Stand 02.07.2018

Duo-Lateral, Super Linear PSD's

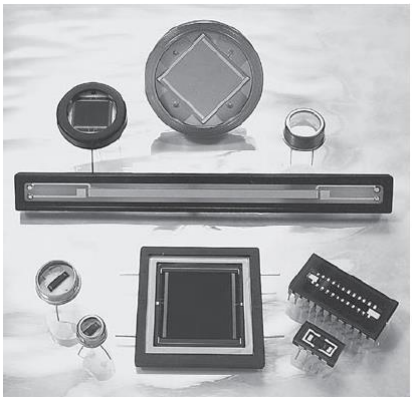
Position Sensing Detectors (PSD)

Features

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

Applications

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



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 1mm in diameter.

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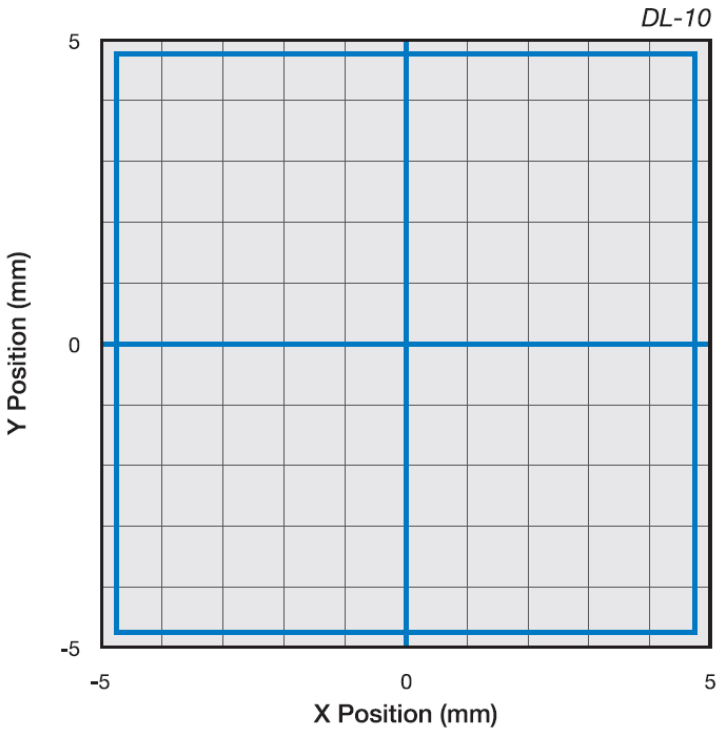
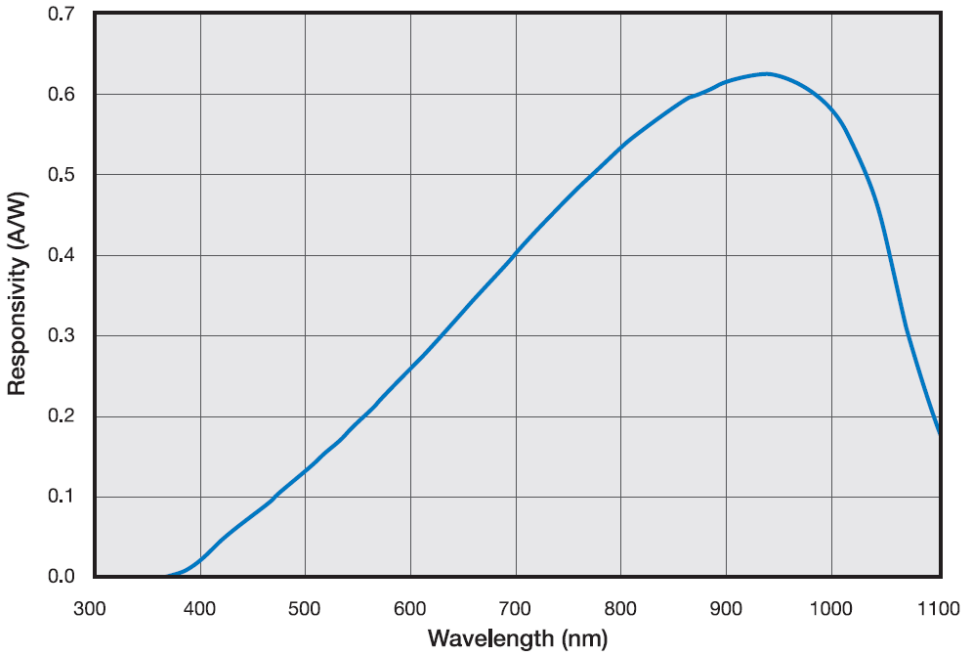
Typical Position Detectability



