

Standard Si PIN Photodiodes

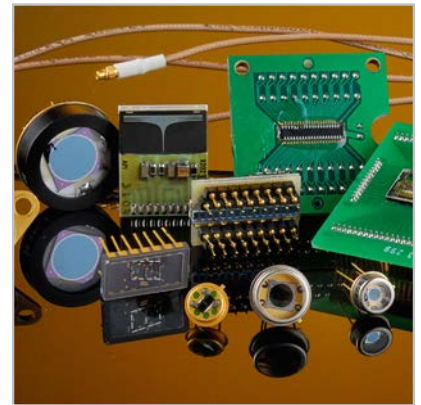
LUNA is a leading supplier of opto-electronic solutions and sensors and instrumentation to a global OEM customer base.

LUNA supports the customer from the initial concept by the designing of the semiconductor, hybridization of support electronics, packaging and signal conditioning or processing from prototype through full-scale production and validation/test. The served markets are: Telecom, Homeland Security, Military, Medical, and Industrial/NDT.

Single Element Silicon PIN Photodiodes

These planar diffused photodiodes are designed for either photoconductive (low capacitance, high speed applications) or photovoltaic operation (low noise, DC applications). Photodiodes are semiconductors that generate a current or voltage when illuminated by light. They have no internal gain, but can operate with much greater dynamic range than other types of photon detectors. In addition to a wide variety of standard detector configurations, LUNA also welcomes the opportunity to design a custom solution to meet your exact needs.

Detailed data sheets for each product are available on request. (The online version of this document includes links to the individual data sheets.)



Ordering Information

Red Enhanced Photodiodes in Leaded Packages

| Product Number | Packaging | Active Area | Dark Current/nA ($V_R = 5\text{ V}$) | Capacitance/pF ($V_R = 10\text{ V}$) | Rise Time/ns ($V_R = 10\text{ V}$) |
|---------------------------------|-----------|----------------|---|---|---|
| SD057-11-21-011 | TO-46 | 1.3 x 1.3 mm | 0.5 | 6 | 13 |
| SD100-11-21-221 | TO-5* | 2.5 mm diam. | 1.6 | 18 | 13 |
| SD172-11-21-221 | TO-5* | 4.7 x 3.2 mm | 5.0 | 53 | 13 |
| SD200-11-21-241 | TO-8* | 5.1 mm diam. | 6.5 | 71 | 13 |
| SD445-11-21-305 | Ceramic | 10.0 x 10.0 mm | 30.0 | 300 | 40 |

(* = isolated cathode)

Red Enhanced High Performance Photodiodes in Leaded Packages

| Product Number | Packaging | Active Area | Dark Current/nA ($V_R = 5\text{ V}$) | Capacitance/pF ($V_R = 5\text{ V}$) | Rise Time/ns ($V_R = 10\text{ V}$) |
|---------------------------------|-----------|----------------|---|--|---|
| SD057-14-21-011 | TO-46 | 1.3 x 1.3 mm | 0.1 | 9 | 13 |
| SD076-14-21-011 | TO-46 | 2.7 x 1.1 mm | 0.2 | 15 | 13 |
| SD100-14-21-021 | TO-5 | 2.5 mm diam. | 0.3 | 26 | 13 |
| SD172-14-21-021 | TO-5 | 4.7 x 3.2 mm | 1.0 | 76 | 13 |
| SD200-14-21-041 | TO-8 | 5.1 mm diam. | 1.3 | 102 | 13 |
| SD445-14-21-305 | Ceramic | 10.0 x 10.0 mm | 6.0 | 500 | 13 |

