# Silicon Photodetectors Series 1

## Blue and UV Sensitive

Series 1 photodiodes offer a broadband spectral response extending into the UV region. The series is particularly intended for applications where sensitivity in the range from 250 to 430 nm is important.
The detectors may be operated with reverse bias up to 10 volts or in the photovoltaic mode for best signal to noise performance.

### ABSOLUTE MAXIMUM RATINGS

| | Max. Rating | Unit |
|---|---|---|
| DC Reverse Voltage | 12 | V |
| Peak Pulse Current (1 µS, 1% duty cycle) | 200 | mA |
| Peak DC Current | 10 | mA |
| Storage Temperature Range<br>Except for: LD20-1, LD35-1, MD25-1, MD100-1 | -45 to +100<br>-25 to +80 | degree C |
| Operating Temperature Range<br>Except for: LD20-1, LD35-1, MD25-1, MD-100-1 | -25 to +75<br>0 to +75 | degree C |
| Soldering Temperature for 5 seconds max. | 200 | degree C |

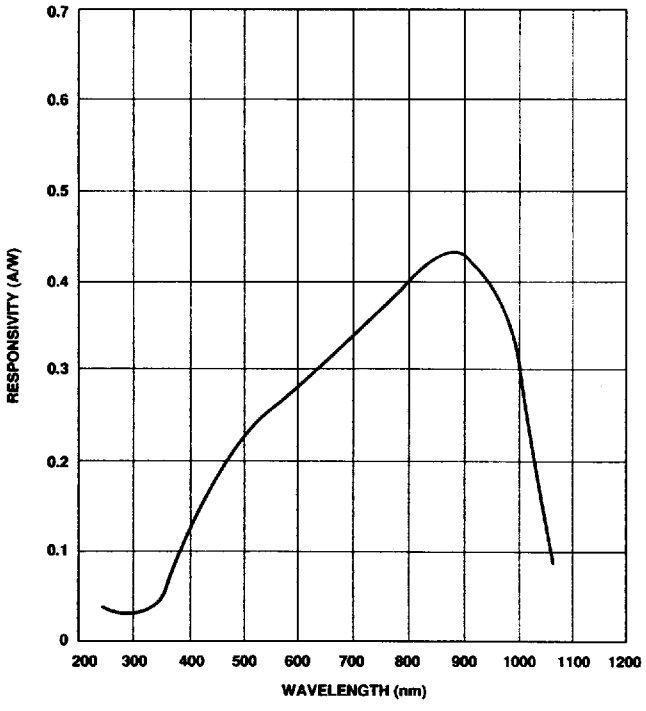


Fig.15 SERIES 1 - TYPICAL SPECTRAL RESPONSE

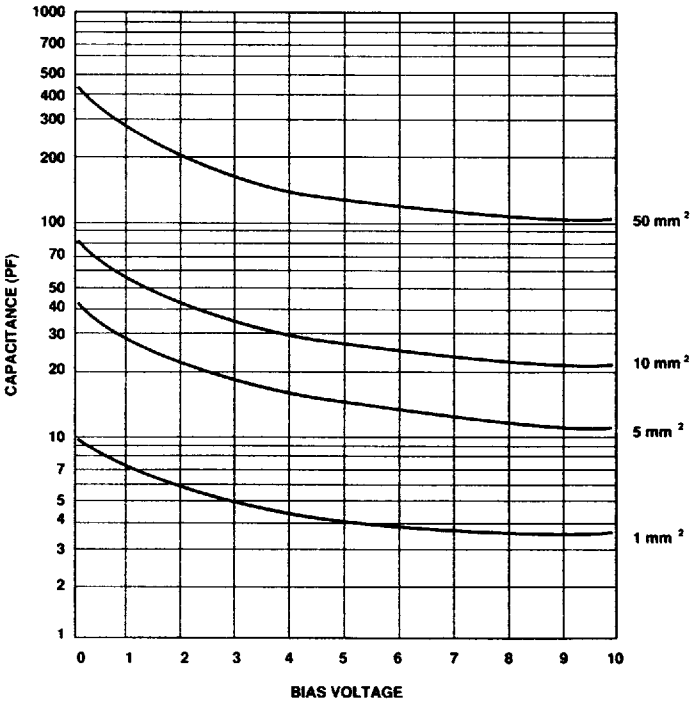


Fig.16 SERIES 1 - TYPICAL CAPACITANCE VERSUS BIAS VOLTAGE FOR A GIVEN DETECTOR AREA

# Series 1

## Electrical / Optical Specifications

Characteristics measured at 22° C (±2) ambient, and a reverse bias of 10 volts, unless otherwise stated.

