



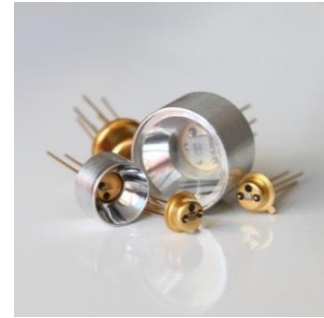
## Mid-Infrared (MIR) Photodiode

2.8 - 4.1  $\mu\text{m}$ 

## Lms41PD-03 series

Device parameters	Symbol	Value	Units
Sensitive area size	d	0.3	mm
Reverse voltage	$V_r$	0.1	V
Operating/ storage temperature	$T_{opr}/ T_{stg}$	-60..+90*	$^{\circ}\text{C}$
Soldering temperature (can be applied for not more than 5 secs)	$T_{sol}$	+180	$^{\circ}\text{C}$

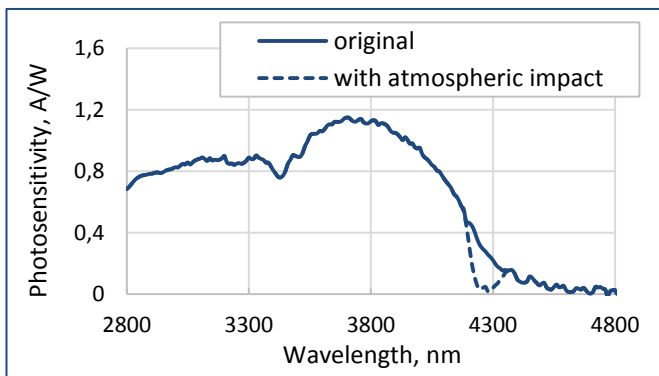
\*Temperature range may vary for different packaging types.

All parameters refer to photodiode operation at ambient temperature 25 $^{\circ}\text{C}$  unless otherwise stated.

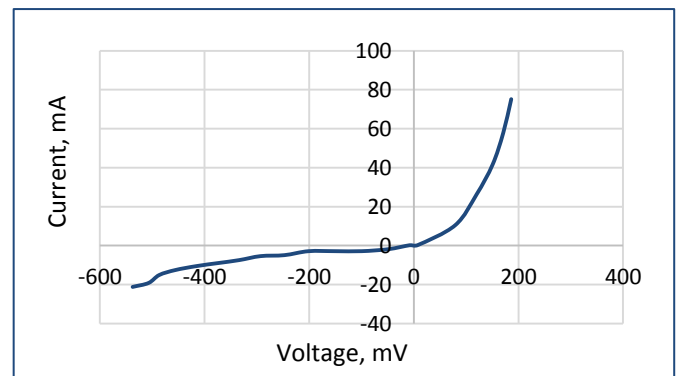
Photodiode parameters	Conditions	Symbol	Value	Units
Cut-off wavelength (at 10% level) <sup>1</sup>	-	$\lambda_{cut}$	4.25 - 4.30	$\mu\text{m}$
Max. sensitivity range (at 80% level) <sup>1</sup>	-	$\lambda_p$	3.5 - 4.0	$\mu\text{m}$
Dark current (typical/ maximal) <sup>2</sup>	$V_r = 0.1 \text{ V}$	$I_d$	typ 5.0 / max 6.0	mA
Shunt resistance (minimal/ typical) <sup>2</sup>	$V_r = 10 \text{ mV}$	$R_{sh}$	min 12 / typ 15	$\Omega$
Capacitance (typical/ maximal) <sup>1</sup>	$V_r = 10 \text{ mV}$	C	-	pF
Photosensitivity (minimal/ typical) <sup>2</sup>	$\lambda = 4.0 \mu\text{m}$	S	min 0.7 / typ 0.8	A/W
Noise equivalent power (typical/ maximal) <sup>2</sup>	$\lambda = 4.0 \mu\text{m}$	NEP	typ $4.1 \cdot 10^{-11}$ / max $5.3 \cdot 10^{-11}$	$\text{W}/\text{Hz}^{1/2}$
Detectivity (minimal/ typical) <sup>2</sup>	$\lambda = 4.0 \mu\text{m}$	$D^*$	min $5.8 \cdot 10^8$ / typ $7.4 \cdot 10^8$	$\text{cm}^2 \cdot \text{Hz}^{1/2} \cdot \text{W}^{-1}$

<sup>1</sup> Parameter tested for representative sampling.<sup>2</sup> Parameter tested for each device.

