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Photoconductive Series

Planar Diffused Silicon Photodiodes

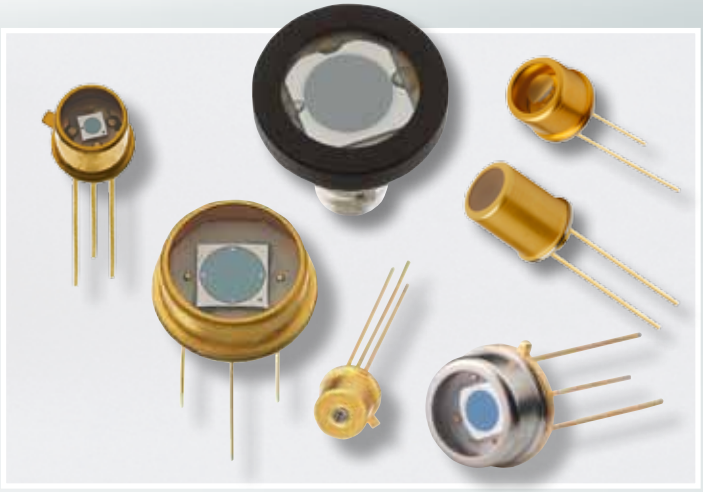
The **Photoconductive Detector Series** are suitable for high speed and high sensitivity applications. The spectral range extends from 350 to 1100 nm, making these photodiodes ideal for visible and near IR applications, including such AC applications as detection of pulsed LASER sources, LEDs, or chopped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



