

## Photoconductive Series

### Planar Diffused Silicon Photodiodes

#### Features

- Pulse Detectors
- Optical Communications
- Bar Code Readers
- Optical Remote Control
- Medical Equipment
- High Speed Photometry

#### Applications

- High Speed Response
- Low Capacitance
- Low Dark Current
- Wide Dynamic Range
- High Responsivity

The Photoconductive Detector Series are suitable for high speed and high sensitivity applications. The spectral range extends from 350 to 1100 nm, making these photodiodes ideal for visible and near IR applications, including such AC applications as detection of pulsed LASER sources, LEDs, or chopped light.



To achieve high speeds, these detectors should be reverse biased. Typical response times from 10 ns to 250 ns can be achieved with a 10V reverse bias, for example. When a reverse bias is applied, capacitance decreases (as seen in the figure below) corresponding directly to an increase in speed.

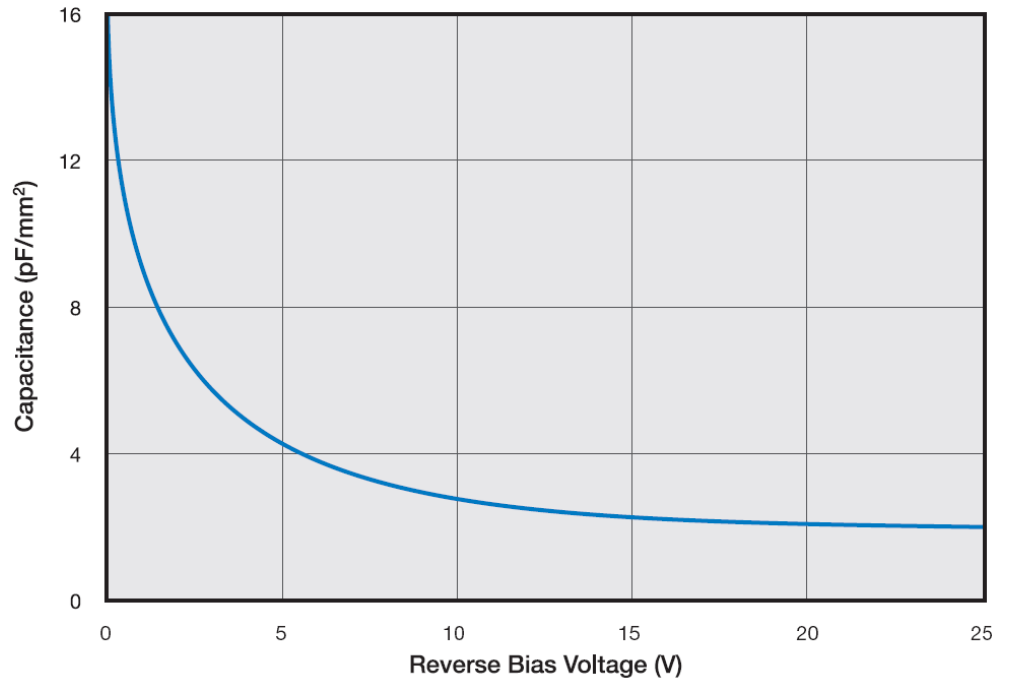
As indicated in the specification table, the reverse bias should not exceed 30 volts. Higher bias voltages will result in permanent damage to the detector.

Since a reverse bias generates additional dark current, the noise in the device will also increase with applied bias. For lower noise detectors, the Photovoltaic Series should be considered.