Typical Spectral Response



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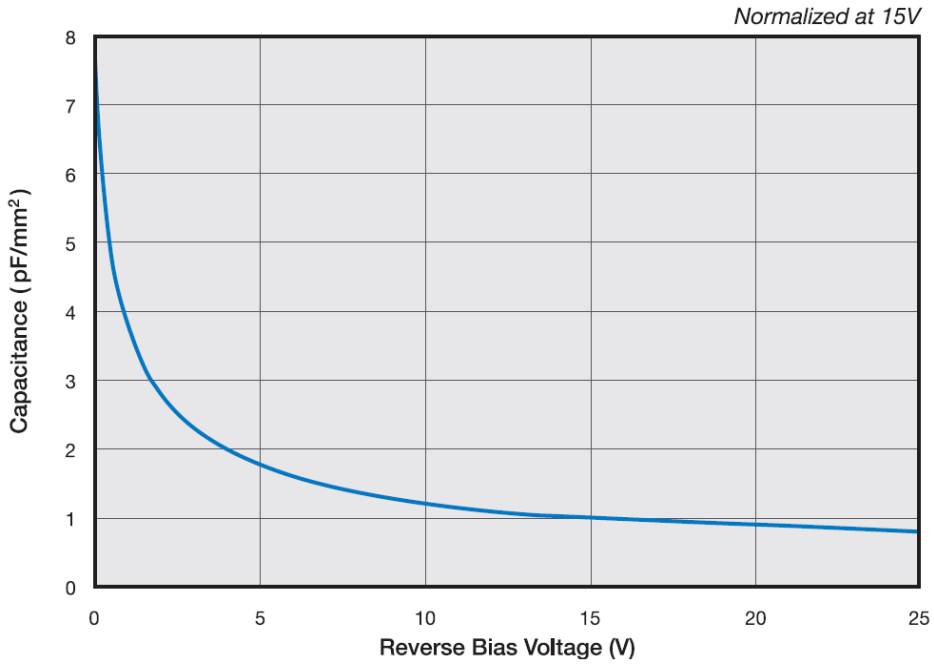
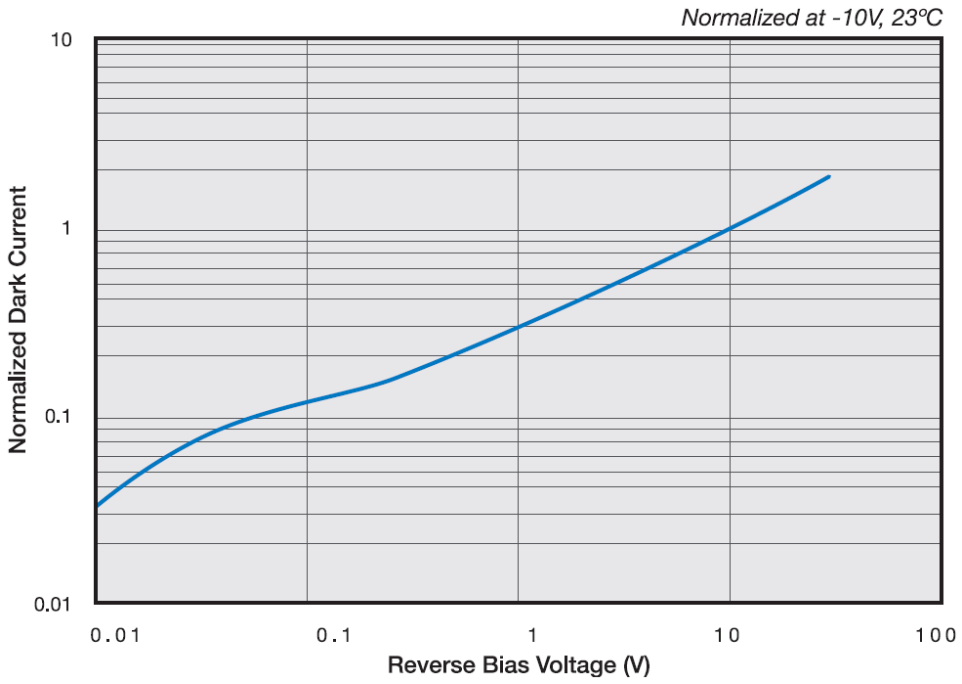
Typical Capacitance vs. Reverse Bias Voltage



