

■ Photovoltaic Series

Planar Diffused Silicon Photodiodes

The Photovoltaic Detector series is utilized for applications requiring high sensitivity and moderate response speeds, with an additional sensitivity in the visible-blue region for the blue enhanced series. The spectral response ranges from 350 to 1100 nm, making the regular photovoltaic devices ideal for visible and near IR applications. For additional sensitivity in the 350 nm to 550 nm region, the blue enhanced devices are more suitable.

These detectors have high shunt resistance and low noise, and exhibit long term stability. Unbiased operation of these detectors offers stability under wide temperature variations in DC or low speed applications. For high light levels (greater than 10mW/cm²), the Photoconductive Series detectors should be considered for better linearity.

These detectors are not designed to be reverse biased! Very slight improvement in response time may be obtained with a slight bias. Applying a reverse bias of more than a few volts (>3V) will permanently damage the detectors. If faster response times are required, the Photoconductive Series should be considered.

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



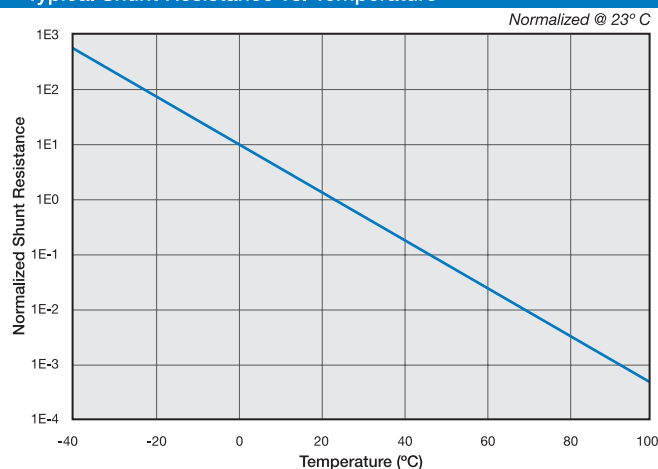
■ APPLICATIONS

- Colorimeters
- Photometers
- Spectroscopy Equipment
- Fluorescence

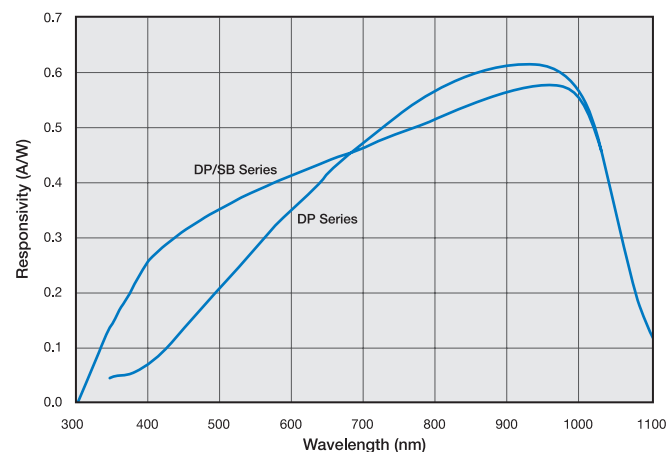
■ FEATURES

- Ultra Low Noise
- High Shunt Resistance
- Wide Dynamic Range
- Blue Enhanced

■ Typical Shunt Resistance vs. Temperature



■ Typical Spectral Response



■ Photovoltaic Series

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

Model Number	Active Area		Peak Responsivity Wavelength	Responsivity at λ_p		Capacitance (pF)	Shunt Resistance (G Ω)		NEP (W/ $\sqrt{\text{Hz}}$)	Rise Time (ns)	Temp.* Range (°C)		Package Style ¶
	Area (mm ²)	Dimensions (mm)	λ_p (nm)	(A/W)		0 V	-10 mV		0V 970 nm	0 V 632 nm 50 Ω	Operating	Storage	
			typ.	min.	typ.	max.	min.	typ.	typ.	typ.			