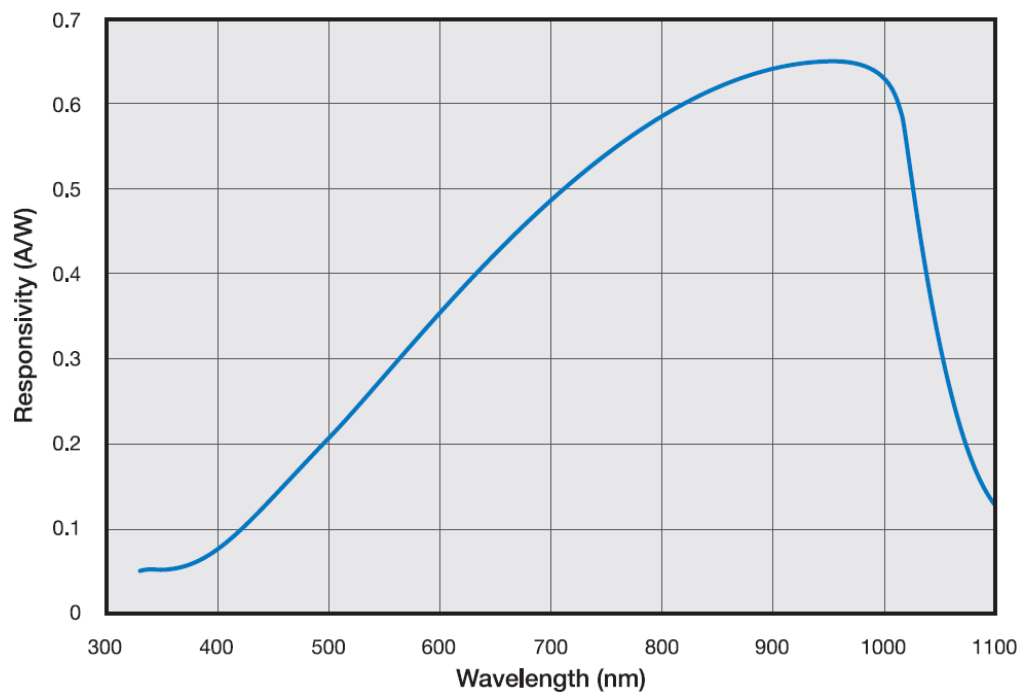
Refer to the Photoconductive Mode (PC) paragraph in the "Photodiode Characteristics" section of this catalog for detailed information on electronics set up.



