Tetra-Lateral PSD's

Position Sensing Detectors (PSD)

Tetra-lateral position sensing detectors are manufactured with one single resistive layer for both one and two dimensional measurements. They feature a common anode and two cathodes for one dimensional position sensing or four cathodes for two dimensional position sensing.

These detectors are best when used in applications that require measurement over a wide spacial range. They offer high response uniformity, low dark current, and good position linearity over 64% of the sensing area.

A reverse bias should be applied to these detectors to achieve optimum current linearity when large light signals are present. The circuit on the opposite page represents a typical circuit set up for two dimensional tetra-lateral PSDs.
For further details as well as the set up for one dimensional PSDs refer to the "Photodiode Characteristics" section of the catalog. Note that the maximum recommended incident power density is 10 mW / cm^2. Furthermore, typical uniformity of response for a 1 mm ϕ spot size is ± 5% for SC-25D and SC-50D and ± 2% for all other tetra-lateral devices.

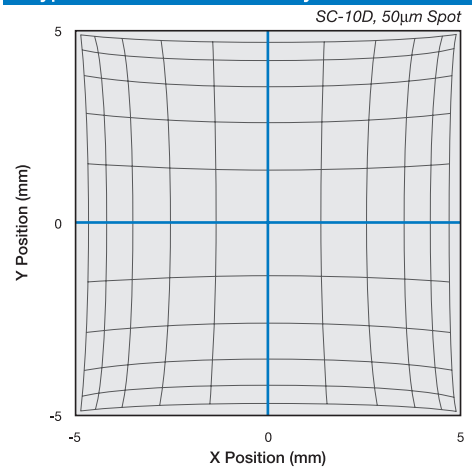
APPLICATIONS

- Tool Alignment and Control
- Leveling Measurements
- Angular Measurements
- 3 Dimensional Vision
- Position Measuring

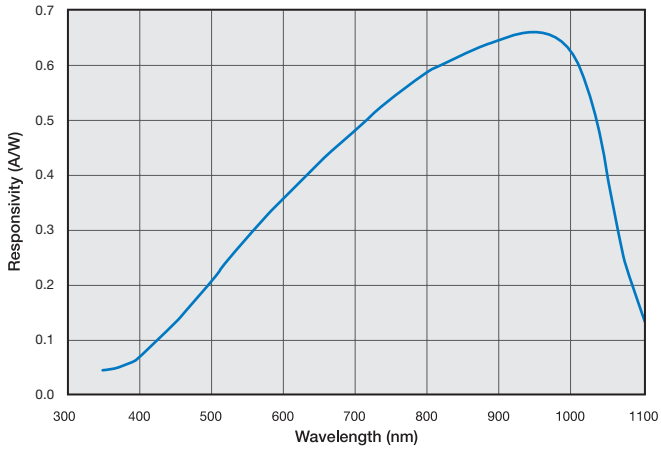
FEATURES

- Single Resistivity Layer
- High Speed Response
- High Dynamic Range
- Very High Resolution
- Spot Size & Shape Independence