Typical Dark Current vs. Reverse Bias



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Typical Electro-Optical Specifications (at T_A = 23°C)

Model Number	Position Sensing Area		Responsivity (A/W) 670nm		Position Detection Error (μm) Over 80% of length 64% of Sensing Area	Dark Current (nA) -15V, SL Series -5V, DL Series		Capacitance (pF) -15V, SL Series -5V, DL Series	
	Area (mm^2)	Dimensions (mm)	Min	Typ	Typ	Typ	Max	Typ	Max
One-Dimensional Series, Metal Package (V_{BIAS} = -15V)									
SL3-1	3	3 x 1	0.3	0.4	3	5	50	3	7
SL5-1	5	5 x 1			5	10	100	5	9
One-Dimensional Series, Ceramic Package (V_{BIAS} = -15V)									
SL3-2	3	3 x 1	0.3	0.4	3	5	50	3	7
SL5-2	5	5 x 1			5	10	100	5	9
SL10-1	20	10 x 2			10	200	500	20	30
SL15	15	15 x 1			15	150	300	15	25
SL30	120	30 x 4			30	150	1000	125	150
SL76-1	190	76 x 2.5			76	100	1000	190	250
Two-Dimensional Series, Metal Package § (V_{BIAS} = -5V)									
DL-2	4	2 sq	0.3	0.4	30	30	600	10	30
DLS-2						10	175	8	14
DLS-2S									
DL-4	16	4 sq			50	50	1000	35	60
DLS-4						25	300	30	40
DL-10	100	10 sq			100	500	5000	175	375
DL-20	400	20 sq			200	2000	12000	600	1500
Two-Dimensional Series, Ceramic Package ** § (V_{BIAS} = -5V)									
DLS-10	100	10 sq	0.3	0.4	100	50	400	160	200
DLS-20	400	20 sq			200	100	1000	580	725
Two-Dimensional Series, Low-Cost Ceramic Package (V_{BIAS} = -5V)									
DL-10C	100	10 sq	0.3	0.4	100	500	5000	175	375
DL-20C	400	20 sq			200	2000	12000	600	1500

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Model Number	Rise Time (µs) 670nm, 50Ω	Position Detection Drift * (µm/ °C)	Interelectrode Resistance (kΩ)		Temp. Range (°C)		Package Style
	Typ	Typ	Min	Max	Operating	Storage	
One-Dimensional Series, Metal Package (V_{BIAS} = -15V)							
SL3-1	0.04	0.06	15	80	-10 ~ +60	-20 ~ +80	41/ TO-5
SL5-1	0.10	0.10	20	100			42/ TO-6
One-Dimensional Series, Ceramic Package (V_{BIAS} = -15V)							
SL3-2	0.04	0.06	15	80	-10 ~ +60	-20 ~ +80	48/ 8-PIN-DIP
SL5-2	0.10	0.10	20	100			
SL10-1	0.40	0.10	40	250			55/ 14-PIN-DIP
SL15	0.60	0.1	60	300			49/ 24-PIN-DIP
SL30	1.0	0.6	40	80			51/ Ceramic
SL76-1	14.0	1.4	120	600			50/ Ceramic
Two-Dimensional Series, Metal Package § (V_{BIAS} = -5V)							
DL-2	0.025	0.20	5	25	-10 ~ +60	-20 ~ +80	37/ TO-8
DLS-2		0.40					
DLS-2S							75/ TO-25
DL-4	0.08	0.25					37/ TO-8
DLS-4		0.30					
DL-10	0.20	0.60					34/ Special
DL-20	1.00	1.0					35/ Special
Two-Dimensional Series, Ceramic Package ** § (V_{BIAS} = -5V)							
DLS-10	0.20	0.70	5	25	-10 ~ +60	-20 ~ +80	36/ Ceramic
DLS-20	1.00	1.2					
Two-Dimensional Series, Low-Cost Ceramic Package (V_{BIAS} = -5V)							
DL-10C	0. 20	0.60	5	25	-10 ~ +60	-20 ~ +80	38/ Ceramic
DL-20C	1.00	1.0					39/ Ceramic

§ The DLS Series are packaged with A/R coated windows and have a lower dark current than the DL series.

* 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.

** Also available in the same packages as DL-10. Specify DL-10-1.

For mechanical drawings please refer to “Mechanical Drawings”.

Notes:

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

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