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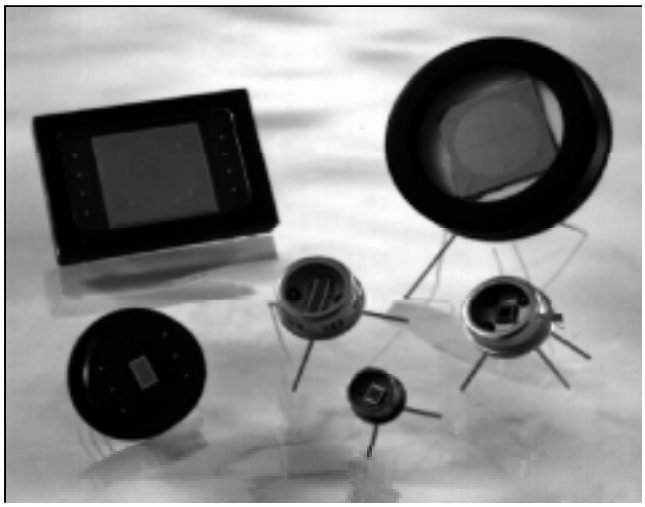
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SEGMENTED PHOTODIODES (SPOT SERIES)

POSITION SENSING DETECTORS (PSD)



APPLICATIONS

- Machine Tool Alignment
- Position Measuring
- Beam Centering
- Surface Profiling
- Targeting
- Guidance Systems

FEATURES

- High Accuracy
- Excellent Resolution
- High-Speed Response
- Ultra Low Dark Current
- Excellent Response Match
- High Stability over Time and Temperature

The SPOT Series are common substrate photodetectors segmented into either two (2) or four (4) separate active areas. They are available with either a 0.005" or 0.0004" well defined gap between the adjacent elements resulting in high response uniformity between the elements. The SPOT series are ideal for very accurate nulling or centering applications. Position information can be obtained when the light spot diameter is larger than the spacing between the cells.

Spectral response range is from 350-1100nm. Notch or bandpass filters can be added to achieve specific spectral responses.

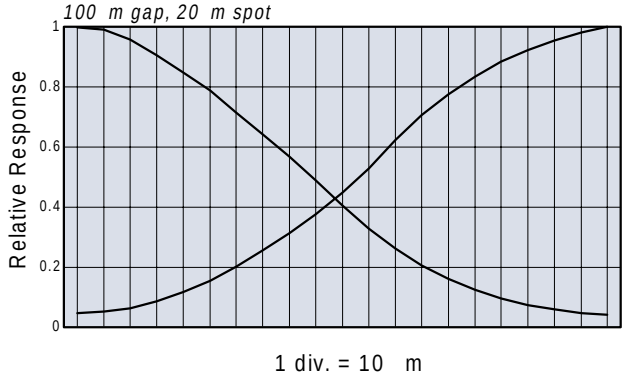
These detectors exhibit excellent stability over time and temperature, fast response times necessary for high speed or pulse operation, and position resolutions of better than 0.1 µm.

Maximum recommended power density is 10 mW / cm^2 and typical uniformity of response for a 1 mm diameter spot is ±2%.

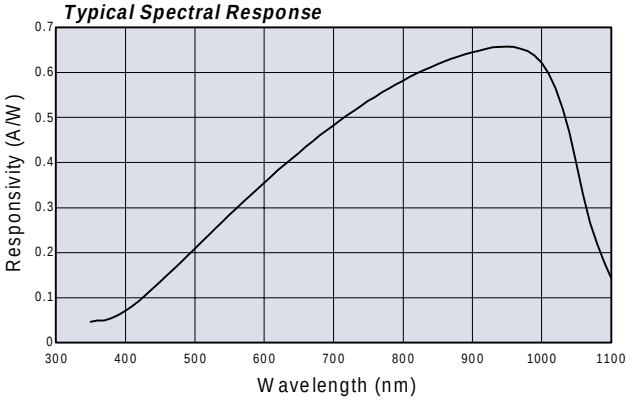
The circuit on the opposite page represents a typical biasing and detection circuit set up for both bi and quad cells. For position calculations and further details, refer to "Photodiode Characteristics" section of the catalog.