'DP' Series, Metal Package

CD-1705	0.88	0.93 sq	850	970	0.55	0.60	70	1.0	10	2.1 e-15	2000	-40 ~ +100	-55 ~ +125	71 / Plastic
PIN-2DPI ‡	1.1	0.81 x 1.37					150				30			4 / TO-18
PIN-12SDPL	1.6	1.27 sq.					160							8 / TO-18
PIN-3CDPI	3.2	1.27 x 2.54					320	0.5	5.0	3.0 e-15	50			4 / TO-18
PIN-3CDP														7 / TO-18
PIN-5DPI	5.1	2.54 ϕ					500	0.4	4.0	3.4 e-15	60			2 / TO-5
PIN-5DP														5 / TO-5
PIN-13DPI	13	3.6 sq					1200	0.35	3.5	3.6 e-15	150			2 / TO-5
PIN-13DP														5 / TO-5
PIN-6DPI	16.4	4.57 ϕ					2000	0.2	2.0	3.9 e-15	220			3 / TO-8
PIN-6DP														6 / TO-8
PIN-44DPI	44	6.6 sq					4300	0.1	1.0	4.8 e-15	475			3 / TO-8
PIN-44DP														6 / TO-8
PIN-10DPI	100	11.28 ϕ					9800	0.05	0.2	6.8 e-15	1000	-10 ~ +60	-20 ~ +70	10 / Lo-Prof
PIN-10DP														11 / BNC
PIN-25DP	613	27.9 ϕ					60000	0.002	0.1	3.0 e-14	6600			12 / BNC

'DP' Series, Plastic Package §

PIN-220DP	200	10 x 20	970	0.55	0.60	20000	0.02	0.2	1.2 e-14	2200	-10 ~ +60	-20 ~ +70	27 / Plastic
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Super Blue Enhanced 'DP/SB' Series, (All Specifications @ $\lambda = 410 \text{ nm}$, $V_{\text{BIAS}} = 0\text{V}$, $R_L = 50\Omega$)

Model No.	Active Area/Dimensions		Responsivity (A/W)		Capacitance (pF)	R _{sh} (MΩ)	NEP (W/√Hz)	Operating Current (mA)	Rise Time (μs)	-10 ~ +60	-20 ~ +70	Package Style ¶
	mm²	mm	min.	typ.	typ.	min.	typ.	max.	typ.			
PIN-040DP/SB	0.81	1.02 ϕ	0.15	0.20	60	600	2.0 e-14	0.5	0.02			1 / TO-18
PIN-5DP/SB †	5.1	2.54 ϕ			450	150	5.2 e-14	2.0	0.2			5 / TO-5
PIN-10DP/SB	100	11.28 ϕ			8800	10	2.0 e-13	10.0	2.0			11 / BNC
PIN-10DPI/SB												10 / Metal
PIN-220DP/SB	200	10 x 20			17000	5	2.9 e-13	10.0	4.0			27 / Plastic

'5T' Series, Blue

Model No.	Active Area/Dimensions		Responsivity (A/W) 436nm		Capacitance (pF) 0V	R_{sh} ($M\Omega$)	NEP ($\text{W}/\sqrt{\text{Hz}}$)	Dark Current (pA)	Rise Time (μs)			Package Style ¶
	mm^2	mm	min.	typ.	max	min.	typ.	max.	typ.			
OSD1-5T	1.0	1.0 sq	0.18	0.21	35	250	2.5 e-14	1.0	7	-25 ~ +75	-45 ~ +100	7 / TO-18
OSD3-5T	3.0	2.5 x 1.2			80	100	3.0 e-14	2.0	9			7 / TO-18
OSD5-5T	5.0	2.5 ϕ			130	100	3.3 e-14	2.0	9			5 / TO-5
OSD15-5T	15.0	3.8 sq			390	50	5.6 e-14	10.0	12			5 / TO-5
OSD60-5T	62.0	7.9 sq			1800	3	2.1 e-13	25.0	30			72 / TO-8
OSD100-5TA	100.0	11.3 ϕ			2500	2	2.5 e-13	30.0	45			74 / Special

‡ 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.

§ 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.

¶ For mechanical drawings please refer to pages 58 thru 69.

† Operating Temperature: -40 to +100 $^{\circ}\text{C}$, Storage Temperature: -55 to +125 $^{\circ}\text{C}$.

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

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: $0.XX \pm 0.01$ "

$0.XXX \pm 0.005$ "

Chip Centering: ± 0.010 "

Dimension 'A': ± 0.015 "

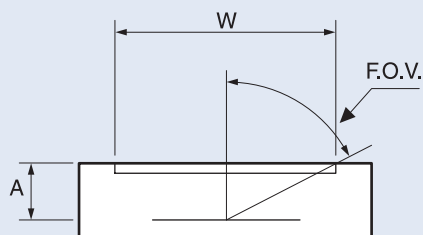
5. Windows

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.



