

YAG Series

Nd:YAG Optimized Photodetectors

The **YAG Series** of photo detectors are optimized for high response at 1060 nm, the YAG laser light wavelength, and low capacitance, for high speed operation and low noise. These detectors can be used for sensing low light intensities, such as the light reflected from objects illuminated by a YAG laser beam for ranging applications. The **SPOT Series** of quadrant detectors are well suited for aiming and pointing applications. These are all N on P devices.

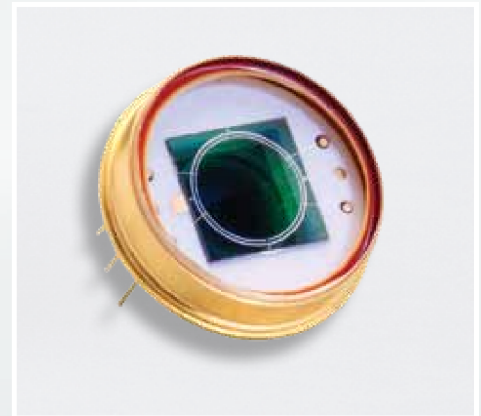
These detectors can be used in the photovoltaic mode, for low speed applications requiring low noise, or in the photoconductive mode, with an applied reverse bias, for high speed applications.

APPLICATIONS

- Nd:YAG Pointing
- Laser Pointing & Positioning
- Position Measurement
- Surface Profiling
- Guidance Systems

FEATURES

- Nd:YAG Sensitivity
- High Breakdown Voltage
- Large Area
- High Speed
- High Accuracy



Model Number	Active Area		Peak Responsivity Wavelength	Responsivity (A/W)	Element Gap	Dark Current (nA)		Capacitance (pF)		Rise Time (ns)	NEP (W/√Hz)	Reverse Voltage (V)	Temp.* Range (°C)		Package Style ¶				
	Area (mm ²)	Dimensions (mm)				λp nm	1060nm -180V	mm	-180 V				1064 nm -180 V 50 Ω	1064 nm -180 V		max.	Operation	Storage	
									typ.										typ.

Nd: YAG Optimized Single Element

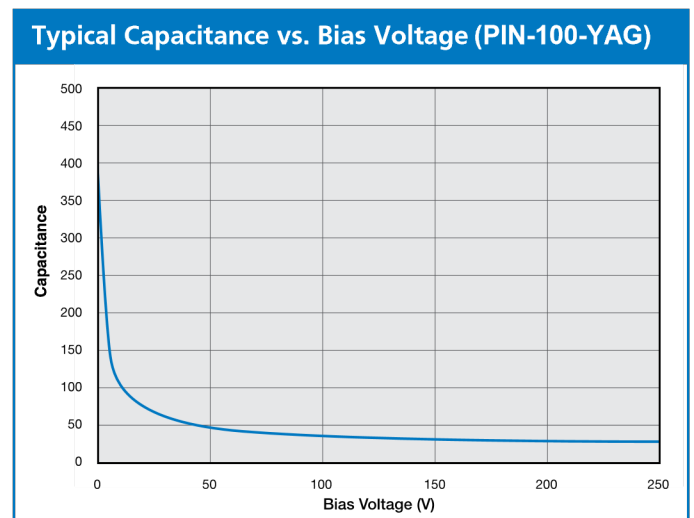
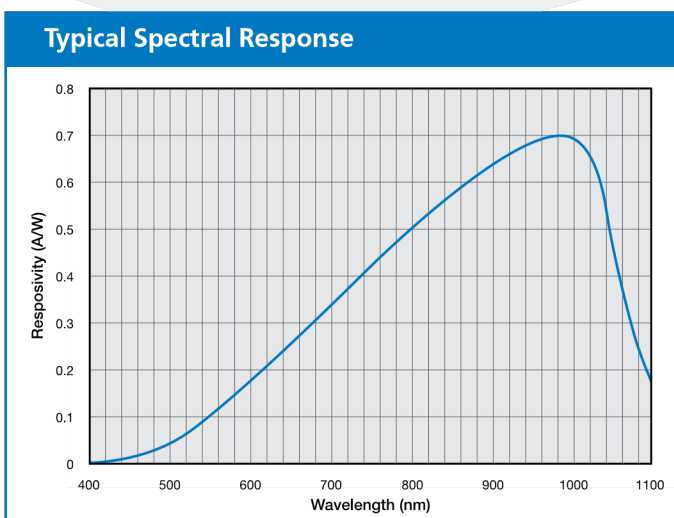
Model Number	Area (mm ²)	Dimensions (mm)	Peak Responsivity Wavelength	Responsivity (A/W)	Element Gap	Dark Current (nA)		Capacitance (pF)		Rise Time (ns)	NEP (W/√Hz)	Reverse Voltage (V)	Temp.* Range (°C)		Package Style ¶
PIN-5-YAG	5.1	2.54 φ	1000	0.4	-	5	-	5	-	10	1.2 e-14	200	-20 ~ +100	-40 ~ +125	2 / TO-5
PIN-100-YAG	100	11.28 φ				75	800	30	-	30	2.5 e-14		20 / Metal		

