



LC-Series

Extended Wavelength InGaAs Linear Photodiode Arrays

The high-sensitivity LC-series linear InGaAs photodiode arrays are designed for broad wavelength range, multi-channel spectrometer designs. The proprietary readout integrated circuit design contains functions that reduce dark current for applications that demand the highest performance. The LC package provides a “no moving part” solution for vibration resistant, highly calibrated instruments that require long term stability.

The LC series InGaAs linear arrays are available with 256 elements of extended response InGaAs material. Anti-blooming protection prevents charge flow from saturated pixels, allowing for increased intra-scenic dynamic range. The autozero function reduces dark current and non-uniformity, extending the detector’s utility to higher temperatures and longer exposure times.

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 three digital control lines for optimum ROIC performance. Four separate gains are selectable with a serial input. The array is available with a two-stage thermoelectric cooler for temperature stabilization and monitoring. SUI LC-Series photodiode arrays are rugged, reliable, and available in volume.

FEATURES

- Autozero reduction of pixel variation & dark current
- Wavelength range of 1.0 μm to 2.6 μm
- Line rates up to 18.9 klps with 1 ADC and 5 MHz clock in Autozero mode
- Full Well capacity options from 1.25 to 250 M-electrons
- Antiblooming protection
- Serial input for mode control
- Integrate-while-read for minimum overhead

APPLICATIONS

- FTIR/NIR Interferometry
- NIR Spectroscopy
- Biomedical Analysis
- Plastic Recycling
- Industrial Process Control

ELECTRICAL INPUTS				
Parameter/Description	Unit	Min.	Nom.	Max.
Power supply voltage V_{DD}	V	4.90	5.00	5.25
Power supply ground V_{SS}	V		0	
Digital inputs and clocks, high	V	2.0	5.0	V_{DD}
Digital inputs and clocks, low			V_{SS}	0.8
Pixel clock frequency	MHz	0.01		12.5

PIXEL PERFORMANCE				
Feedback Capacitor	Typical Gain	Typical Capacity	Typical Read noise ¹	Typical Dynamic Range
0.1 pF	1.6 μ V/e	1.25 Me	800 e RMS	1700:1
1.0 pF	160 nV/e	12.5 Me	1 ke RMS	4300:1
10.0 pF	16 nV/e	125 Me	10 ke RMS	5000:1
20.0 pF	8 nV/e	250 Me	10 ke RMS	5000:1

¹ Largest photodiode, autozero off.

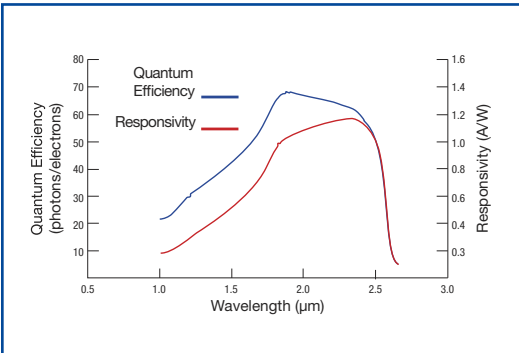
PHOTODIODE PERFORMANCE AT -20°C	
Photodiode type	2.6 μ m, 250 μ m
Quantum efficiency (QE) at peak, min.	50%
Dark current, autozero off, max.	2nA
Inoperable pixels, maximum	5%
Photoresponse nonuniformity (PRNU), max.	\pm 10%

ABSOLUTE MAXIMUM RATINGS				
Parameter	Unit	Min.	Typ	Max.
Power consumption (V_{DD} =5.00 V), 4 outputs, high power mode	mW			350
Power consumption (V_{DD} =5.00 V), 1 output, low power mode	mW			135
Operating temperature range	°C	-20		+80
Storage temperature range	°C	-20		+85

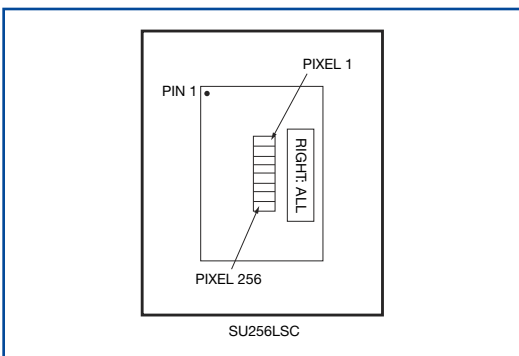
AVAILABLE CONFIGURATION	
Configuration	SU256LSC-2.6T2-0250
Photodiodes	256
Outputs	1, 2, 4
Material	2.6 μ m
TEC	Two-stage
Aperture	250 μ m



SPECTRAL RESPONSE at 20°C



CONFIGURATION



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