

# Solderable Chip Series

## Planar Diffused Silicon Photodiodes

The **Solderable photodiode chip series** offer a low cost approach to applications requiring large active area photodetectors with or without flying leads for ease of assembly and / or situations where the detector is considered "disposable". They have low capacitance, moderate dark currents, wide dynamic ranges and high open circuit voltages. These detectors are available with two 3" long leads soldered to the front (anode) and back (cathode). There are two types of photodiode chips available. "Photoconductive" series, (SXXCL) for low capacitance and fast response and "Photovoltaic" series (SXXVL) for low noise applications.

**All of the devices are also available in chip form without any leads. For ordering subtract suffix 'L' from the model number, e.g. S-100C.**

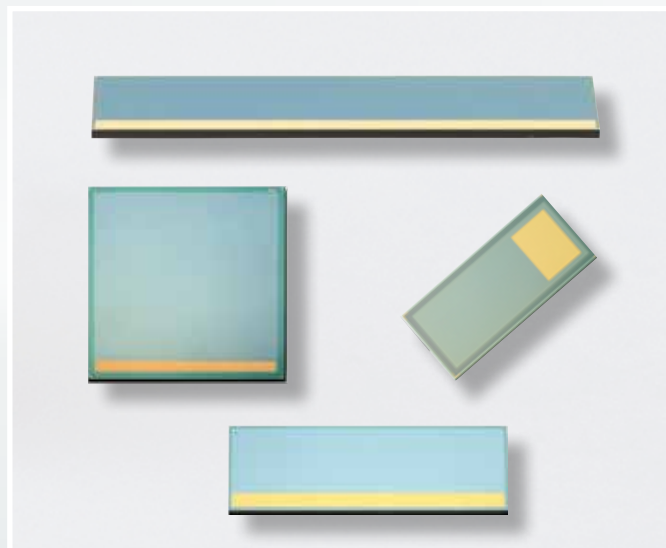
For large signal outputs, the detectors can be connected directly to a current meter or across a resistor for voltage measurements. Alternately, the output can be measured directly with an oscilloscope or with an amplifier. Please refer to the "Photodiode Characteristics" section for further details.

### APPLICATIONS

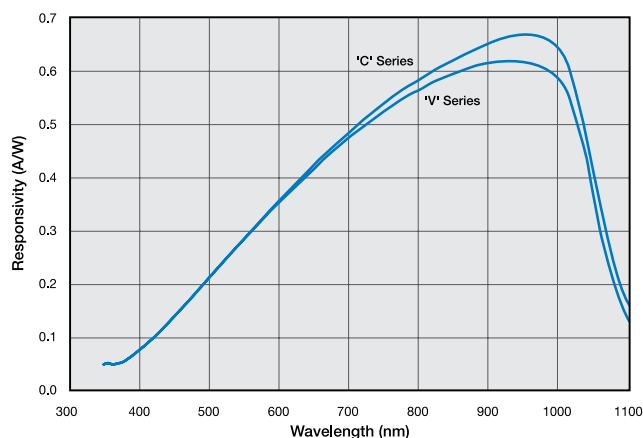
- Solar Cells
- Low Cost Light Monitoring
- Diode Laser Monitoring
- Low Capacitance

### FEATURES

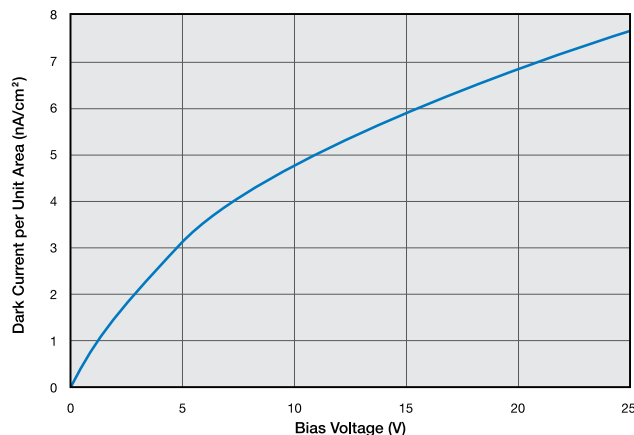
- Large Active Areas
- Various Sizes
- High Shunt Resistance
- With or Without Leads



