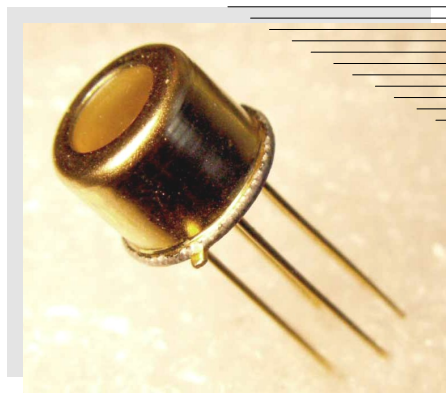




## Features

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

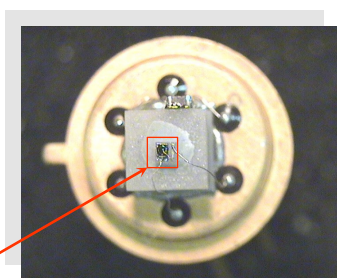


## Applications

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

## Accessories (optional)

- **Amplifier with temperature controller AMT-07M**



Photodiode CHIP

## Description

Photodiode **PD48-03-TEC** is a model of **photodetector** with thermo electric cooler (TEC) and thermistor for a control of temperature. Components are integrated inside the standard 9.2 mm TO-5 package.

Photodiode **PD48-03-TEC** is designed for detection of radiation in the Middle Infrared (MIR) spectral range from 2500 to 4800 nm.

Diameter of the photosensitive area of **PD48-03-TEC** is 300 μm. 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-TEC** can be used in optical pair with our **LED37, LED38, LED39, LED41, LED43, LED46**.

## General characteristics

Package	Parameter	Symbol	Value	Unit
TO-5 with TEC	Sensitive area diameter	d	0.3	mm
	Weight	m	1.15	g
	Operating temperature	T <sub>opr</sub>	- 10...+ 40	°C
	Window material		Sapphire glass	
	Cooling		One-stage TE-cooled	
	Soldering temperature	T <sub>s</sub>	230	°C
	Storage temperature	T <sub>stg</sub>	- 20...+ 50	°C
	Maximum reverse bias voltage	V <sub>b</sub>	- 0.5	V
	Size	D	9.2	mm
H		20.2		



### Electrical and optical characteristics

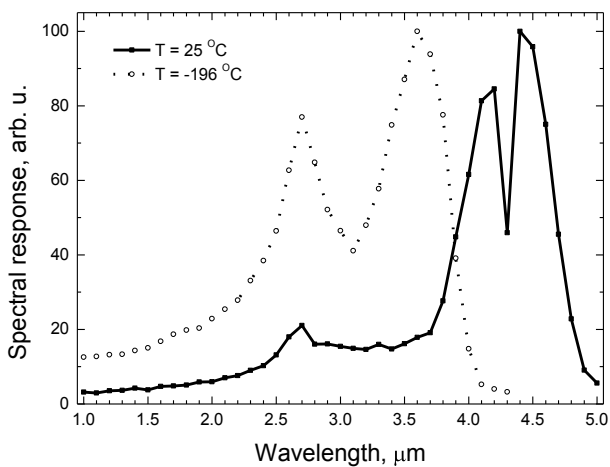
Parameter	Symbol	Element temperature			Unit
		0 °C	20 °C	40 °C	
Spectral sensitivity range (at level 10%)	$\lambda$	-	2.5 – 4.8	-	$\mu\text{m}$
Peak sensitivity wavelength (at level 90%)	$\lambda_p$	-	4.3 – 4.6	-	$\mu\text{m}$
Photo sensitivity (at $\lambda_p$ )	S	-	0.6 – 0.8	-	A/W
Detectivity (at $\lambda_p$ )	$D^*$	-	[5 – 8]·10 <sup>8</sup>	-	$\text{cm}\cdot\text{Hz}^{1/2}\cdot\text{W}^{-1}$
Dark current (V = - 0.1 V)	$I_d$	0.4 – 0.6	0.6 – 1.0	≥ 1	mA
Rise time	$t_r$	-	10 – 20	-	ns
Terminal capacitance (V = - 0.1 V)	C	-	25 – 50	-	pF
Shunt resistance	$R_0$	800 – 1600	100 – 500	-	$\Omega$
Noise equivalent power (at $\lambda_p$ )	NEP	-	-	-	$\text{W}\cdot\text{Hz}^{-1/2}$

