The high-speed LC/LSC 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/LSC Series InGaAs linear arrays are available with 256, 512 and 1024 elements on a 25µm or 50µm pixel pitch with pixel heights of 25, 250 and 500 µm. Standard wavelength range of 0.8 to 1.7 µm, a shorter range of 0.8 to 1.45 µm or extended wavelength range of 1.1 to 2.2 µm and 1.1 to 2.6 µm is available. Anti-blooming protection prevents charge flow from saturated pixels, allowing for increased and 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 one or two-stage thermoelectric cooler for temperature stabilization and monitoring. The SUI LC/LSC Series photodiode arrays are rugged, reliable, and available in volume.

**FEATURES**

- Autozero reduction of pixel variation and dark current
- Wavelength ranges of 0.8 to 2.6 µm
- Max lps 91KHz (LC); Max lps 15.5KHz (LSC)
- 4 Full Well capacity options
- 25 µm or 50 µm pitch – One inch or one-half inch array
- Pixel heights of 25 µm, 250 µm or 500 µm
- Anti-blooming to prevent charge overflow from saturated pixels
- Digital serial input for mode control
- Selectable bandwidth circuit
- ESD Resistant
- Integrate-while-read for minimum overhead

Model No: LC/LSC SERIES
PHOTODIODE PERFORMANCE AT -20°C

- Photodiode type: 2.6 µm, 250 µm
- Inoperable pixels, maximum: 5%
- Photoresponse nonuniformity (PRNU), max.: ±10%

PIXEL PERFORMANCE

- Feedback Capacitor
  - Typical Gain
  - Typical Capacity
  - Read noise
  - Dynamic Range

<table>
<thead>
<tr>
<th>Feedback Capacitor</th>
<th>Typical Gain</th>
<th>Typical Capacity</th>
<th>Read noise</th>
<th>Dynamic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 pF</td>
<td>1.6 µV/e</td>
<td>1.25 Me</td>
<td>800 e RMS</td>
<td>1700:1</td>
</tr>
<tr>
<td>1.0 pF</td>
<td>160 nV/e</td>
<td>12.5 Me</td>
<td>1 ke RMS</td>
<td>4300:1</td>
</tr>
<tr>
<td>10.0 pF</td>
<td>16 nV/e</td>
<td>125 Me</td>
<td>10 ke RMS</td>
<td>5000:1</td>
</tr>
<tr>
<td>20.0 pF</td>
<td>8 nV/e</td>
<td>250 Me</td>
<td>10 ke RMS</td>
<td>5000:1</td>
</tr>
</tbody>
</table>

1 Largest photodiode, autozero off.

LINEAR ARRAY COMPARISON TABLE (Representative Values)

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

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