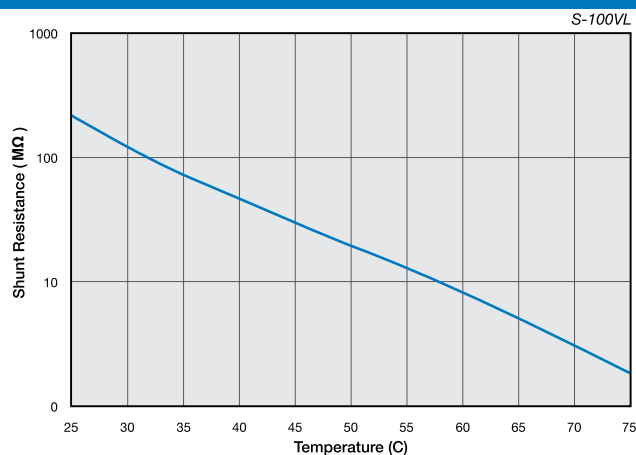
#### Typical Spectral Response



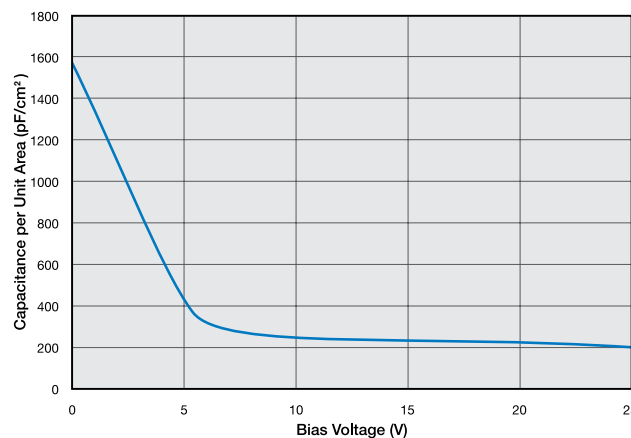
#### Typical Dark Current per Unit Area vs. Bias Voltage