### Typical Capacitance vs. Reverse Bias (normalized @ 20°C)

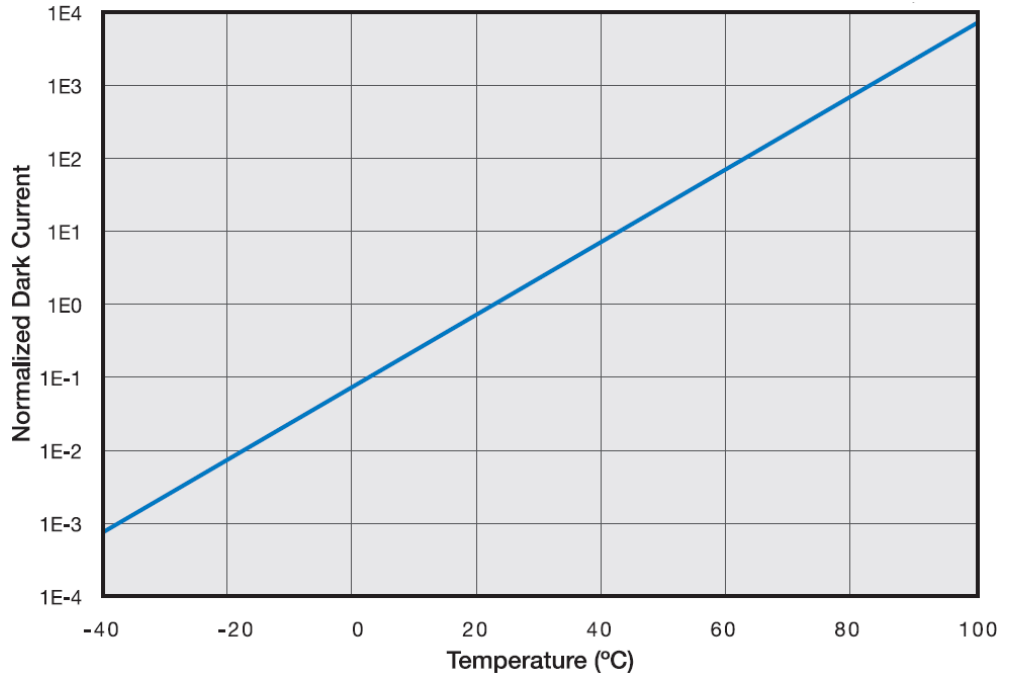


### Typical Spectral Response

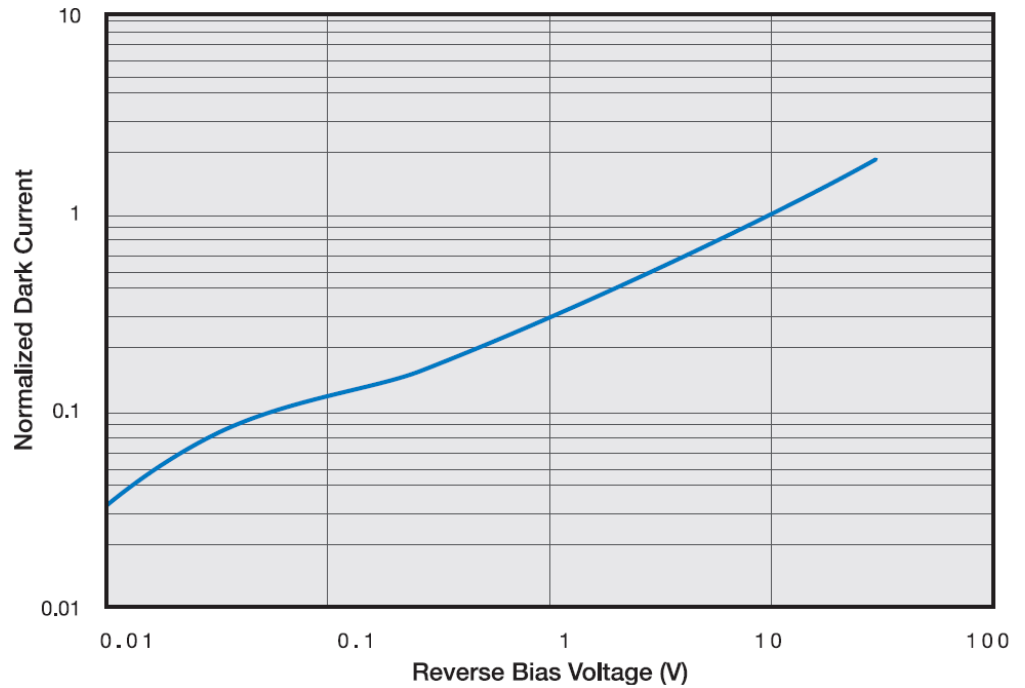




Typical Dark Current vs. Temperature (normalized @ -10V, 23°C)



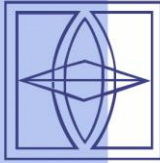
Typical Dark Current vs. Reverse Bias (normalized @ -10V, 23°C)





## Typical Electro-Optical Specifications at $T_A=23^\circ\text{C}$

Model Number	Active Area		Peak Responsivity Wavelength $\lambda_p$ (nm)	Responsivity at $\lambda_p$ (A/W)		Capacitance (pF)		Dark Current (nA)	
	Area (mm <sup>2</sup> )	Dimensions (mm)	Typ	Min	Typ	Typ		-10V	
						0V	-10V	Typ	Max
<b>`D` Series, Metal Package</b>									
PIN-020A	0.20	0.51 $\phi$	970	0.60	0.65	4	1	0.01	0.15
PIN-040A	0.81	1.02 $\phi$				8	2	0.05	0.50
PIN-2DI ^	1.1	0.81 x 1.37				25	5	0.10	1.0
PIN-3CDI	3.2	1.27 x 2.54				45	12	0.15	2
PIN-3CD									
PIN-5DI	5.1	2.54 $\phi$				85	15	0.25	3
PIN-5D									
PIN-13DI	13	3.6 sq				225	40	0.35	6
PIN-13D									
PIN-6DI	16.4	4.57 $\phi$				330	60	0.5	10
PIN-6D									
PIN-44DI	44	6.6 sq				700	130	1	15
PIN-44D									
PIN-10DI	100	11.28 $\phi$				1500	300	2	25
PIN-10D									
PIN-25D	613	27.9 $\phi$	9500	1800	15	1000			
<b>`O` Series, Metal Package</b>									
OSD1-0	1	1.0 sq	900	0.47	0.54	12	3	1	3
OSD5-0	5	2.5 $\phi$				50	8	5	10
OSD15-0	15	3.8 sq				150	20	8	15
OSD35-0	35	5.9 sq				350	46	12	30
OSD60-0	58	7.6 sq				600	75	15	50
OSD100-0A	100	11.3 $\phi$				1000	130	30	70
<b>`D` Series, Plastic Package **</b>									
FIL-5C	5.1	2.54 $\phi$	970	0.60	0.65	85	15	0.25	3
FIL-20C	16.4	4.57 $\phi$				330	60	0.5	10
FIL-44C	44	6.6 sq				700	130	1	15
FIL-100C	100	11.28 $\phi$				1500	300	2	25
PIN-220D	200	10 x 20				3200	600	5	100