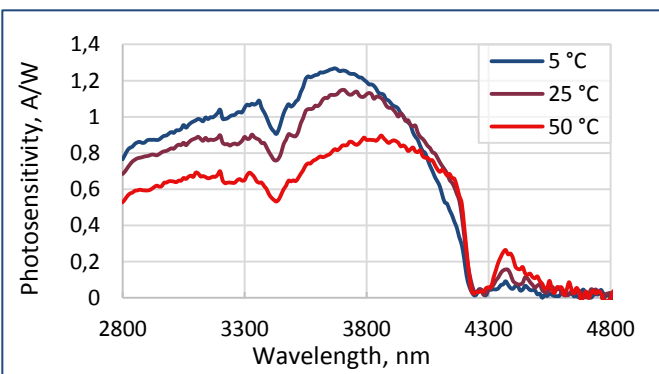
Typical spectral response



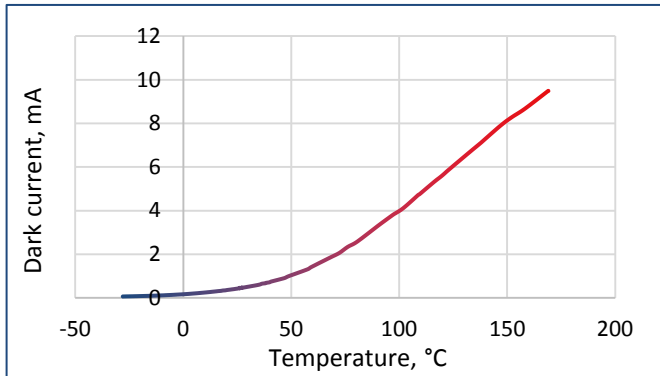
Typical current-voltage characteristic



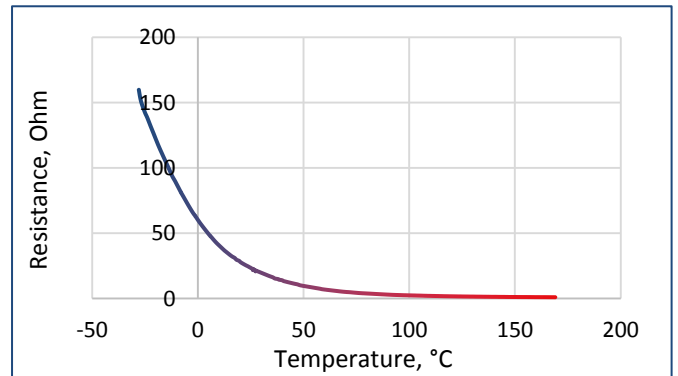
Temperature shift of spectral response



Dark current vs. temperature ( $V_r = 0.1 \text{ V}$ )



Shunt resistance vs. temperature ( $V_r = 10 \text{ mV}$ )

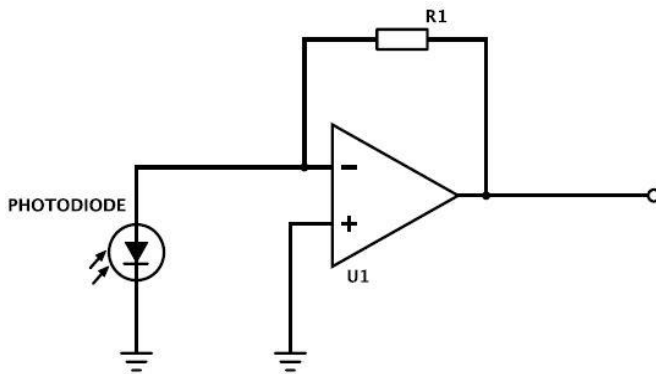


Packages*	Model
TO-18 with a cap without a glass window	Lms41PD-03
TO-18 with a parabolic reflector without a glass window	Lms41PD-03-R
TO-18 with a parabolic reflector with a glass window	Lms41PD-03-RW
TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window	Lms41PD-03-TEM
TO-5 with a built-in thermocooler and thermoresistor, covered by a parabolic reflector with a glass window	Lms41PD-03-TEM-R
PD with a built-in preamplifier; TO-18 with a parabolic reflector without a window in an aluminum tube	Lms41PD-03-R-PA
PD with a built-in preamplifier; TO-18 with a parabolic reflector with a window in an aluminum tube	Lms41PD-03-RW-PA

