

# PD24-05-PRW Mid-Infrared Photodiodes

## Description

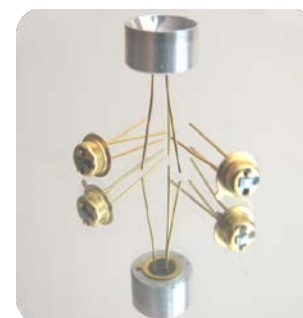
Photodiodes PD24-05-PRW are fabricated from narrow band-gap GaInAsSb/AlGaAsSb-based heterostructures lattice matched to GaSb substrate, and are designed for detection of light signals in Mid-Infrared spectral range with cut-off wavelength around 2.45  $\mu\text{m}$ .

## Features

- Diameter of photosensitive area: 0.5 mm
- Fast Response: <50 ns
- Package: TO-18 with a parabolic reflector and with a glass window

## Applications

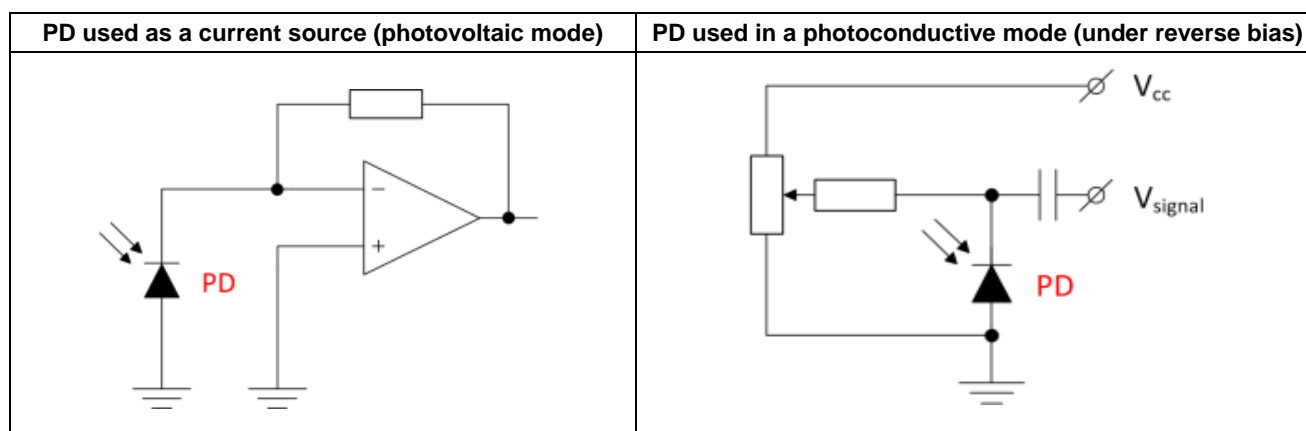
- Industrial Process Control
- Sensor development
- Medical diagnostics



## Specification

### Recommended modes of PD operation

We recommend using photovoltaic mode, when PD is used under no reverse bias.



### Device Parameters

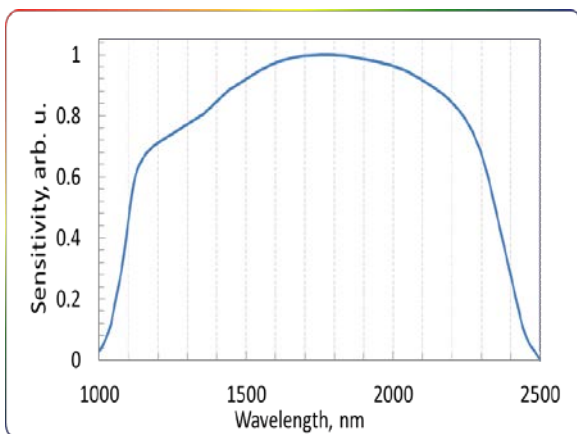
| Device Parameters       | Symbol           | Value      | Units              |
|-------------------------|------------------|------------|--------------------|
| Sensitive area diameter | d                | 0.5        | mm                 |
| Storage temperature     | $T_{\text{stg}}$ | -200 ~ +70 | $^{\circ}\text{C}$ |
| Operating temperature   | $T_{\text{opr}}$ | -200 ~ +60 | $^{\circ}\text{C}$ |
| Reverse voltage         | $V_r$            | -1         | V                  |

### Optical and Electrical Characteristics

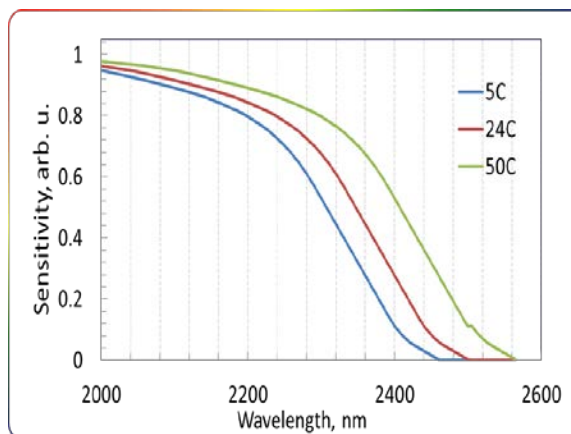
| Photodiode Parameters              | Conditions                   | Symbol          | Value                 | Units   |
|------------------------------------|------------------------------|-----------------|-----------------------|---|
| Cut-off wavelength                 | T=300 K                      | $\lambda_{cut}$ | 2.45                  | $\mu\text{m}$   |
| Max. sensitivity wavelength (>90%) | T=300 K                      | $\lambda_p$     | 1.4 — 2.2             | $\mu\text{m}$   |
| Dark current                       | T=300 K, $V_r=-1$ V          | $I_d$           | 40— 100               | $\mu\text{A}$   |
| Shunt resistance                   | T=300 K, $V_r=-10$ mV        | $R_{sh}$        | 4 — 10                | k $\Omega$  |
| Capacitance                        | T=300 K, $\lambda=\lambda_p$ | C               | 200 — 400             | pF  |
| Sensitivity                        | T=300 K, $\lambda=\lambda_p$ | S               | 0.7-1.1               | A/W   |
| Detectivity                        | T=300 K, $\lambda=\lambda_p$ | $D^*$           | $(2-5) \cdot 10^{10}$ | $\text{cm} \cdot \text{Hz}^{1/2} \cdot \text{W}^{-1}$ |