#### Typical Shunt Resistance vs. Temperature



#### Typical Capacitance per Unit Area vs. Bias Voltage



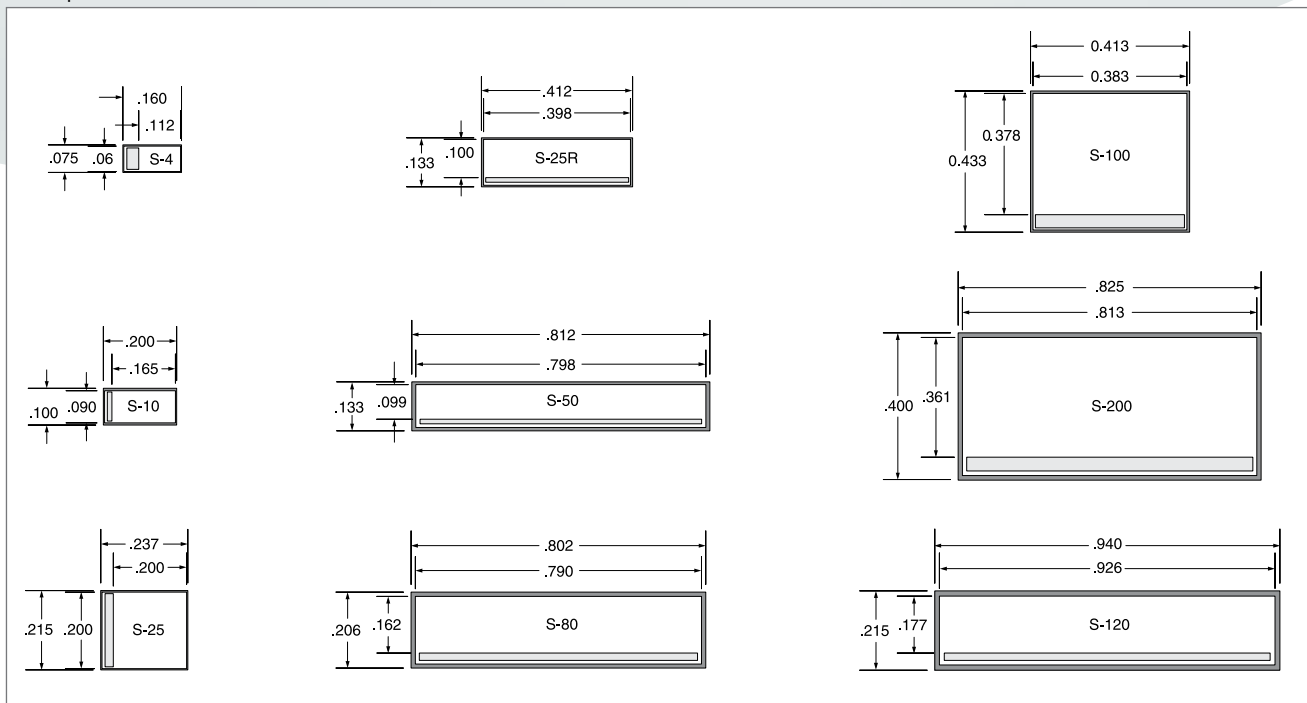
# Solderable Chip Series

Typical Electro-Optical Specifications at T<sub>A</sub>=23°C

Model Number	Active Area		Chip size mm (inches)	Peak Responsivity Wavelength	Responsivity at $\lambda_p$		Shunt Resistance (M $\Omega$ )	Dark Current (nA)	Capacitance (pF)				
	Area mm <sup>2</sup> (inches <sup>2</sup> )	Dimensions mm (inches)		$\lambda_p$ (nm)	A/W		-10 mV	-5 V	0 V	-5 V			
				typ.	min.	typ.	min.	max.	typ.	typ.			
S-4CL §	4.7 (0.007)	1.7 × 2.8 (0.07 × 0.11)	1.9 × 4.1 (0.08 × 0.16)	970	0.60	0.65	---	20	---	15			
S-4VL							10	---	370	---			
S-10CL	9.6 (0.015)	2.3 × 4.2 (0.09 × 0.17)	2.5 × 5.1 (0.10 × 0.20)				---	40	---	30			
S-10VL							8	---	750	---			
S-25CL	25.8 (0.04)	5.1 × 5.1 (0.20 × 0.20)	5.5 × 6.0 (0.22 × 0.24)				---	100	---	95			
S-25VL							5	---	2100	---			
S-25CRL	25.4 (0.039)	2.5 × 10.1 (0.10 × 0.40)	3.4 × 10.5 (0.13 × 0.41)				---	100	---	95			
S-25VRL							5	---	2100	---			
S-50CL	51.0 (0.079)	2.5 × 20.3 (0.10 × 0.80)	3.4 × 20.6 (0.13 × 0.81)				---	300	---	200			
S-50VL							3	---	4000	---			
S-80CL	82.6 (0.128)	4.1 × 20.1 (0.16 × 0.79)	5.2 × 20.4 (0.21 × 0.80)				---	500	---	300			
S-80VL							2	---	6000	---			
S-100CL	93.4 (0.145)	9.7 × 9.7 (0.38 × 0.38)	10.5 × 11.00 (0.42 × 0.43)				---	600	---	375			
S-100VL							1.0	---	8500	---			
S-120CL	105.7 (0.164)	4.5 × 23.5 (0.18 × 0.93)	5.5 × 23.9 (0.22 × 0.94)				---	800	---	450			
S-120VL							0.5	---	10000	---			
S-200CL	189.0 (0.293)	9.2 × 20.7 (0.36 × 0.81)	10.2 × 21.0 (0.40 × 0.83)				---	1200	---	750			
S-200VL							0.2	---	17000	---			

§ All of the above bare chips are provided with two 3" long 29-30 AWG insulated color coded leads attached to the front for anode (RED) and to the back for Cathode (BLACK). They are also available in chip form only (Leadless). For Ordering subtract Suffix 'L' from the Model Number, i.e. S-100C.