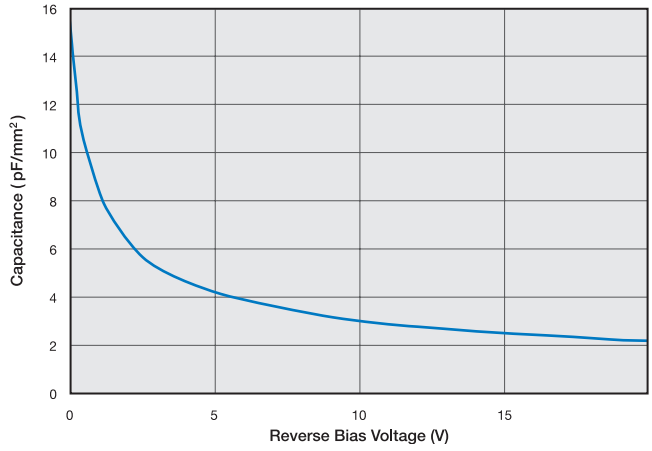
Typical Position Detectability



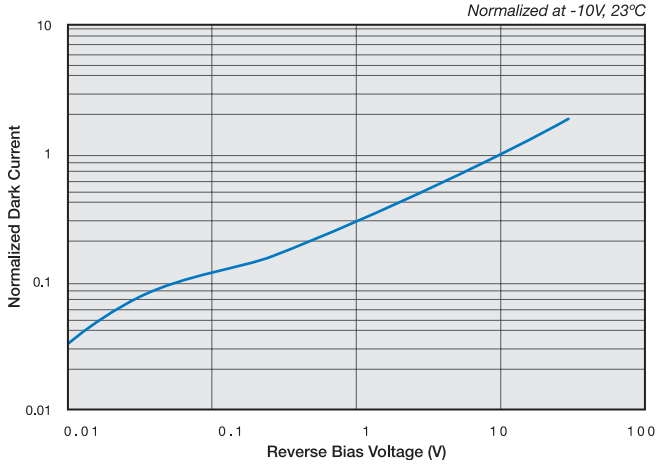
Typical Spectral Response



Typical Capacitance vs. Reverse Bias Voltage



Typical Dark Current vs. Reverse Bias



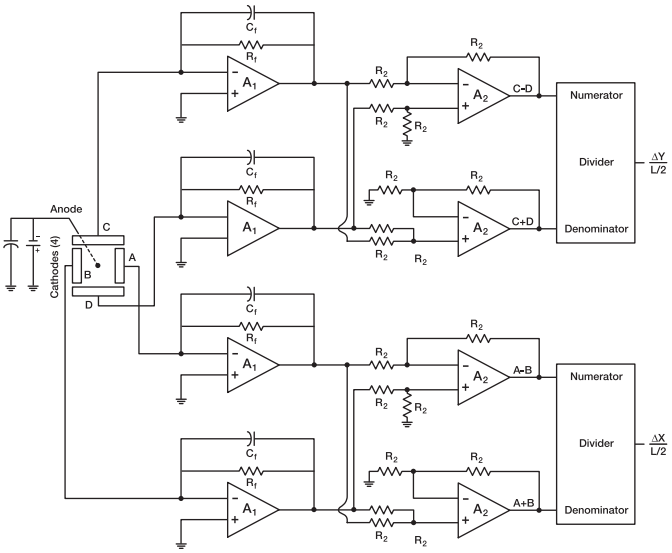
Tetra-Lateral Position Sensors

Typical Electro-Optical Specifications at T_A=23°C

Model Number	Position Sensing Area		Responsivity (A/W)		Absolute Position Detection Error (mm)	Dark Current (µA)		Capacitance (pF)	Rise Time † (µs)	Inter-electrode Resistance (kΩ)		Temp.* Range (°C)		Package Style ¶
	Area (mm^2)	Dimension (mm)	670 nm		Over 80% of Length 64% of Area	-15 V		-15 V	-15 V 670 nm 50Ω			Operating	Storage	
			min.	typ.	typ.	typ.	max.	typ.	typ.	min.	max.			
One-Dimensional Series, Plastic Package														
LSC-5D	11.5	5.3 x 2.2	0.35	0.42	0.040	0.01	0.10	50	0.25	2	50	-10 ~ +60	-20 ~ +70	47 / Plastic
LSC-30D	122	30 x 4.1			0.240	0.025	0.250	300	3.00	4	100			46 / Plastic
Two-Dimensional Series, Metal Package														
SC-4D	6.45	2.54 sq	0.35	0.42	0.080	0.005	0.050	20	0.66	3	30	0 ~ +70	-20 ~ +80	41 / TO-5
SC-10D	103	10.16 sq			1.30	0.025	0.250	300	1.00					44 / Special
SC-25D	350	18.80 sq			2.5	0.10	1.0	1625	5.00					45 / Special
SC-50D	957	30.94 sq			5.0	0.25	2.5	3900	13.00					21 / Special
Two Dimensional Series, Plastic Package §														
FIL-C4DG	6.45	2.54 sq	0.35	0.42	0.080	0.005	0.050	20	0.66	3	30	-10 ~ +60	-20 ~ +70	14 / Plastic
FIL-C10DG	103	10.16 sq			1.30	0.025	0.250	300	1.00					15 / Plastic

† Rise time specifications are with a 1 mm φspot size at the center of the device.
§ The photodiode chips in "FIL" series are isolated in a low profile plastic package. They have a large field of view as well as "in line" pins.
¶ For mechanical drawings please refer to pages 58 thru 69.
* Non-Condensing temperature and Storage Range, Non-Condensing Environment.

Chip centering within ± 0.010".



