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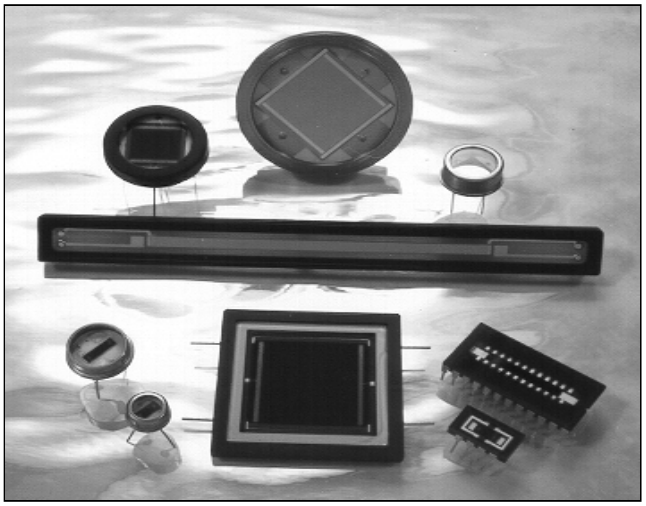
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# DUO-LATERAL, SUPER LINEAR PSD'S

## POSITION SENSING DETECTORS (PSD)



### APPLICATIONS

- Beam Alignment
- Position Sensing
- Angle Measurement
- Surface Profiling
- Height Measurements
- Targeting
- Guidance System
- Motion Analysis

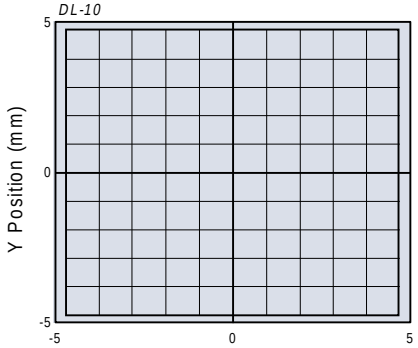
### FEATURES

- Super Linear
- Ultra High Accuracy
- Wide Dynamic Range
- High Reliability
- Duo Lateral Structure

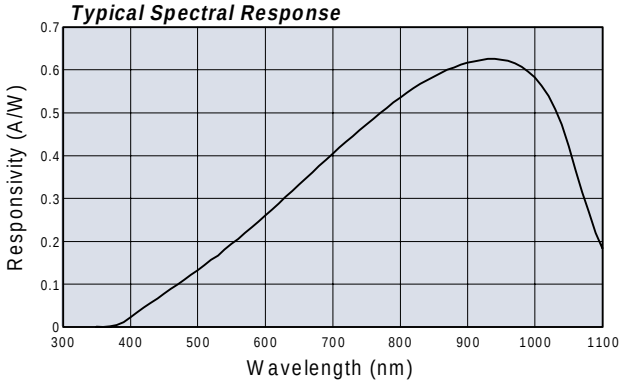
The Super Linear Position Sensors feature state of the art duo-lateral technology to provide a continuous analog output proportional to the displacement of the centroid of a light spot from the center, on the active area. As continuous position sensors, these detectors are unparalleled; offering position accuracies of 99% over 64% of the sensing area. These accuracies are achieved by duo-lateral technology, manufacturing the detectors with two separate resistive layer, one located on the top and the other at the bottom of the chip. One or two dimensional position measurements can be obtained using these sensors.
A reverse bias should be applied to these detectors to achieve optimum current linearity at high light levels. For position calculations and further details on circuit set up, refer to the "Photodiode Characteristics" section of the catalog.

The maximum recommended power density incident on the duo lateral PSDs are 1 mW / $cm^2$ . For optimum performance, incident beam should be perpendicular to the active area with spot size less than 1 mm in diameter.

