



PD41-03 AMP series

- Mid-IR PD Series with Integrated Preamplifier
- Sensitivity Range: 2.8 – 4.1 μm
- Sensitive Area Diameter: \varnothing 0.3 mm
- 12 mm Aluminum Tube



Description

PD41-03 AMP series are fabricated from narrow band-gap InAsSb/InAsSbP-based heterostructures lattice matched to InAs substrate. The photodiode chip has a photosensitive area of \varnothing 0.3 mm. Its maximum sensitivity wavelength is specified with 3.5 – 4.0 μm and has a cut-off wavelength at 4.25 – 4.30 μm . The PD is packed in an aluminum tube with built-in preamplifier, which works in photovoltaic mode (with zero bias). The current generated by the photodiode is amplified directly and converted into a voltage signal. You can choose between with our without a containing window for protection reason.

Maximum Ratings

Parameter	Symbol	Values		Unit
		Min.	Max.	
Operating Temperature *1	T_{CASE}	-60	+ 90	$^{\circ}\text{C}$
Storage Temperature *1	T_{STG}	-60	+ 90	$^{\circ}\text{C}$
Lead Solder Temperature *2	T_{SLD}		+ 180	$^{\circ}\text{C}$

*1 Temperature range may vary for different packaging types.

*2 must be completed within 5 seconds

Photodiode Characteristics ($T_{CASE}=25^{\circ}\text{C}$)