For further details, refer to the "Photodiode Characteristics" section of the catalog.

Mechanical Drawings

Mechanical Specifications and Die Topography

1. Parameter Definitions:

A = Distance from top of chip to top of glass.
a = Photodiode Anode.
B = Distance from top of glass to bottom of case.
c = Photodiode Cathode
(Note: cathode is common to case in metal package products unless otherwise noted).
W = Window Diameter.
F.O.V. = Filed of View (see definition below).

2. Dimensions are in inches (1 inch = 25.4 mm).

3. Pin diameters are 0.018 ± 0.002" unless otherwise specified.

4. Tolerances (unless otherwise noted)

General: 0.XX ±0.01"
0.XXX ±0.005"
Chip Centering: ±0.010"
Dimension 'A': ±0.015"

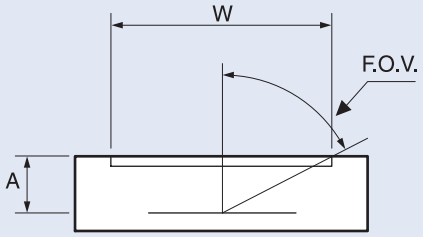
5. Windows

All **'UV'** Enhanced products are provided with QUARTZ glass windows, 0.027 ± 0.002" thick.

All **'XUV'** products are provided with removable windows.

All **'DLS'** PSD products are provided with A/R coated glass windows.

All **'FIL'** photoconductive and photovoltaic products are epoxy filled instead of glass windows.



$$F.O.V. = \tan^{-1}\left(\frac{W}{2A}\right)$$

For Further Assistance
Please Call One of Our Experienced
Sales and Applications Engineers

310-978-0516

- Or -
On the Internet at

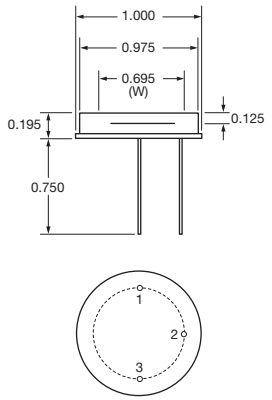
www.osioptoelectronics.com

All units in inches. Pinouts are bottom view.

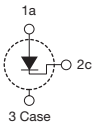
10 Low Profile

Products:

PIN-10DI
PIN-10DPI
PIN-10DPI/SB
UV-50L
UV-100L



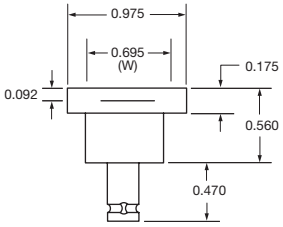
Pin Circle Dia.=0.73



11 BNC

Products:

PIN-10D
PIN-10DP
PIN-10DP/SB
UV-50
UV-100

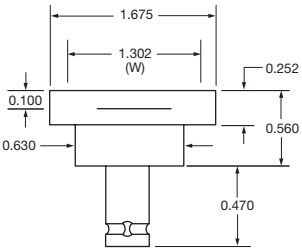


Outer Contact — Anode	PIN-10D, PIN-10DP, PIN-10DP/SB
Outer Contact — Cathode	UV-50, UV-100

12 BNC

Products:

PIN-25D
PIN-25DP

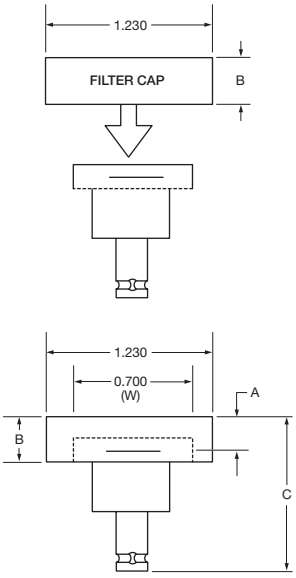


Outer Contact — Anode

13 Special BNC

Products:

PIN-10AP
PIN-10DF



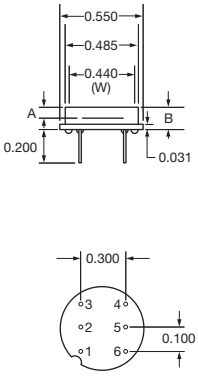
Dimensions

P/N	A	B	C
PIN-10DF	0.217	0.330	1.020
PIN-10AP	0.386	0.550	1.415

14 Special Plastic

Products:

