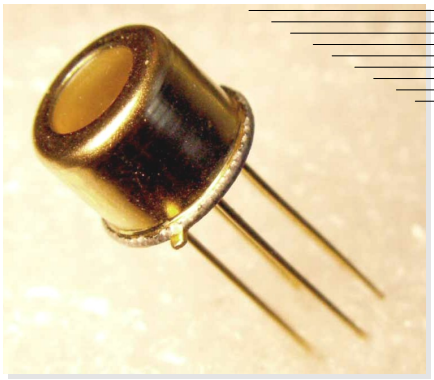
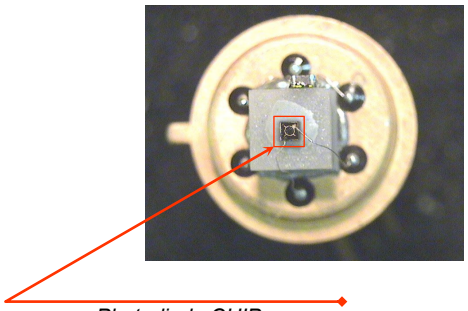
Mid infrared IBSG Optoelectronics



Features

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



Photodiode CHIP

Applications

- **Invironment measurements**
- **Gas analysis (CH_4, CO, CO_2)**
- **Infared spectrophotometry**
- **Laser detection**
- **Analytical instruments**

Accessories (optional)

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

Description

Photodiode **PD48-05-WS-TEC** is a model of photodetector with wide spectral range (**WS**) for detection of radiation in the Middle Infrared (Mid-IR) spectral range from 800 to 4800 nm operating at room temperature.

Photodiode **PD48-05-WS-TEC** has thermo electric cooler (**TEC**) and termistor for a control of temperature. Components are integrated inside the standard 9.2 mm TO-5 package with **TEC**.

Photosensitive area of **PD48-05-WS-TEC** is 0.45×0.45 mm^2. High speed of response makes it possible for detection of modulated radiation of laser diodes (LDs) and light-emitting diodes (LEDs).

Related products: **PD48-05-WS-TEC** can be used in optical pair with our **LED36**, **LED37**, **LED38**, **LED39**, **LED41**, **LED43**, **LED46**.

General characteristics

WS - wide spectrum

Package	Parameter	Symbol	Value	Unit
TO-5 with **TEC**	Chip size (photosensitive area)	A	0.45×0.45	mm^2
	Weight	m	1.15	g
	Operating temperature	T_{opr}	− 20…+ 40	℃
	Window material	sapphire glass		
	Cooling	one-stage TE-cooled		
	Soldering temperature	T_s	+ 230	℃
	Storage temperature	T_{stg}	− 20…+ 50	℃
	Maximum reverse bias voltage	V_b	− 0.5	V
	Size	D	9.2	mm
		H	20.2	

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Electrical and optical characteristics

Parameter	Symbol	Condition	Element temperature			Unit
			− 20 °C	0 °C	+ 20 °C	
Spectral sensitivity range	λ	at level 10%	0.8 - 4.65	0.8 - 4.75	0.8 - 4.8	μm
Peak sensitivity wavelength	λ_p	at level 90%	3.15 - 3.9	3.2 - 4.0	3.25 - 4.15	μm
Photo sensitivity	S	$\lambda = \lambda_P$	0.7 - 0.9	0.6 - 0.8	0.6 - 0.8	A/W
Detectivity	D*	$\lambda = \lambda_P$	$[8 - 10]\cdot10^8$	$[6 - 9]\cdot10^8$	$[5 - 9]\cdot10^8$	$cm\cdot Hz^{½}\cdot W^{-1}$
Dark current	I_d	$V_b = -0.1$ V	0.2 - 0.4	0.5 - 1.0	1.0 - 3.0	mA
Rise time	t_r	$V_b = 0$ V, R_L = 50 Ω	≤ 20			ns
Fall time	t_f					
Capacitance	C	$V_b = 0$ V, f = 1 MHz	30 - 40	40 - 50	40 - 60	pF
Shunt resistance	R_0	$V_b \approx \pm$ [5 - 10] mV	200 - 300	100 - 220	50 - 150	Ω
Noise equivalent power (at λ_P)	NEP	$\lambda = \lambda_P$	-	-	-	$W\cdot Hz^{-½}$

