

# PN Silicon Photodiode

OP900SL



**Features:**

- Narrow receiving angle
- Enhanced temperature range
- Ideal for direct mounting to PCBoard
- Fast switching speed
- Linear response vs.irradiance
- Mechanically and spectrally matched to OP123 emitters

**Description:**

Each **OP900SL** consists of a PN junction silicon photodiode mounted in a miniature glass-lensed hermetically sealed “pill” package. The lensing effect allows an acceptance half-angle of 18°, when measured from the optical axis to the half-power point.

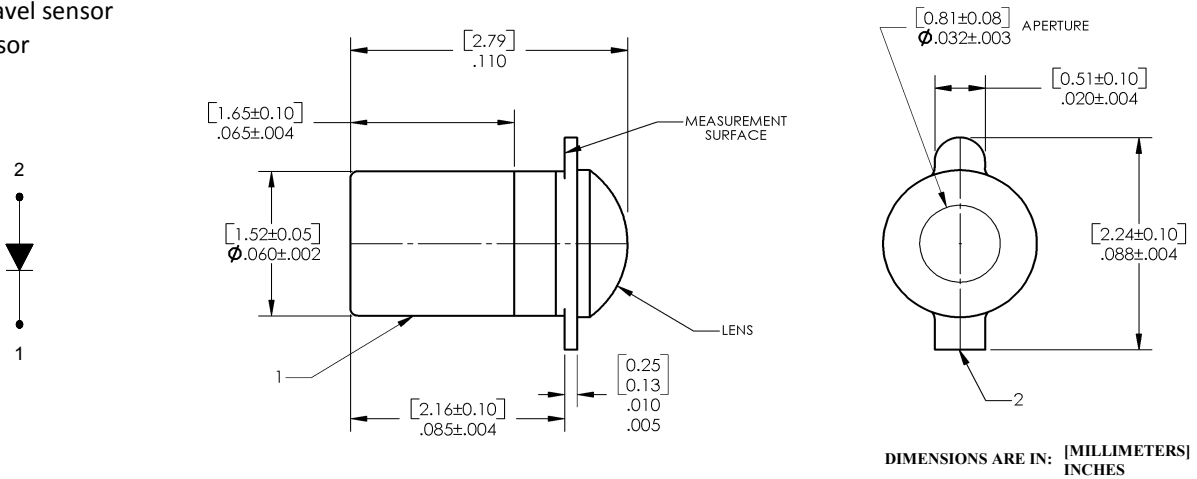
*The OP900SL is mechanically and spectrally matched to the OP123 series emitters.*

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data, and to Application Bulletin 202 for pill-type soldering to PCBoard.

**Applications:**

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

| Ordering Information |            |               |
|----------------------|------------|---------------|
| Part Number          | Sensor     | Viewing Angle |
| OP900SL              | Photodiode | 35°           |



| Pin # | Sensor              |
|-------|---------------------|
| 1     | Collector / Cathode |
| 2     | Emitter / Anode     |



RoHS

**General Note**

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

OPTEK Technology, Inc.  
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www.optekinc.com | www.ttelectronics.com

### Electrical Specifications

| Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                     |   |
|---|---|
| Reverse Voltage   | 100 V                                       |
| Operating Temperature Range   | $-65^\circ\text{C}$ to $+125^\circ\text{C}$ |
| Storage Temperature Range   | $-65^\circ\text{C}$ to $+150^\circ\text{C}$ |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 seconds with soldering iron] | $260^\circ\text{C}^{(1)}$                   |
| Power Dissipation   | $50\text{ mW}^{(2)}$                        |

| Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                           |     |     |     |               |   |
|---|---------------------------|-----|-----|-----|---------------|---|
| SYMBOL  | PARAMETER                 | MIN | TYP | MAX | UNITS         | TEST CONDITIONS   |
| $I_L$   | Light Current             | 8   | 14  | -   | $\mu\text{A}$ | $V_R = 10\text{ V}$ , $E_E = 20\text{ mW/cm}^2$ <sup>(3)(4)</sup>                             |
| $I_D$   | Dark Current              | -   | -   | 10  | nA            | $V_R = 10\text{ V}$ , $E_E = 0$ <sup>(3)</sup>  |
| $V_{(BR)R}$   | Reverse Voltage Breakdown | 100 | 150 | -   | V             | $I_R = 100\ \mu\text{A}$  |
| $t_r$   | Rise Time                 | -   | 100 | -   | ns            | $V_R = 50\text{ V}$ , $I_L = 8\ \mu\text{A}$ , $R_L = 1\text{ k}\Omega$<br>(see test circuit) |
| $t_f$   | Fall Time                 | -   | 100 | -   |               |   |

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly  $0.5\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Junction temperature maintained at  $25^\circ\text{C}$ .
- (4) Light source is an unfiltered tungsten bulb operating at  $CT = 2870\text{ K}$  or equivalent infrared source..

