



HIGH-PERFORMANCE PHOTODIODES PDC-series

DESCRIPTION

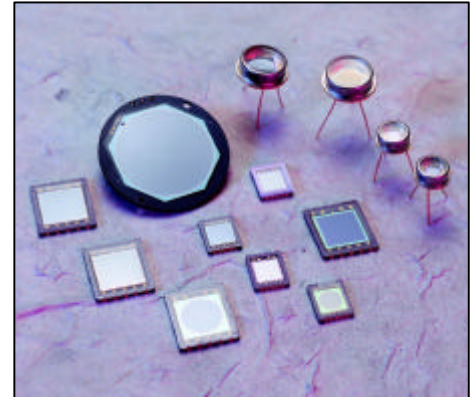
PDC-series photodiodes are extra high-resistivity PIN photodiodes with an excellent spectral response at 550 nm. This is achieved by using ultra pure starting material, special high-purity manufacturing process, and optimized optical filtering. PDC-series photodiodes also incorporate a unique guard-ring structure, which greatly reduces leakage current in biased operation.

BENEFITS

- fast response time
- high sensitivity
- extremely low noise due to
 - ultra-low capacitance
 - low leakage current

TYPICAL APPLICATIONS

- scintillator applications (e.g. CsI(Tl), CdWO₄, GOS, plastic scintillators)
- high-speed pulse counting



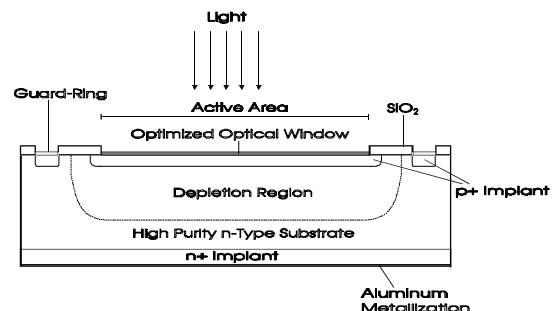
| Characteristics | | | | | | | | | | | | |
|---|---|-------------------------|-------------------|---|--|---------------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|--|---|---------------------------------|
| Type series, size, shape, package (see below) | Active Area | | Spectral Response | | | Shunt Resistance | | Dark Current | | Term. Cap. | Rise Time | Package |
| | dimensions mm | area mm ² | range nm | peak sensitivity wavelength nm | photo sensitivity at 550 nm A/W | typical V _R =10mV MΩ | minimum V _R =10mV MΩ | typical V _R =70V nA | maximum V _R =70V nA | typical V _R =30V f=100kHz pF | typical V _R =0V R _{load} =50Ω ns | type, see package layouts |
| PDC 24s-MU | 2.4 x 2.4 | 5.76 | 300-1120 | 960 | 0.39 | 140 / 280 (g) | 90 | 0.11 (g) | 0.25 (g) | 5 | 30 | TO-5 |
| PDC 50s-MU | 5.0 x 5.0 | 25.0 | 300-1120 | 960 | 0.39 | 63 / 145 (g) | 40 | 0.22 (g) | 0.50 (g) | 14 | 180 | TO-8 |
| PDC 50s-CR | 5.0 x 5.0 | 25.0 | 330-1120 | 960 | 0.36 | 63 / 145 (g) | 40 | 0.22 (g) | 0.50 (g) | 14 | 180 | LCC67 |
| PDC 100s-CR | 10.0 x 10.0 | 100.0 | 330-1120 | 960 | 0.36 | 26 / 45 (g) | 18 | 0.98 (g) | 2.0 (g) | 54 | 250 | LCC112 |
| PDC 254d-PR | diam. 25.4 | 506.6 | 330-1120 | 960 | 0.36 | 13 / 31 (g) | 5 | 3.30 (g) | 14 (g) | 250 | n/a | PR34 |
| PDC CUSTOM | size and geometry to be specified with the customer | | | | | | | | | | | |
| Common | Temperature Coefficient | | | | | | | | | Silicon Thickness | | |
| Series | dark current (0°C-80°C) | | | dark current (0°C-80°C) (g) | | | sensitivity 400-800 nm | | | μm | | |
| PDC-series | 1.15 times/°C | | | 1.11 times/°C | | | < 0.1 % | | | 380 | | |

