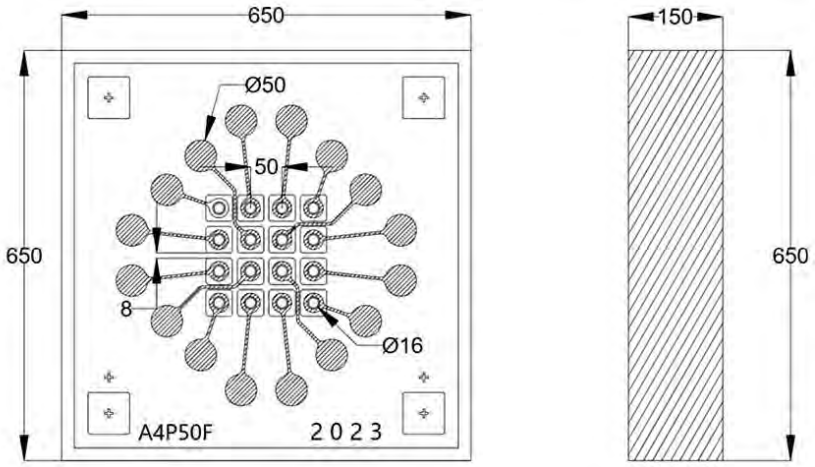
1550nm 4x4 Geiger-mode APD small array chip



Description:

InGaAs and InGaAsP single-photon avalanche diode (SPAD) chips with 4×4 and 8×8 array specifications are dedicated chips for short-wave infrared single-photon detection, counting and imaging. In the Geiger working mode, each pixel of the chip operates independently and freely, and is mainly used to detect weak light signals in the near-infrared band range of 0.9~1.7μm and 0.95~1.25μm.

Features:

- Spectral response band 0.9~1.7μm and 0.95~1.25μm are optional
- Pixels run independently and freely
- Pixel can detect weak photon signals
- High detection efficiency

Application

- Range measurement through fog, haze, smoke and dust
- Near infrared laser warning
- Long-distance light ranging
- Long distance space laser communication

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E/O Characteristics

Parameter/Symbol		Test Condition	Min.	Max.	Unit
Unit DC Characteristics Tc=23±2℃	Breakdown Voltage，Vbr	Id=10μA	50	80	V
	Responsivity，Re	λ=1.55μm/1.06μm, Vr=Vbr－2V, Φe=1μW	7.5		A/W
	Dark Current，Id	Vr=Vbr－2V, Φe=0μW		1	nA
	Capacitance，Ctot	Vr=Vbr－2V, f=1MHz		0.25	pF
	Temperature Coefficient of Breakdown Voltage，η	Top = －40~＋30℃, I=10μA, Φe=0		0.15	V/℃
	Breakdown Voltage Consistency，ΔVbr	Id=10μA		0.05	V

Parameter/Symbol		Test Condition	Chip Module			
			A4P50F-1550	A4P50F-1064	A4(8)P100F-1550	A4(8)P100F-1064
Unit Geiger characteristic Top=－20℃	Photon detection efficiency，PDE	0.1ph/pulse，λ=Response peak wavelength	≥ 20%			
	Normalized dark count rate*，DCR	fg=100MHz, PDE=20%	≤ 10kHz	≤ 5kHz	≤ 10kHz	≤ 5kHz
	Afterpulse probability，APP	fg=100MHz, PDE=20%	≤ 2.5%	≤ 2%	≤ 2.5%	≤ 2%
	Crosstalk probability，Pxt	fg=100MHz, PDE=20%	≤ 20%		≤ 10%	