Red Enhanced Ultra Low Capacitance Photodiodes in Leaded Packages

| Product Number | Packaging | Active Area | Dark Current/nA ($V_R = 50\text{ V}$) | Capacitance/pF ($V_R = 50\text{ V}$) | Rise Time/ns ($V_R = 50\text{ V}$) |
|---------------------------------|-----------|--------------|--|---|---|
| SD041-11-33-211 | TO-46* | 1.0 x 0.8 mm | 2.0 | 0.5 | 13 |
| SD076-11-31-211 | TO-46* | 1.1 x 2.7 mm | 8.0 | 2.5 | 5 |
| SD100-11-31-221 | TO-5* | 2.5 mm diam. | 12.0 | 3.5 | 6 |
| SD172-11-31-221 | TO-5* | 4.7 x 3.2 mm | 35.0 | 10.0 | 13 |
| SD200-11-31-241 | TO-8* | 5.1 mm diam. | 50.0 | 11.0 | 8 |
| SD290-11-31-241 | TO-8* | 7.6 x 5.6 mm | 110.0 | 22.0 | 8 |

(* = isolated cathode)

Blue Enhanced Photodiodes in Leaded Packages

| Product Number | Packaging | Active Area | Dark Current/ nA | Capacitance/ pF | Rise Time/ ns |
|---------------------------------|---------------|---------------|---------------------|--------------------|------------------|
| SD100-12-22-021 | TO-5 | 2.5 mm diam. | 1.6 | 87 | 13 |
| SD200-12-22-041 | TO-8 | 5.1 mm diam | 6.5 | 102 | 13 |
| SD200-12-22-241 | TO-8* | 5.1 mm diam. | 6.5 | 102 | 13 |
| SD290-12-22-241 | TO-8* | 5.6 x 7.6 mm | 13.0 | 213 | 13 |
| SD444-12-12-171 | BNC connector | 11.3 mm diam. | 13.0 | 213 | 13 |

(* =isolated cathode)

Blue Enhanced Photoconductive Photodiodes

| Product Number | Packaging | Active Area | Dark Current/ nA | Capacitance/ pF | Rise Time/ns ($V_R = 10 V$) |
|--------------------------|-------------------|--------------|---------------------|--------------------|----------------------------------|
| PDB-C107 | Ceramic | 5.7 x 3.1 mm | 150 | 100 | 13 |
| PDB-C109 | TO-8 | 8.1 x 5.3 mm | 5 | 120 | 13 |
| PDB-C110 | Ceramic | 9.9 x 9.4 mm | 10 | 300 | 13 |
| PDB-C113 | Ceramic | 2.9 x 2.9 mm | 5 | 60 | 13 |
| PDB-C122 | Ceramic submount | 0.3 x 0.3 mm | 0.5 | 5 | 13 |
| PDB-C140 | Ceramic | 7.6 x 3.8 mm | 10 | 200 | 13 |
| PDB-C164 | Metalized Ceramic | 2.6 x 1.2 mm | 1 | 7 | 13 |
| PDB-C165 | Metalized Ceramic | 2.9 x 2.9 mm | 1 | 60 | 13 |

UV Enhanced Photodiodes

| Product Number | Packaging | Active Area | Dark Current/nA ($V_R = 10 \text{ mV}$) | Capacitance/pF ($V_R = 0 \text{ V}$) | Rise Time/ns ($V_R = 0 \text{ V}$) |
|-------------------------------|-----------|------------------------|--|---|---|
| SD012-UVA-005 | SMT | 0.076 mm ² | 0.0001 | 10 | |
| SD012-UVA-011 | TO-46 | 0.076 mm ² | 0.0001 | 10 | |
| SD012-UVB-005 | SMT | 0.0076 mm ² | 0.0001 | 10 | |
| SD012-UVB-011 | TO-46 | 0.0076 mm ² | 0.0001 | 10 | |
| SD012-UVC-011 | TO-46 | 0.0076 mm ² | 0.0001 | 10 | |