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



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310-978-0516



- Or -
On the Internet at

www.osioptoelectronics.com

Mechanical Specifications

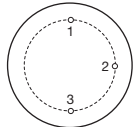
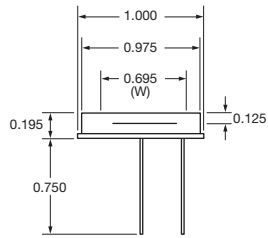
All units in inches. Pinouts are bottom view.

1 TO-18		2 TO-5		3 TO-8																																			
Pin Circle Dia.=0.100 <table><tr><th>P/N</th><th>A</th><th>B</th><th>W</th></tr><tr><td>PIN-020A</td><td>0.075</td><td>0.200</td><td>0.155</td></tr><tr><td>PIN-040A</td><td>0.075</td><td>0.200</td><td>0.155</td></tr></table>		P/N	A	B	W	PIN-020A	0.075	0.200	0.155	PIN-040A	0.075	0.200	0.155	Pin Circle Dia.=0.200 <table><tr><th>P/N</th><th>A</th><th>B</th><th>W</th></tr><tr><td>All Others</td><td>0.094</td><td>0.180</td><td>0.240</td></tr><tr><td>CD-25T</td><td>0.050</td><td>0.130</td><td>0.23</td></tr></table>		P/N	A	B	W	All Others	0.094	0.180	0.240	CD-25T	0.050	0.130	0.23	Pin Circle Dia.=0.295 <table><tr><th>P/N</th><th>A</th></tr><tr><td>PIN-6DI/6DPI</td><td>0.115</td></tr><tr><td>PIN-44DI/44DPI</td><td>0.125</td></tr><tr><td>OSD35-0</td><td>0.130</td></tr><tr><td>OSD35-7Q</td><td>0.130 Quartz Window</td></tr></table>		P/N	A	PIN-6DI/6DPI	0.115	PIN-44DI/44DPI	0.125	OSD35-0	0.130	OSD35-7Q	0.130 Quartz Window
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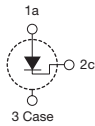
Mechanical Specifications

All units in inches. Pinouts are bottom view.

10 Low Profile

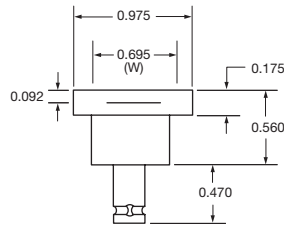


Pin Circle Dia.=.73



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

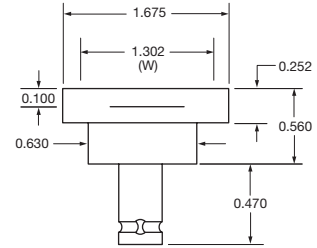
11 BNC



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

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

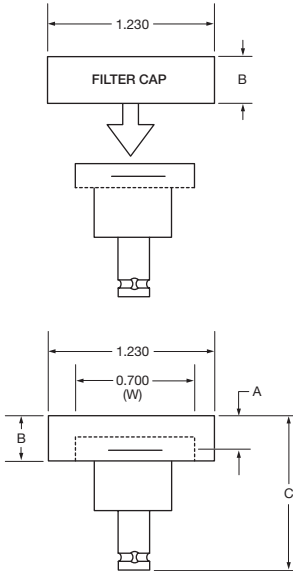
12 BNC



Outer Contact — Anode

Products:
PIN-25D
PIN-25DP

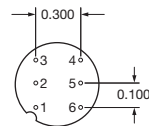
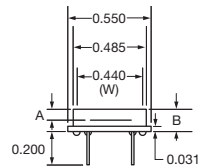
13 Special BNC