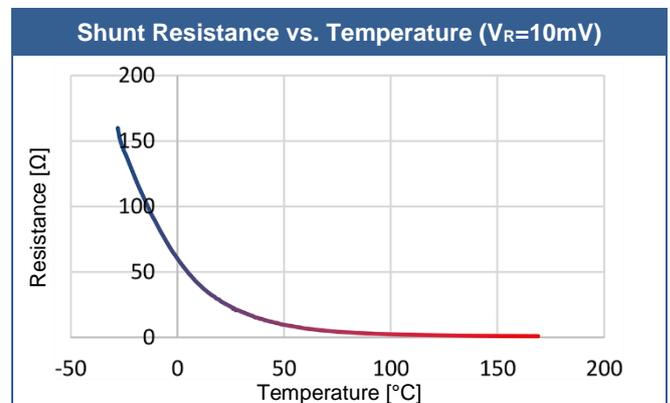
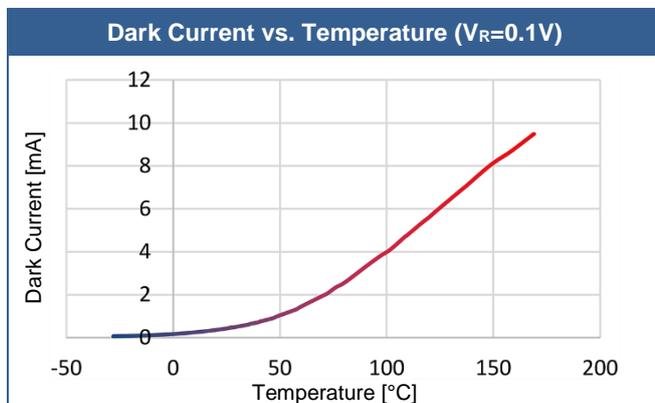
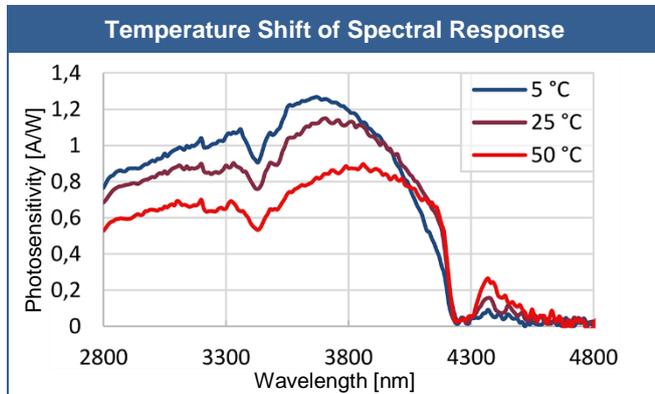
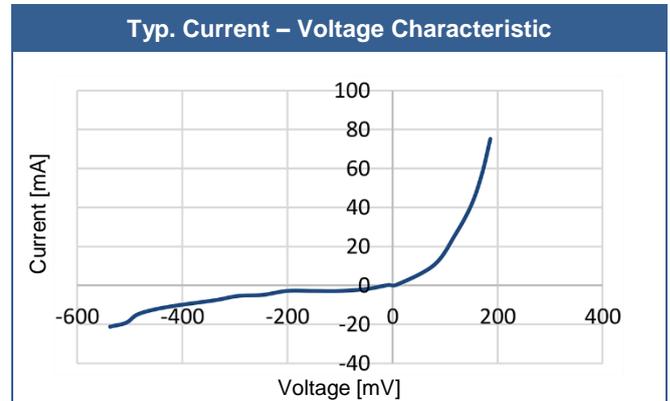
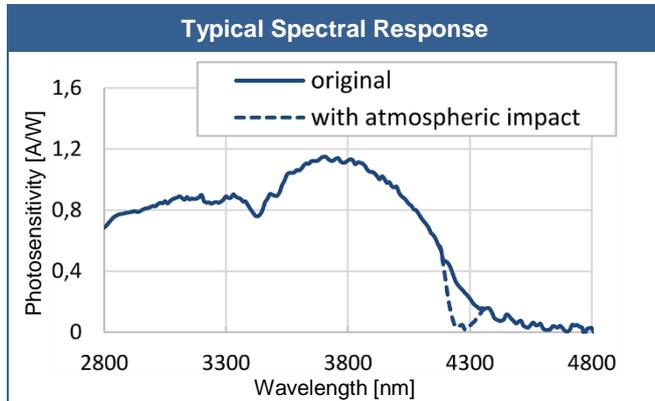
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Sensitive Area Diameter	D			0.3		mm
Cut-off Wavelength (at 10%)	λ_{cut}		4.25		4.30	μm
Max. Sensitivity Wavelength (at 80%)	λ_P		3.5		4.0	μm
Reverse Voltage	V_R				0.1	V
Dark Current	I_D	$V_R=0.1\text{V}$		5.0	6.0	mA
Shunt Resistance	R_{SH}	$V_R=10\text{mV}$	12.0	15.0		Ω
Capacitance	C	$V_R=10\text{mV}$				pF
Sensitivity	S	$\lambda=4.0\mu\text{m}$	0.7	0.8		A/W
Noise Equivalent Power	NEP	$\lambda=4.0\mu\text{m}$		$4.1 \cdot 10^{-11}$	$5.3 \cdot 10^{-11}$	$\text{W}/\sqrt{\text{Hz}}$
Detectivity	D^*	$\lambda=4.0\mu\text{m}$	$5.8 \cdot 10^8$	$7.4 \cdot 10^8$		$\text{cm} \cdot \sqrt{\text{Hz}} \cdot \text{W}^{-1}$

Package Options

Part Number	Description
PD41-03R-AMP	PD with built-in preamplifier; TO-18 with parabolic reflector without window in an aluminum tube
PD41-03RW-AMP	PD with built-in preamplifier; TO-18 with parabolic reflector with window in an aluminum tube