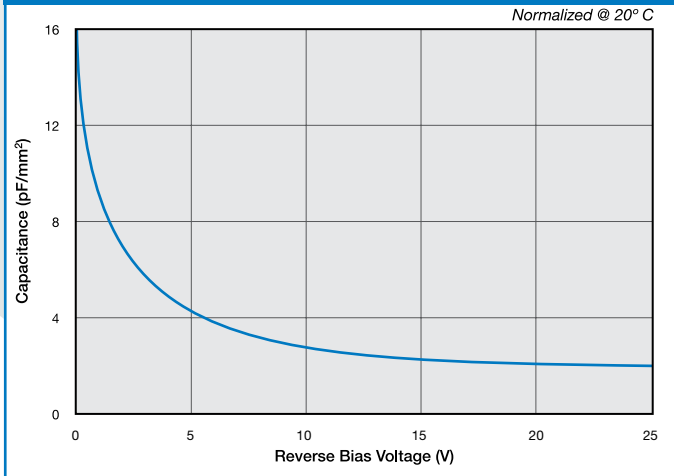
APPLICATIONS

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

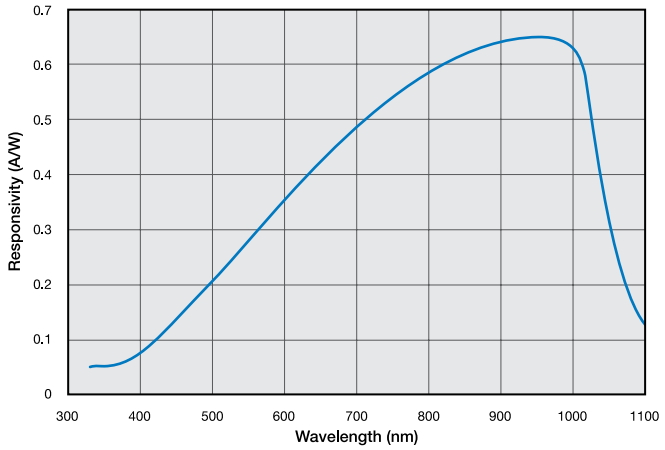
FEATURES

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

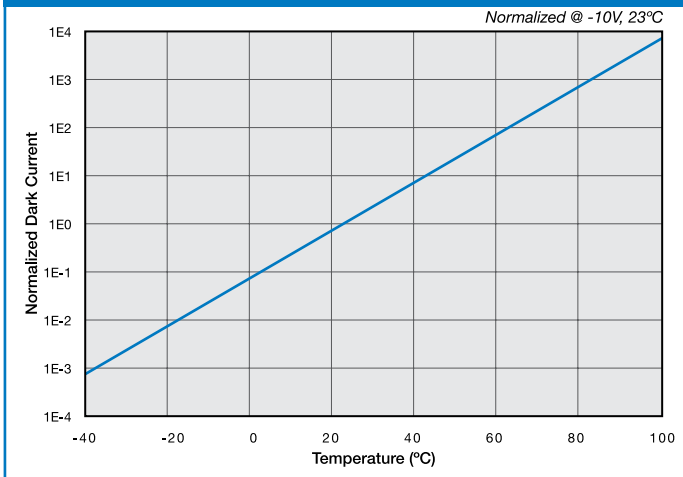
Typical Capacitance vs. Reverse Bias



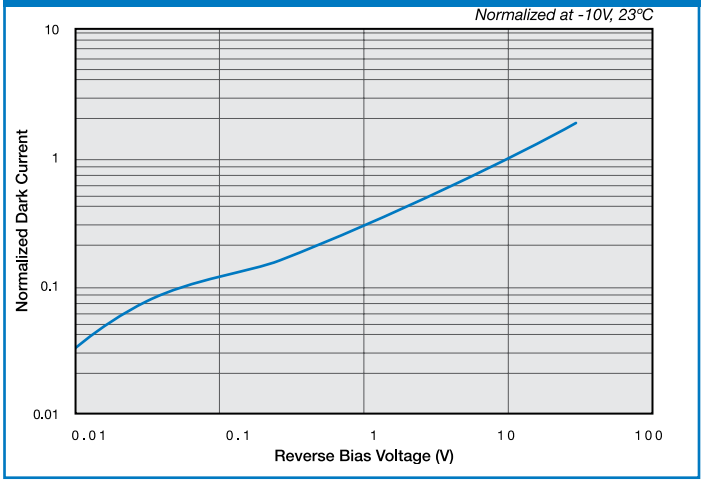
Typical Spectral Response



Typical Dark Current vs. Temperature



Typical Dark Current vs. Reverse Bias



Photoconductive Series

Typical Electro-Optical Specifications at T_A=23°C

Model Number	Active Area		Peak Responsivity Wavelength	Responsivity at λp		Capacitance (pF)		Dark Current (nA)		NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (ns)	Temp.* Range (°C)		Package Style ¶
	Area (mm²)	Dimensions (mm)	λp (nm)	(A/W)		0 V	-10 V	-10 V		-10V 970nm		-10V 632nm 50 Ω	Operating	Storage	
			typ.	min.	typ.	typ.	typ.	typ.	max.	typ.	max.	typ.			
'D' Series, Metal Package															
PIN-020A	0.20	0.51 ϕ	970	0.60	0.65	4	1	0.01	0.15	2.8 e-15	30	6	-40 ~ +100	-55 ~ +125	1 / TO-18
PIN-040A	0.81	1.02 ϕ				8	2	0.05	0.50	6.2 e-15		8			
PIN-2DI ‡	1.1	0.81 x 1.37				25	5	0.10	1.0	8.7 e-15		10			4 / TO-18
PIN-3CDI	3.2	1.27 x 2.54				45	12	0.15	2	1.1 e-14					
PIN-3CD															7 / TO-18
PIN-5DI	5.1	2.54 ϕ				85	15	0.25	3	1.4 e-14		12			2 / TO-5
PIN-5D															5 / TO-5
PIN-13DI	13	3.6 sq				225	40	0.35	6	1.6 e-14		14			2 / TO-5
PIN-13D															5 / TO-5
PIN-6DI	16.4	4.57 ϕ				330	60	0.5	10	1.9 e-14		17			3 / TO-8
PIN-6D															6 / TO-8
PIN-44DI	44	6.6 sq				700	130	1	15	2.8 e-14		24			3 / TO-8
PIN-44D															6 / TO-8
PIN-10DI	100	11.28 ϕ				1500	300	2	25	3.9 e-14		43	-10 ~ +60	-20 ~ +70	10/ Lo-Prof
PIN-10D															11 / BNC
PIN-25D	613	27.9 ϕ				9500	1800	15	1000	1.1 e-13		250			12 / BNC
'O' Series, Metal Package															
OSD1-0	1	1.0 sq	900	0.47	0.54	12	3	1	3	4.5 e-14	50	10	-25 ~ +75	-40 ~ +100	7 / TO-18
OSD5-0	5	2.5 ϕ				50	8	5	10	1.0 e-13		8			5 / TO-5
OSD15-0	15	3.8 sq				150	20	8	15	1.3 e-13		9			5 / TO-5
OSD60-0	58	7.6 sq				600	75	15	50	1.7 e-13		14			69 / TO-8
OSD100-0A	100	11.3 ϕ				1000	130	30	70	2.5 e-13		19			55 /Special
'D' Series, Plastic Package															
PIN-220D«	200	10 x 20	970	0.60	0.65	3200	600	5	100	6.2 e-14	30	75	-10 ~ +60	20 ~ +70	27 / Plastic

‡ 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.
¶ For mechanical drawings please refer to pages 61 thru 73.
* Non-condensing temperature and storage range, Non-condensing environment.