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

Products:
PIN-10AP
PIN-10DF

14 Special Plastic

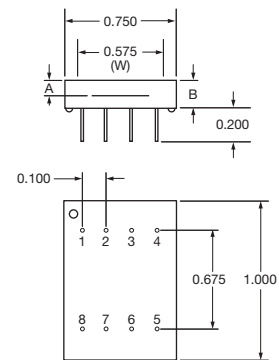


Dimensions		
P/N	A	B
FIL-5C FIL-20C FIL-UV20 FIL-C4DG	0.060	0.130
FIL-UV005 FIL-UV20 FIL-C4DG	0.087	0.152

Products:
FIL-5C
FIL-20C
FIL-UV20
FIL-C4DG

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



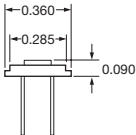
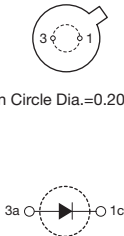
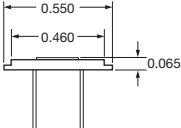
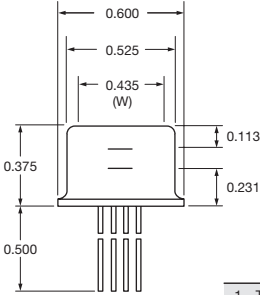
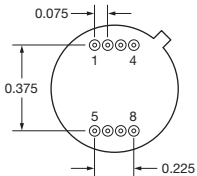
Dimensions		
P/N	A	B
FIL-44C FIL-100C FIL-UV50 FIL-UV100 FIL-C10DG	0.052	0.130
FIL-UV50 FIL-UV100	0.090	0.155
FIL-C10DG	0.082	0.155

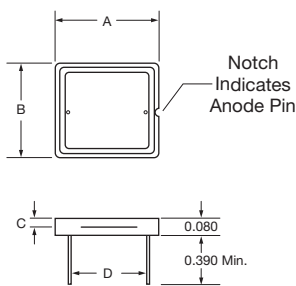
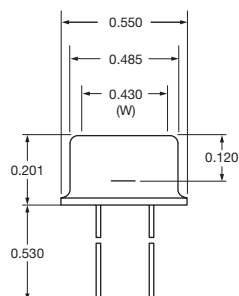
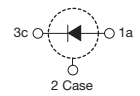
Products:
FIL-44C
FIL-100C
FIL-UV50
FIL-UV100
FIL-C10DG

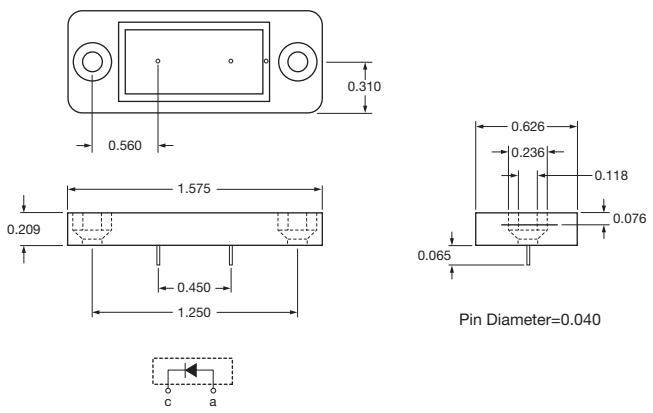
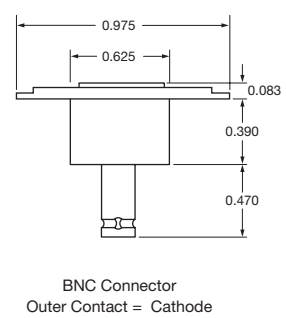
Pinouts								
P/N	1	2	3	4	5	6	7	8
FIL-44C FIL-100C	a	-	-	c	a	-	-	c
FIL-UV50 FIL-UV100	c	-	-	a	c	-	-	a
FIL-C10DG	c	a	a	c	c	a	a	c

Mechanical Specifications

All units in inches. Pinouts are bottom view.