FIL-5C
FIL-20C
FIL-UV20
FIL-C4DG



Dimensions

P/N	A	B
FIL-5C FIL-20C	0.060	0.130
FIL-UV005 FIL-UV20 FIL-C4DG	0.087	0.152

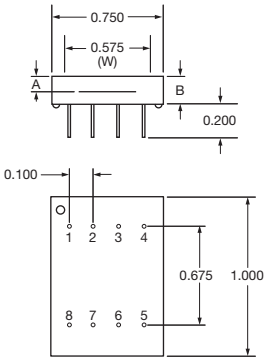
Pinouts

P/N	1	2	3	4	5	6
FIL-5C FIL-20C FIL-UV005	a	-	c	a	-	c
FIL-UV20	c	-	a	c	-	a
FIL-C4DG	c	a	c	c	a	c

15 Special Plastic

Products:

FIL-44C
FIL-100C
FIL-UV50
FIL-UV100
FIL-C10DG



Dimensions

P/N	A	B
FIL-44C FIL-100C	0.052	0.130
FIL-UV50 FIL-UV100	0.090	0.155
FIL-C10DG	0.082	0.155

Pinouts

P/N	1	2	3	4	5	6	7	8
FIL-44C FIL-100C	a	-	-	c	a	-	-	c
FIL-UV50 FIL-UV100	c	-	-	a	c	-	-	a
FIL-C10DG	c	a	a	c	c	a	a	c

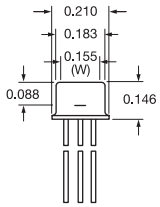
Mechanical Specifications

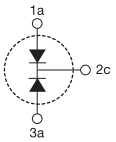
All units in inches. Pinouts are bottom view.

40 TO-18

Products:

SPOT-2DMI



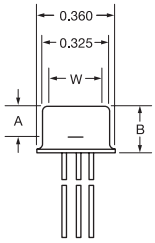


Pin Circle Dia.=0.100

41 TO-5

Products:

SC-4D
SL3-1
SPOT-2D
SPOT-3D
SPOT-4D
SPOT-4DMI
SPOT-4DUV
QD7-0



Pin Circle Dia.=0.200

Dimensions

P/N	A	B	W
SC-4D	0.071	0.142	0.240
SL3-1	0.106	0.195	0.217
SPOT-2D	0.063	0.114	0.240
SPOT-3D	0.104	0.138	0.240
SPOT-4D	0.063	0.142	0.240
SPOT-4DMI	0.063	0.142	0.240
SPOT-4DUV	0.063	0.142	0.240
QD7-0	0.050	0.130	0.230

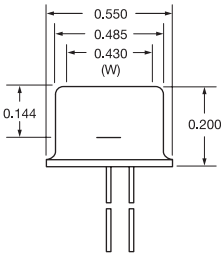
Pinouts

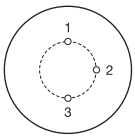
P/N	1	2	3	4	5
SC-4D	c	c	c	c	a
SL3-1	a	c	a	--	--
SPOT-2D	a	c	a	--	--
SPOT-3D	a	c	a	--	--
SPOT-4D	a	a	a	a	c
SPOT-4DMI	a	a	a	a	c
SPOT-4DUV	a	a	a	a	c
QD7-0	a	a	a	a	c

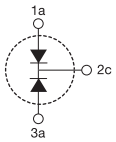
42 TO-8

Products:

SL5-1





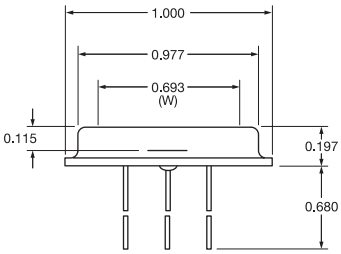


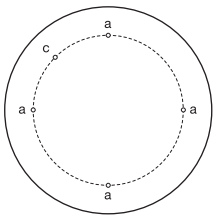
Pin Circle Dia.=0.300

43 Low Profile

Products:

SPOT-9D
SPOT-9DMI



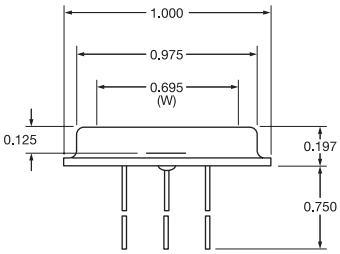


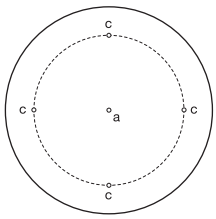
Pin Circle Dia.=0.730

44 Special

Products:

SC-10D



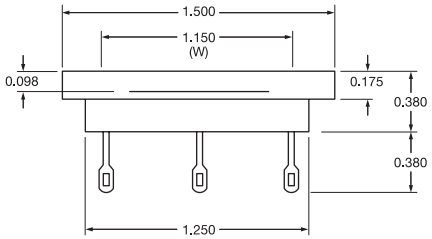


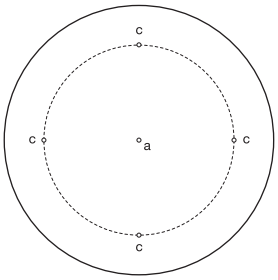
Pin Circle Dia.=0.730

45 Special

Products:

SC-25D





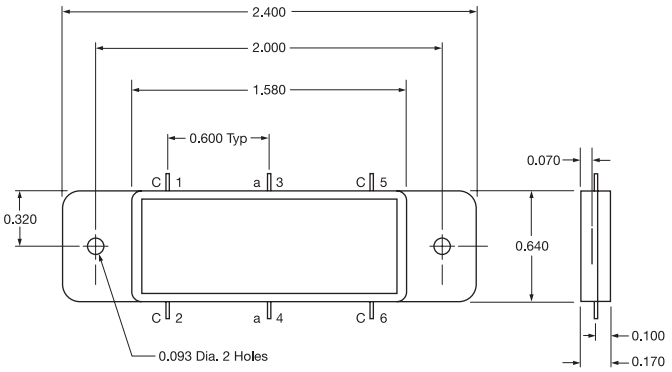
Pin Circle Dia.=0.950

All units in inches.

46 Plastic

Products:

LSC-30D

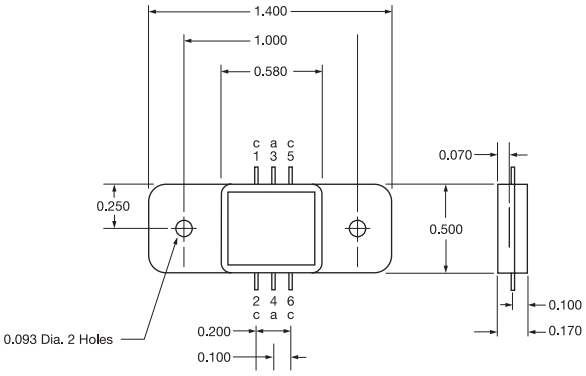


PIN Length = 0.100 Typ.

47 Plastic

Products:

LSC-5D

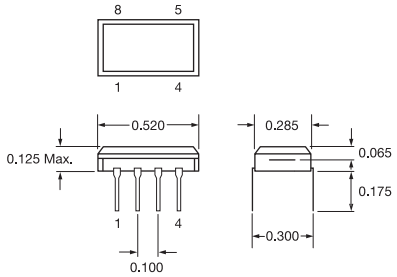


PIN Length = 0.100 Typ.

48 8-PIN DIP

Products:

SL3-2
SL5-2

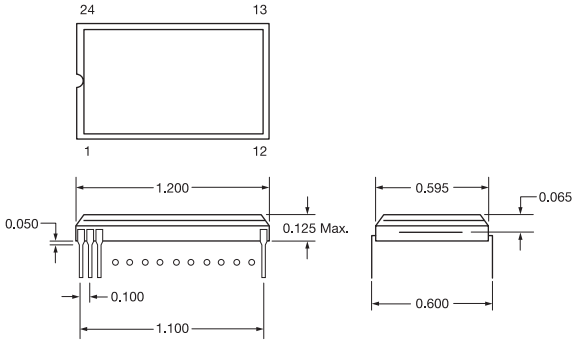


Pinouts	
2, 7	Anode 1
1, 4, 5, 8	Common Cathode
3, 6	Anode 2

49 24-PIN DIP

Products:

SL-15



PIN Length = 0.225 Typ.
PIN Thickness = 0.010 Typ.

Pinouts	
11	Anode 1
12, 24	Common Cathode
23	Anode 2
All Other Pins NOT CONNECTED	

50 Special

Products:

SL76-1