Raytheon
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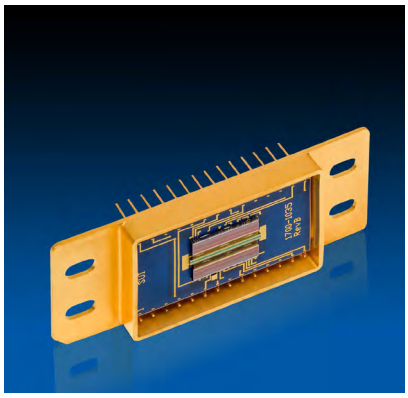
# Sensors Unlimited: LDB/LSB Series



## InGaAs linear photodiode arrays

Easy to use, analog LDB/LSB Series InGaAs photodiode arrays for high performance in NIR spectroscopy and imaging applications.

### BENEFITS

- 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 – 1/2 and 1/4 inch array
- Two separate gains are selectable with a single input
- Maximum lps 1.25KHz – analog output
- Anti-blooming to prevent charge overflow from saturated pixels
- Available with one- or two-stage thermoelectric cooler or without a cooler for uncooled or externally cooled operation
- ESD resistant

The LDB/LSB Series of linear InGaAs photodiode arrays are ideal for monitoring optical performance across S, C, and L band channels in DWDM networks. They also serve in diverse applications such as agricultural sorting, biomedical analysis, thermal imaging, and industrial process control.

The LDB/LSB series are available with options of 256 and 512 elements, available on either a 25 µm or 50 µm pixel pitch, and with pixel heights of 250 µm and 500 µm. The arrays support various wavelength ranges: a standard range of 0.8 to 1.7 µm, a shorter range of 0.8 to 1.45 µm, or an extended range of 1.1 to 2.2 µm. These photodetector arrays are integrated with SUI's proprietary CMOS readout integrated circuits (ROIC), designed to maximize noise immunity and sensitivity.

Operating these arrays requires minimal circuitry, with only one analog supply and two digital control lines needed for optimal ROIC performance. The arrays offer selectable gains through a single input. Optionally, they can be equipped with thermoelectric coolers for temperature stabilization and monitoring.

### Applications

- Optical performance monitoring of S, C and L band channels in DWDM networks
- Agricultural sorting
- Biomedical analysis
- Thermal imaging
- Industrial process control
- Spectroscopy
- Telecommunications

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**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 | |
| **$V_{DP}$/amplifier dead potential** | V | | 3.25 | |
| **$V_{CLK}$/digital pixel clock** | V | | Hi: $V_{DD}$<br>Low: $V_{SS}$ | |
| **$V_{LSYNC}$/digital exposure control** | V | | Hi: $V_{DD}$<br>Low: $V_{SS}$ | |
| **$V_{CAP}$/digital gain control** | V | | Hi: $V_{DD}$<br>Low: $V_{SS}$ | |

**Absolute maximum ratings**

| Parameter/description | | Unit | Min. | Typical | Max. |
|---|---|---|---|---|---|
| **Power consumption ($V_{DD}$=5.00 V)** | LDB<br>LSB | mW<br>mW | | | 300<br>150 |
| **Operating temperature range** | | °C | -20 | | +70 |
| **Storage temperature range** | | °C | -40 | | +85 |

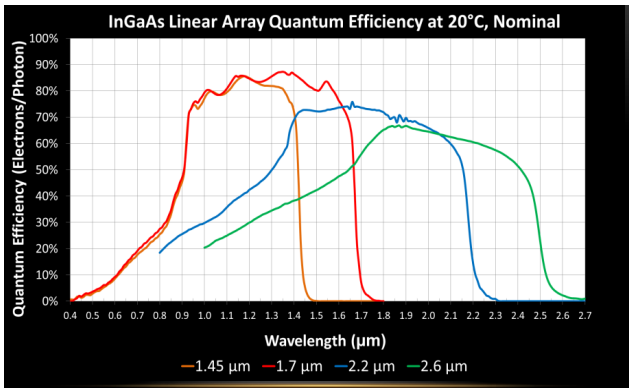
**Performance characteristics**

| Parameter | Unit | Min. | Typical | Max. |
|---|---|---|---|---|
| **Peak wavelength sensitivity (λpk)** | µm | | 1.5 | |
| **Responsivity (at λpk)** | nV/ photon | 10.5 | | |
| **Photoresponse nonuniformity (PRNU)** | % | | 5 | 10 |
| **Gain** | nV/ electron | | 4.00[1], 15.4[2] | |
| **Saturation charge** | pC | | 0.8[1], 20.8[2] | |
| **Readout noise** | Electron/ √scan | | 800[1], 10,000[2] | |
| **Pixel clock** | MHz | | | 1.25 |
| **Readout rate per output** | Mpix/ sec/ output | | | 2.5 |
| **Inoperable pixels** | % | | | 0 |

[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 |




Specifications subject to change without notice.

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