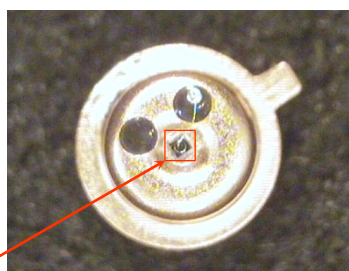
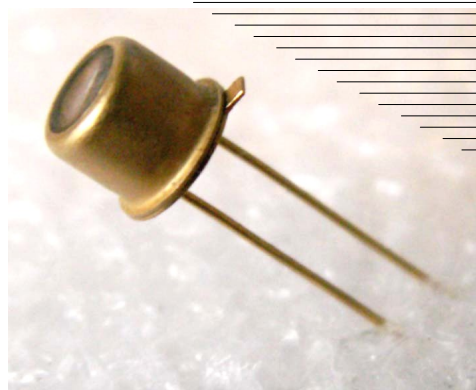


## Features

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



Photodiode CHIP



## Applications

- Environment measurements
- Gas analysis ( $\text{CH}_4$ ,  $\text{CO}$ ,  $\text{CO}_2$ )
- Infrared spectrophotometry
- Laser detection
- Analytical instruments

## Accessories (optional)

- Amplifier AM-07M

## Description

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

Photodiode is disposed inside the standard 5.5 mm TO-18 package.

Diameter of the photosensitive area of **PD48-03-NS** 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** can be used in optical pair with our **LED37**, **LED38**, **LED39**, **LED41**, **LED43**, **LED46**.

## General characteristics

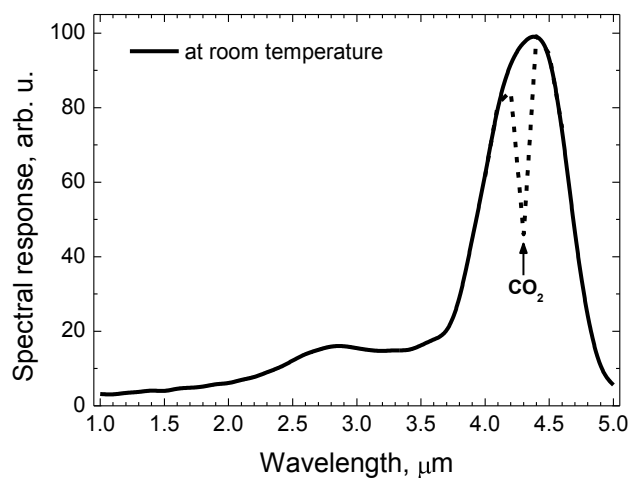
NS - narrow spectrum

| Package | Parameter                    | Symbol           | Value       | Unit |
|---------|------------------------------|------------------|-------------|------|
| TO-18   | Sensitive area diameter      | d                | 0.3         | mm   |
|         | Weight                       | m                | 0.26        | g    |
|         | Operating temperature        | T <sub>opr</sub> | - 20...+ 40 | °C   |
|         | Soldering temperature        | T <sub>s</sub>   | + 230       | °C   |
|         | Storage temperature          | T <sub>stg</sub> | - 55...+ 60 | °C   |
|         | Maximum reverse bias voltage | V <sub>b</sub>   | - 0.5       | V    |
|         | Size                         | D                | 5.5         | mm   |
|         |                              | H                | 17.7        |      |

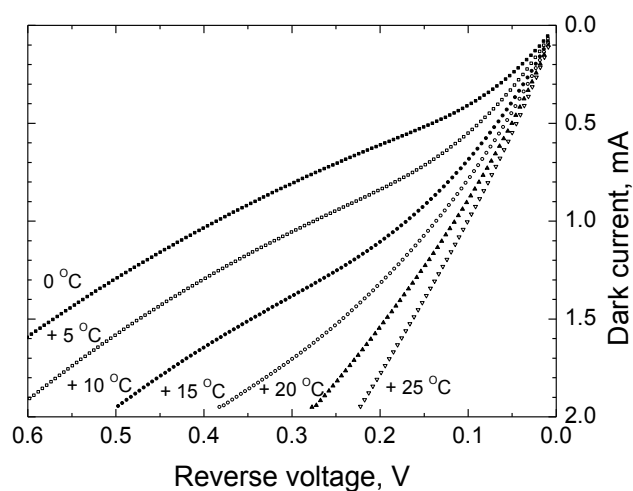
## Electrical and optical characteristics

| Parameter                   | Symbol      | Condition<br>$T \approx + 20^\circ\text{C}$ | Min.           | Typ.           | Max.           | Unit                                                  |
|-----------------------------|-------------|---------------------------------------------|----------------|----------------|----------------|-------------------------------------------------------|
| Spectral sensitivity range  | $\lambda$   | 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                | $I_d$       | $V_b = - 0.1 \text{ V}$                     | 0.6            | 0.9            | 1.2            | mA                                                    |
| Rise time                   | $t_r$       | $V_b = 0 \text{ V}, R_L = 50 \Omega$        | $\leq 20$      |                |                | ns                                                    |
| Fall time                   | $t_f$       |                                             |                |                |                |                                                       |
| Capacitance                 | C           | $V_b = 0 \text{ V}, f = 1 \text{ MHz}$      | 25             | 30             | 50             | pF                                                    |
| Shunt resistance            | $R_0$       | $V_b \approx \pm [5 - 10] \text{ mV}$       | 100            | 150 - 200      | 500            | $\Omega$                                              |
| Noise equivalent power      | NEP         | at $\lambda_p$                              | -              | -              | -              | $\text{W} \cdot \text{Hz}^{-1/2}$                     |

