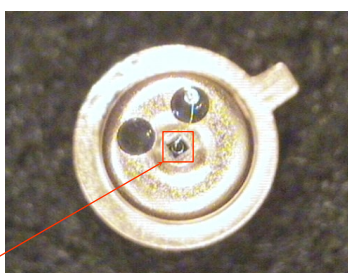


## Features

- High reliability
- Superior linearity
- Easy-to-use detector/amplifier modules are also available
- Parabolic reflector



Photodiode CHIP

## Description

Photodiode **PD48-03-NS-PRW** is a model of **photodetector** with narrow spectral range (**NS**) for detection of radiation at room temperature in the Middle Infrared (Mid-IR) spectral range from 3700 to 4800 nm.

Photodiode chip is disposed inside the standard 5.5 mm TO-18 package with parabolic reflector (**PR**) and window (**W**).

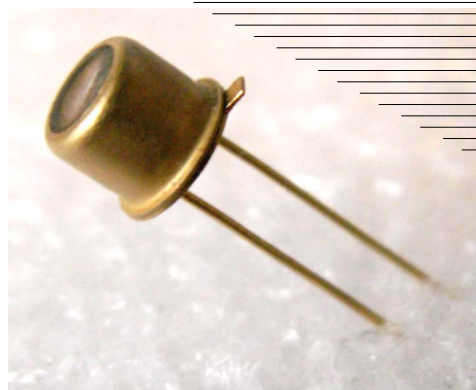
Diameter of the photosensitive area of **PD48-03-NS-PRW** is 300  $\mu\text{m}$ . High speed of response makes it possible for detection of modulated radiation of laser diodes (LDs) and light-emitting diodes (LEDs).

Related products: **PD48-03-NS-PRW** can be used in optical pair with our **LED38...LED46**.

## General characteristics

NS - narrow spectrum

| Package | Parameter                    | Symbol           | Value      | Unit |
|---------|------------------------------|------------------|------------|------|
| TO-18   | Sensitive area diameter      | d                | 0.3        | mm   |
|         | Weight                       | m                | 0.65       | g    |
|         | Operating temperature        | T <sub>opr</sub> | -200...+60 | °C   |
|         | Window material              | sapphire glass   |            |      |
|         | Soldering temperature        | T <sub>s</sub>   | +230       | °C   |
|         | Storage temperature          | T <sub>stg</sub> | -55...+70  | °C   |
|         | Maximum reverse bias voltage | V                | -0.5       | V    |
|         | Size                         | D                | 9.0        | mm   |
|         |                              | H                | 18.5       |      |



## Applications

- Environment measurements
- Gas analysis (CH<sub>4</sub>, CO, CO<sub>2</sub>)
- Infrared spectrophotometry
- Analytical instruments

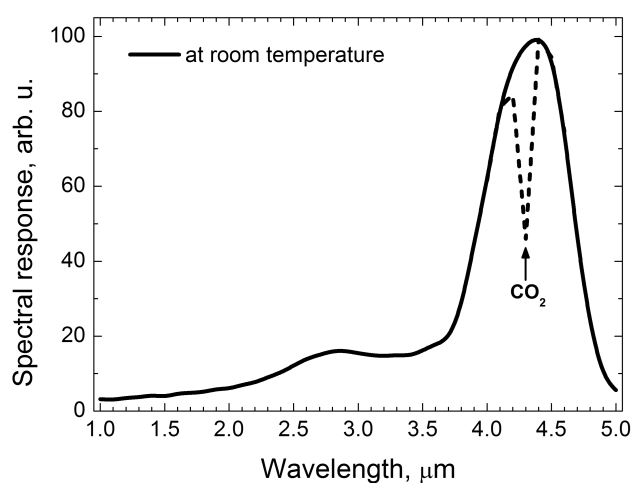
## Accessories (optional)