Model Number	NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (ns)	Temp. * Range (°C)		Package Style																						
	-10V, 970nm		-10V, 632nm, 50Ω	Operating	Storage																							
	Typ		Max				Typ																					
<b>`D` Series, Metal Package</b>																												
PIN-020A	2.8 e -15	30	6	-40 ~ +100	-55 ~ +125	1/ TO-18																						
PIN-040A	6.2 e -15		8			-40 ~ +100	-55 ~ +125	4/ TO-18																				
PIN-2DI ^	8.7 e -15		10					-40 ~ +100	-55 ~ +125	7/ TO-18																		
PIN-3CDI	1.1 e -14									12	-40 ~ +100	-55 ~ +125	2/ TO-5															
PIN-3CD			1.4 e -14										14	-40 ~ +100	-55 ~ +125	5/ TO-5												
PIN-5DI	1.6 e -14									17						-40 ~ +100	-55 ~ +125	2/ TO-5										
PIN-5D			1.9 e -14										24					-40 ~ +100	-55 ~ +125	5/ TO-5								
PIN-13DI	2.8 e -14									43										-40 ~ +100	-55 ~ +125	3/ TO-8						
PIN-13D			3.9 e -14										250									-40 ~ +100	-55 ~ +125	6/ TO-8				
PIN-6DI	1.1 e -13									250														-10 ~ +60	-20 ~ +70	3/ TO-8		
PIN-6D			2.8 e -14										250													-10 ~ +60	-20 ~ +70	6/ TO-8
PIN-44DI	3.9 e -14									250																		-10 ~ +60
PIN-44D			1.1 e -13	250	-10 ~ +60								-20 ~ +70															
PIN-10DI	1.1 e -13					250	-10 ~ +60			-20 ~ +70																		
PIN-10D			1.1 e -13	250				-10 ~ +60	-20 ~ +70																			
PIN-25D	1.1 e -13					250					-10 ~ +60	-20 ~ +70																
<b>`O` Series, Metal Package</b>																												
OSD1-0	4.5 e -14	50	10	-25 ~ +75		-40 ~ +100								7/ TO-18														
OSD5-0	1.0 e -13		50											8	-25 ~ +75	-40 ~ +100	5/ TO-5											
OSD15-0	1.3 e -13													50			9	-25 ~ +75	-40 ~ +100	5/ TO-5								
OSD35-0	1.6 e -13																50			12	-25 ~ +75	-40 ~ +100	3/ TO-8					
OSD60-0	1.7 e -13																			50			14	-25 ~ +75	-40 ~ +100			
OSD100-0A	2.5 e -13																						50			19	-25 ~ +75	
<b>`D` Series, Plastic Package **</b>																												
FIL-5C	1.4 e -14	30	12	-10 ~ +60	-20 ~ +70	14/ Plastic																						
FIL-20C	1.9 e -14		30				17			-10 ~ +60			-20 ~ +70	15/ Plastic														
FIL-44C	2.8 e -14					30	24	-10 ~ +60	-20 ~ +70						27/ Plastic													
FIL-100C	3.9 e -14						30				43	-10 ~ +60		-20 ~ +70		27/ Plastic												
PIN-220D	6.2 e -14										30				75		-10 ~ +60	-20 ~ +70	27/ Plastic									
<b>`D` Series, Plastic Package **</b>																												

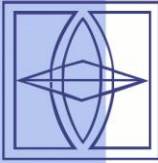
^ The "I" suffix on the model number is indicative of the photodiode chip being isolated from the package by an additional pin connected to the case.

