Arrays 1,7µm InGaAs Avalanche Photodiode

for Geiger Mode Operation, Single Photon Detection

Back-Illuminated 2x2, 4x4, 1x16 Pixels, 800nm – 1700nm

Stand 2026

Description

Our back-illuminated single photon 1,7µm InGaAs Avalanche Photodiode designed for Geiger-Mode operation includes 2x2, 4x4 and 1x16 element arrays – and other models. The pixel spacing is 50µm adopting a back-illuminated structure and an integrating microlens on the back to improve the effective duty cycle. This meets the prerequisites for applications like Spatial Light Transmission, Spatial Single Photon and Low Light Level Detection etc.

Features

- Back illuminated planar APD
- Low Voltage Operation
- Very Low Dark Current
- Competitive Prices
- BARE DIE
- High Operational Frequency Range
- Large Active Area
- Spectral Range between 800nm to 1700nm
- Competitive Lead Times
- Custom Design or Customer Carrier

Applications

- Distance Measurement
- Eye Safe Range Finder
- OTDR
- Spatial light Transmission
- Low Light Level Detection
- Optical Communication

Electro-Optical Characteristics & Specifications

T(ambient) @ +25°C

Parameter	Condition	Min	Typ	Max	Unit
Active area	dia	45	48	50	µm
Spectral Range	V_R 0V	900		1650	nm
Spectral Peak	V_R 0V		1550		nm
Responsivity	λ_p 1,55µm, Ev 10µW, Vbr-2V	8	8,5		A/W
Temperature Coefficient	Vbr, λ_p 1,55µm, Ev 10µW		0,1	0,15	v / °C
Response Time	f 1MHz, R_L 50Ω		1		ns
Dark Current	Vbr – 2 V		1	10	nA
Reverse Breakdown Voltage	I_R 10µA	40	70	90	V
Junction Capacitance	$VR=V_{BR}$-2V, F 1M		0,2	0,5	pF
Operating Voltage			$0,9*V_{BR}$		V

Absolute Maximum Ratings

T(ambient) @ +25°C

Parameter	Condition	Min	Typ	Max	Unit
Operating Temperature		-40		+ 85	°C
Storage Temperature		-50		+100	°C

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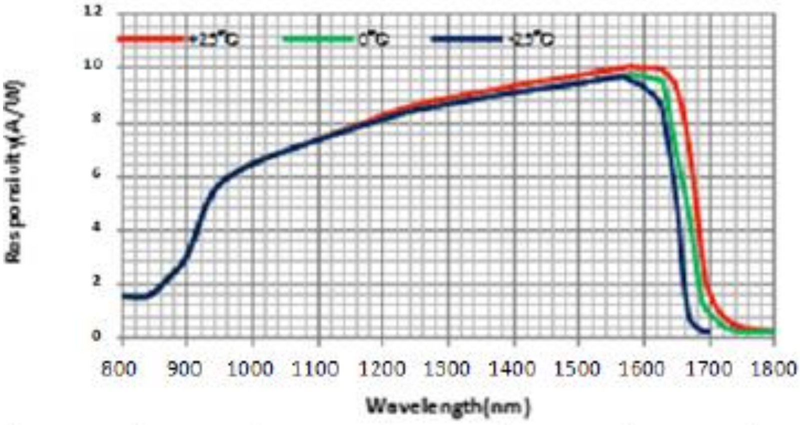
Single Photon Characteristics & Specifications

T(ambient) @ +25°C

Parameter	Condition	Min	Typ	Max	Unit
Active area	dia	45	48	50	µm
Photon Detection Efficiency	Top -30°C, 1,55µm, 0,1 ph/pulse	20			%
Dark Count Rate	Top -30°C, 1ns, 100 MHz gated mode			20	kHz
After Pulsing Probability	100ns, Top -30°C, 1,55µm 0,1 ph/pulse			4	%
Timing Jitter	Top -30°C, 1ns, 100MHz gated mode, PDE 20%		2		ps
Neighboring Pixel Crosstalk Probability	Top -30°C dark count statistics at Vex corresponding to PDE 20%			20	%

REMARK: Single photon detection characteristics are closely related to the quenching circuitry and test conditions!