- **Amplifier AM-07M**

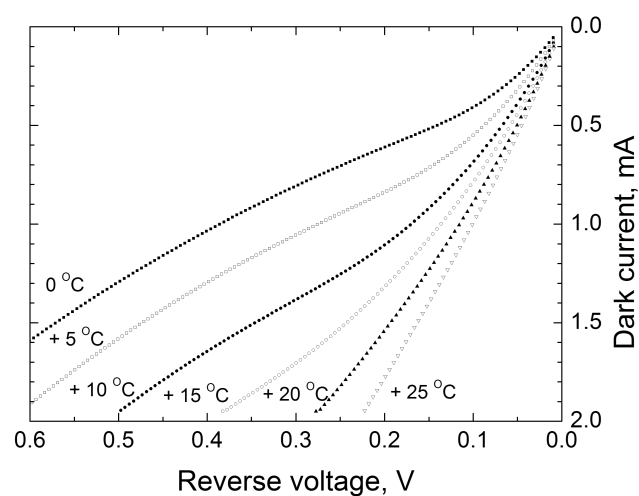
## ▼ Electrical and optical characteristics

| Parameter                   | Symbol      | Condition<br>$T \approx +20^\circ\text{C}$ | Min.                 | Typ.                 | Max.                 | Unit                                                  |
|-----------------------------|-------------|--------------------------------------------|----------------------|----------------------|----------------------|-------------------------------------------------------|
| Cut-off wavelength          | $\lambda$   | at level 10%                               | 2.5 - 4.9            |                      |                      | $\mu\text{m}$                                         |
| Peak sensitivity wavelength | $\lambda_p$ | at level 90%                               | 4.3 - 4.6            |                      |                      | $\mu\text{m}$                                         |
| Photo sensitivity           | S           | at $\lambda_p$                             | 0.6                  | 0.7                  | 0.8                  | A/W                                                   |
| Detectivity                 | $D^*$       | at $\lambda_p$                             | $5 \cdot 10^8$       | $7 \cdot 10^8$       | $8 \cdot 10^8$       | $\text{cm} \cdot \text{Hz}^{1/2} \cdot \text{W}^{-1}$ |
| Dark current                | $I_d$       | $V = -0.1 \text{ V}$                       | 0.6                  | 0.9                  | 1.2                  | mA                                                    |
| Capacitance                 | C           | $V = 0 \text{ V}$ ,<br>$f = 1 \text{ MHz}$ | 25                   | 30                   | 50                   | pF                                                    |
| Rise time                   | $t_r$       | $V = 0 \text{ V}$ ,<br>$R_L = 50 \Omega$   | $\leq 20$            |                      |                      | ns                                                    |
| Fall time                   | $t_f$       |                                            |                      |                      |                      |                                                       |
| Shunt resistance            | $R_0$       | $V \approx -10 \text{ mV}$                 | 100                  | 150 - 200            | 500                  | $\Omega$                                              |
| Noise equivalent power      | NEP         | at $D^*$                                   | $1.1 \cdot 10^{-10}$ | $7.6 \cdot 10^{-11}$ | $6.7 \cdot 10^{-11}$ | $\text{W} \cdot \text{Hz}^{-1/2}$                     |

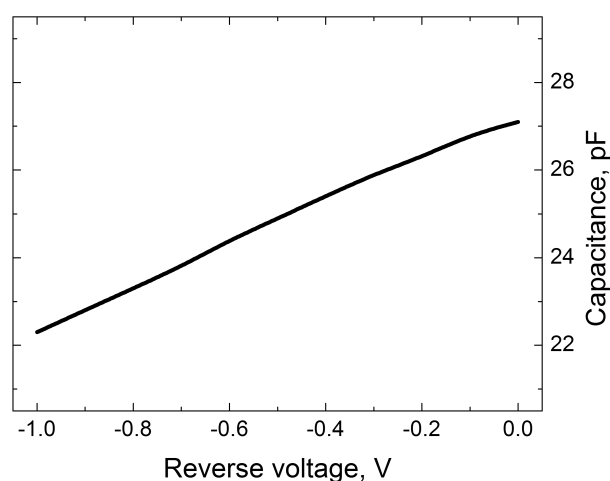
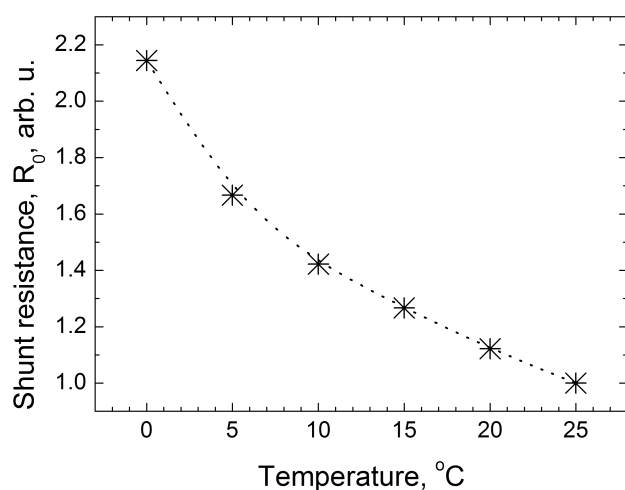
### ▼ Spectral response