UV Enhanced Photodiodes (Photoconductive)

| Product Number | Packaging | Active Area | Dark Current/nA ($V_R = 5 \text{ V}$) | Capacitance/ pF | Rise Time/ns ($V_R = 10 \text{ V}$) |
|---------------------------------|-----------|--------------|--|--------------------|--|
| SD100-13-23-022 | TO-5 | 2.5 mm diam. | 0.1 | 9 | 13 |
| SD100-13-23-222 | TO-5* | 2.5 mm diam. | 1 | 9 | 13 |
| SD200-13-23-042 | TO-8 | 5.1 mm diam. | 6 | 102 | 13 |
| SD200-13-23-242 | TO-8* | 5.1 mm diam. | 6 | 102 | 13 |

(* = isolated cathode)

Surface Mount Packages

| Product Number | Packaging | Active Area | Dark Current/ nA ($V_R = 10$ V) | Capacitance/ pF | Rise Time/ ns |
|--|-------------------------|---------------------|-------------------------------------|--------------------|------------------|
| SD019-101-411 | 0805 | 0.2 mm ² | 0.5 | 6 | 1000 |
| SD019-111-411 | 0805 | 0.2 mm ² | 0.5 | 6 | 1000 |
| SD019-111-IR920 | 0805 | 0.4 x 0.4 mm | 0.02 | 6 | 1 |
| SD019-141-411- RGB | 0805 | 0.2 mm ² | 0.5 | 6 | 10 |
| SD040-101-411 | 1206 | 0.8 mm ² | 0.5 | 20 | |
| SD040-111-411 | 1206 | 0.8 mm ² | 0.5 | 20 | |
| PDB-C150SM | SOT-23 surface mount | 0.4 x 0.4 mm | 2 | 1 | 6 |
| PDB-C152SM | Surface mount | 0.8 x 0.8 mm | 2 | 15 | 50 |
| PDB-C154SM | Surface mount | 1.5 x 1.5 mm | 2 | 5 | 10 |
| PDB-C171SM | Surface mount | 2.8 x 2.8 mm | 2 | 25 | 100 |

Photodiode Packages with Filter

| Product Number | Packaging | Active Area | Dark Current/ nA | Capacitance/ pF ($V_R = 0$ V) | Rise Time/ μ s |
|----------------------------|--------------|--------------|---------------------|-----------------------------------|-----------------------|
| SLD-68-026 | TO-46 | 1.7 x 1.7 mm | 100 | 40 | 1.0 |
| SLD-70BG2 | Dome package | 3.6 x 3.6mm | 1...100 | 180 | 4 |

Solderable Photodiodes

| Product Number | Packaging | Active Area | Dark Current/ nA ($V_R = 5\text{ V}$) | Capacitance/ pF | Rise Time/ ns |
|-----------------------------|---------------------|----------------------|--|--------------------|------------------|
| PDB-C601-1 | Bare chip | 1.9 x 0.6 mm | 0.5 | 10 | 10 |
| PDB-C607-2 | Chip with PVC wire | 9.9 x 1.5 mm | 2 | 125 | 25 |
| PDB-C609-2 | Chip with PVC wire | 7 x 6.1 mm | 30 | 240 | 30 |
| PDB-C609-3 | Chip with buss wire | 7 x 6.1 mm | 30 | 240 | 30 |
| PDB-C612-2 | Chip with PVC wire | 17.6 x 3.9 mm | 1 | 300 | 45 |
| PDB-C613-2 | Chip with PVC wire | 9.8 x 8.8 mm | 90 | 350 | 50 |
| PDB-C615-2 | Chip with PVC wire | 25.2 x 9.3 mm | 350 | 775 | 150 |
| PDB-V601-1 | Bare chip | 1.9 x 0.6 mm | 3 | 250 | 300 |
| PDB-V609-3 | Chip with buss wire | 7 x 6.1 mm | 50 | 5500 | 1500 |
| PDB-V612-2 | Chip with PVC wire | 17.6 x 3.9 mm | 40 | 9000 | 2800 |
| PDB-V615-2 | Chip with PVC wire | 25.1 x 9.3 mm | 350 | 25800 | 7000 |
| PDB-V617-2 | Chip with PVC wire | 25.2 x | 35 | 8500 | 2500 |
| SLCD-61N5 | Bare chip | 93.6 mm ² | 3300 | 2000 | |
| SLSD-71N300 | Chip with PVC | | 1700 | 1000 | |
| SLSD-71N400 | Chip with PVC | | 5000 | 1500 | |