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

Parameter	Symbol	Value	Unit
Current power (ΔT_{max})	I_{max}	1.50	A
Voltage (ΔT_{max})	U_{max}	0.80	V
Cooling energy	Q_{max}	1.30	W
Temperature range (vacuum)	ΔT_{max}	70	K
Termistor resistance (T = + 20 °C)	R_t	10.00	kΩ

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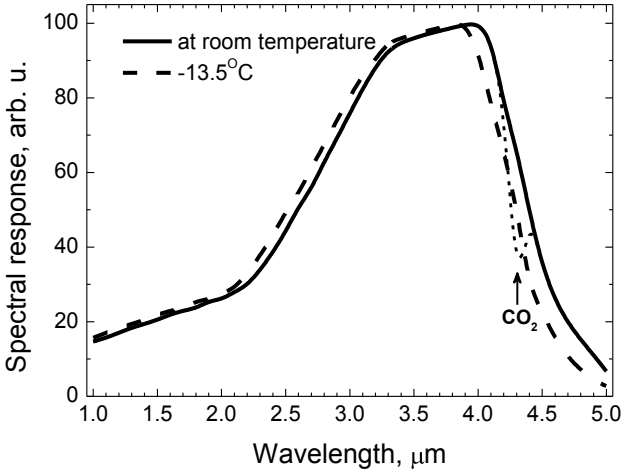
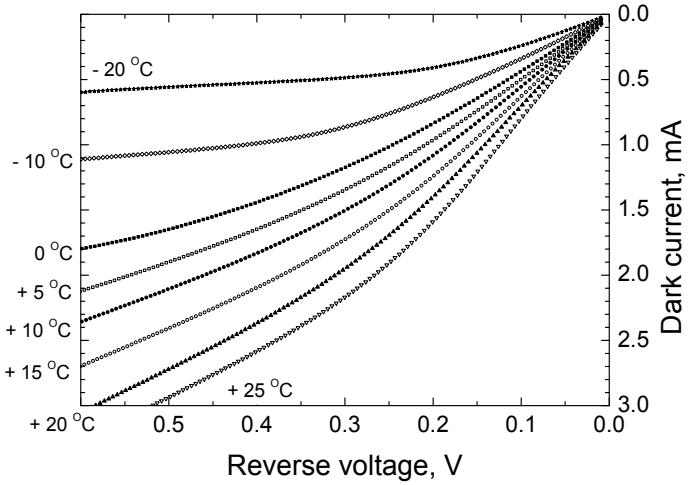
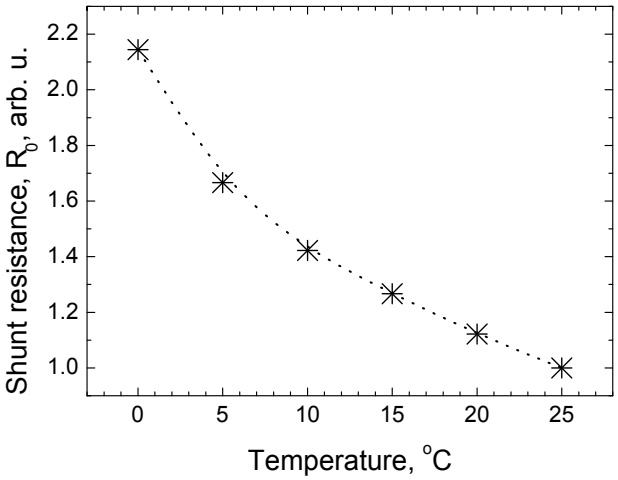
Spectral response