« Minimum order quantities apply

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Photodiode Care and Handling Instructions

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: Immersion Time: Soldering Time:	260±5°C. within 5 Sec. 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 ± 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"

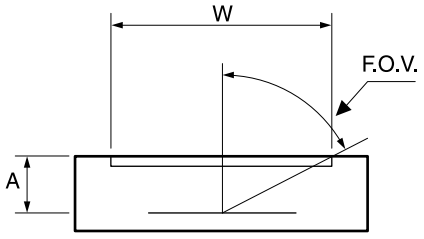
5. Windows

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

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An OSI Systems Company



- Or -
visit our website at
www.osioptoelectronics.com

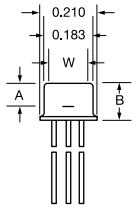
Mechanical Specifications

All units in inches. Pinouts are bottom view.

1 TO-18

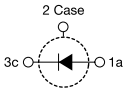
Products:

PIN-020A
PIN-040A
PIN-040-DP/SB





Pin Circle Dia.=0.100

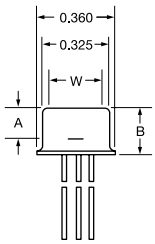


P/N	A	B	W
PIN-020A	0.075	0.200	0.155
PIN-040A	0.075	0.200	0.155

2 TO-5

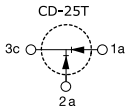
Products:

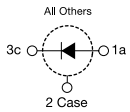
PIN-5DI
PIN-5DPI
PIN-13DI
PIN-13DPI
PIN-5-YAG
CD-25T





Pin Circle Dia.=0.200





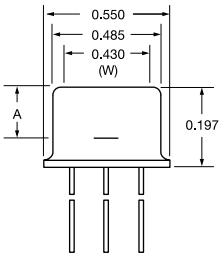
P/N	A	B	W
All Others	0.094	0.180	0.240
CD-25T	0.050	0.130	0.23

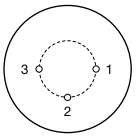
3 TO-8

Products:

PIN-6DI
PIN-6DPI
PIN-44DI
PIN-44DPI

APD50-8-150-TO8





Pin Circle Dia.=0.295



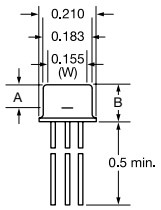


P/N	A
PIN-6DI/6DPI APD50-8-150-TO8	0.115
PIN-44DI/44DPI	0.125

4 TO-18

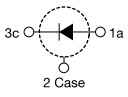
Products:

PIN-2DI
PIN-2DPI
PIN-3CDI
PIN-3CDPI





Pin Circle Dia.=0.100



A	B
0.090	0.150

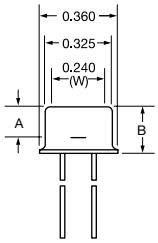
5 TO-5

Products:

PIN-5D
PIN-5DP
PIN-5DP/SB
PIN-13D
PIN-13DP
PIN-005E-550F

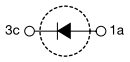
UV-001
UV-005
UV-005DQ
UV-005EQ
UV-013DQ
UV-013EQ
UV-015

OSD-5-0
OSD15-0
OSD5-5T
OSD15-5T





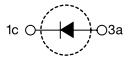
Pin Circle Dia.=0.200



PIN-5D, PIN-5DP, PIN-5DP/SB,
PIN-13D, PIN-13DP, PIN-005E-550F
UV-005DQ, UV-005EQ, UV-013DQ, UV-013EQ
15OSD-5-0, OSD15-0, OSD5-5T, OSD15-5T
OSD5.8-7Q, OSD5.8-7U

P/N	A	B
OSD-Prefix Devices	0.050	0.130
UV-XXXDQ	0.065	0.138
UV-XXXEQ	0.055	0.138
All Others	0.102	0.180