Nd: YAG Optimized Quadrant Photodetectors**

Model Number	Area (mm ²)	Dimensions (mm)	Peak Responsivity Wavelength	Responsivity (A/W)	Element Gap	Dark Current (nA)		Capacitance (pF)		Rise Time (ns)	NEP (W/√Hz)	Reverse Voltage (V)	Temp.* Range (°C)		Package Style ¶
SPOT-9-YAG	19.6	10 φ	1000	0.4	0.15	20	100	7	-	13	2.7 e-13	200	-20 ~ +100C	-40 ~ +125C	20 / Metal
SPOT-11A-YAG FL	26	11.5 φ				7	75	12	17	15	1.8 e-13				29 / Metal
SPOT-13A-YAG-FL	33.7	13.1 φ				8	80	14	20	15	1.9 e-13				29 / Metal
SPOT-15-YAG	38.5	14.0 φ				50	200	15	22	18	4.1 e-13				20 / Metal

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

** Specifications are per element



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: 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 ± 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 "

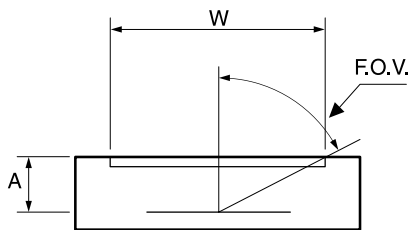
5. Windows

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.



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



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

Mechanical Specifications

All units in inches. Pinouts are bottom view.

