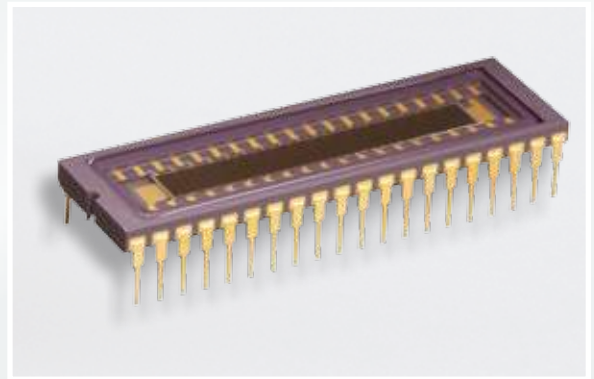


# Multi-Element Array Series

## Planar Diffused Silicon Photodiodes

**Multichannel array photodetectors** consist of a number of single element photodiodes laid adjacent to each other forming a one-dimensional sensing area on a common cathode substrate. They can perform simultaneous measurements of a moving beam or beams of many wavelengths. They feature low electrical cross talk and super high uniformity between adjacent elements allowing very high precision measurements. Arrays offer a low cost alternative when a large number of detectors are required. The detectors are optimized for either UV, visible or near IR range.

They can be either operated in photoconductive mode (reverse biased) to decrease the response time, or in photovoltaic mode (unbiased) for low drift applications. A2V-16 can be coupled to any scintillator crystal for measuring high-energy photons in the X-ray and gamma ray region of electromagnetic spectrum. In addition, they have been mechanically designed, so that several of them can be mounted end to end to each other in applications where more than 16 elements are needed.



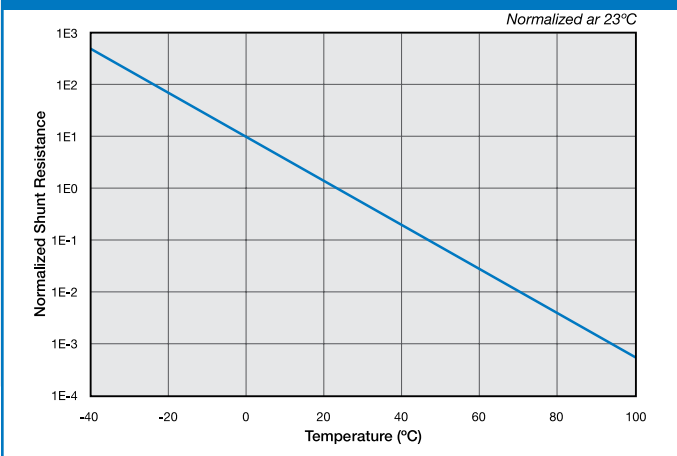
### APPLICATIONS

- Level Meters
- Optical Spectroscopy
- Medical Equipment
- High Speed Photometry
- Computed Tomography Scanners
- Position Sensors

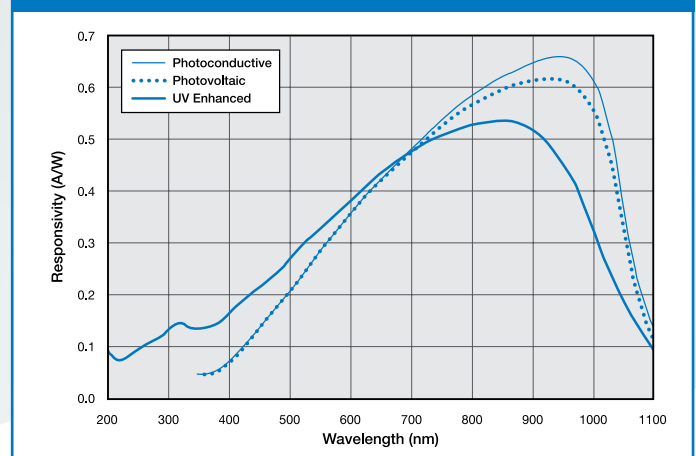
### FEATURES

- Common Substrate Array
- Ultra Low Cross Talk
- UV Enhanced (A5V-35UV)
- Low Dark Current
- Low Capacitance
- Solderable