Quartz Window: OSD5.8-7Q
UV Transmissive Window: OSD5.8-7U

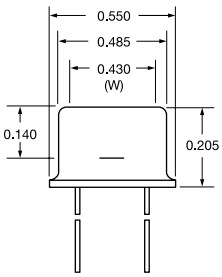


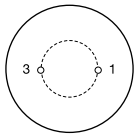
UV-001, UV-005, UV-015

6 TO-8

Products:

PIN-6D
PIN-6DP
PIN-44D
PIN-44DP
UV-020
UV-035DQ
UV-035EQ
UV-035

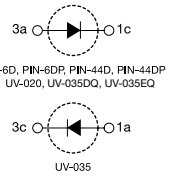




Pin Circle Dia.=0.295

Dimensions

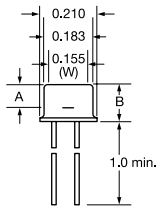
P/N	A	B
UV-035DQ	0.130	0.195
UV-035EQ	0.120	0.195
All Others	0.140	0.205



7 TO-18

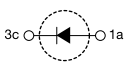
Products:

PIN-3CD
PIN-3CDP
BPX-65
OSD1-0
OSD1-5T
OSD3-5T
OSD1-E
OSD3-E





Pin Circle Dia.=0.100



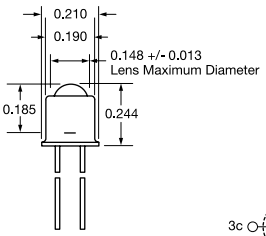
P/N	A	B
PIN-3CD / 3CDP	0.087	0.146
BPX-65	0.075	0.200
OSD-Prefix Devices	0.080	0.200

Quartz Window: OSD1.2-7Q
UV Transmissive Window: OSD1.2-7U

8 TO-18

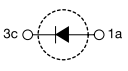
Products:

PIN-125DPL





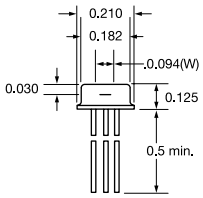
Pin Circle Dia.=0.100



9 TO-18

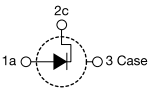
Products:

PIN-HR005
PIN-HR008
PIN-HR020
PIN-HR026
PIN-HR040





Pin Circle Dia.=0.100



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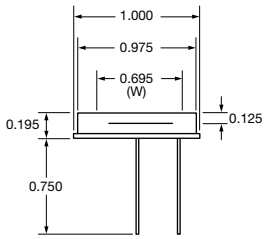
Mechanical Specifications

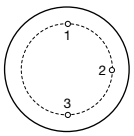
All units in inches. Pinouts are bottom view.

10 Low Profile

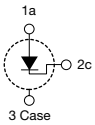
Products:

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





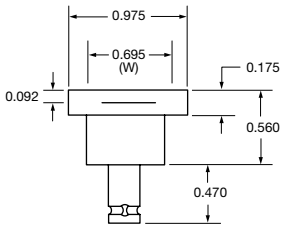
Pin Circle Dia.=0.73



11 BNC

Products:

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

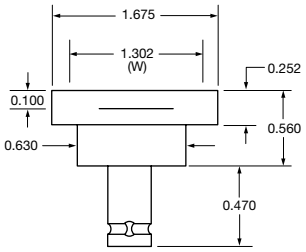


Outer Contact — Anode	PIN-10D, PIN-10DP, PIN-10DP/SB UV-100DQ, UV-100EQ
Outer Contact — Cathode	UV-50, UV-100

12 BNC

Products:

PIN-25D
PIN-25DP

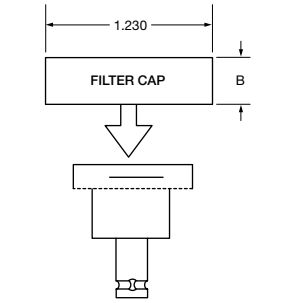


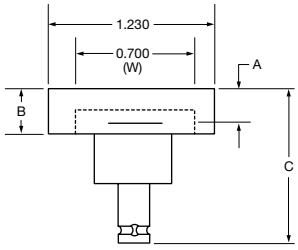
Outer Contact — Anode

13 Special BNC

Products:

PIN-10AP
PIN-10DF





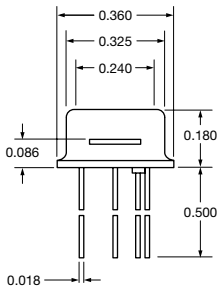
Dimensions

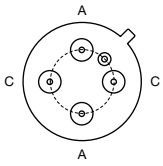
P/N	A	B	C
PIN-10DF	0.217	0.330	1.020
PIN-10AP	0.386	0.550	1.415

14 TO-5

Products:

DLS-2S



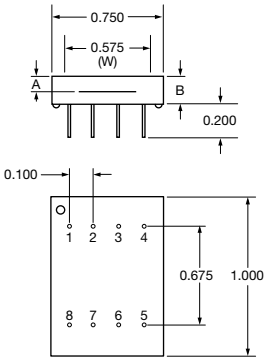


Pin Circle Dia.= 0.200
Bottom View

15 Special Plastic

Products:

FIL-UV50



Dimensions

P/N	A	B
FIL-UV50	0.090	0.155

Pinouts

P/N	1	2	3	4	5	6	7	8
FIL-UV50	c	-	-	a	c	-	-	a

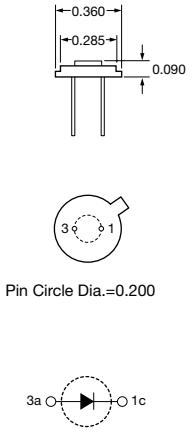
Mechanical Specifications

All units in inches. Pinouts are bottom view.

22 TO-5

Products:

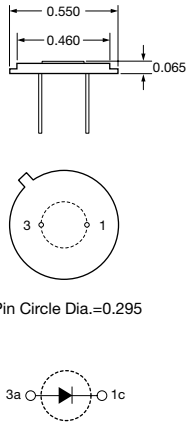
XUV-005



23 TO-8

Products:

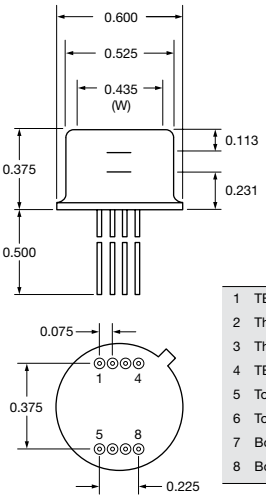
XUV-020
XUV-035



24 TO-8

Products:

PIN-DSIn-TEC



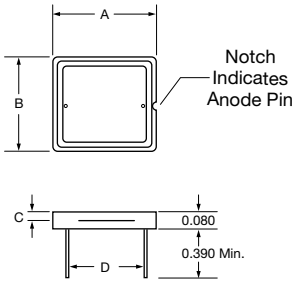
Pinout

1	TEC (-)
2	Thermistor
3	Thermistor
4	TEC (+)
5	Top Silicon, Cathode
6	Top Silicon, Anode
7	Bottom InGaAs, Anode
8	Bottom InGaAs, Cathode

25 Special Ceramic / Plastic

Products:

RD-100
RD-100A
UV-35P
UV-005EQC
UV-035EQC
UV-100EQC
UV-005DQC
UV-035DQC
UV-100DQC
XUV-50C
XUV-100C
OSD35-LR-A
OSD35-LR-D



Dimensions

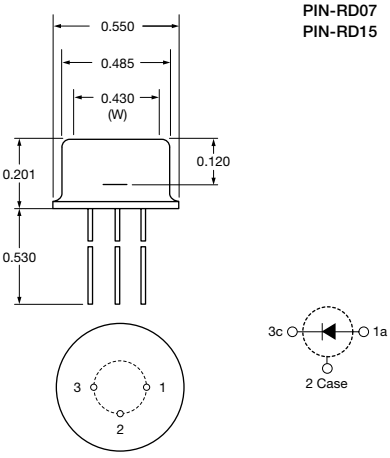
P/N	A	B	C	D
UV-005EQC	0.300	0.236	0.024	0.177
UV-035EQC	0.400	0.350	0.028	0.290
UV-100EQC	0.650	0.590	0.028	0.490
UV-005DQC	0.300	0.236	0.035	0.177
UV-035DQC	0.400	0.350	0.039	0.290
UV-100DQC	0.650	0.590	0.039	0.490
XUV-50C	0.650	0.590	0.027	0.490
XUV-100C	0.650	0.590	0.027	0.490
RD-100	0.650	0.590	0.027	0.490
RD-100A	0.650	0.590	0.027	0.490
UV-35P	0.390	0.345	0.050	0.275
OSD35-LR-A	0.390	0.350	---	0.290
OSD35-LR-D	0.390	0.350	---	0.290