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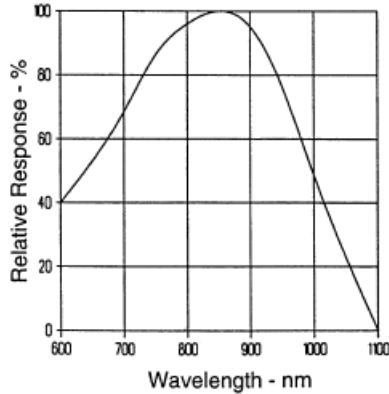
OP900SL



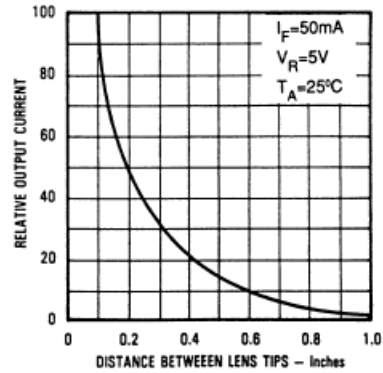
## Performance

OP900SL

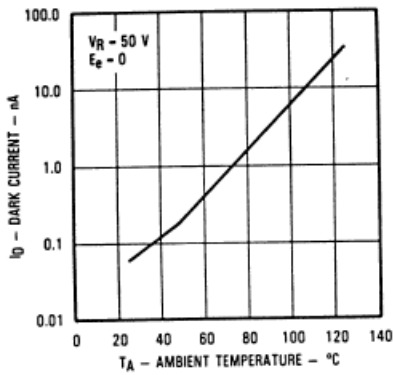
Typical Spectral Response



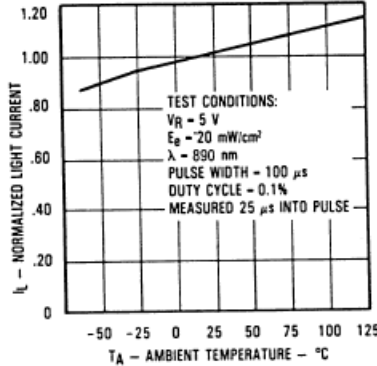
Coupling Characteristics of OP123 and OP900SL



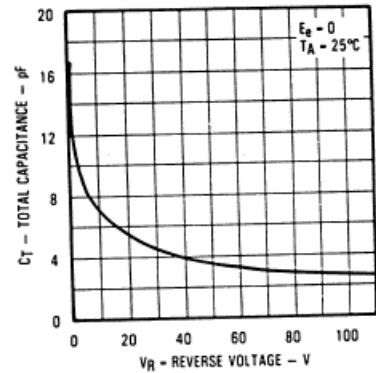
Dark Current vs. Ambient Temperature



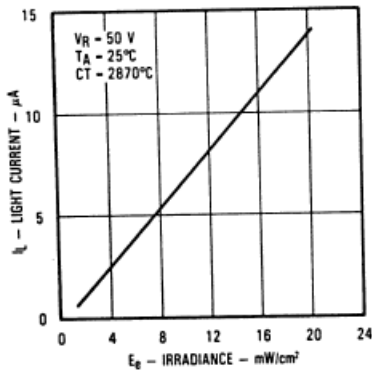
Normalized Light Current vs. Ambient Temperature



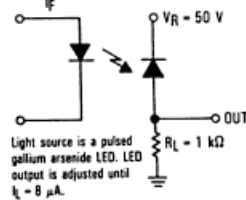
Total Capacitance vs. Reverse Voltage



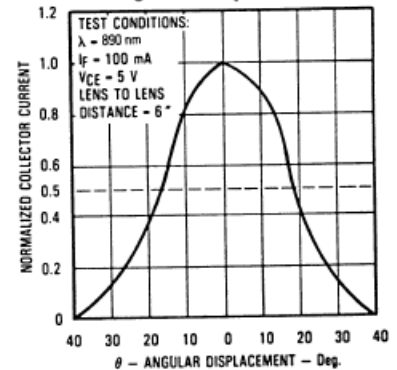
Light Current vs. Irradiance



Switching Time Test Circuit



Light Current vs. Angular Displacement



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