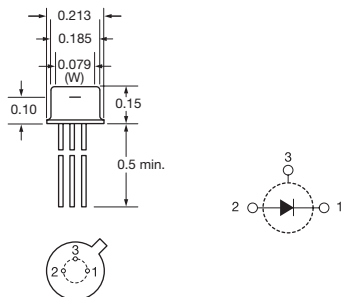
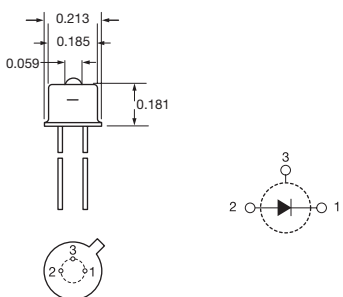
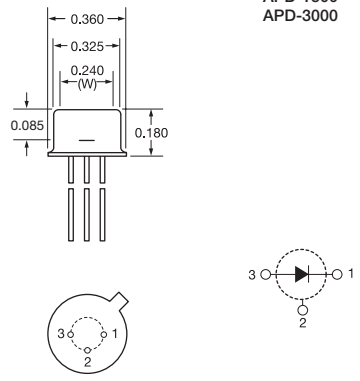
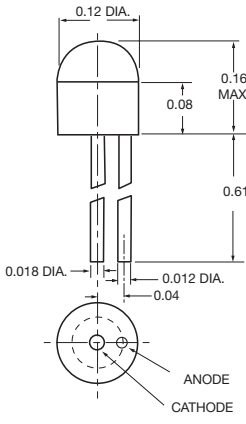
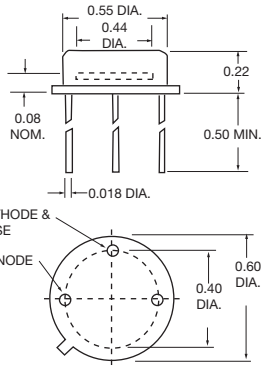
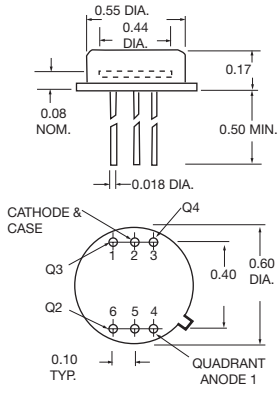
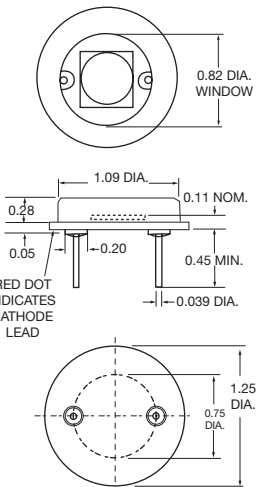
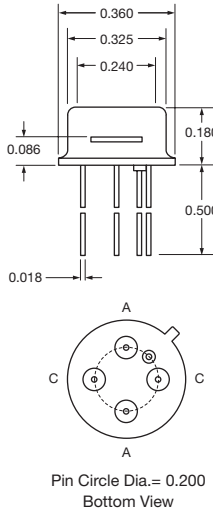
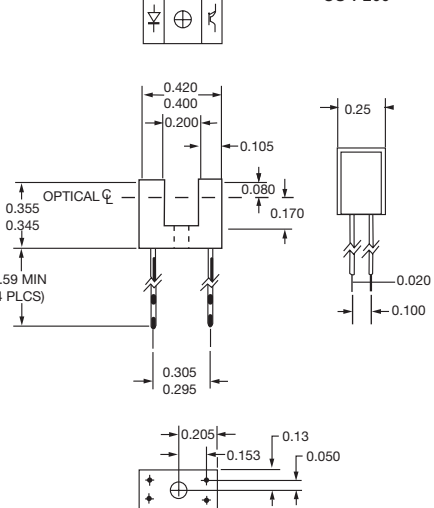
22 TO-5	23 TO-8	24 TO-8																
Products: XUV-005  Pin Circle Dia.=0.200 	Products: XUV-020 XUV-035  Pin Circle Dia.=0.295 	Products: PIN-DSIn-TEC  Pinout <table><tr><td>1</td><td>TEC (-)</td></tr><tr><td>2</td><td>Thermistor</td></tr><tr><td>3</td><td>Thermistor</td></tr><tr><td>4</td><td>TEC (+)</td></tr><tr><td>5</td><td>Bottom InGaAs, Cathode</td></tr><tr><td>6</td><td>Bottom InGaAs, Anode</td></tr><tr><td>7</td><td>Top Silicon, Anode</td></tr><tr><td>8</td><td>Top Silicon, Cathode</td></tr></table> 	1	TEC (-)	2	Thermistor	3	Thermistor	4	TEC (+)	5	Bottom InGaAs, Cathode	6	Bottom InGaAs, Anode	7	Top Silicon, Anode	8	Top Silicon, Cathode
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3	Thermistor																	
4	TEC (+)																	
5	Bottom InGaAs, Cathode																	
6	Bottom InGaAs, Anode																	
7	Top Silicon, Anode																	
8	Top Silicon, Cathode																	