Note: OSD35-prefix packages come with 0.31" (min.) leads

26 TO-8

Products:

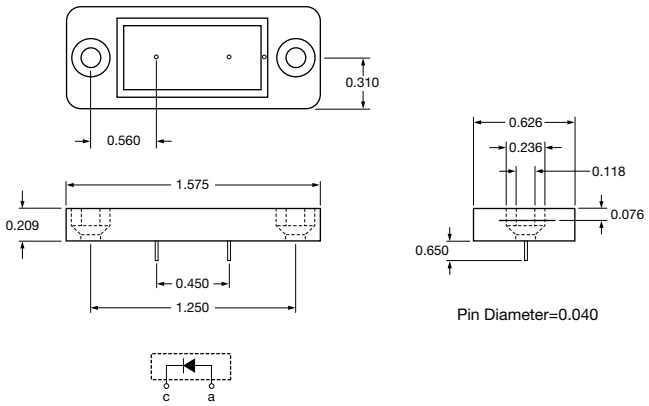
PIN-RD07
PIN-RD15



27 Special Plastic

Products:

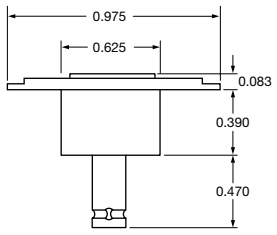
PIN-220D
PIN-220DP
PIN-220DP/SB



28 BNC

Products:

XUV-100



BNC Connector
Outer Contact = Cathode

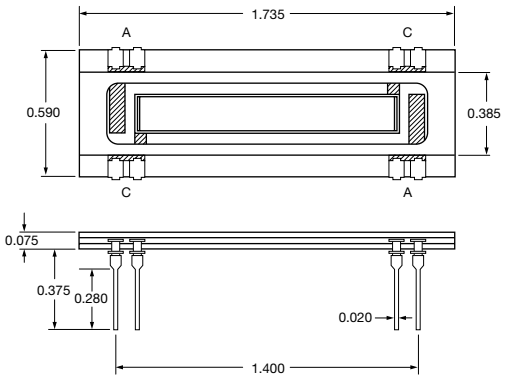
Mechanical Specifications

All units in inches. Pinouts are bottom view.

51 Low Cost Ceramic

Products:

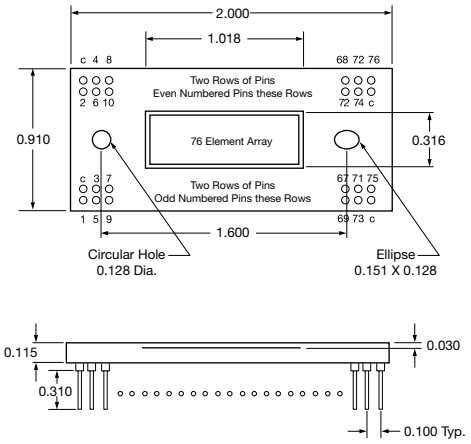
SL-30



52 Special

Products:

A2V-76

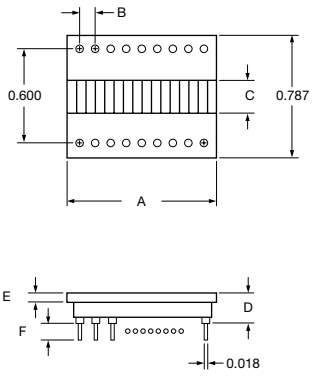


Pin Diameter = 0.025

53 Special

Products:

A2V-16



Dimensions

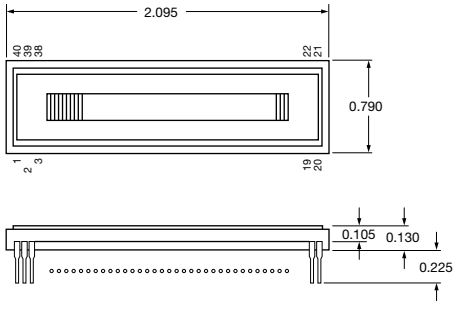
P/N	A	B	C	D	E	F
A2V-16	1	0.1	0.212	0.2	0.062	0.06

