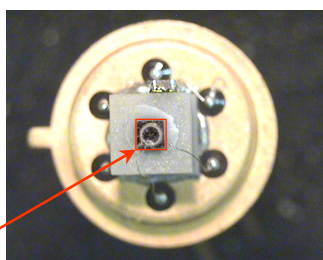


Features

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



Photodiode CHIP

Description

Photodiode **PD24-05-TEC** is a model of [photodetector](#) for detection of radiation at room temperature in the Middle Infrared (Mid-IR) spectral range from 1150 to 2400 nm.

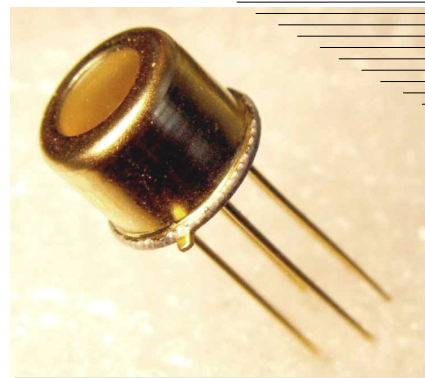
Photodiode **PD24-05-TEC** has thermo electric cooler (TEC) and thermistor for a control of temperature. Components are integrated inside the standard 9.2 mm TO-5 package with TEC.

Diameter of the photosensitive area of **PD24-05-TEC** is 500 μm . High speed of response makes it possible for detection of modulated radiation of laser diodes (LDs) and light-emitting diodes (LEDs).

Related products: **PD24-05-TEC** can be used in optical pair with our [LED11...LED23](#) and [LD200...LD230](#).

General characteristics

Package	Parameter	Symbol	Value	Unit
TO-5 with TEC	Sensitive area diameter	d	0.5	mm
	Weight	m	1.15	g
	Operating temperature	T _{opr}	- 20...+ 40	°C
	Window material	sapphire glass		
	Cooling	one-stage TE-cooled		
	Soldering temperature	T _s	+ 230	°C
	Storage temperature	T _{stg}	- 20...+ 50	°C
	Maximum reverse bias voltage	V	- 2.0	V
	Size	D	9.2	mm
		H	20.2	



Applications

- Environment measurements
- Infrared spectrophotometry
- Laser detection
- Analytical instruments

Accessories (optional)

- [Amplifier with temperature controller](#)
[AMT-07M](#)

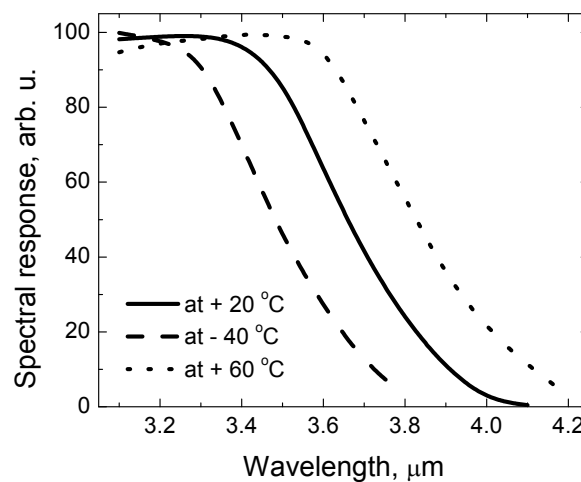
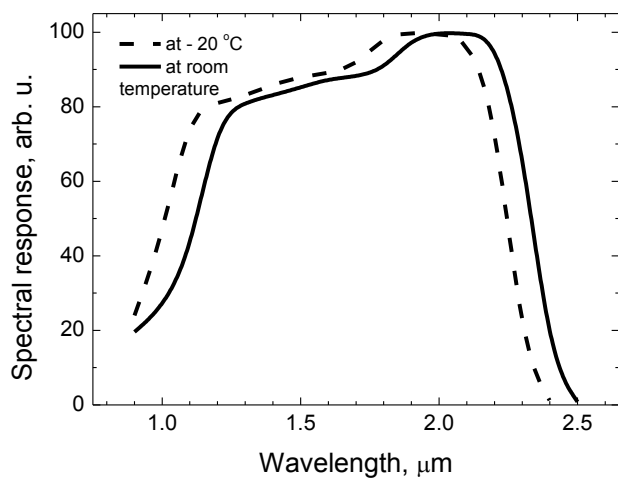
Electrical and optical characteristics

