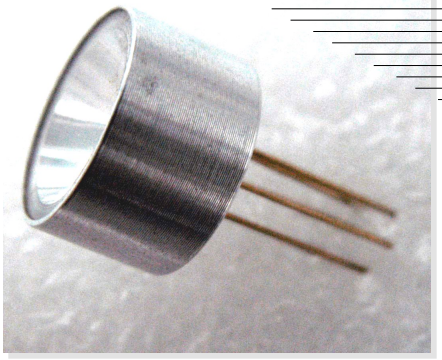
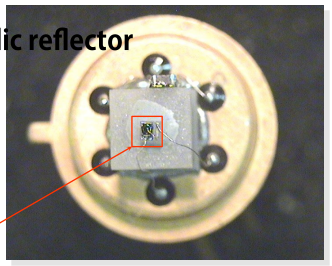
Mid infrared IBSG Optoelectronics



Features

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



Applications

- **Invironment measurements**
- **Infared spectrophotometry**
- **Laser detection**
- **Analytical instruments**

Accessories (optional)

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

Description

Photodiode **PD36-02-TEC-PRW** is a model of photodetector for detection of radiation at room temperature in the Middle Infrared (Mid-IR) spectral range from 1500 to 3800 nm.

Photodiode **PD36-02-TEC-PRW** 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**, parabolic reflector (**PR**) and window (**W**).

Diameter of the photosensitive area of **PD36-02-TEC-PRW** is 200 µm. High speed of response makes it possible for detection of modulated radiation of laser diodes (LDs) and light-emitting diodes (LEDs). **PR** allows to increase detectivity of the photodiode by a factor of 10 in the case of parallel beam of radiation.

General characteristics

Package	Parameter	Symbol	Value	Unit
TO-5 with TEC PR W	Sensitive area diameter	d	0.2	mm
	Weight	m	3.65	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	−1.0	V
	Size	D	10.5	mm
		H	23.0	

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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%	1.5* - 3.6	-	1.5* - 3.8	µm
Peak sensitivity wavelength	λ_p	at level 90%	2.5 - 3.3	-	2.6 - 3.4	µm
Photo sensitivity	S	at λ_P	1.0 - 1.2			A/W
Detectivity	D*	at λ_P	$[0.6 - 1.0]\cdot10^{10}$	-	$[3 - 6]\cdot10^{9}$	$cm\cdot Hz^{½}\cdot W^{-1}$
Dark current	I_d	V = −0.2 V	20 - 50	-	80 - 250	µA
		V = −0.4 V	70 - 100	-	140 - 400	
Capacitance	C	V = 0 V, f = 1 MHz	60 - 800			pF
Rise time	t_r	V = 0 V, R_L = 50 Ω / V = −0.5 V	10 - 100		10 - 15	ns
Fall time	t_f					
Shunt resistance	R_0	V ≈ −10 mV	1.5 - 9.0	-	0.2 - 1.5	kΩ
Noise equivalent power	NEP	at λ_P	$[5.9 - 3.5]\cdot10^{-12}$	-	$[1.2 - 0.6]\cdot10^{-11}$	$W\cdot Hz^{-½}$

