

SU1024LE-1.7

InGaAs Linear Photodiode Array

Now available in machine vision and spectroscopy formats, the high-resolution LE-series linear InGaAs photodiode arrays have set the standard for high performance. Other applications include industrial process control and inspection in agricultural sorting, biomedical analysis and thermal imaging.

SUI produces LE InGaAs array products with 1024 elements on 25 μm channel spacing and a pixel height of 25 or 500 μm for standard 0.8 to 1.7 μm arrays. Anti-blooming protection prevents charge flow from saturated pixels, allowing for increased intra-scenic dynamic range. These channels are >99% operable and have unmatched uniformity. The photodetector arrays are hybridized with CMOS readout integrated circuits (ROIC) of SUI's exclusive design to offer maximum noise immunity and sensitivity.

Operating circuit designs need only provide for one analog supply and two digital control lines for optimum ROIC performance. Two separate gains are selectable with a single input. Arrays are available with thermoelectric coolers for temperature stabilization and monitoring. SUI LE-Series photodiode arrays are reliable and available in volume.

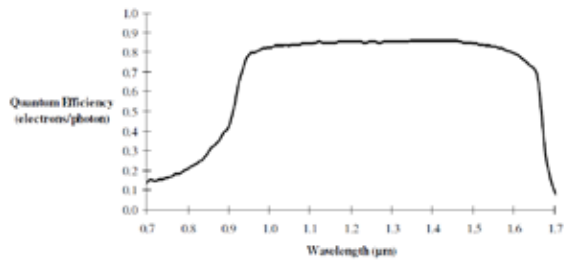
FEATURES

- Operating wavelength range 0.8 μm – 1.7 μm
- Up to 107 pixels per second read-out
- 1.3 x 10⁸ electrons full-well capacity
- Antiblooming protection
- Pixel heights of 25 μm or 500 μm
- Serial input for mode control
- Integrate-while-read for minimum overhead

BENEFITS

- Room temperature stabilized
- Reduced fixed pattern noise
- ESD resistant
- Easy to use
- Large collection area for spectroscopy, square pixel for machine vision

SPECTRAL RESPONSE FOR SU1024LE-1.7



ELECTRICAL INPUTS

Parameter/Description	Unit	Min.	Typical	Max.
V _{DD} /Analog supply voltage	V	4.90	5.00	5.25
V _{SS} /Analog supply ground	V		0	
V _{CLK} /Digital pixel clock	V		Hi: V _{DD} Low: V _{SS}	
V _{LSYNC} /Digital exposure control	V		Hi: V _{DD} Low: V _{SS}	
V _{CAP} /Digital gain control	V		Hi: V _{DD} Low: V _{SS}	

PERFORMANCE CHARACTERISTICS

Parameter	Unit	Min.	Typical	Max.
Peak wavelength sensitivity (λ_{pk})	μm		1.5	
Responsivity (at λ_{pk}) ²	nV/photon	10.5		
Photoresponse nonuniformity (PRNU)	+/- %		5	10
Quantum efficiency (QE)	%	70		
Non-linearity of response	%			1
Gain	nV/electron		400 ¹ , 15.4 ²	
Saturation charge	Me		5 ¹ , 130 ²	
Readout noise	Electrons rms		800 ¹ , 10,000 ²	
Dark rate ²	V/s		0.2 ^{2,3} 0.06 ^{2,4}	0.25 ^{2,3} 0.5 ^{2,4}
Sensor dynamic range	ratio		6250:1 ¹ 13000:1 ²	
Readout rate per port	MHz	0.01		2.5
Inoperable pixels	%			1

¹High-sensitivity mode: high gain capacitor

²High dynamic range mode: low gain capacitor

³25 micron pixel height

⁴500 micron pixel height