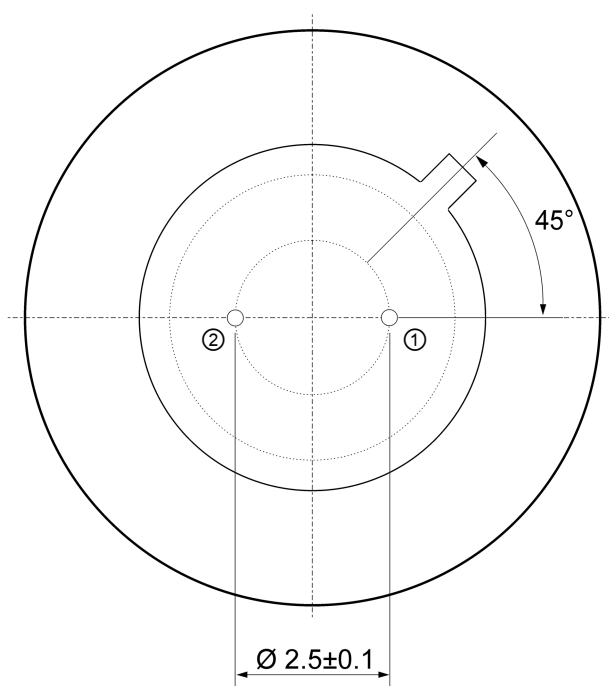
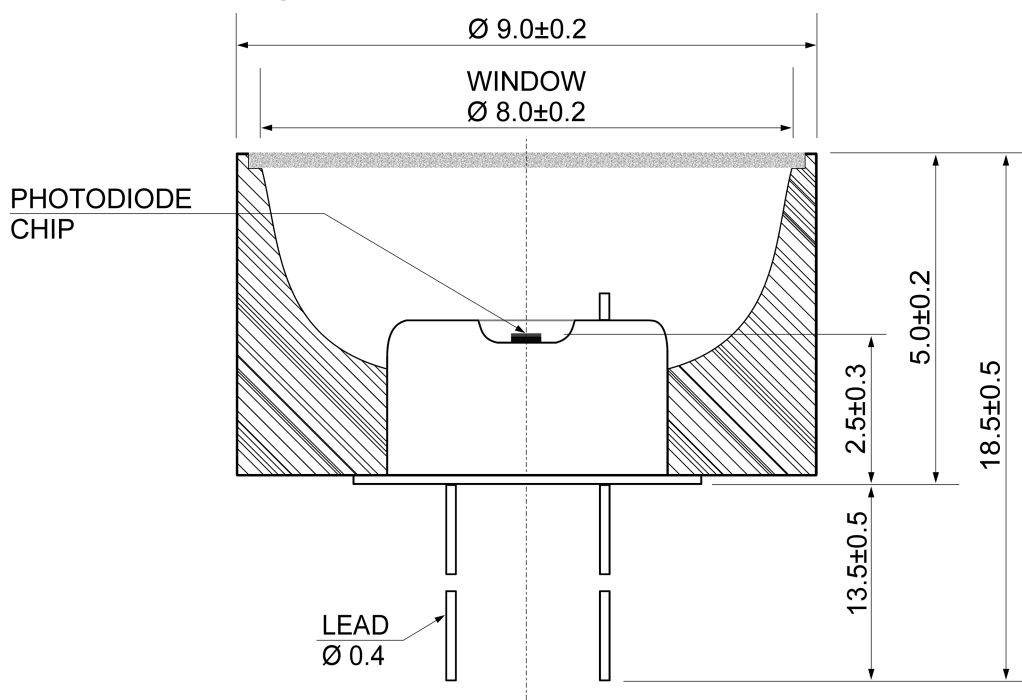
### ▼ Dark current vs. reverse voltage



### ▼ Shunt resistance vs. element temperature ▼ Capacitance vs. reverse voltage



▼ TO-18 package with PR & W dimensions (unit: mm)



| Pin | Description         |
|-----|---------------------|
| ①   | Detector (anode)*   |
| ②   | Detector (cathode)* |

\*Special order: the pin polarity can be changed.