***Typical Position Detectability***

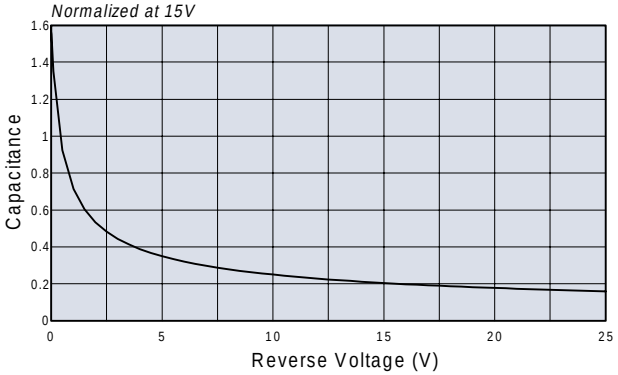



***Typical Spectral Response***



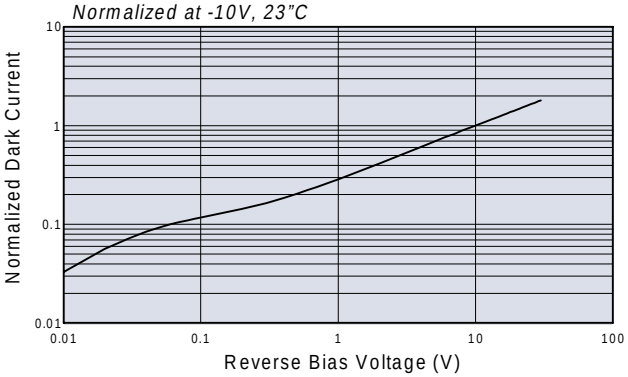

***Typical Capacitance vs Reverse Bias***

*Normalized at 15V*




***Typical Dark Current vs Reverse Bias***

*Normalized at -10V, 23°C*



| Model No. | Position Sensing Area | | Respon-sivity (A/W) | | Position Detection Error (µm) | Dark Current (nA) | | Capacitance (pF) | | Rise Time (µs) | Position Detection Drift (µm / ℃) | Inter-electrode Resistance (KΩ) | | Temp Range (℃) | | Package Style ¶ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area ($mm^2$) | Dimension (mm) | 670 nm | | Over 80% of Length 64% of Sensing Area | -15V, SL Series -5 V, DL Series | | -15V, SL Series -5V, DL Series | | 670 nm 50 Ω | | | | Operating | Storage | |
| | | | min | typ | typ | typ | max | typ | max | typ | typ | min | max | | | |
| **ONE-DIMENSIONAL SERIES METAL PACKAGE ($V_{BIAS}$=-15V)** | | | | | | | | | | | | | | | | |
| **SL3-1** | 3 | 3 X 1 | 0.3 | 0.4 | 3 | 5 | 50 | 3 | 7 | 0.04 | 0.06 | 15 | 80 | -10 ~ +60 | -20 ~ +80 | 38 / TO-5 |
| **SL5-1** | 500 | 5 X 1 | | | 5 | 10 | 100 | 5 | 9 | 0.10 | 0.10 | 20 | 100 | | | 39 / TO-8 |
| **ONE-DIMENSIONAL SERIES CERAMIC PACKAGE ($V_{BIAS}$=-15V)** | | | | | | | | | | | | | | | | |
| **SL3-2** | 3 | 3 X 1 | 0.3 | 0.4 | 3 | 5 | 50 | 3 | 7 | 0.04 | 0.06 | 15 | 80 | -10 ~ +60 | -20 ~ +80 | 45 / 8-pin DIP |
| **SL5-2** | 5 | 5 X 1 | | | 5 | 10 | 100 | 5 | 9 | 0.10 | 0.10 | 20 | 100 | | | |
| **SL15** | 15 | 15 x 1 | | | 15 | 150 | 300 | 15 | 25 | 0.60 | 0.10 | 60 | 300 | | | 46 / 24-pin DIP |
| **SL76-1** | 190 | 76 x 2.5 | | | 76 | 100 | 1000 | 190 | 250 | 14.00 | 1.4 | 120 | 600 | | | 47 / Special |
| **TWO-DIMENSIONAL SERIES METAL PACKAGE § ($V_{BIAS}$=-5V)** | | | | | | | | | | | | | | | | |
| **DL-2** | 4 | 2 sq | 0.3 | 0.4 | 30 | 30 | 600 | 10 | 30 | 0.25 | 0.20 | 5 | 25 | -10 ~ +60 | -20 ~ +80 | 36 / TO-8 |
| **DLS-2** | | | | | | 10 | 175 | 8 | 14 | | 0.40 | | | | | |
| **DL-4** | 16 | 4 sq | | | 50 | 50 | 1000 | 35 | 60 | 0.08 | 0.20 | | | | | |
| **DLS-4** | | | | | | 25 | 300 | 30 | 40 | | 0.40 | | | | | |
| **DL-10** | 100 | 10 sq | | | 100 | 500 | 5000 | 175 | 375 | 0.20 | 0.20 | | | | | 41 / Special |
| **DL-20** | 400 | 20 sq | | | 200 | 2000 | 12000 | 600 | 1500 | 1.00 | 0.40 | | | | | 34 / Special |
| **TWO-DIMENSIONAL SERIES CERAMIC PACKAGE § ($V_{BIAS}$=-5V)** | | | | | | | | | | | | | | | | |
| **DLS-10** | 100 | 10 sq | 0.3 | 0.4 | 100 | 50 | 400 | 160 | 200 | 0.20 | 0.2 | 5 | 25 | -10 ~ +60 | -20 ~ +80 | 35 / Ceramic |
| **DLS-20** | 400 | 20 sq | | | 200 | 100 | 1000 | 580 | 725 | 1.00 | 0.4 | | | | | |

The position temperature drift specifications are for the die mounted on a copper plate without a window and the beam at the electrical center of the sensing area.

§ The DLS Series are packaged with A/R coated windows and have a lower dark current than the DL series. Also available in the same package as DL-10. Specificy DL-10-1.

¶ For mechanical drawings please refer to pages 59 thru 71.

**NOTES:**

1. DL(S) series are available with removable windows.
2. Chip centering within – 0.010".

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