25 Special Ceramic / Plastic		26 TO-8																																																																																
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<table><thead><tr><th rowspan="2">P/N</th><th colspan="4">Dimensions</th></tr><tr><th>A</th><th>B</th><th>C</th><th>D</th></tr></thead><tbody><tr><td>UV-005EC</td><td>0.400</td><td>0.350</td><td>0.030</td><td>0.280</td></tr><tr><td>UV-035EC</td><td>0.400</td><td>0.350</td><td>0.030</td><td>0.290</td></tr><tr><td>UV-100EC</td><td>0.650</td><td>0.590</td><td>0.048</td><td>0.500</td></tr><tr><td>UV-005DC</td><td>0.400</td><td>0.350</td><td>0.030</td><td>0.280</td></tr><tr><td>UV-035DC</td><td>0.400</td><td>0.350</td><td>0.030</td><td>0.290</td></tr><tr><td>UV-100DC</td><td>0.650</td><td>0.590</td><td>0.053</td><td>0.500</td></tr><tr><td>XUV-50C</td><td>0.650</td><td>0.590</td><td>0.027</td><td>0.490</td></tr><tr><td>XUV-100C</td><td>0.650</td><td>0.590</td><td>0.027</td><td>0.490</td></tr><tr><td>RD-100</td><td>0.650</td><td>0.590</td><td>0.027</td><td>0.490</td></tr><tr><td>RD-100A</td><td>0.650</td><td>0.590</td><td>0.027</td><td>0.490</td></tr><tr><td>UV-35P</td><td>0.390</td><td>0.345</td><td>0.050</td><td>0.275</td></tr><tr><td>OSD35-7CO</td><td>0.390</td><td>0.350</td><td>---</td><td>0.290</td></tr><tr><td>OSD35-LR-A</td><td>0.390</td><td>0.350</td><td>---</td><td>0.290</td></tr><tr><td>OSD35-LR-D</td><td>0.390</td><td>0.350</td><td>---</td><td>0.290</td></tr></tbody></table>		P/N	Dimensions				A	B	C	D	UV-005EC	0.400	0.350	0.030	0.280	UV-035EC	0.400	0.350	0.030	0.290	UV-100EC	0.650	0.590	0.048	0.500	UV-005DC	0.400	0.350	0.030	0.280	UV-035DC	0.400	0.350	0.030	0.290	UV-100DC	0.650	0.590	0.053	0.500	XUV-50C	0.650	0.590	0.027	0.490	XUV-100C	0.650	0.590	0.027	0.490	RD-100	0.650	0.590	0.027	0.490	RD-100A	0.650	0.590	0.027	0.490	UV-35P	0.390	0.345	0.050	0.275	OSD35-7CO	0.390	0.350	---	0.290	OSD35-LR-A	0.390	0.350	---	0.290	OSD35-LR-D	0.390	0.350	---	0.290		
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Note: OSD35-prefix packages come with 0.31" (min.) leads		Pin Circle Dia.=0.295																																																																																

27 Special Plastic	Products:	28 BNC	Products:
PIN-220D PIN-220DP PIN-220DP/SB  Pin Diameter=0.040		XUV-100  BNC Connector Outer Contact = Cathode	

Mechanical Specifications

All units in inches. Pinouts are bottom view.

68 TO-18	69 TO-18	70 TO-5
Products: APD-300 APD-500  Pin Circle Dia.=0.100	Products: APD-300L APD-500L  Pin Circle Dia.=0.100	Products: APD-900 APD-1500 APD-3000  Pin Circle Dia.=0.200
71 Plastic	72 TO-8	73 TO-8
Products: CD-1705  ANODE CATHODE	Products: OSD-60-0  CATHODE & CASE ANODE	Products: QD50-0  CATHODE & CASE Q4 Q3 Q2 Q1 QUADRANT ANODE 1
74 Special	75 TO-5	76 Plastic Molded
Products: OSD100-0A OSD100-5TA  RED DOT INDICATES CATHODE LEAD	Products: DLS-2S  Pin Circle Dia.= 0.200 Bottom View	Products: OS-P200  OPTICAL C QUADRANT ANODE 1