NOTE: (g) = guard ring connected

T_a=25°C

| Packages and Windows | | | | |
|----------------------|---------------------------------------|-----------------------------------|--------------------------|------------------------|
| Code | Package | Absolute Maximum Ratings | | |
| | | reverse voltage V | operating temp. °C | storage temp. °C |
| CR | ceramic package, epoxy window | 80 | -20 to +60 | -20 to +80 |
| MU | metal TO-package, UV window | 80 | -30 to +70 | -40 to +80 |
| PR | polymer package, epoxy window | 80 | -10 to +60 | -20 to +70 |
| CN | ceramic package, no window | available on special order | | |
| D | die | available on special order | | |
| CUSTOM | customized ceramic or polymer package | to be specified with the customer | | |

Figure 1 Cross Section of a PDC-series Photodiode



HIGH-PERFORMANCE PHOTODIODES PDC-series cont.

NOTES

- Diodes marked with note (g) in dark current specification have a guard-ring, which can be connected to anode voltage or left floating
- All products are tested to meet the specifications
- For package layouts see package section

Figure 2 Spectral Response in PDC-series Photodiodes

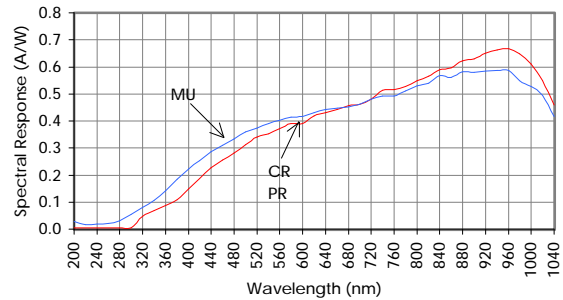


Figure 3 Dark Current vs. Reverse Voltage in PDC 24s and PDC 50s (typical)

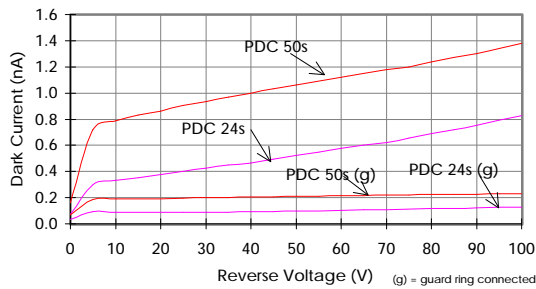


Figure 4 Dark Current vs. Reverse Voltage in PDC 100s and PDC 254d (typical)

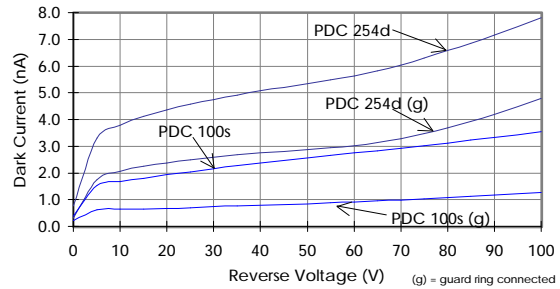


Figure 5 Terminal Capacitance vs. Reverse Voltage in PDC 24s and PDC 50s

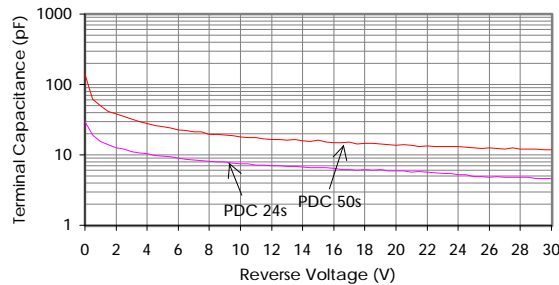


Figure 6 Terminal Capacitance vs. Reverse Voltage in PDC 100s and PDC 254d

