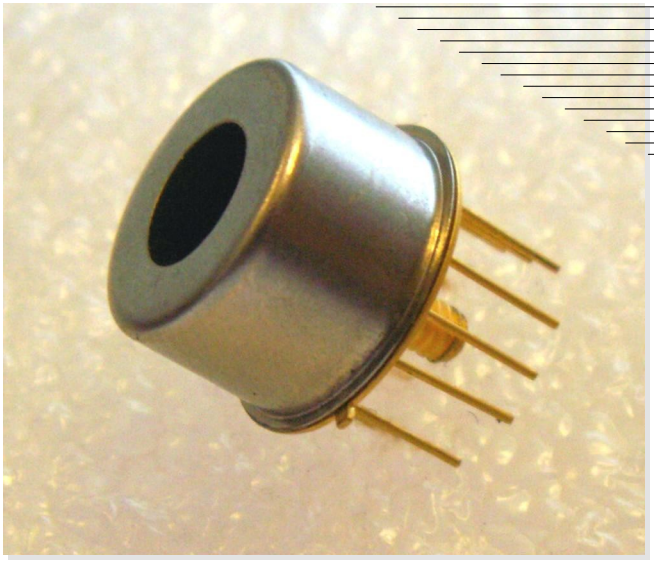
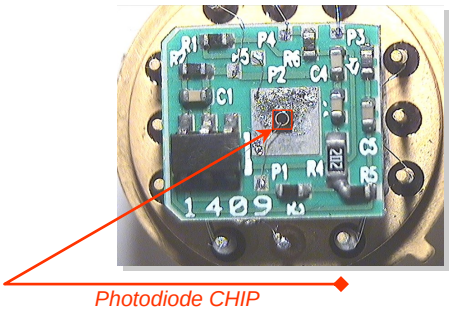
Mid infrared IBSG Optoelectronics



Features

- **High sensitivity**
- **High reliability**
- **Superior linearity**
- **Thermo stability**



Applications

- **Optical measurement equipment**
- **Analytical instruments**

Description

Photodiode amplifier with TEC **AMP24-05** is a model of photodetector, consist of photodiode PD24-05, pre-amplifier, thermoelectric cooler (TEC) and thermistor for a control of temperature. Components are integrated inside the standard 15.2 mm TO-8 package with TEC.

Photodiode amplifier with TEC **AMP24-05** is designed for detection of radiation in the Middle Infrared (Mid-IR) spectral range from 1150 to 2400 nm. Heterostructures with the InGaAsSb active layer and the AlGaAsSb "window" are grown on GaSb substrates.

Diameter of the photosensitive area of **AMP24-05** is 500 µm. Fast response makes it possible for detection of modulated radiation of laser diodes (LDs) and light-emitting diodes (LEDs).

Related products: **AMP24-05** can be used in optical pair with our **LED11...LED23** and **LD200...LD230**.

General characteristics

Package	Parameter	Symbol	Value	Unit
TO-8 with TEC	Sensitive area diameter	d	0.5	mm
	Weight	m	4.0	g
	Operating temperature	T_{opr}	0…+30	°C
	Window material	Sapphire glass		
	Cooling	One-stage TE-cooled		
	Soldering temperature	T_s	230	°C
	Storage temperature	T_{stg}	−20…+40	°C
	Size	D	15.2	mm
		H	16	

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Electrical and optical characteristics (absolute maximum values at +20℃)

Parameter	Symbol	Value	Unit
Spectral sensitivity range (at level 10%)	λ	1.15-2.40	µm
Peak sensitivity wavelength	λ_p	2.0-2.2	µm
Volt sensitivity	S_v	$4 \cdot 10^4$	V/A
Detection threshold (at λ_{max})	P	10^{-7}	W
Detectivity	D*	$[0.7\text{-}1.0] \cdot 10^{11}$	$cm \cdot Hz^{½} \cdot W^{-1}$
Frequency range	Δf	0.15-350	kHz
Rise time	t_r	1	µs
Fall time	t_f	1	µs
Output impedance	R	20	Ω
Maximal amplitude of output signal	V_{amp}	<5	V
External power supply	V_p	5-6 (stabilized)	V
Output noise voltage (peak to peak at Δf ≈ 350 kHz)	V_N	3	mV
Output signal	AC		
Output polarity	Negative		