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	kΩ

* Not at level 10%

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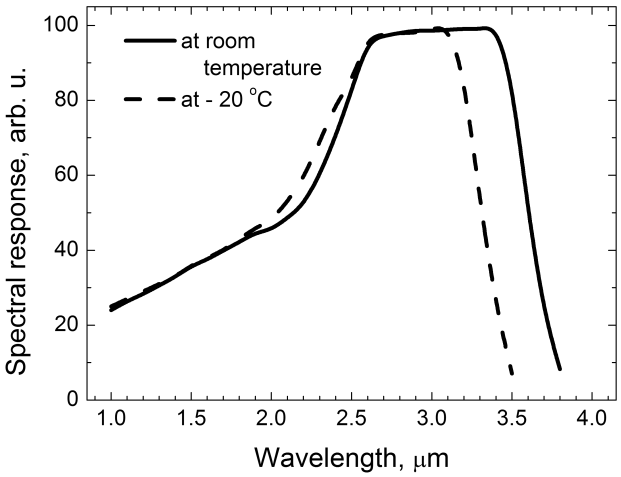
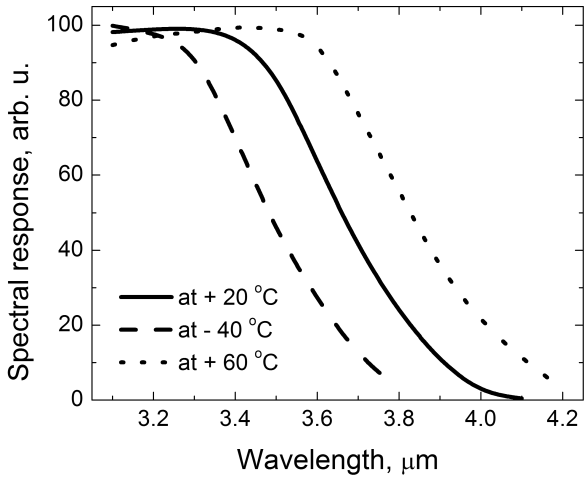
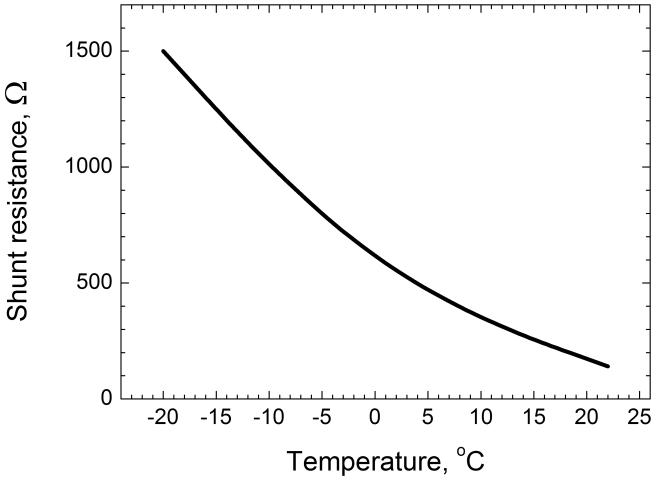
Spectral response





Shunt resistance vs. element temperature



Capacitance vs. reverse voltage

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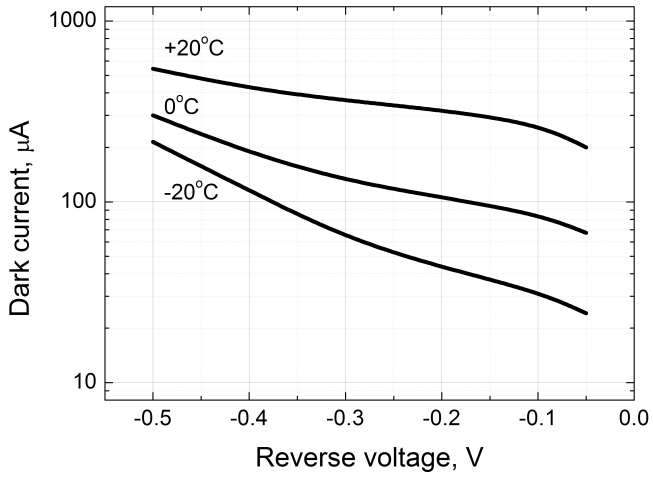
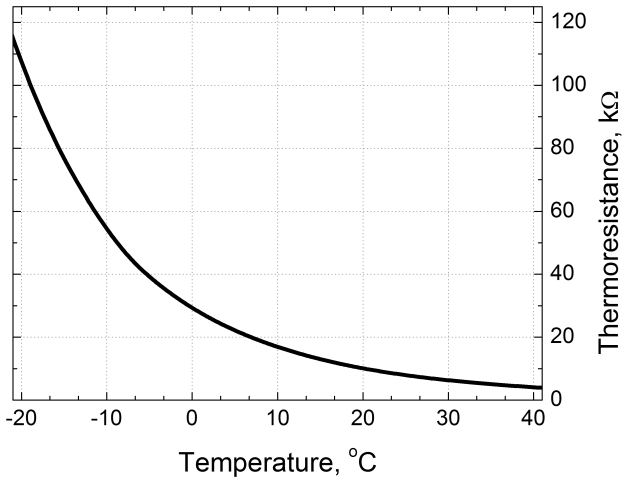
Dark current vs. reverse voltage