### Typical Characteristic Curves

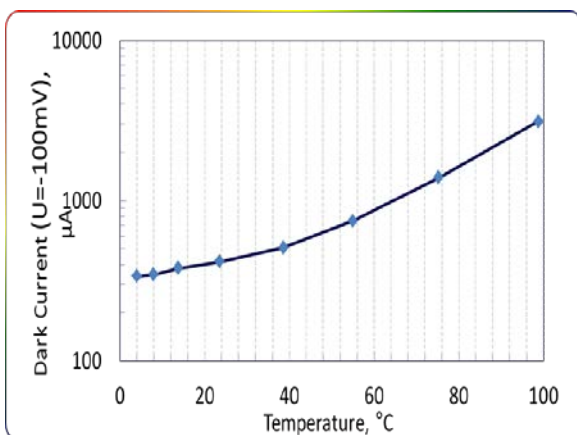
Spectral response (typical)



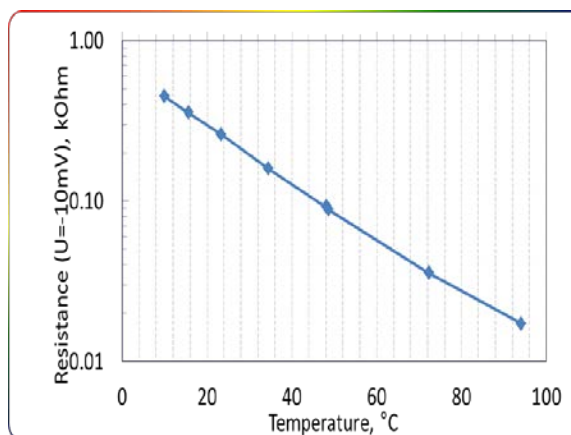
Temperature shift of spectral response



Dark current temperature dependence

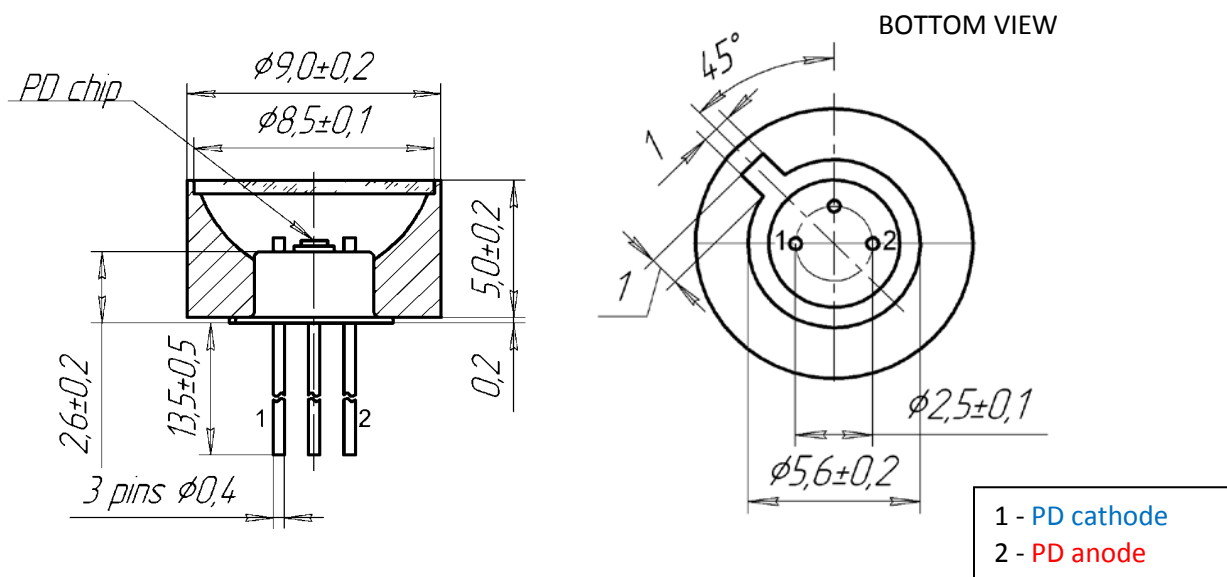


Resistance-temperature dependence



## TO18 Package with a parabolic reflector and with a glass window

Dimension Drawing (units: mm)



## Precautions

Photodiodes are polarity sensitive. Please note the anode of PD is marked with a RED dot. Check all polarity connections before using the device. Please do not connect the PD to the multimeter.

The MID-IR photodiodes are ESD (electro static discharge) sensitive and should be handled with the proper ESD protection environment.