### Typical Shunt Resistance vs. Temperature



### Typical Spectral Response



### Typical Capacitance vs. Reverse Bias Voltage

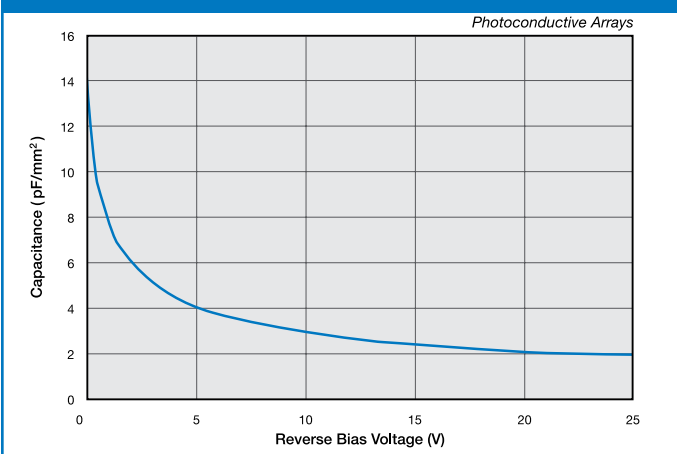


Figure 11 in the "Photodiode Characteristics" section of this catalog provides a detailed circuit example for the arrays.

# Multi-Element Array Series

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

Model Number	Number of Elements	Active Area Per Element		Pitch (mm)	Responsivity (A/W)	Shunt Resistance (MΩ)	Dark Current (nA)	Capacitance (pF)		NEP (W / √Hz)		Temp. Range (°C)		Package Style ¶		
		Area (mm <sup>2</sup> )	Dimensions (mm)		970nm	-10 mV	-10 V	0 V	-10 V	0 V 970nm	-10 V 970nm	Operating	Storage			
					typ.	typ.	typ.	typ.		min.	typ.					
<b>Photoconductive Arrays</b>																
<b>A5C-35</b>	35	3.9	4.39 x 0.89	0.99	0.65	---	0.05	---	12	---	6.2 e-15	-30 ~ +85	-40 ~ +125	54 / 40 pin DIP		
<b>A5C-38</b>	38													53 / PCB		
<b>Photovoltaic Arrays</b>																
<b>A2V-16</b>	16	1.92	1.57 x 1.22	1.59	0.60	1000	---	170	---	4.8 e-15	---			-30 ~ +85	-40 ~ +125	54 / 40 pin DIP
<b>A5V-35</b>	35	3.9	4.39 x 0.89	0.99	0.60	1000	---	340	---	4.8 e-15	---					54 / 40 pin DIP
<b>A5V-38</b>	38															52 / Ceramic
<b>A2V-76</b>	76	1.8	6.45 x 0.28	0.31	0.50	500	---	160	---	8.2 e-15	---					54 / 40 pin DIP
<b>UV Enhanced Array (All Specifications @ λ = 254 nm, V<sub>BIAS</sub> = -10V)</b>																
<b>A5V-35UV</b>	35	3.9	4.39 x 0.89	0.99	0.06**	500	---	340	---	6.8 e-14	---					54 / 40 pin DIP

The chips are equipped with 2" long bare tinned leads soldered to all anodes and the common cathode.

'V' suffix indicates the device is optimized for 'photovoltaic' operation.

'C' suffix indicates the device is optimized for 'photoconductive' operation.

¶ For mechanical drawings please refer to pages 61 thru 73.

\* Non-Condensing temperature and Storage Range, Non-Condensing Environment.

\*\* λ = 254 nm

## 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. = Filed 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':  $\pm 0.015$ "

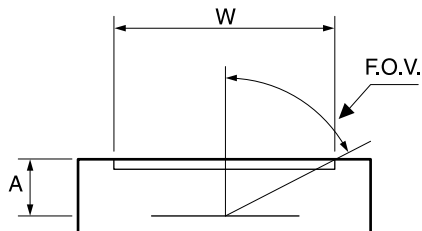
## 5. Windows

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.



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

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

**310-978-0516**

**OSI Optoelectronics**  
An OSI Systems Company

- Or -

visit our website at

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

# Mechanical Specifications

All units in inches. Pinouts are bottom view.