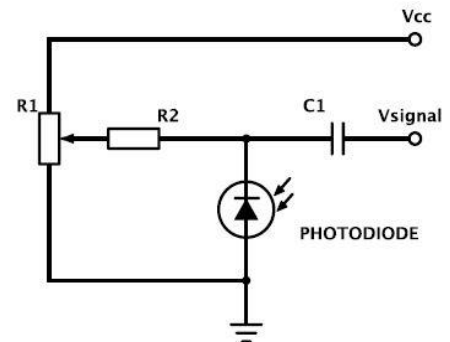
\*Standard photodiode packaging is non-hermetical, so that condensation during device operation and storage must be prevented.

### Recommended modes of PD operation

#### PD used as a current source (photovoltaic mode)



#### PD used in a photoconductive mode (under reverse bias)



We recommend using **photovoltaic mode**, when PD is used under no reverse bias.  
Use photoconductive mode (mode with reverse bias) with caution.

### IMPORTANT CAUTIONS:

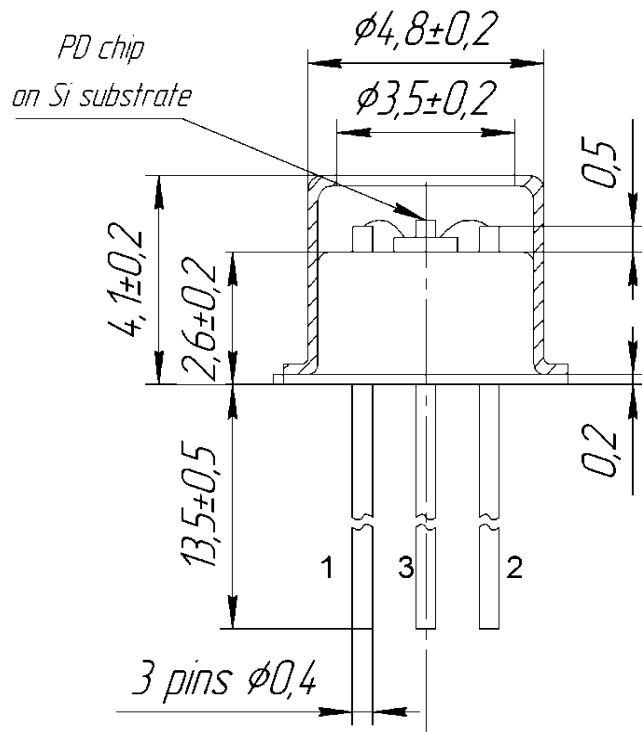
- please check your connection circuit before turning on the PD;
- please mind the PD polarity: PD anode is marked with a RED dot;
- please do not connect the PD to the multimeter.

### Related products:

- **Light emitting diodes (LEDs)** - sources of IR radiation;
- **PAb preamplifier** - amplifies photocurrent generated by a PD and converts it into a voltage signal;
- **SDM synchronous detector** - enables synchronous operation of a PD coupled with a preamplifier and an LED coupled with a driver; performs conversion of an output PD preamplifier signal into DC voltage signal.

Technical Drawings

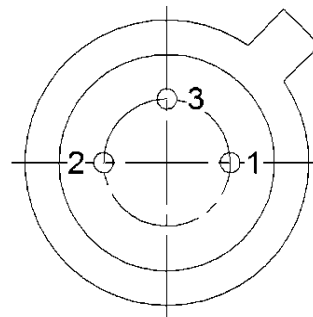
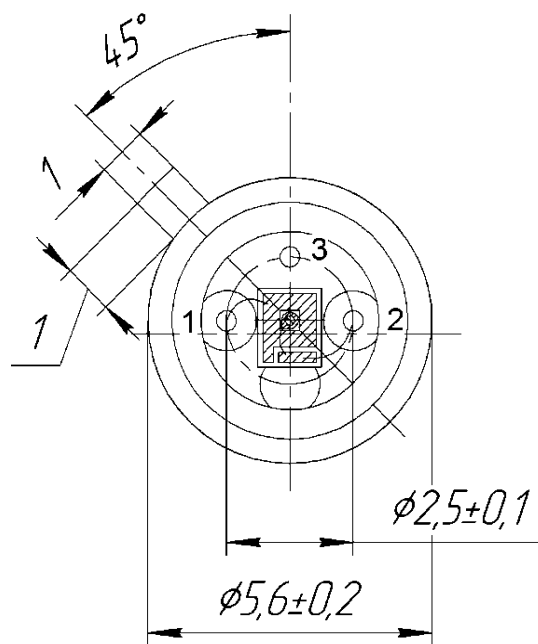
Lms41PD-03