TEC *1MC06-018-08* parameters (without load)

Parameter	Symbol	Value	Unit
Current (ΔT_{max})	I_{max}	2.20	A
Voltage (ΔT_{max})	U_{max}	2.20	V
Cooling energy	Q_{max}	2.65	W
Temperature range (vacuum)	ΔT_{max}	70	K
Thermistor resistance (+20℃)	R_t	10.00	kΩ

* Recommend to use all capacitances type of TKE: “X7R”

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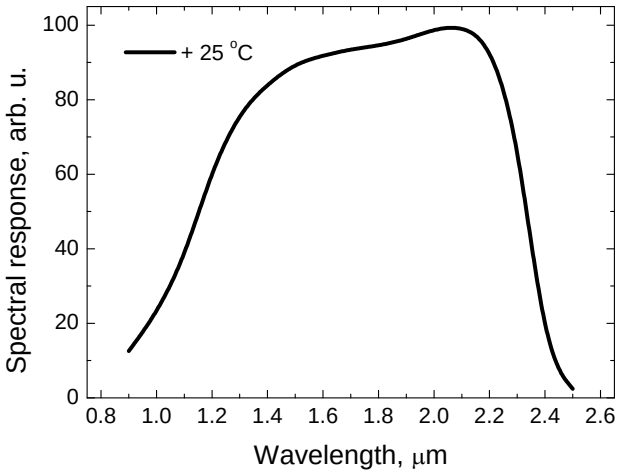
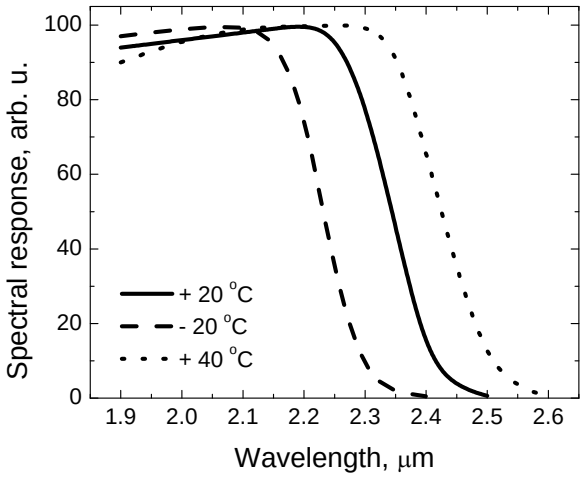
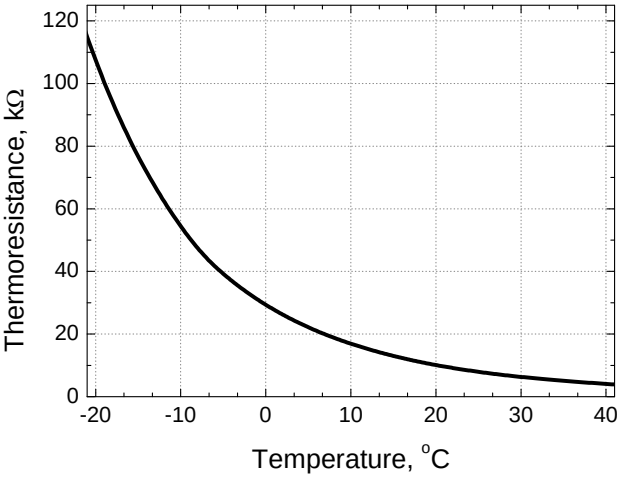
Spectral response