### TEC TO506.1MC0400710.TB103 parameters (without load)

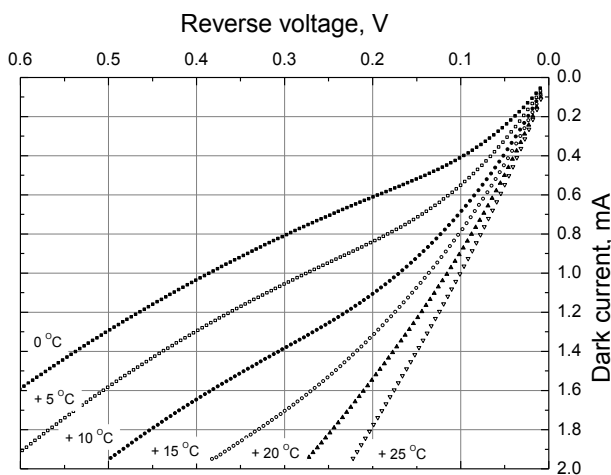
Parameter	Symbol	Value	Unit
Current power ( $\Delta t_{\text{max}}$ )	$I_{\text{max}}$	1.50	A
Voltage ( $\Delta t_{\text{max}}$ )	$U_{\text{max}}$	0.80	V
Cooling energy	$Q_{\text{max}}$	1.30	W
Temperature range (vacuum)	$\Delta T_{\text{max}}$	70	K
Termistor resistance (t = 20 °C)	$R_t$	10.00	k $\Omega$