1 TO-18	2 TO-5	3 TO-8																																		
<p>Products: PIN-020A PIN-040A PIN-040-DP/SB</p> <p>Pin Circle Dia.=0.100</p> <table border="1"> <thead> <tr> <th>P/N</th> <th>A</th> <th>B</th> <th>W</th> </tr> </thead> <tbody> <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> </tbody> </table>	P/N	A	B	W	PIN-020A	0.075	0.200	0.155	PIN-040A	0.075	0.200	0.155	<p>Products: PIN-5DI PIN-5DPI PIN-13DI PIN-13DPI PIN-5-YAG CD-25T</p> <p>Pin Circle Dia.=0.200</p> <table border="1"> <thead> <tr> <th>P/N</th> <th>A</th> <th>B</th> <th>W</th> </tr> </thead> <tbody> <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> </tbody> </table>	P/N	A	B	W	All Others	0.094	0.180	0.240	CD-25T	0.050	0.130	0.23	<p>Products: PIN-6DI PIN-6DPI PIN-44DI PIN-44DPI</p> <p>APD50-8-150-TO8</p> <p>Pin Circle Dia.=0.295</p> <table border="1"> <thead> <tr> <th>P/N</th> <th>A</th> </tr> </thead> <tbody> <tr> <td>PIN-6DI/6DPI APD50-8-150-TO8</td> <td>0.115</td> </tr> <tr> <td>PIN-44DI/44DPI</td> <td>0.125</td> </tr> </tbody> </table>	P/N	A	PIN-6DI/6DPI APD50-8-150-TO8	0.115	PIN-44DI/44DPI	0.125				
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<p>4 TO-18</p> <p>Products: PIN-2DI PIN-2DPI PIN-3CDI PIN-3CDPI</p> <p>Pin Circle Dia.=0.100</p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>0.090</td> <td>0.150</td> </tr> </tbody> </table>	A	B	0.090	0.150	<p>5 TO-5</p> <p>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</p> <p>OSD-5-0 OSD15-0 OSD5-5T OSD15-5T</p> <p>Pin Circle Dia.=0.200</p> <table border="1"> <thead> <tr> <th>P/N</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>OSD-Prefix Devices</td> <td>0.050</td> <td>0.130</td> </tr> <tr> <td>UV-XXXDQ</td> <td>0.065</td> <td>0.138</td> </tr> <tr> <td>UV-XXXEQ</td> <td>0.055</td> <td>0.138</td> </tr> <tr> <td>All Others</td> <td>0.102</td> <td>0.180</td> </tr> </tbody> </table> <p>Quartz Window: OSD5.8-7Q UV Transmissive Window: OSD5.8-7U</p>	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	<p>6 TO-8</p> <p>Products: PIN-6D PIN-6DP PIN-44D PIN-44DP UV-020 UV-035DQ UV-035EQ UV-035</p> <p>Pin Circle Dia.=0.295</p> <table border="1"> <thead> <tr> <th colspan="3">Dimensions</th> </tr> <tr> <th>P/N</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>UV-035DQ</td> <td>0.130</td> <td>0.195</td> </tr> <tr> <td>UV-035EQ</td> <td>0.120</td> <td>0.195</td> </tr> <tr> <td>All Others</td> <td>0.140</td> <td>0.205</td> </tr> </tbody> </table>	Dimensions			P/N	A	B	UV-035DQ	0.130	0.195	UV-035EQ	0.120	0.195	All Others	0.140	0.205
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<p>7 TO-18</p> <p>Products: PIN-3CD PIN-3CDP BPX-65 OSD1-0 OSD1-5T OSD3-5T OSD1-E OSD3-E</p> <p>Pin Circle Dia.=0.100</p> <table border="1"> <thead> <tr> <th>P/N</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>PIN-3CD / 3CDP</td> <td>0.087</td> <td>0.146</td> </tr> <tr> <td>BPX-65</td> <td>0.075</td> <td>0.200</td> </tr> <tr> <td>OSD-Prefix Devices</td> <td>0.080</td> <td>0.200</td> </tr> </tbody> </table> <p>Quartz Window: OSD1.2-7Q UV Transmissive Window: OSD1.2-7U</p>	P/N	A	B	PIN-3CD / 3CDP	0.087	0.146	BPX-65	0.075	0.200	OSD-Prefix Devices	0.080	0.200	<p>8 TO-18</p> <p>Products: PIN-125DPL</p> <p>Pin Circle Dia.=0.100</p>	<p>9 TO-18</p> <p>Products: PIN-HR005 PIN-HR008 PIN-HR020 PIN-HR026 PIN-HR040</p> <p>Pin Circle Dia.=0.100</p>																						
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Mechanical Specifications

All units in inches. Pinouts are bottom view.

16 TO-18 Lensed Cap 17 TO-5 18 TO-5

Products:
 PIN-HR005L
 PIN-HR008L
 PIN-HR020L
 PIN-HR026L
 PIN-HR040L

Pin Circle Dia.=0.100

Products:
 PIN-DSS
 PIN-DSIn

Pin Circle Dia.=0.220

Bottom Diode Top Diode
 PIN-DSS

Bottom Diode Top Diode
 PIN-DSIn

Products:
 PIN-005D-245F

Pin Circle Dia.=0.215

19 Plastic Mold 20 Special Metal 21 Special Metal

Products:
 BPW34
 BPW34B
 BPW34S

Tab Identifies Cathode (c)

(c)