Thermoresistance vs. temperature



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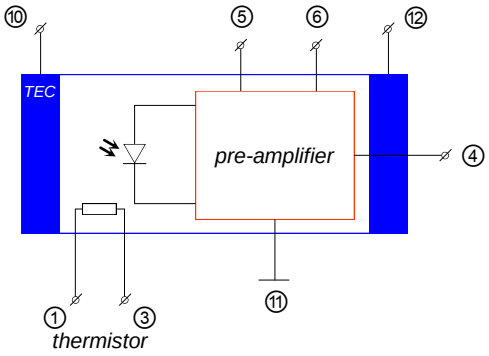
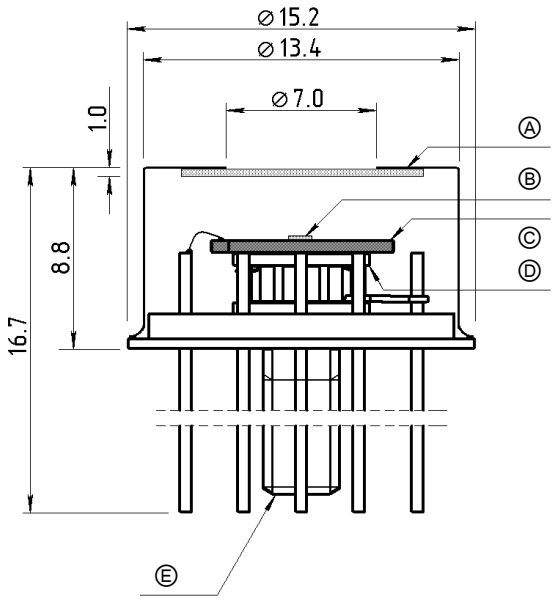


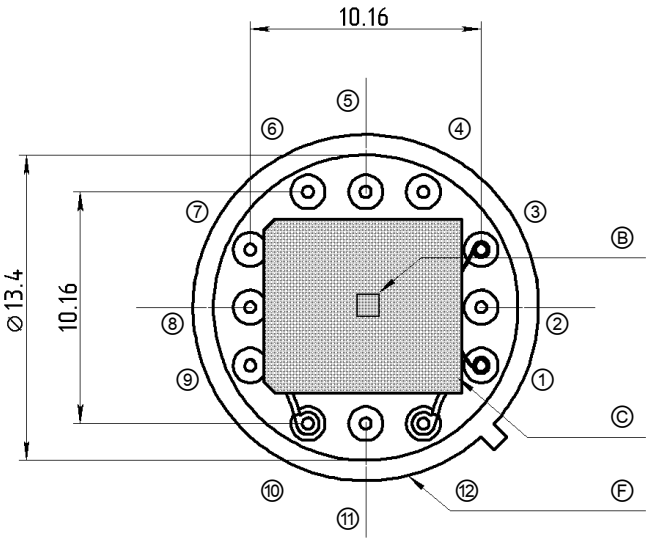
Pin	Description
①	Thermistor TC103
③	
④	Signal output
⑤	+ 5 V
⑥	0 V
⑩	TEC −
⑫	TEC +
⑪	GND
②, ⑦, ⑧, ⑨	Not applicable

Package dimensions (unit: mm)

PROFILE SIDE VIEW



TOP SIDE VIEW (without cap)



Ⓐ WINDOW
Ⓑ Photodiode CHIP
Ⓒ Pre-amplifier
Ⓓ TEC 1MC06-018-08
Ⓔ 4-40 UNC
Ⓕ TO-8 12 pin header

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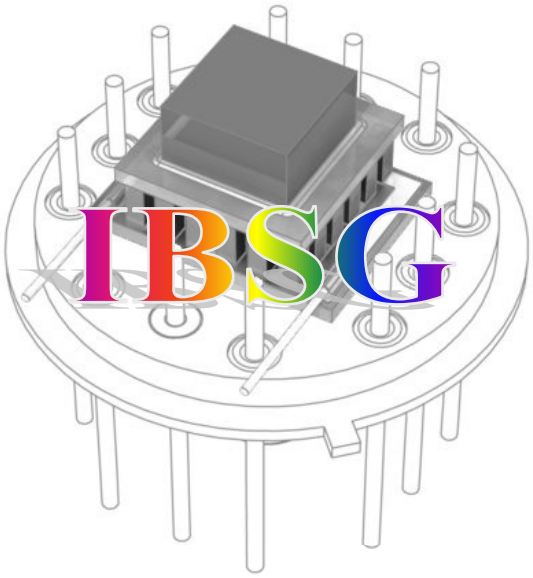
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