Spectral Response @ M 10

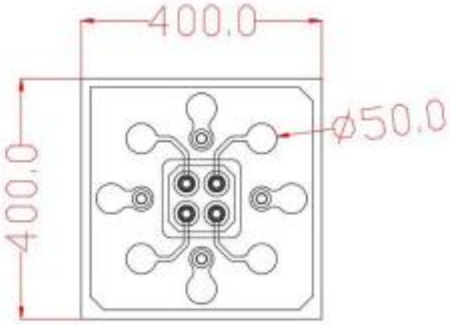
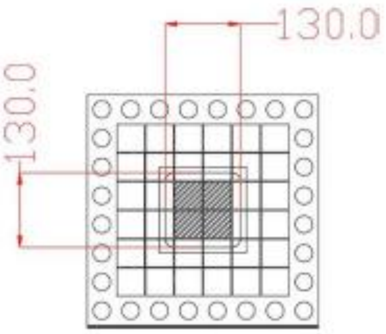
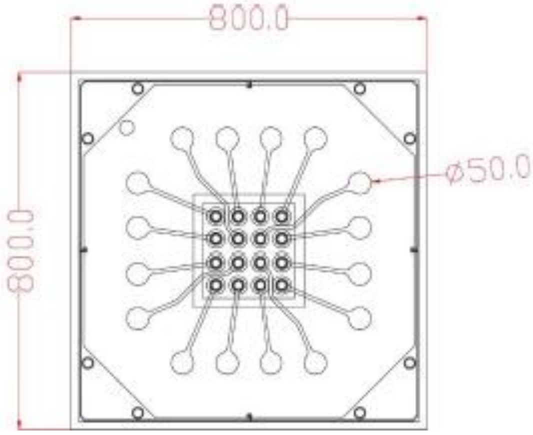
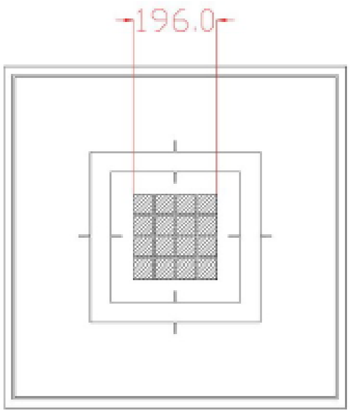
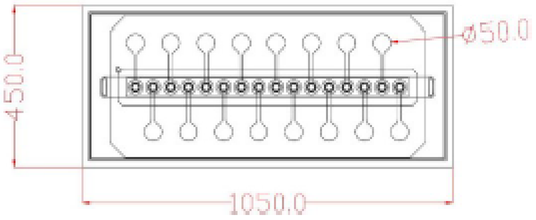
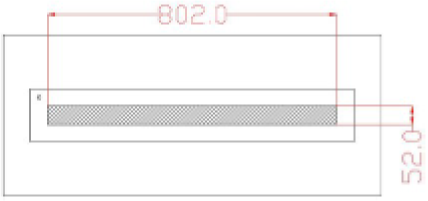


Bare Die Dimensions

Part-Number	Pixel Number	Chip Dimensions	Chip Thickness	Back Side Micro Lens Features	Unit
GM400-4B	2 x 2	400 x 400	200	48 x 48, R137	µm
GM800-16B	4 x 4	800 x 800	200	48 x 48, R137	µm
GM4501050-16B	1 x 16	450 x 1050	200	48 x 48, R137	µm

REMARK: The chip dimension error is +,- 10µm, thickness is +,- 5µm, microlens size +,-2µm, radius curvature is +,- 12µm

Bare Die Layout

Part-Number	Pixel Number	Front Side View	Back Side View
GM400-4B	**2 x 2**		
GM800-16B	**4 x 4**		
GM4501050-16B			

The active areas are covered by metallic reflectors on the front side. The shadowed areas on the back side view are the photo-sensitive window. It is suggested to use a ceramic interposer with aperture to flip the chip for further packaging