BPW34S

CATHODE

Products:
 SPOT-15-YAG
 SPOT-9-YAG
 PIN-100-YAG

Pin Circle Dia.=0.750

GR=Guard Ring

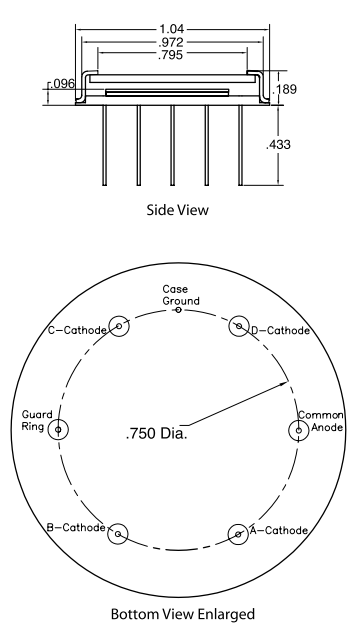
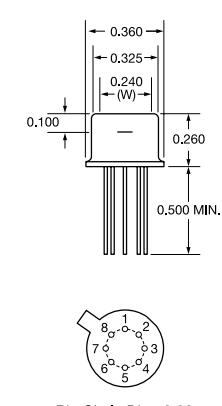
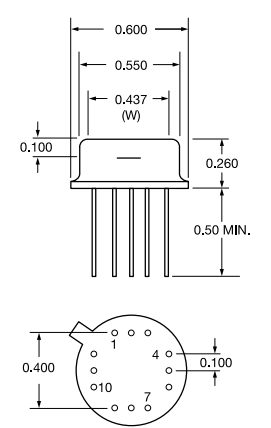
Pinouts						
P/N	1	2	3	4	5	6
SPOT-15-YAG	C1	GR	C4	C2	A	C3
SPOT-9-YAG	C1	GR	C4	C2	A	C3
PIN-100-YAG	--	C	--	--	A	--

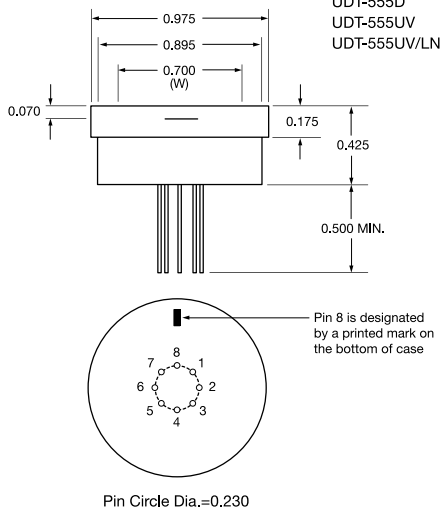
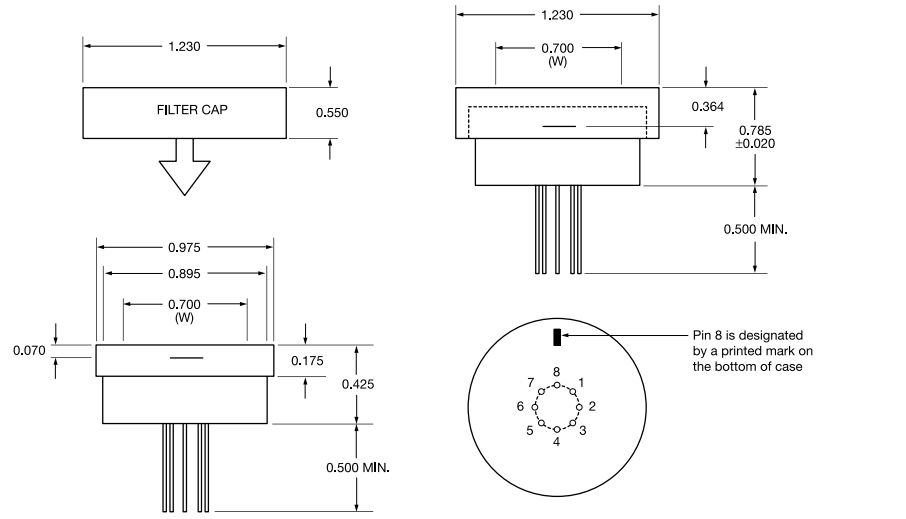
Products:
 SC-50D