Parameter	Symbol	Condition	Element temperature			Unit
			- 20 °C	0 °C	+ 20 °C	
Spectral sensitivity range	λ	at level 10%	1.20 - 2.32	-	1.20 - 2.42	μm
Peak sensitivity wavelength	λ_p	at level 90%	1.63 - 2.14	-	1.75 - 2.23	μm
Photo sensitivity	S	at λ_p	0.9 - 1.1			A/W
Detectivity	D^*	at λ_p	$[1.5 - 3.0] \cdot 10^{11}$	-	$[4.0 - 7.0] \cdot 10^{10}$	$\text{cm} \cdot \text{Hz}^{1/2} \cdot \text{W}^{-1}$
Dark current	I_d	$V = -0.2 \text{ V}$	0.7 - 1.2	-	8.0 - 15.0	μA
		$V = -0.5 \text{ V}$	0.9 - 1.2	-	10.0 - 20.0	
		$V = -1.0 \text{ V}$	1.1 - 3.0	-	12.0 - 30.0	
Capacitance	C	$V = 0 \text{ V}$ $f = 1 \text{ MHz}$	140 - 220			pF
Rise time	t_r	$V = 0 \text{ V}$ $R_L = 50 \Omega$	15 - 25			ns
Fall time	t_f					
Shunt resistance	R_0	$V \approx -10 \text{ mV}$	50 - 150	-	5 - 12	k Ω
Noise equivalent power	NEP	at D^*	$[5.9 - 3.0] \cdot 10^{-13}$	-	$[2.2 - 1.3] \cdot 10^{-12}$	$\text{W} \cdot \text{Hz}^{-1/2}$

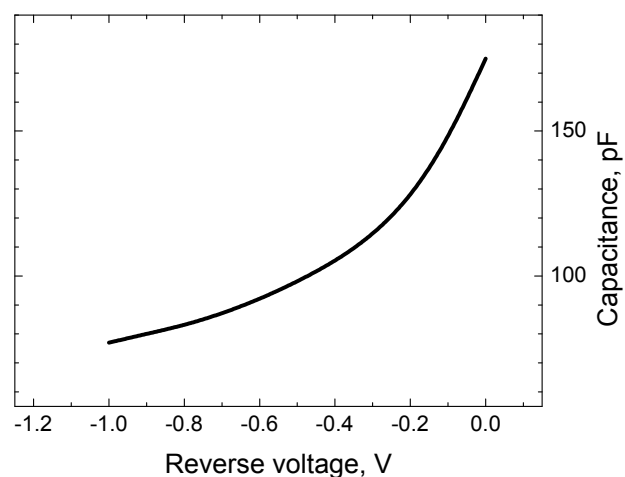
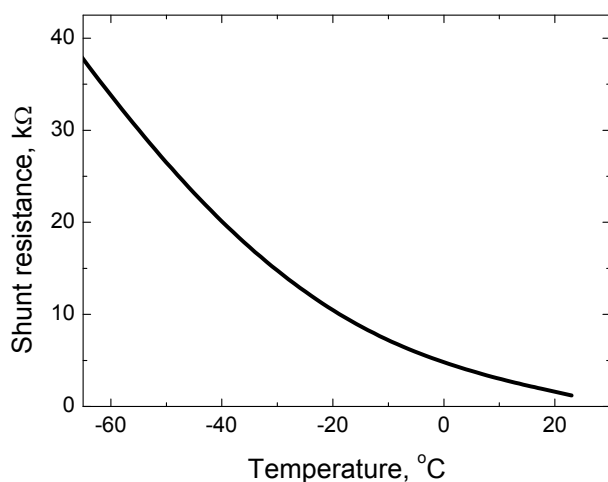
TEC TO506.1MC0400710.TB103 parameters (without load)

Parameter	Symbol	Condition	Value	Unit
Current	I_{max}	ΔT_{max}	1.50	A
Voltage	U_{max}	ΔT_{max}	0.80	V
Cooling energy	Q_{max}	-	1.30	W
Temperature range	ΔT_{max}	vacuum	70	K
Thermistor resistance	R_t	at + 20 °C	10.00	k Ω