Thermoresistance vs. temperature



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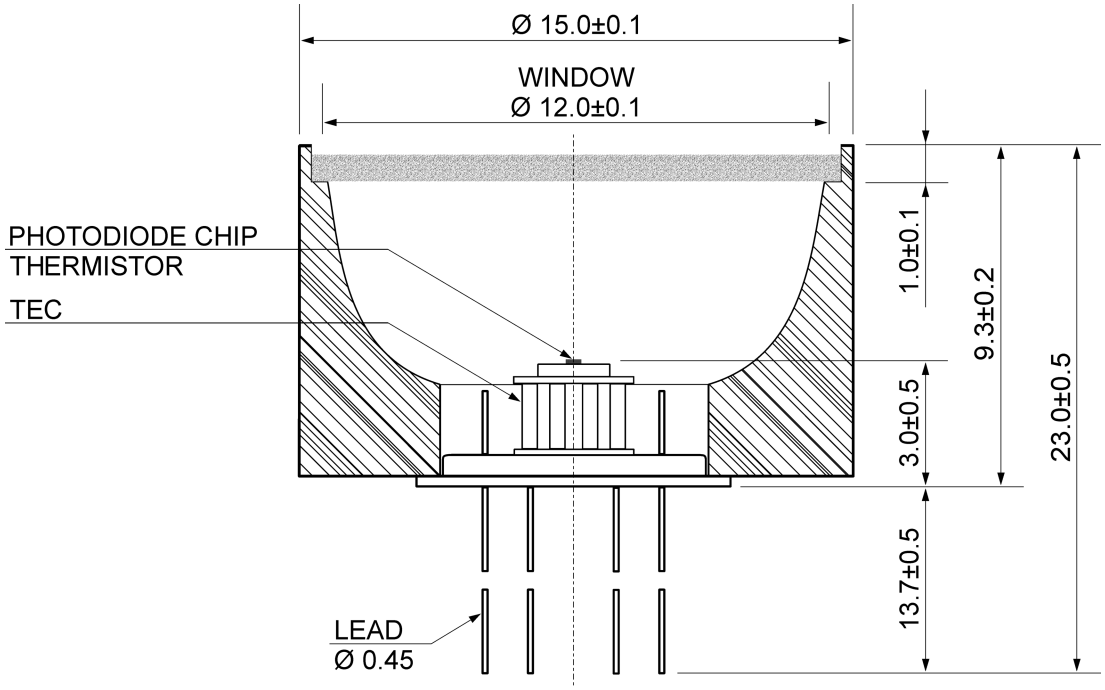
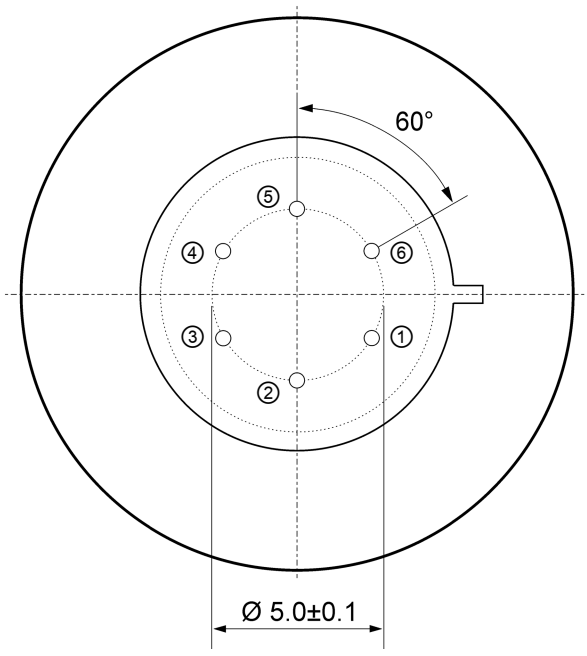
TO-5 package with TEC & PR dimensions (unit: mm)





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

*Special order: the pin polarity can be changed.

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