Princeton Infrared Technologies

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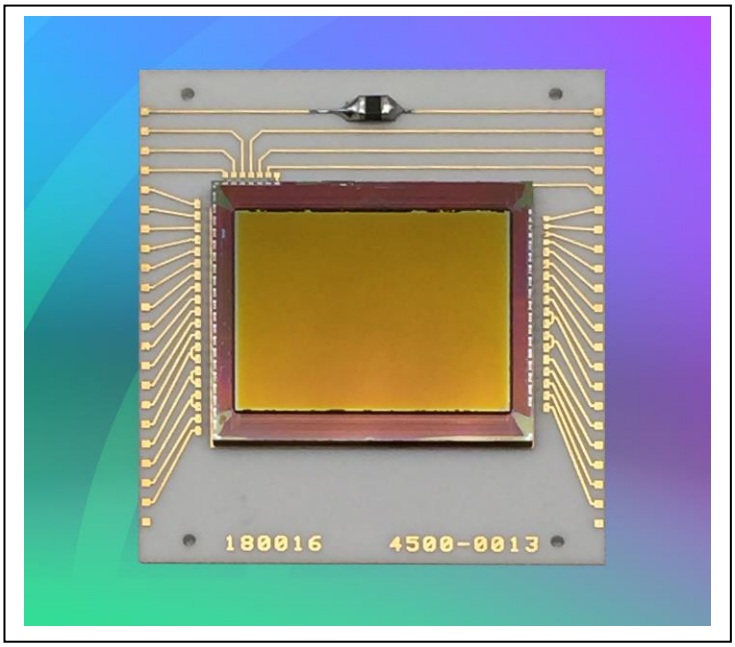
PIRT1280A1-12

InGaAs 1280x1024x12μm Focal Plane Array

Model # PIRT1280A1-InGaAs-1.7-01

The Princeton Infrared Technologies, Inc. PIRT1280A1 series is the highest frame rate megapixel SWIR imager available anywhere!



This lattice matched InGaAs 2D focal plane array (FPA) allows for high resolution SWIR imaging at high frame rates >90 frames per second (fps). This small pitch array, 12 μm, combined with the high quantum efficiency of the lattice matched InGaAs detector arrays enables impressive imaging in the SWIR and visible bands. Princeton Infrared Technologies, Inc. offers this low power array by itself on a ceramic submount or with a custom packaging. It is also incorporated in a set of camera electronics for a complete solution in our 1280SciCam.

This advance digital array offers 14 bit digital output with low read noise of <90e-. This combined with the low dark current InGaAs will enable high sensitivity imaging. The all-digital design enables simple integration to camera electronics. Lattice matched InGaAs provides high quantum efficiency response in the shortwave infrared as well as in the visible with response from 0.4 μm to 1.7 μm. Excellent in high speed machine vision applications as well as long range surveillance where the small pitch is advantageous.

Features

- **1280x1024 resolution**
- **Small 12 μm pitch**
- **Snapshot exposure**
- **No image lag**
- **Low power <150 mW**
- **High frame rate >90 fps at 1280x1024**
- **Response from 0.4-1.7 μm**
- **QE>75% from 1-1.6 μm**
- **14 bit A/D on chip**
- **Low Read Noise <90e-**
- **Integration times from 50 μs to >3 minutes**
- **High Dynamic Range >1000:1**

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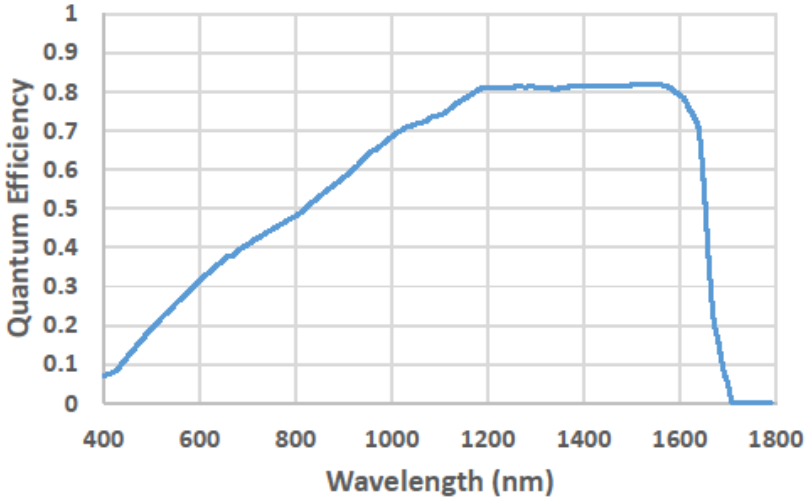
Quantum Efficiency Curve at 25°C



Parameter	Unit	Min	Typical	Max	Comments
Resolution	Resolution		1280x1024		
Pixel Pitch	µm		12		
Full Well	ke-	35	50	65	
Frame Rate 1280x1024 512x512	Frames/second		 95 387		
Data output	Bits	14			LVDS
Quantum efficiency	Electron/photon		0.75		Using 1.5 µm light See full QE chart below
Fill Factor	%	99	100		
Responsivity	µm	0.4		1.68	At 25°C
Integration time At 25C At 0C At -50C	seconds	 5e-6 5e-6 5e-6		 0.080 1.010 143.0	Max integration time for half the full well at max dark signal at the given temperature
Dark Signal Rate	ke-/s		40	250 0.160	At 25°C At -50°C
Read Noise	e- (RMS)		75	90	At 25°C
D*	cm-√Hz/W		$1.3x10^{13}$		At 0°C, with 1.5um light at 16ms integration time
Inoperable Pixels	%			0.5	At 25°C
Non-Linearity	%			+/-1	Across 98% of dynamic range
Power	mW			<200	

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