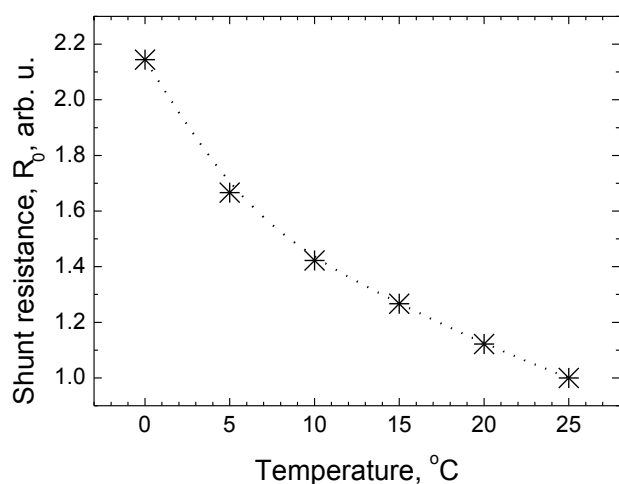
## ▼ Spectral response



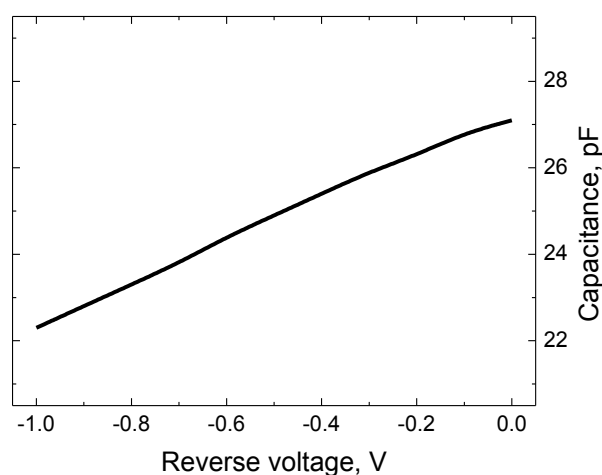
## ▼ Dark current vs. reverse voltage



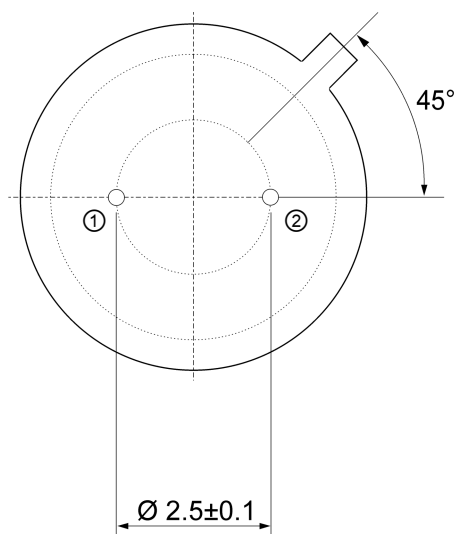
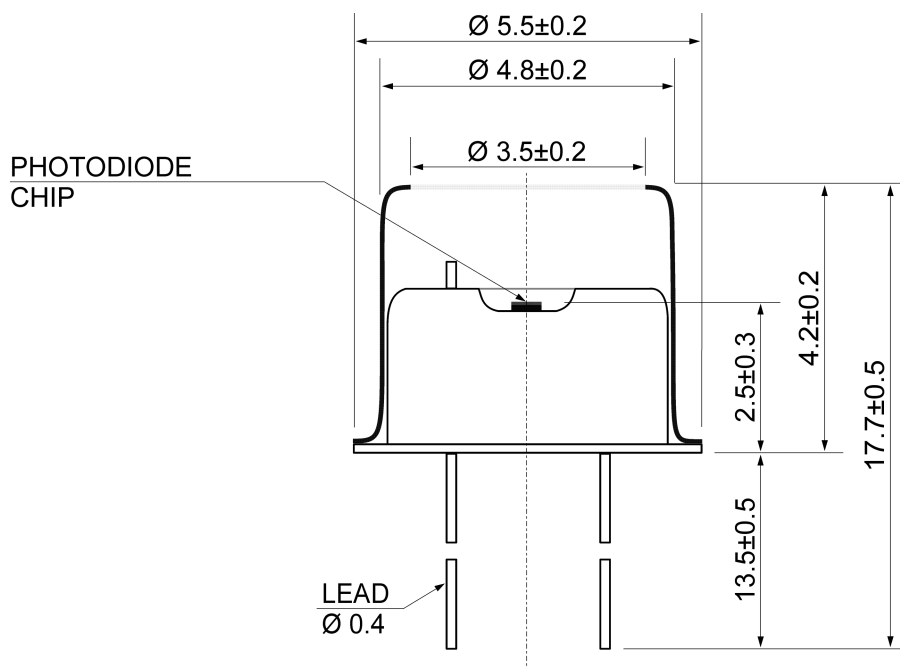
## ▼ Shunt resistance vs. temperature



## ▼ Capacitance vs. reverse voltage



▼ TO-18 package dimensions (unit: mm)



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

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