54 40-PIN-DIP

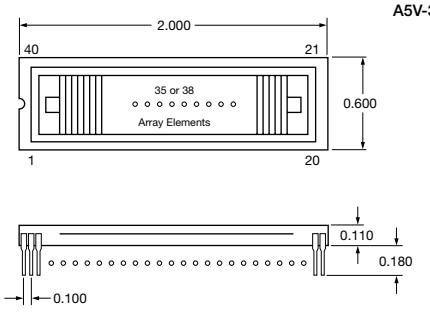
Products:

A5V-35UV
A5C-35
A5C-38
A5V-35
A5V-38

A5V-35UV



A5C-35, A5C-38
A5V-35, A5V-38



35 Element Array

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

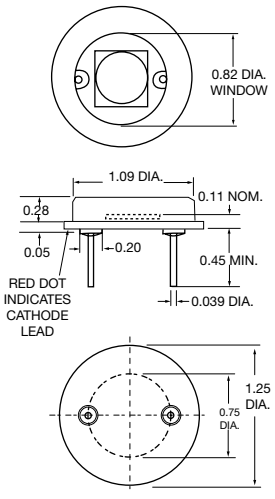
38 Element Array

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

55 Special

Products:

OSD100-0A
OSD100-5TA



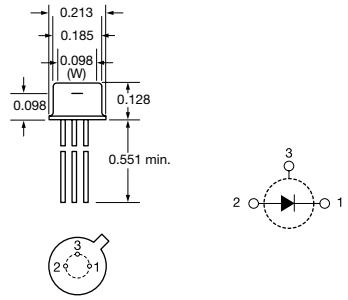
Mechanical Specifications

All units in inches. Pinouts are bottom view.

65 TO-52

Products:

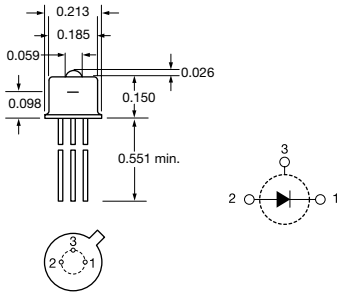
APD02-8-150-T52
APD05-8-150-T52
APD10-8-150-T52



66 TO-52L

Products:

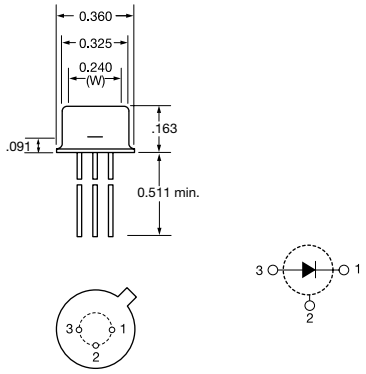
APD02-8-150-T52L
APD05-8-150-T52L
APD10-8-150-T52L



67 TO-5

Products:

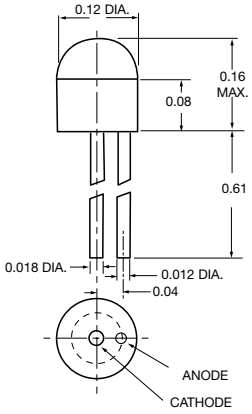
APD15-8-150-TO5
APD30-8-150-TO5



68 Plastic

Products:

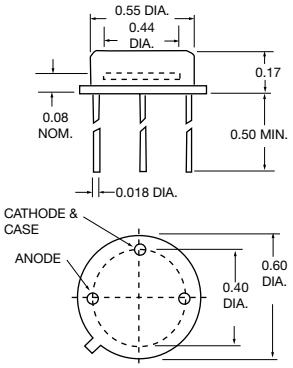
CD-1705



69 TO-8

Products:

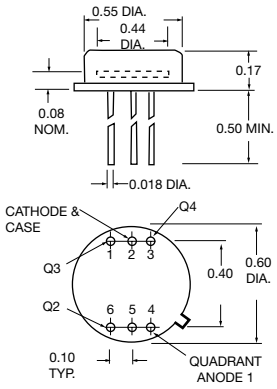
OSD60-0
OSD60-5T
OSD60-E



70 TO-8

Products:

QD50-0



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