CdS Photocells

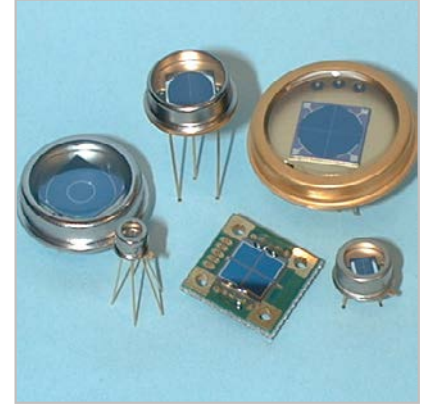
| Product Number | Packaging | Spectral Peak/ nm | Light Resistance/ kOhm | Dark Resistance/ MOhm |
|---------------------------|-----------|----------------------|---------------------------|--------------------------|
| NORPS-12 | TO-18 | 550 | 12.6 | 1.0 |
| NSL-19M51 | TO-18 | 550 | 100 | 20 |
| NSL-4132 | TO-18 | 550 | 42 | 1.8 |
| NSL-4142 | TO-18 | 550 | 20 | 0.8 |
| NSL-4172 | TO-18 | 515 | 154 | 6.6 |
| NSL-4182 | TO-18 | 550 | 70 | 3 |
| NSL-4512 | TO-5 | 550 | 133 | 67 |
| NSL-4522 | TO-5 | 550 | 26 | 15 |
| NSL-5112 | TO-18 | 550 | 14 | 0.67 |
| NSL-5122 | TO-18 | 550 | 27 | 1.3 |
| NSL-5152 | TO-18 | 550 | 20 | 0.01 |
| NSL-5162 | TO-18 | 550 | 133 | 0.067 |
| NSL-5512 | TO-5 | 550 | 26 | 15 |
| NSL-5522 | TO-5 | 550 | 26 | 15 |
| NSL-5532 | TO-5 | 550 | 220 | 11 |
| NSL-5542 | TO-5 | 550 | 40 | 20 |
| NSL-5572 | TO-5 | 550 | 63 | 1 |
| NSL-5922 | TO-8 | 550 | 4 | 0.2 |
| NSL-6112 | TO-18 | 690 | 2 | 1.3 |

Multi-Element Silicon Photodiodes

These devices consist of a number of photosensitive areas imaged on a single substrate forming a one-dimensional array with a common cathode substrate.

They feature low crosstalk among adjacent elements and high uniformity in response. These types of devices provide a cost effective alternative in applications requiring several photodiodes. In addition, optical filtering can be applied for tuning to particular wavelengths or, in the case of x-ray scanning applications, scintillation crystals that interact to the x-ray energy for provide imaging.

Detailed data sheets for each product are available on request. (The on-line version of this document includes links to the individual data sheets)



Ordering Information

Sandwich

| Product Number | Packaging | Active Area | NEP fw/ $\sqrt{\text{Hz}}$ | Capacitance/pF |
|---------------------------------|-----------|------------------------------|----------------------------|----------------|
| SD138-11-31-211 | TO-5 | 3.5 mm diam. 3.1 mm diam. | 12 45 | 305 |

Bi-Cells

| Product Number | Packaging | Active Area/ Element | Dark Current/nA ($V_R = 5 \text{ V}$) | Capacitance/pF ($V_R = 10 \text{ V}$) | Rise Time/ns ($V_R = 10 \text{ V}$) |
|---------------------------------|-----------|-------------------------|--|--|--|
| PDB-C201 | TO-5 | 3.2 mm ² | 0.5 | 15 | 13 |
| SD066-24-21-011 | TO-5 | 0.7 mm ² | 0.2 | 3 | 13 |
| SD113-24-21-021 | TO-5 | 3.1 mm ² | 0.9 | 13 | 13 |
| SD160-24-21-021 | TO-5 | 2.3 mm ² | 0.7 | 9 | 13 |
| SD385-24-21-041 | TO-8 | | 6.0 | 85 | 13 |