Performance Characteristics

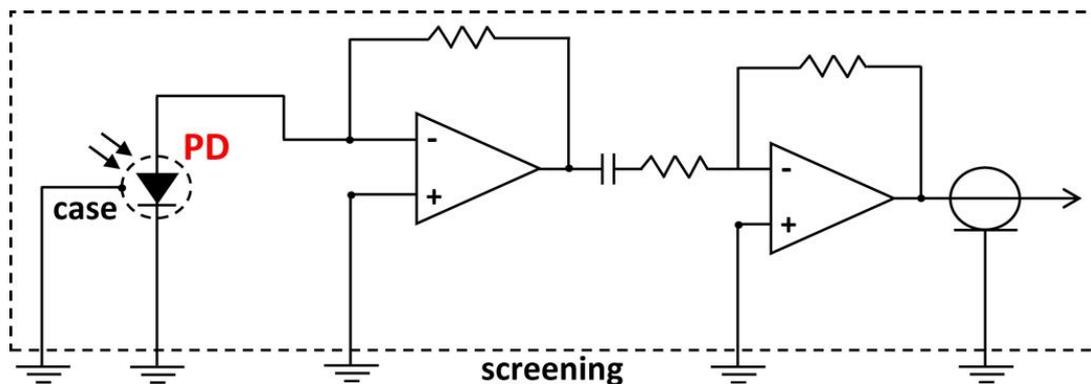




Operation Mode of Photodiode with a Built-in Preamplifier

Photodiode models with containing preamplifier (-AMP) work in photovoltaic mode. Current generated by photodiode is amplified and converted by preamplifier into voltage signal. There is straight correspondence between PD current and resulting output voltage. The signal converted by preamplifier will have the same form, frequency and pulse duration as the photocurrent signal from photodiode. Current into voltage conversion coefficient is constant and depends on given photodiode.

NOTE! Preamplifier is typically tuned for operation with an LED emitter working in a pulse mode with 0.5 kHz frequency and 20 μ s pulse duration. Tuning for other operation modes is available under special request.



Power input voltage: +5 VDC, stabilized

Connections:

The output of PD with a built-in preamplifier has four wires:

- "+" power input (to the "+" of the power output terminal block of the PCB-sdetect-3P synch. detector)
- "-" power input (to the "-" of the power output terminal block of the PCB-sdetect-3P synch. detector)
- output photodiode signal (to the "-" of the signal input terminal block of the PCB-sdetect-3P synch. detector)
- output photodiode signal (to the "+" of the signal input terminal block of the PCB-sdetect-3P synch. detector)

For the proper connection mind colours of the wires pointed in the technical data provided with the photodiode.

Important Cautions:

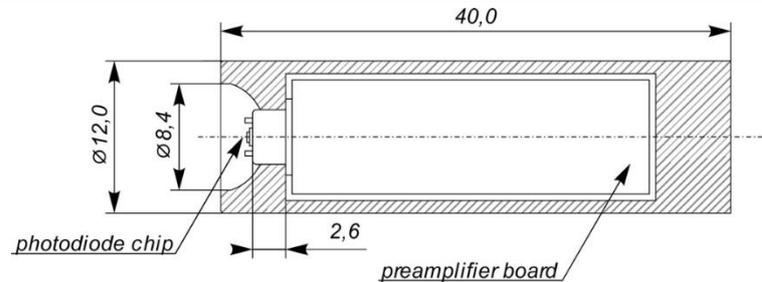
- Check your connection circuits before turning on the PD.
- Mind the polarity as marked on the technical data sheet.
- DO NOT connect the PD to the multimeter.



Outline Dimensions

PD41-03R-AMP

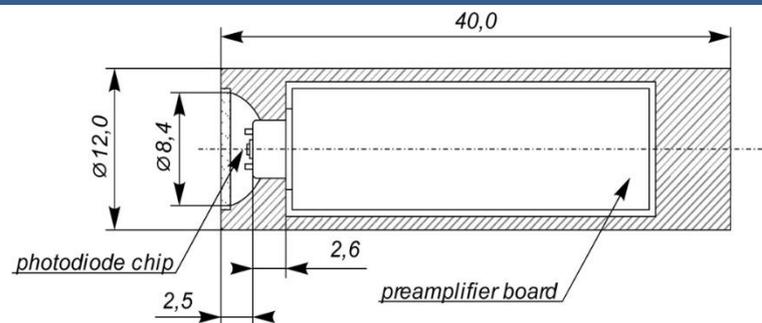
PD with built-in preamplifier; TO-18 with parabolic reflector without window in an aluminum tube



All Dimensions in mm

PD41-03RW-AMP

PD with built-in preamplifier; TO-18 with parabolic reflector with window in an aluminum tube



All Dimensions in mm

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