Typical Cross-Over Characteritics

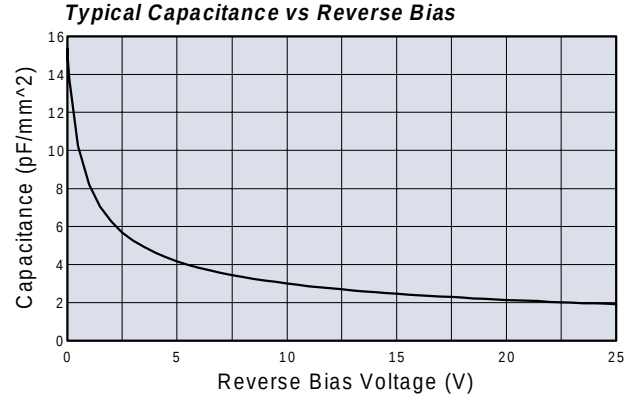
100 m gap, 20 m spot



Typical Spectral Response

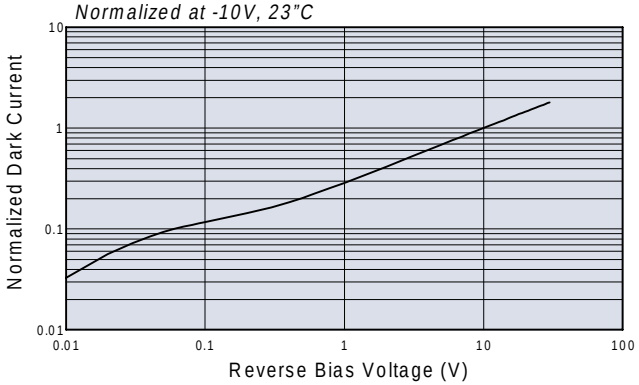


Typical Capacitance vs Reverse Bias



Typical Dark Current vs Reverse Bias

Normalized at -10V, 23"C

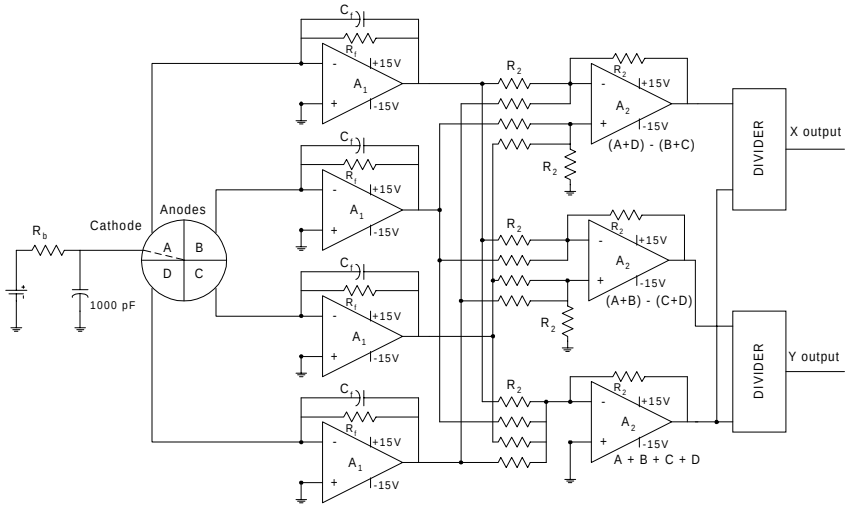


Model No.	Active Area Per Element		Element Gap (mm)	Responsivity (A/W)		Capacitance (pF)	Dark Current (nA)		NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (ns)	Temp Range (°C)		Package Style ¶
	Area (mm^2)	Dimension (mm)		970 nm		-10 V	-10 V		-10 V 970 nm		-10V 780 nm 50 Ω	Operating	Storage	
				min	typ	typ	typ	max	typ	max	typ			
TWO-ELEMENT SERIES, METAL PACKAGE														
SPOT-2D	3.3	1.3 X 2.5	.127	0.60	0.65	11	0.15	2.0	1.1 e -14	30	5	-40 ~ +100	-55 ~ +125	38 / TO-5
SPOT-2DMI	0.7	0.6 x 1.2	.013			3	0.05	1.0	6.2 e -15		7			37 / TO-18
SPOT-3D	2.8	0.6 X 4.6	.025			7	0.13	2.0	9.9 e -15		4			38 / TO-5
FOUR-ELEMENT SERIES, METAL PACKAGE														
SPOT-4D	1.61	1.3 sq	.127	0.60	0.65	5	0.10	1.0	8.7 e -15	30	3	-40 ~ +100	-55 ~ +125	38 / TO-5
SPOT-4DMI	0.25	0.5 sq	.013			1	0.01	0.5	2.8 e -15					
SPOT-9D	19.6	10 ϕ	.102			60	0.50	10.0	1.9 e -14					40 / LoProf
SPOT-9DMI			.010											
PLASTIC PACKAGE §														
FIL-S2DG	3.3	1.3 X 2.5	.127	0.60	0.65	11	0.15	2.0	1.1 e -14	30	5	-10 ~ +60	-20 ~ +70	14 / Plastic
FIL-S4DG	1.6	1.3 sq	.127			5	0.10	1.0	8.7 e -15		3			
FIL-S9DG	19.6	10 ϕ	.102			60	0.50	10.0	1.9 e -14					15 / Plastic

§ The photodiode chips in FIL series are isolated in a low profile plastic package. The have a large field of view as well as in line pins. FIL-S2DG has the same photodiode as SPOT-2D, FIL-S4DG has the same photodiode as SPOT-4D and FIL-S9DG has the same photodiode chip as SPOT-9D.
Overall Diameter (All four Quads)

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

Chip centering within –0.010".



For further details refer to the Photodiode Characteristic section of the catalog.

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