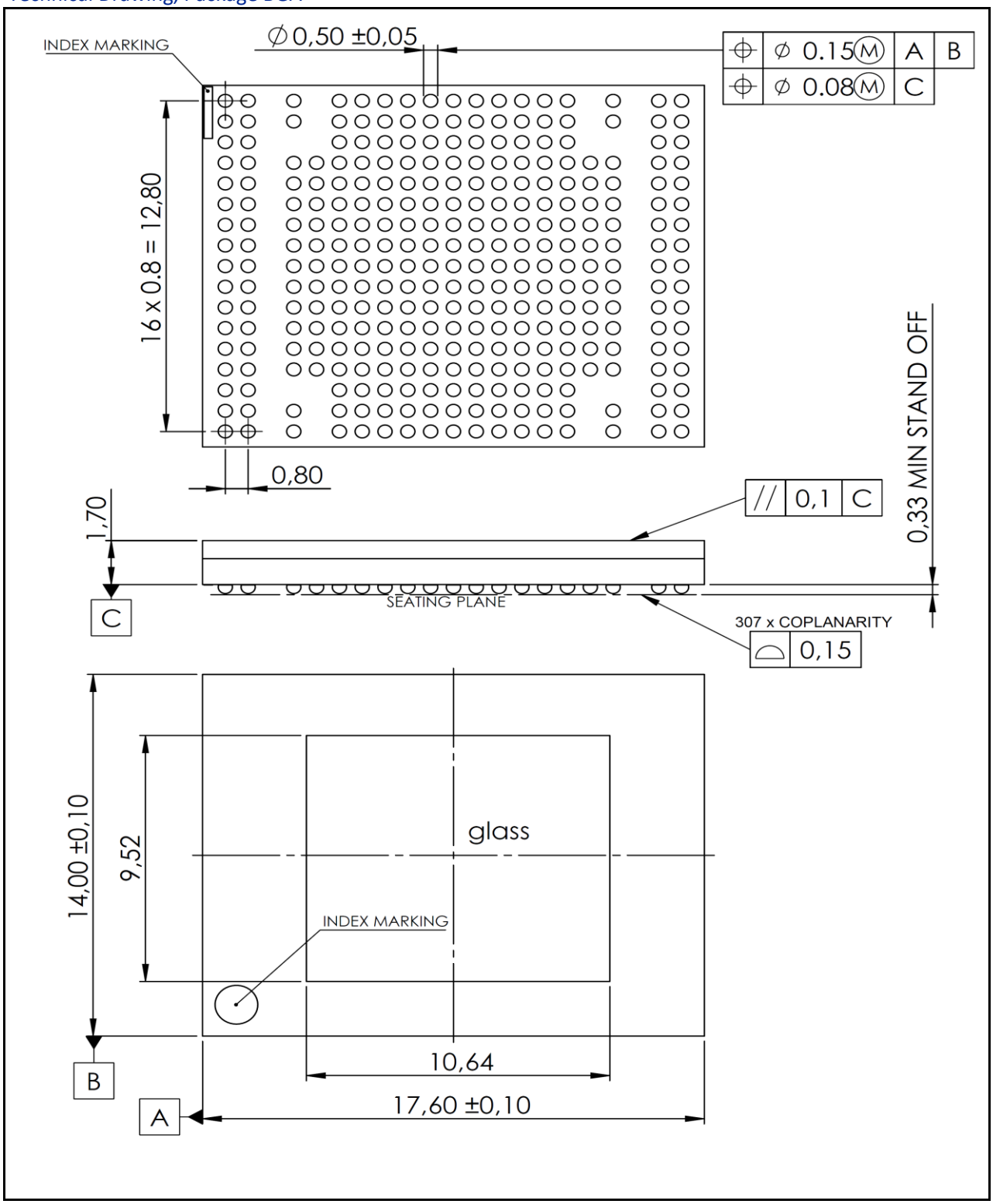


**** Illumination with 10 nW optical power

Chip drawing 64AA1.2-9



Technical Drawing, Package BGA



Pinning (top view)

	1	2	3	4	5	6-9	10	11	12	13-16	17	18	19	20	21
Q	G	Gnd		A		n.c.	n.c.	n.c.	n.c.	n.c.		A		C64	C63
P	C31	C32		A		n.c.	n.c.	n.c.	n.c.	n.c.		A		C62	C61
O	C29	C30				n.c.	n.c.	n.c.	n.c.	n.c.				C60	C59
N	C27	C28		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C58	C57
M	C25	C26		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C56	C55
L	C23	C24		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C54	C53
K	C21	C22		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C52	C51
J	C19	C20		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C50	C49
I	C17	C18		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C48	C47
H	C15	C16		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C46	C45
G	C13	C14		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C44	C43
F	C11	C12		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C42	C41
E	C9	C10		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C40	C39
D	C7	C8		n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.	n.c.		C38	C37
C	C5	C6				n.c.	n.c.	n.c.	n.c.	n.c.				C36	C35
B	C3	C4		A		n.c.	n.c.	n.c.	n.c.	n.c.		A		C34	C33
A	C1	C2		A		n.c.	n.c.	n.c.	n.c.	n.c.		A		Gnd	G

A	Anode
C	Cathode
n.c.	not connected
Gnd	Ground
G	Guard (It is recommended to connect only one guard contact and to connect it by 33 kOhm against ground potential, see "application-note-apd-array.pdf")

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"