*Supports customization for special applications：DCR＜1kHz @0℃ or APP＜0.5% @0℃

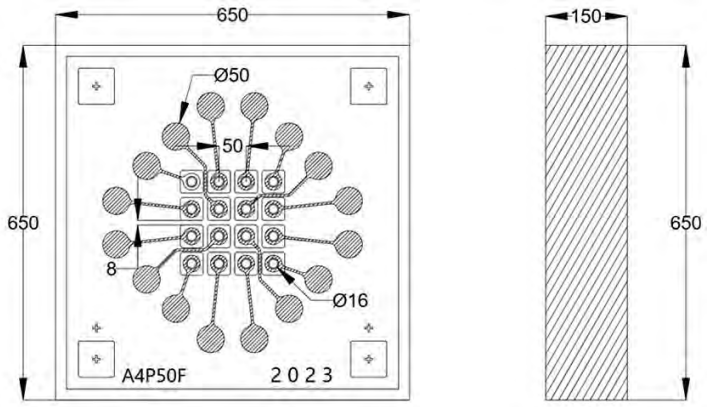
Absolute Maximum Ratings

Items	Parameter/Symbol	rated value
Absolute maximum rating	storage temperature，Tstg	- 50℃~ + 85℃
	(operating) ambient temperature，Tc	- 50℃~ + 80℃
	Solder temperature，Tsld（Time）	260℃（10s）
	DC reverse bias voltage，Vr	Vbr
	Overbias Pulse Amplitude，Vg	10V
	Input optical power，Φe（Continuous ）	1mW
	Forward current，If（Continuous ）	1mA
	Electrostatic Discharge Sensitivity，ESD	≥300V

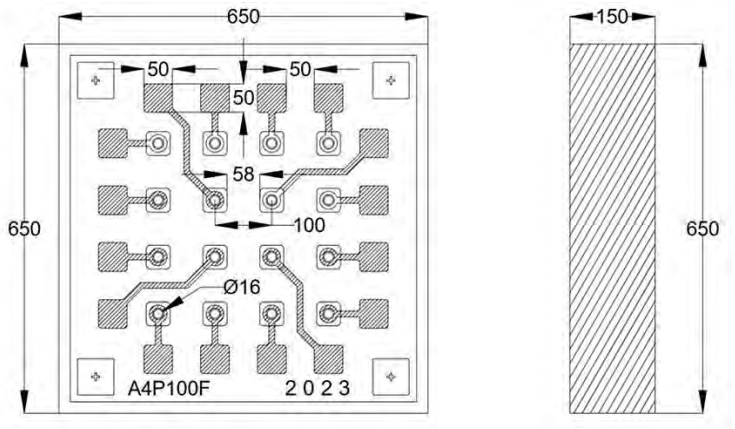
Chip Structure

Chip Module	A4P50F-1550/-1064	A4P100F-1550/-1064	A8P100F-1550/-1064
Array size	4×4		8×8
pixel size	50μm×50μm	100μm×100μm	100μm×100μm
Active area size	Φ16μm		

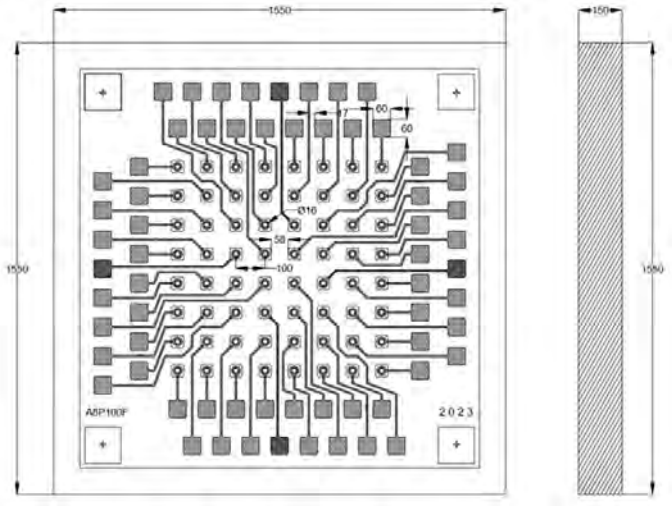
Outline Diagram and Die Dimensions



Schematic diagram of the structure of the 50μm pixel pitch 4×4 array chip A4P50F



Schematic diagram of the 100μm pixel pitch 4×4 array chip A4P100F



Schematic diagram of the structure of the 8×8 array chip A8P100F with a pixel pitch of 100 μm

Quality reliability: The product meets the requirements of Telcordia-GR-468-CORE for product reliability.