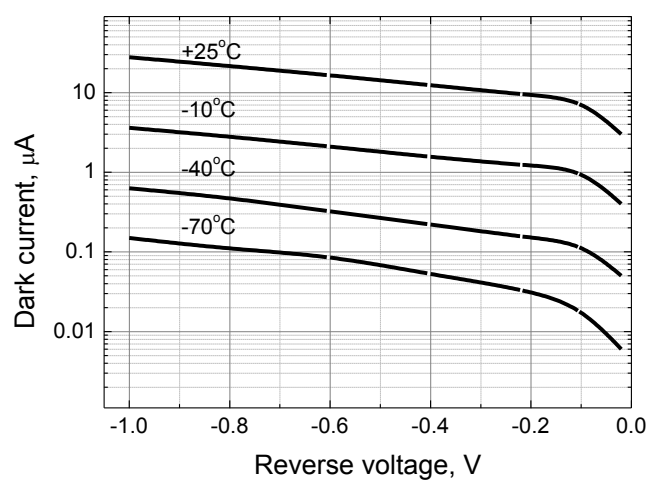
▼ Spectral response



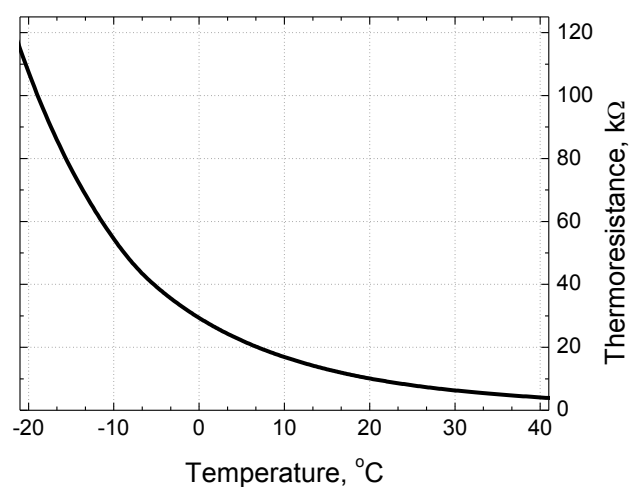
▼ Shunt resistance vs. element temperature ▼ Capacitance vs. reverse voltage



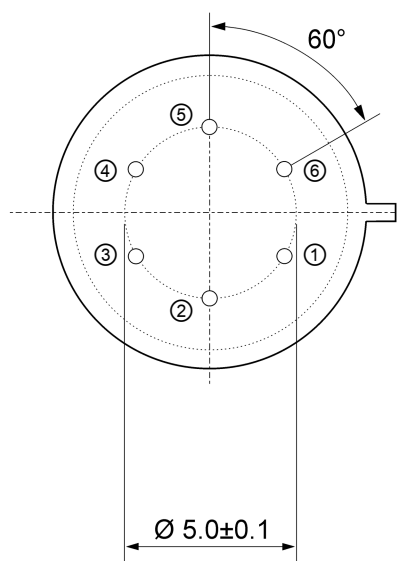
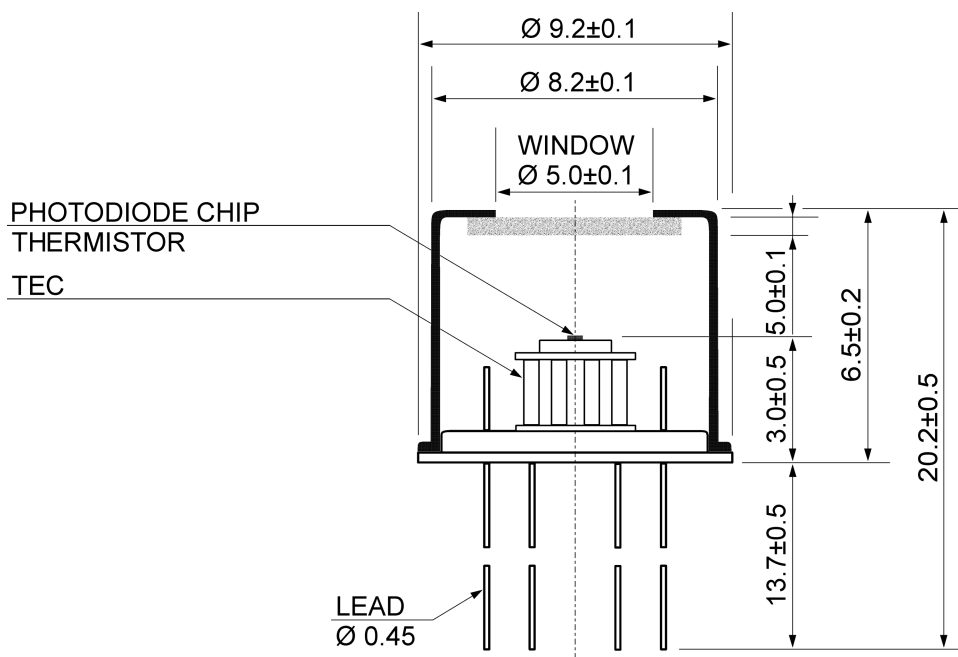
Dark current vs. reverse voltage



Thermoresistance vs. temperature



▼ TO-5 package with TEC dimensions (unit: mm)



Pin	Description
①	TEC (anode)
②	Detector (anode)*
③	Detector (cathode)*
④	Thermistor TC103
⑤	
⑥	TEC (cathode)

*Special order: the pin polarity can be changed.