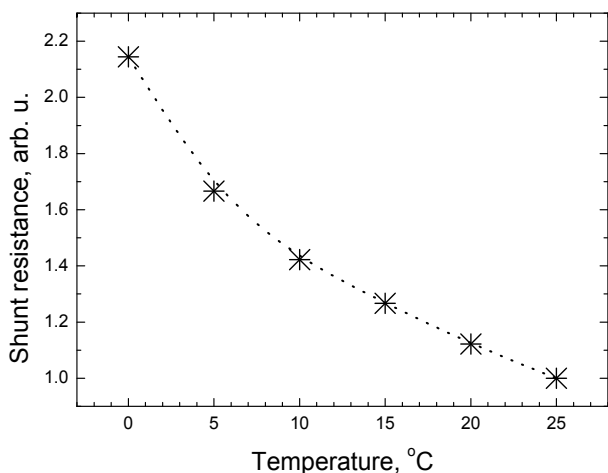
▼ Spectral response



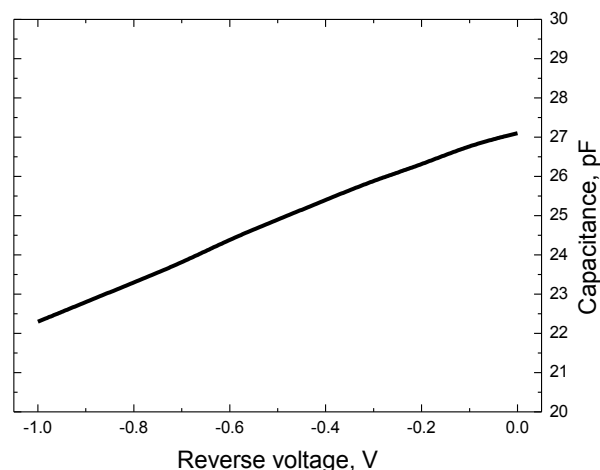
▼ Dark current vs. reverse voltage



▼ Shunt resistance vs. element temperature

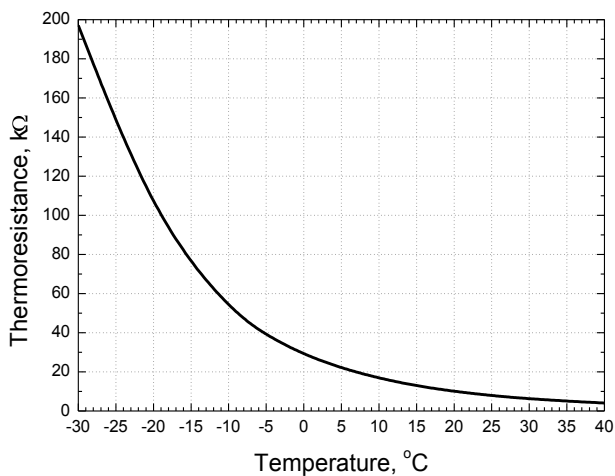


▼ Capacitance vs. reverse voltage





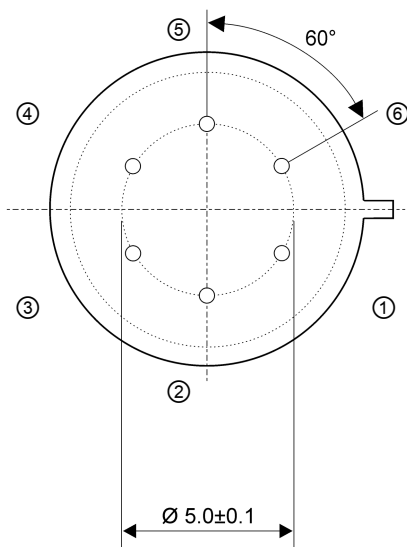
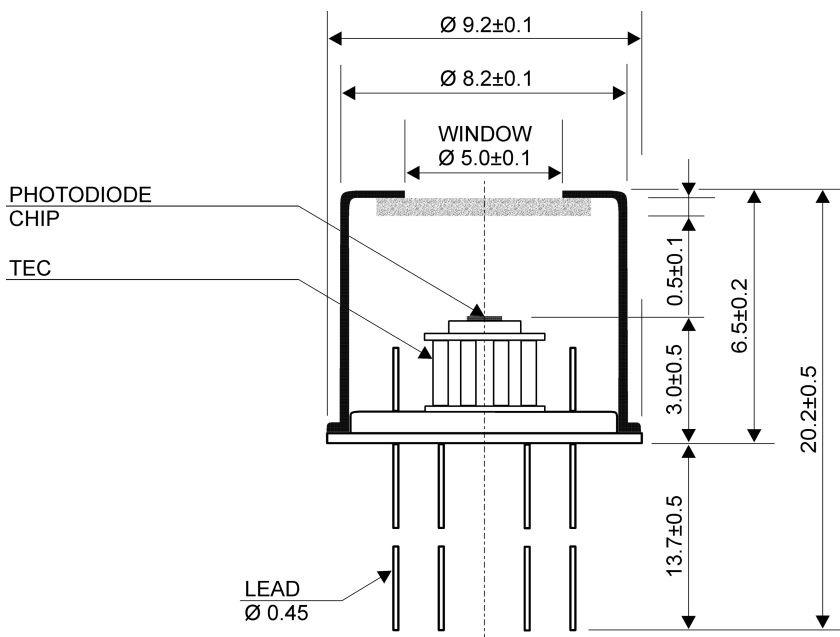
## Thermoresistance vs. temperature



## Photo sensitivity temperature characteristic



▼ TO-5 package dimensions (unit: mm)



- ① TEC +
- ② PD +
- ③ PD -
- ④ Termistor TC103
- ⑤ Termistor TC103
- ⑥ TEC -