\* Non-condensing temperature and storage range, non-condensing environment.

\*\* 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 "Mechanical Drawings".

OEC



Opto-Electronic  
Components



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### 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 ± 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"

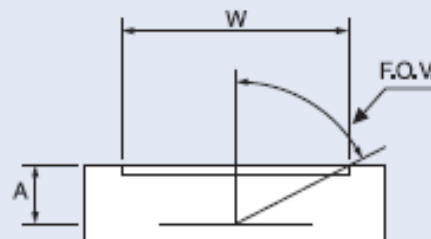
### 5. Windows

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.

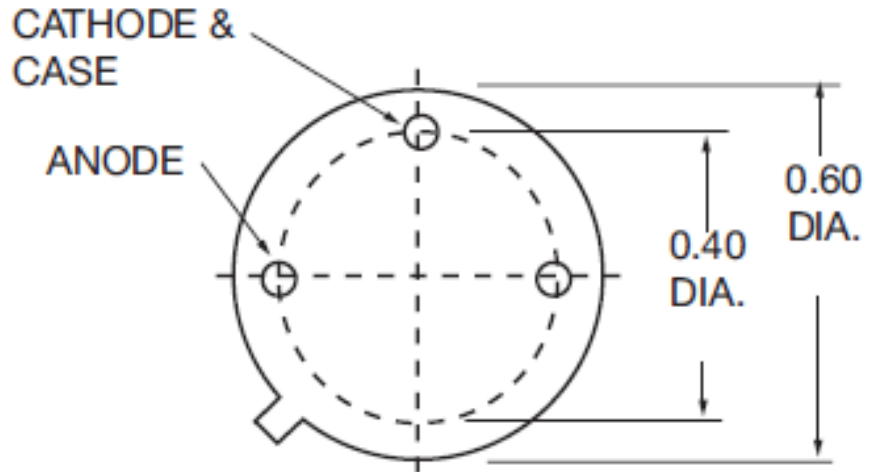
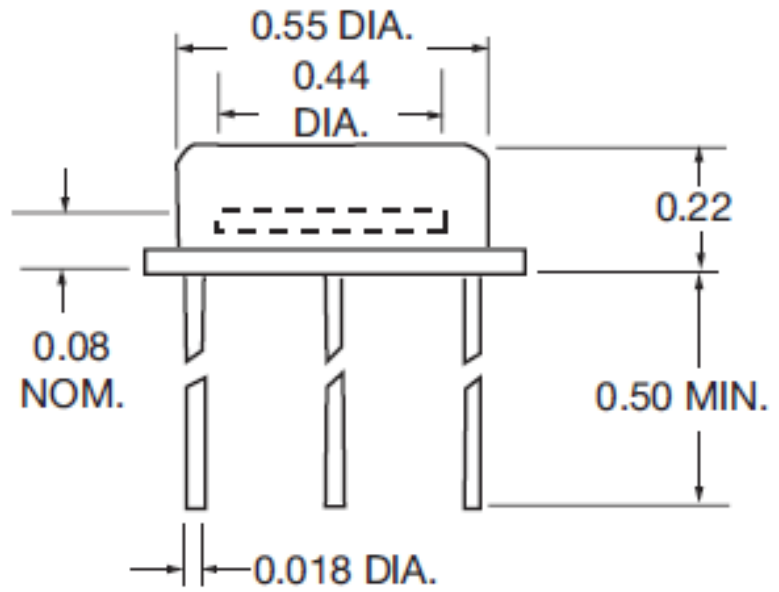


$$F.O.V. = \tan^{-1} \left( \frac{W}{2A} \right)$$



Gehäuse für OSD60-0

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