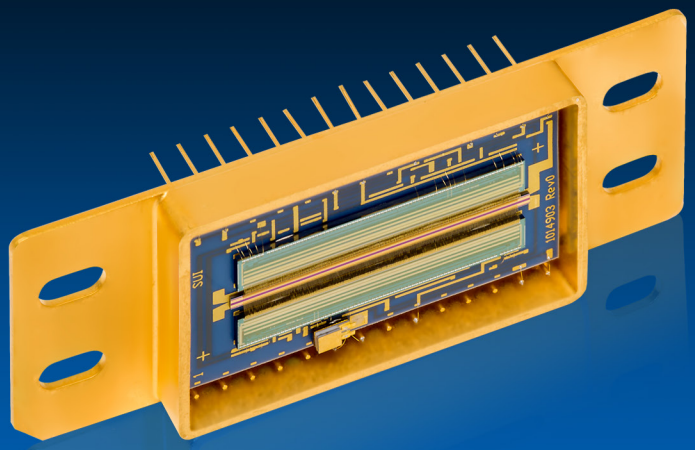
SENSORS UNLIMITED



LE/LSE Series

InGaAs Linear Photodiode Arrays

Now available in machine vision and spectroscopy formats, the high-resolution LE/LSE 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/LSE InGaAs array products with 512 and 1024 elements on a 25µm or 50µm pixel pitch with pixel heights of 250 and 500 µm. Standard wavelength range of 0.8 to 1.7 µm or extended wavelength range of 1.1 to 2.2 µm. 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.

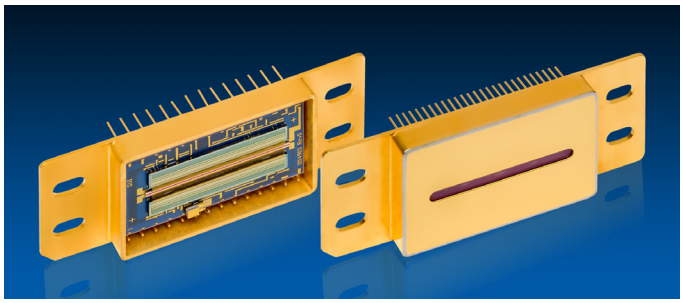
Operating circuit designs need only provide for one analog supply and two digital control lines for optimum ROIC performance. Two separate gains are selectable with a single input. Arrays are available with 1 or 2 stage thermoelectric coolers for temperature stabilization and monitoring.

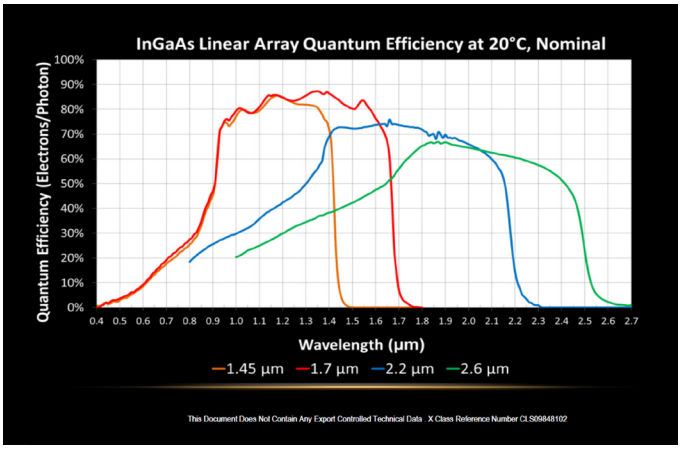
FEATURES

- Easy to use analog design
- Wavelength ranges of 0.8 to 2.2 µm
- Pixel heights of 250 µm or 500 µm
- 25 µm or 50 µm pitch – One inch array
- Two separate gains are selectable with a single input
- Max Ips 1.25KHz - Analog Output
- Antiblooming to prevent charge overflow from saturated pixels
- Available with 1 or 2 stage thermoelectric cooler, or without a cooler for uncooled or externally-cooled operation.
- ESD Resistant

SENSORS UNLIMITED

Model No: LE/LSE Series





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
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]	
Sensor dynamic range	ratio		6250:1 [1] 13000:1 [2]	
Readout rate per port	MHz	0.01		2.5
Inoperable pixels	%			1

[1] High-sensitivity mode: high gain capacitor
[2] High dynamic range mode: low gain capacitor

LINEAR ARRAY COMPARISON TABLE (Representative Values)

Material type	Dark Current	50% QE Cut-on λ (µm)	50% QE Cut-off λ (µm	Peak λ (µm)
1.45 µm	1.3 Pa	0.91	1.415	1.17
1.7 µm	2.3 pA	0.91	1.65	1.36
2.2 µm	10 nA	1.3	2.155	1.67
2.6 µm	100 nA	1.64	2.41	1.84

SENSORS UNLIMITED

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