51 Low Cost Ceramic	52 Special	53 Special														
<p><b>Products:</b> SL-30</p>	<p><b>Products:</b> A2V-76</p> <p>Pin Diameter = 0.025</p>	<p><b>Products:</b> A2V-16</p> <table border="1"> <caption>Dimensions</caption> <thead> <tr> <th>P/N</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>A2V-16</td> <td>1</td> <td>0.1</td> <td>0.212</td> <td>0.2</td> <td>0.062</td> <td>0.06</td> </tr> </tbody> </table>	P/N	A	B	C	D	E	F	A2V-16	1	0.1	0.212	0.2	0.062	0.06
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54 40-PIN-DIP	55 Special																																																																																																																																																																								
<p><b>Products:</b> A5V-35UV A5C-35, A5C-38 A5V-35, A5V-38</p> <table border="1"> <caption>35 Element Array</caption> <thead> <tr> <th>Pin Number</th> <th>Element Number</th> <th>Pin Number</th> <th>Element Number</th> </tr> </thead> <tbody> <tr><td>1</td><td>C</td><td>21</td><td>C</td></tr> <tr><td>2</td><td>2</td><td>22</td><td>35</td></tr> <tr><td>3</td><td>4</td><td>23</td><td>33</td></tr> <tr><td>4</td><td>6</td><td>24</td><td>31</td></tr> <tr><td>5</td><td>8</td><td>25</td><td>29</td></tr> <tr><td>6</td><td>10</td><td>26</td><td>27</td></tr> <tr><td>7</td><td>12</td><td>27</td><td>25</td></tr> <tr><td>8</td><td>14</td><td>28</td><td>23</td></tr> <tr><td>9</td><td>16</td><td>29</td><td>21</td></tr> <tr><td>10</td><td>18</td><td>30</td><td>19</td></tr> <tr><td>11</td><td>--</td><td>31</td><td>17</td></tr> <tr><td>12</td><td>20</td><td>32</td><td>15</td></tr> <tr><td>13</td><td>22</td><td>33</td><td>13</td></tr> <tr><td>14</td><td>24</td><td>34</td><td>11</td></tr> <tr><td>15</td><td>26</td><td>35</td><td>9</td></tr> <tr><td>16</td><td>28</td><td>36</td><td>7</td></tr> <tr><td>17</td><td>30</td><td>37</td><td>5</td></tr> <tr><td>18</td><td>32</td><td>38</td><td>3</td></tr> <tr><td>19</td><td>34</td><td>39</td><td>1</td></tr> <tr><td>20</td><td>C</td><td>40</td><td>C</td></tr> </tbody> </table> <table border="1"> <caption>38 Element Array</caption> <thead> <tr> <th>Pin Number</th> <th>Element Number</th> <th>Pin Number</th> <th>Element Number</th> </tr> </thead> <tbody> <tr><td>1</td><td>C</td><td>21</td><td>C</td></tr> <tr><td>2</td><td>2</td><td>22</td><td>37</td></tr> <tr><td>3</td><td>4</td><td>23</td><td>35</td></tr> <tr><td>4</td><td>6</td><td>24</td><td>33</td></tr> <tr><td>5</td><td>8</td><td>25</td><td>31</td></tr> <tr><td>6</td><td>10</td><td>26</td><td>29</td></tr> <tr><td>7</td><td>12</td><td>27</td><td>27</td></tr> <tr><td>8</td><td>14</td><td>28</td><td>25</td></tr> <tr><td>9</td><td>16</td><td>29</td><td>23</td></tr> <tr><td>10</td><td>18</td><td>30</td><td>21</td></tr> <tr><td>11</td><td>20</td><td>31</td><td>19</td></tr> <tr><td>12</td><td>22</td><td>32</td><td>17</td></tr> <tr><td>13</td><td>24</td><td>33</td><td>15</td></tr> <tr><td>14</td><td>26</td><td>34</td><td>13</td></tr> <tr><td>15</td><td>28</td><td>35</td><td>11</td></tr> <tr><td>16</td><td>30</td><td>36</td><td>9</td></tr> <tr><td>17</td><td>32</td><td>37</td><td>7</td></tr> <tr><td>18</td><td>34</td><td>38</td><td>5</td></tr> <tr><td>19</td><td>36</td><td>39</td><td>3</td></tr> <tr><td>20</td><td>38</td><td>40</td><td>1</td></tr> </tbody> </table>	Pin Number	Element Number	Pin Number	Element Number	1	C	21	C	2	2	22	35	3	4	23	33	4	6	24	31	5	8	25	29	6	10	26	27	7	12	27	25	8	14	28	23	9	16	29	21	10	18	30	19	11	--	31	17	12	20	32	15	13	22	33	13	14	24	34	11	15	26	35	9	16	28	36	7	17	30	37	5	18	32	38	3	19	34	39	1	20	C	40	C	Pin Number	Element Number	Pin Number	Element Number	1	C	21	C	2	2	22	37	3	4	23	35	4	6	24	33	5	8	25	31	6	10	26	29	7	12	27	27	8	14	28	25	9	16	29	23	10	18	30	21	11	20	31	19	12	22	32	17	13	24	33	15	14	26	34	13	15	28	35	11	16	30	36	9	17	32	37	7	18	34	38	5	19	36	39	3	20	38	40	1	<p><b>Products:</b> OSD100-0A OSD100-5TA</p> <p>RED DOT INDICATES CATHODE LEAD</p>
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