## Single Elements

| Type No. | Active Area | | Responsivity A/W L = 250 nm | | Responsivity A/W L = 436 nm | | Dark Current µA | | NEP WHz$^{-1/2}$ L = 250 nm | Capacitance pF | | Package |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm² | mm | Min. | Typ. | Min. | Typ. | Max. | Typ. | Typ. | Vr = 0V Max. | Vr = 10V Max. | |
| OSD1-1 | 1 | 1.13 dia | 0.03 | 0.04 | 0.12 | 0.16 | 0.2 | 0.02 | 4.0 x 10$^{12}$ | 12 | 4 | 1 |
| OSD5-1 | 5 | 2.52 dia | 0.03 | 0.04 | 0.12 | 0.16 | 0.4 | 0.02 | 4.0 x 10$^{12}$ | 52 | 12 | 3 |
| OSD15-1 | 15 | 3.8 x 3.8 | 0.03 | 0.04 | 0.12 | 0.16 | 1.2 | 0.1 | 8.9 x 10$^{12}$ | 150 | 35 | 3 |
| ODS50-1 | 50 | 7.98 dia | 0.03 | 0.04 | 0.12 | 0.16 | 4.0 | 0.2 | 1.3 x 10$^{11}$ | 500 | 110 | 9 |
| OSD60-1 | 62 | 7.9 x 7.9 | 0.03 | 0.04 | 0.12 | 0.16 | 5.0 | 0.3 | 1.5 x 10$^{11}$ | 600 | 130 | 9 |
| OSD100-1 | 100 | 11.3 dia | 0.03 | 0.04 | 0.12 | 0.16 | 6.0 | 0.6 | 2.2 x 10$^{11}$ | 1000 | 220 | 13 |
| OSD200-1 | 200 | 15.96 dia | 0.03 | 0.04 | 0.12 | 0.16 | 8.0 | 1.0 | 2.8 x 10$^{11}$ | 2000 | 420 | 13 |
| OSD300-1 | 300 | 19.54 dia | 0.03 | 0.04 | 0.12 | 0.16 | 10.0 | 1.5 | 3.5 x 10$^{11}$ | 3000 | 630 | 15 |

## Quadrants

**(Values given are per element unless otherwise stated)**

| Type No. | Active Area (Total) | | | Responsivity A/W L = 250 nm | | Responsivity A/W L = 436 nm | | Dark Current µA | | NEP WHz$^{-1/2}$ L = 250 nm | Capacitance pF | | Crosstalk % L = 250 nm | | Package |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm² | mm | Sep. mm | Min. | Typ. | Min. | Typ. | Max. | Typ. | Typ | Vr = 0V Max. | Vr = 10V Max. | Max | Typ. | |
| QD7-1 | 7 | 2.99 dia | 0.2 | 0.03 | 0.04 | 0.12 | 0.16 | 0.5 | 0.1 | 8.9 x 10$^{12}$ | 20 | 8 | 5 | 1 | 7 |
| QD50-1 | 50 | 7.98 dia | 0.2 | 0.03 | 0.04 | 0.12 | 0.16 | 4.0 | 0.2 | 1.3 x 10$^{11}$ | 127 | 28 | 5 | 1 | 10 |
| QD100-1 | 100 | 11.3 dia | 0.2 | 0.03 | 0.04 | 0.12 | 0.16 | 4.5 | 0.3 | 1.5 x 10$^{11}$ | 250 | 55 | 5 | 1 | 11 |
| QD320-1 | 320 | 20.2 dia | 0.3 | 0.03 | 0.04 | 0.12 | 0.16 | 5.0 | 1.0 | 2.8 x 10$^{11}$ | 800 | 180 | 5 | 1 | 14 |

## Linear Arrays

**(Values given are per element unless otherwise stated)**

| Type No. | No. of Elements | Array Dimensions | | | | Responsivity A/W L = 250 nm | | Responsivity A/W L = 436 nm | | Dark Current nA | | NEP WHz$^{-1/2}$ L = 250 nm | Capacitance pF | | Package |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area mm² | Width mm | Lgth. mm | Sep. mm | Min. | Typ. | Min. | Typ. | Max. | Typ. | Typ. | Vr = 0V Max. | Vr = 10V Max. | |
| LD2-1A | 2 | 1.00 | 2.00 | 0.5 | 0.05 | 0.03 | 0.04 | 0.12 | 0.16 | 200 | 5 | 2.0 x 10$^{12}$ | 12 | 4 | 4 |
| LD2-1B | 2 | 2.02 | 1.42 | 1.42 | 0.45 | 0.03 | 0.04 | 0.12 | 0.16 | 200 | 7 | 2.4 x 10$^{12}$ | 22 | 8 | 4 |
| LD20-1 | 20 | 3.6 | 4.0 | 0.9 | 0.05 | 0.03 | 0.04 | 0.12 | 0.16 | 500 | 9 | 2.7 x 10$^{12}$ | 38 | 10 | 16 |
| LD35-1 | 35 | 4.42 | 4.6 | 0.96 | 0.03 | 0.03 | 0.04 | 0.12 | 0.16 | 500 | 10 | 2.8 x 10$^{12}$ | 46 | 15 | 17 |

## Matrix Arrays

**(Values given are per element unless otherwise stated)**

| Type No. | No. of Elements | Array Dimensions | | | | Responsivity A/W L = 250 nm | | Responsivity A/W L = 436 nm | | Dark Current nA | | NEP WHz$^{-1/2}$ L = 250 nm | Capacitance pF | | Package |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area mm² | Width mm | Lgth. mm | Sep. mm | Min. | Typ. | Min. | Typ. | Max. | Typ. | Typ. | Vr = 0V Max. | Vr = 10V Max. | |
| MD25-1 | 5 x 5 | 7.29 | 2.7 | 2.7 | 0.1 | 0.03 | 0.04 | 0.12 | 0.16 | 2000 | 20 | 4.0 x 10$^{12}$ | 92 | 15 | 18 |
| MD100-1 | 10 x 10 | 1.96 | 1.4 | 1.4 | 0.1 | 0.03 | 0.04 | 0.12 | 0.16 | 600 | 10 | 2.8 x 10$^{12}$ | 22 | 4 | 19 |

**Note: Recommended operating voltage range 0 to 10 volts, for all Series 1 Detectors.**