All chip dimensions in inches.



## AVOID DIRECT LIGHT

Since the spectral response of silicon photodiode includes the visible light region, care must be taken to avoid photodiode exposure to high ambient light levels, particularly from tungsten sources or sunlight. During shipment from OSI Optoelectronics, your photodiodes are packaged in opaque, padded containers to avoid ambient light exposure and damage due to shock from dropping or jarring.

## AVOID SHARP PHYSICAL SHOCK

Photodiodes can be rendered inoperable if dropped or sharply jarred. The wire bonds are delicate and can become separated from the photodiode's bonding pads when the detector is dropped or otherwise receives a sharp physical blow.

## CLEAN WINDOWS WITH OPTICAL GRADE CLOTH / TISSUE

Most windows on OSI Optoelectronics photodiodes are either silicon or quartz. They should be cleaned with isopropyl alcohol and a soft (optical grade) pad.

## OBSERVE STORAGE TEMPERATURES AND HUMIDITY LEVELS

Photodiode exposure to extreme high or low storage temperatures can affect the subsequent performance of a silicon photodiode. Storage temperature guidelines are presented in the photodiode performance specifications of this catalog. Please maintain a non-condensing environment for optimum performance and lifetime.

## OBSERVE ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

OSI Optoelectronics photodiodes, especially with IC devices (e.g. Photops) are considered ESD sensitive. The photodiodes are shipped in ESD protective packaging. When unpacking and using these products, anti-ESD precautions should be observed.

## DO NOT EXPOSE PHOTODIODES TO HARSH CHEMICALS

Photodiode packages and/or operation may be impaired if exposed to CHLOROTHENE, THINNER, ACETONE, or TRICHLOROETHYLENE.

## INSTALL WITH CARE

Most photodiodes in this catalog are provided with wire or pin leads for installation in circuit boards or sockets. Observe the soldering temperatures and conditions specified below:

Soldering Iron:	Soldering 30 W or less Temperature at tip of iron 300°C or lower.	
Dip Soldering:	Bath Temperature:	260±5°C.
	Immersion Time:	within 5 Sec.
	Soldering Time:	within 3 Sec.
Vapor Phase Soldering:	DO NOT USE	
Reflow Soldering:	DO NOT USE	

Photodiodes in plastic packages should be given special care. Clear plastic packages are more sensitive to environmental stress than those of black plastic. Storing devices in high humidity can present problems when soldering. Since the rapid heating during soldering stresses the wire bonds and can cause wire to bonding pad separation, it is recommended that devices in plastic packages to be baked for 24 hours at 85°C.

The leads on the photodiode **SHOULD NOT BE FORMED**. If your application requires lead spacing modification, please contact OSI Optoelectronics Applications group at (310)978-0516 before forming a product's leads. Product warranties could be voided.



\*Most of our standard catalog products are RoHS Compliant. Please contact us for details

# 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. = Field of View (see definition below).

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

## 3. Pin diameters are $0.018 \pm 0.002$ " unless otherwise specified.

## 4. Tolerances (unless otherwise noted)

General:  $0.XX \pm 0.01$ "

$0.XXX \pm 0.005$ "

Chip Centering:  $\pm 0.010$ "

Dimension 'A':  $\pm 0.015$ "

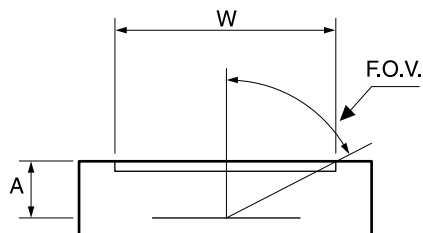
## 5. Windows

All '**UV**' Enhanced products are provided with QUARTZ glass windows,  $0.027 \pm 0.002$ " 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.



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

**OSI Optoelectronics**  
An OSI Systems Company

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

**310-978-0516**

- Or -

visit our website at

**[www.osioptoelectronics.com](http://www.osioptoelectronics.com)**

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Advanced Photonix:](#)

[S-100CL](#)