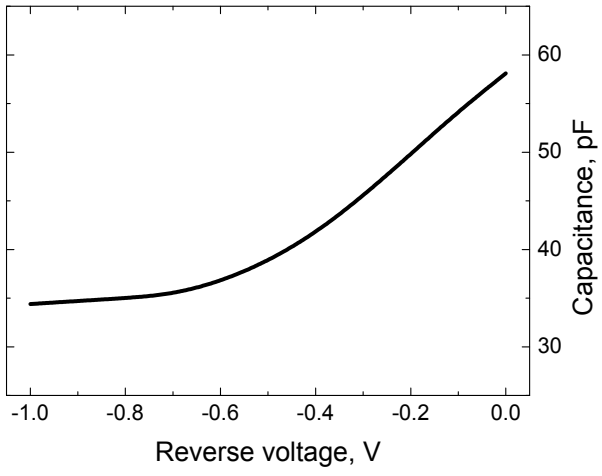
Dark current vs. reverse voltage



Shunt resistance vs. temperature



Capacitance vs. reverse voltage



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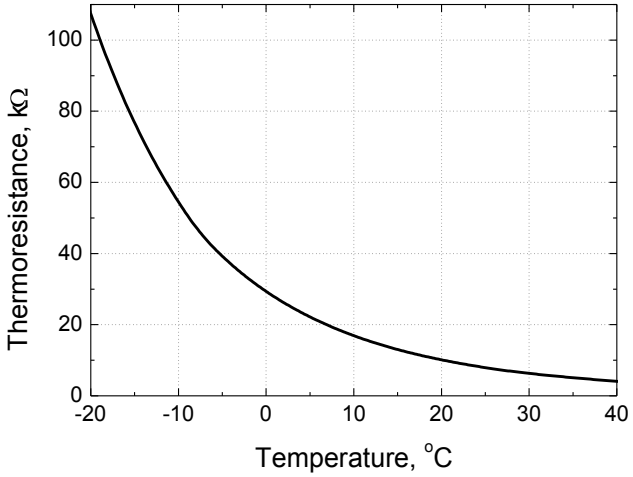
Thermoresistance vs. temperature



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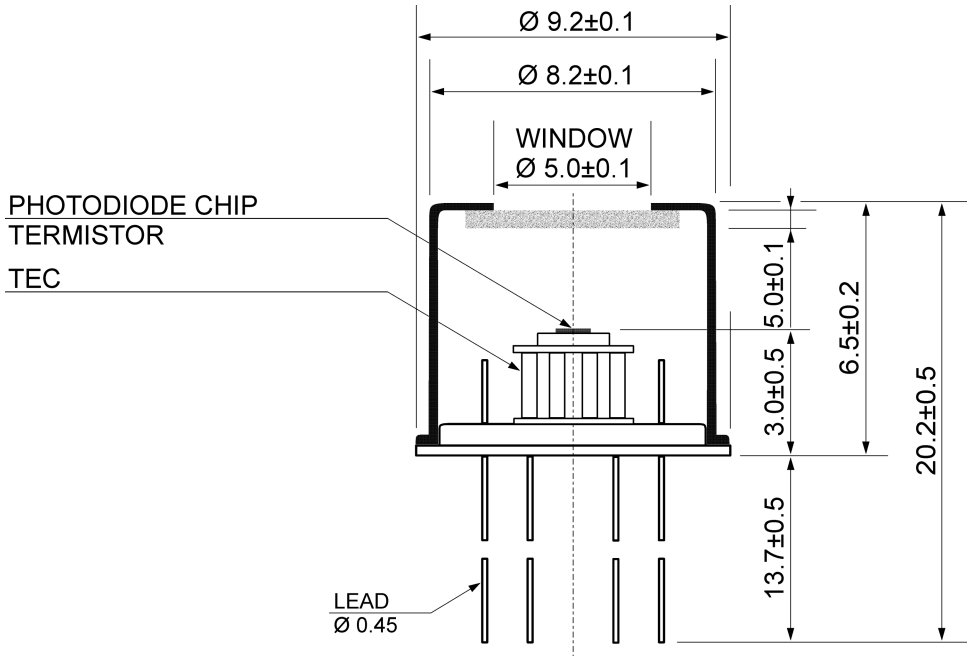
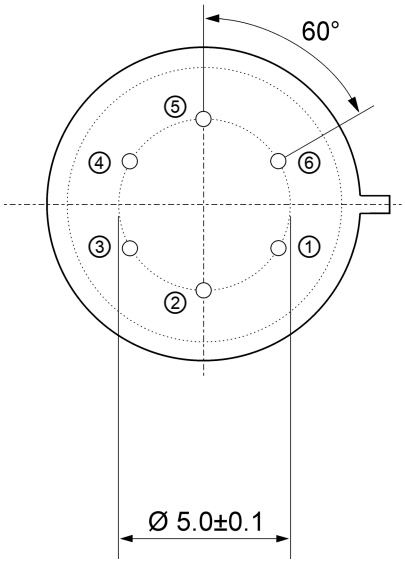
TO-5 package with TEC dimensions (unit: mm)





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

*Special order: the pin polarity can be changed.

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