Pin Circle Dia.=1.110

Mechanical Specifications

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29 Metal	30 TO-5	31 TO-8																																																																						
<p>Products: SPOT-13A-YAG-FL SPOT-11A-YAG-FL</p>  <p>Side View</p> <p>Bottom View Enlarged</p> <p>Pin Circle Dia.=.750 Dia.</p>	<p>Products: UDT-455 UDT-455UV OSI-515</p>  <p>Pin Circle Dia.=.023</p> <table border="1"> <thead> <tr> <th colspan="2">Pinout</th> </tr> </thead> <tbody> <tr><td>1</td><td>Offset Null</td></tr> <tr><td>2</td><td>Inverting Input Detector Cathode</td></tr> <tr><td>3</td><td>Noninverting Input</td></tr> <tr><td>4</td><td>V (-)</td></tr> <tr><td>5</td><td>Offset Null</td></tr> <tr><td>6</td><td>Output</td></tr> <tr><td>7</td><td>V (+)</td></tr> <tr><td>8</td><td>Detector Anode</td></tr> </tbody> </table> <p>OSI-515 pin 1 & 5 are N/C</p>	Pinout		1	Offset Null	2	Inverting Input Detector Cathode	3	Noninverting Input	4	V (-)	5	Offset Null	6	Output	7	V (+)	8	Detector Anode	<p>Products: UDT-020D PIN-020UV</p>  <p>Pin Circle Dia.=.0295</p> <table border="1"> <thead> <tr> <th colspan="2">UDT-020D Pinout</th> <th colspan="2">PIN-020UV</th> </tr> </thead> <tbody> <tr><td>1</td><td>Not Used</td><td>1</td><td>Not Used</td></tr> <tr><td>2</td><td>Not Used</td><td>2</td><td>Not Used</td></tr> <tr><td>3</td><td>Not Used</td><td>3</td><td>Not Used</td></tr> <tr><td>4</td><td>Not Used</td><td>4</td><td>Not Used</td></tr> <tr><td>5</td><td>Inverting Input</td><td>5</td><td>Inverting Input</td></tr> <tr><td>6</td><td>Noninverting Input</td><td>6</td><td>Noninverting Input</td></tr> <tr><td>7</td><td>Detector Cathode</td><td>7</td><td>Detector Cathode</td></tr> <tr><td>8</td><td>Case Ground</td><td>8</td><td>Case Ground</td></tr> <tr><td>9</td><td>Detector Anode</td><td>9</td><td>Detector Anode</td></tr> <tr><td>10</td><td>V (-)</td><td>10</td><td>V (-)</td></tr> <tr><td>11</td><td>Output</td><td>11</td><td>Output</td></tr> <tr><td>12</td><td>V (+)</td><td>12</td><td>V (+)</td></tr> </tbody> </table>	UDT-020D Pinout		PIN-020UV		1	Not Used	1	Not Used	2	Not Used	2	Not Used	3	Not Used	3	Not Used	4	Not Used	4	Not Used	5	Inverting Input	5	Inverting Input	6	Noninverting Input	6	Noninverting Input	7	Detector Cathode	7	Detector Cathode	8	Case Ground	8	Case Ground	9	Detector Anode	9	Detector Anode	10	V (-)	10	V (-)	11	Output	11	Output	12	V (+)	12	V (+)
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<p>Products: UDT-055UV UDT-555D UDT-555UV UDT-555UV/LN</p>  <p>Pin Circle Dia.=.0230</p> <table border="1"> <thead> <tr> <th colspan="2">Pinout</th> </tr> </thead> <tbody> <tr><td>1</td><td>Offset Null</td></tr> <tr><td>2</td><td>Inverting Input Detector Cathode</td></tr> <tr><td>3</td><td>Noninverting Input</td></tr> <tr><td>4</td><td>V (-)</td></tr> <tr><td>5</td><td>Offset Null</td></tr> <tr><td>6</td><td>Output</td></tr> <tr><td>7</td><td>V (+)</td></tr> <tr><td>8</td><td>Detector Anode and Case</td></tr> </tbody> </table>	Pinout		1	Offset Null	2	Inverting Input Detector Cathode	3	Noninverting Input	4	V (-)	5	Offset Null	6	Output	7	V (+)	8	Detector Anode and Case	<p>Products: PIN-555AP</p>  <p>Pin Circle Dia.=.0230</p> <table border="1"> <thead> <tr> <th colspan="2">Pinout</th> </tr> </thead> <tbody> <tr><td>1</td><td>Offset Null</td></tr> <tr><td>2</td><td>Inverting Input Detector Cathode</td></tr> <tr><td>3</td><td>Noninverting Input</td></tr> <tr><td>4</td><td>V (-)</td></tr> <tr><td>5</td><td>Offset Null</td></tr> <tr><td>6</td><td>Output</td></tr> <tr><td>7</td><td>V (+)</td></tr> <tr><td>8</td><td>Detector Anode and Case</td></tr> </tbody> </table>	Pinout		1	Offset Null	2	Inverting Input Detector Cathode	3	Noninverting Input	4	V (-)	5	Offset Null	6	Output	7	V (+)	8	Detector Anode and Case
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