Princeton Infrared Technologies

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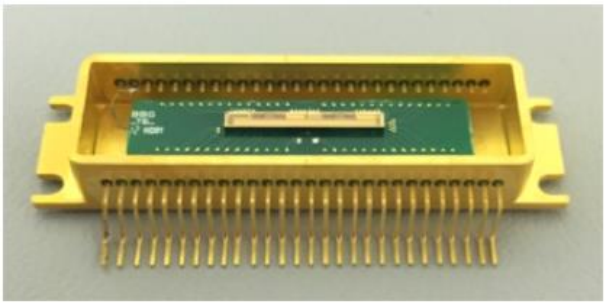
1024L1 Linear Array

1024x1x12.5µm InGaAs Linear Array

PIRT1024L1-12.5-T



The Princeton Infrared Technologies, Inc. InGaAs linear array is the best available imager for spectroscopy in the SWIR band!

The 1024L1 is a 1024x1 state of the art InGaAs linear array imager on 12.5µm pitch that was built for both spectroscopy and machine vision in the Short Wave Infrared Band. The 1024L1-12.5-T is an advanced digital array with the lowest read noise available <110e- for a 250µm tall pixel. Our new advanced SWIR On-chip Noise Suppression Circuit will enable some spectroscopic applications to see read noise levels <50e-. A single ROIC chip is used thus minimizing variation from output to output found on linear arrays with multiple ROICs. The chips have built in 14bit A/Ds that are designed for the system thus maximizing dynamic range and minimizing the noise while enabling 34klines/s at 1024 elements. Multiple full well capacities from 75ke- to 100Me- with 128steps are available to optimize the array for the signal levels. On chip optical pixel binning (where every other detector is disconnected from the ROIC thus signal is captured by neighboring pixels) is available by command to trade spectral resolution for increased signal level. Pixel skipping or binning is also available allowing for 48klines/s at 512 resolution on the same imager.

This lattice matched InGaAs array is backside illuminated enabling detection from 0.4 to 1.7µm with no bond pads or wires in the way of your signal and minimize stray reflections found in front side illuminated arrays with many wire bonds near the active imaging area. The array can be customized to allow optical filters to be placed on the active detector area something that is nearly impossible in front side illuminated devices.

Arrays standardly come in a 56pin J-wing package with a single stage TEC but we can provide no TEC packages as well as arrays on submounts. Please contact you PIRT representative for more details.

Features

- **1024x1 resolution**
- **Small 12.5µm pitch**
- **250µm tall pixel**
- **<110e- read noise**
- **SWIR On Chip Noise Suppression Circuit**
- **Response from 0.4-1.7µm (Backside Illuminated)**
- **QE>75% from 1-1.6µm**
- **14 bit A/D on chip**
- **>6000:1 dynamic range**
- **75ke- to 100Me- full well**

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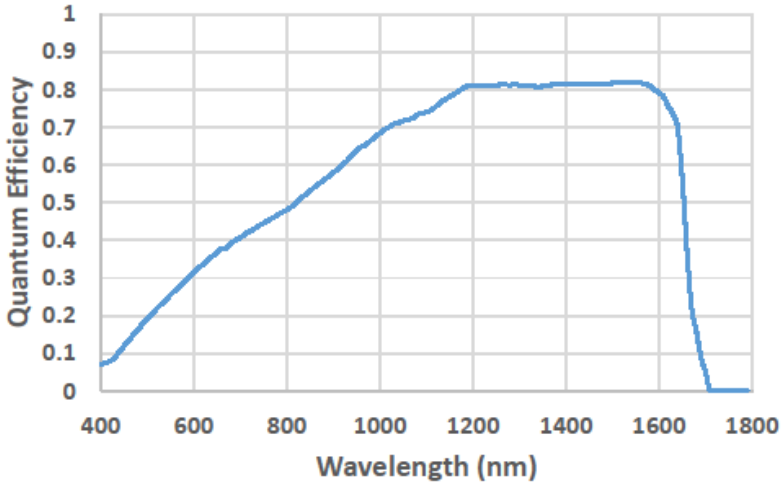
Quantum Efficiency Curve at 25C



Parameter	Unit	Min	Typical	Max	Comments
Resolution	pixels	512x1	1024x1		Pixel skipping/Optical Binning
Pixel Pitch	µm		12.5	25	Pixel skipping/Optical Binning
Pixel Height	µm		250		Custom sizes available
Full Well	e-	75k		100Me-	Adjustable by 128 steps
Line Rate 1024x1 512x1	klines/s			32 48	
Data output	Bits	14			
Quantum efficiency	e-/photon		0.75		Using 1.5um light Full QE chart Above
Fill Factor	%	99	100		
Responsivity	µm	0.4		1.68	At 20C
Integration time	s	1e-5		>10	At 20C
Dark Signal Rate	ke-/s		500	2400	At 20C
Read Noise 75ke- full well 100Me- full well	e- /(scan)$^{1/2}$	<50	 90 14800	 110	At 20C
Inoperable Pixels	%		0	1	
Photoresponse Non-Uniformity	%		3	6	At 25C
Operating Range	◦C	-40		75	
Power	mW		<110		TEC Off

Mechanical Package- 56 pin J-lead package (Also available on Ceramic Only)