Quadrants

| Product Number | Packaging | Active Area/ Element | Dark Current/nA ($V_R = 5\text{ V}$) | Capacitance/ pF | Rise Time/ns ($V_R = 10\text{ V}$) |
|---------------------------------|-----------|-------------------------|---|--------------------|---|
| PDB-C203 | TO-5 | 1.6 mm ² | 0.5 | 8 | 13 |
| SD055-23-21-211 | TO-18* | 0.3 mm ² | 0.1 | 3 | 13 |
| SD085-23-21-021 | TO-5 | 2.3 mm ² | 0.6 | 9 | 13 |
| SD118-23-21-021 | TO-5 | 1.6 mm ² | 0.5 | 7 | 13 |
| SD197-23-21-041 | TO-8 | 4.8 mm ² | 1.4 | 20 | 13 |
| SD225-23-21-040 | TO-8 | 5.4 mm ² | 1.2 | 24 | 13 |
| SD380-23-21-051 | TO-8 | 17.8 mm ² | 5.0 | 75 | 13 |
| SD380-23-21-251 | TO-8* | 17.8 mm ² | 5.0 | 75 | 13 |

(* = isolated cathode)

Linear Arrays

| Product Number | Packaging | Active Area/ Element | Dark Current/ nA ($V_R = 10\text{ V}$) | Capacitance/ pF ($V_R = 0\text{ V}$) | Rise Time/ns ($V_R = 10\text{ V}$) |
|---------------------------------|-----------------|-------------------------|---|---|---|
| SD219-51-03-301 | Ceramic Package | 2 mm ² | 2.7 | 28 | 13 |

Hybrid Silicon Detectors

Silicon (Si) photodiodes can be coupled with a low noise preamplifier chip in the same package. This configuration makes them highly resistant to external noise and suitable for compact circuit design.

Additionally, devices can also be provided with a built-in thermoelectric cooler to reduce the dark current and enhance performance. This range of products is ideal for a wide range of applications involving low-light-level detection and when circuit board space is limited.

Detailed data sheets for each product are available on request. (The on-line version of this document includes links to the individual data sheets)



Ordering Information

Detector / Amplifier Hybrids without Internal Feedback Resistors

| Product Number | Packaging | Active Area | Features | Gain |
|---------------------------------|-----------|------------------|---------------|------|
| SD100-41-21-231 | TO-5 | 2.54 mm diameter | Red enhanced | |
| SD100-42-22-231 | TO-5 | 2.54 mm diameter | Blue enhanced | |
| SD100-43-23-232 | TO-5 | 2.54 mm diameter | UV enhanced | |
| SD444-41-21-261 | TO-8 | 11.3 mm diameter | Red enhanced | |
| SD444-42-22-261 | TO-8 | 11.3 mm diameter | Blue enhanced | |
| SD444-43-23-262 | TO-8 | 11.3 mm diameter | UV enhanced | |

Detector / Amplifier Hybrids with Internal Feedback Resistors

| Product Number | Packaging | Active Area | Features | Gain |
|---------------------------------|-----------|-----------------------------|---------------|----------------|
| SD112-42-11-221 | TO-5 | 2.18 x 2.54 mm ² | Red enhanced | 0.1 kOhm Tgain |
| SD112-43-11-221 | TO-5 | 2.18 x 2.54 mm ² | Red enhanced | 75 MOhm Tgain |
| SD112-45-11-221 | TO-5 | 2.18 x 2.54 mm ² | Blue enhanced | 600 MOhm Tgain |