- 1 - PD cathode
- 2 - PD anode
- 3 - ground pin

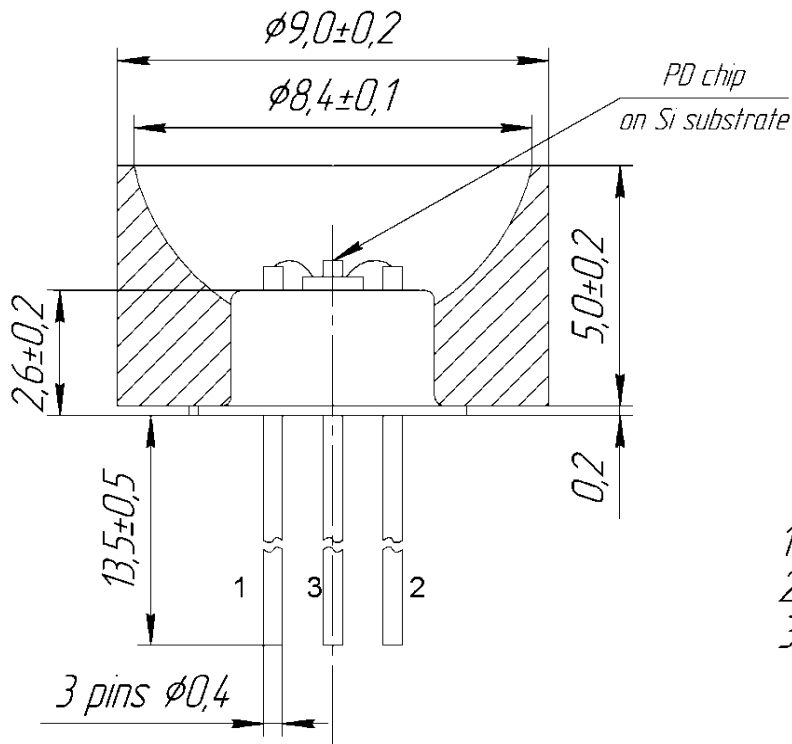
TOP VIEW

BOTTOM VIEW



Technical Drawings

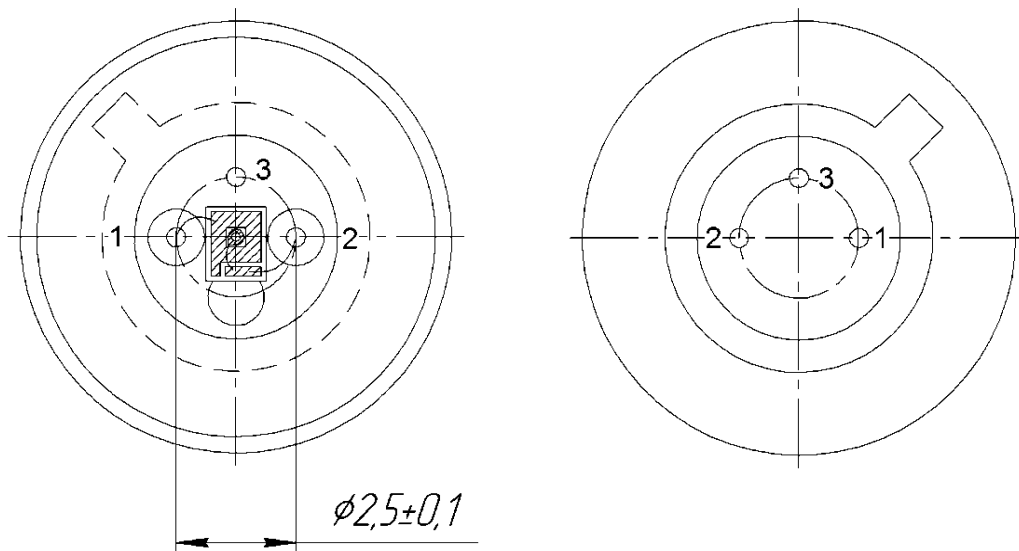
Lms41PD-03-R



- 1 - PD cathode
- 2 - PD anode
- 3 - ground pin

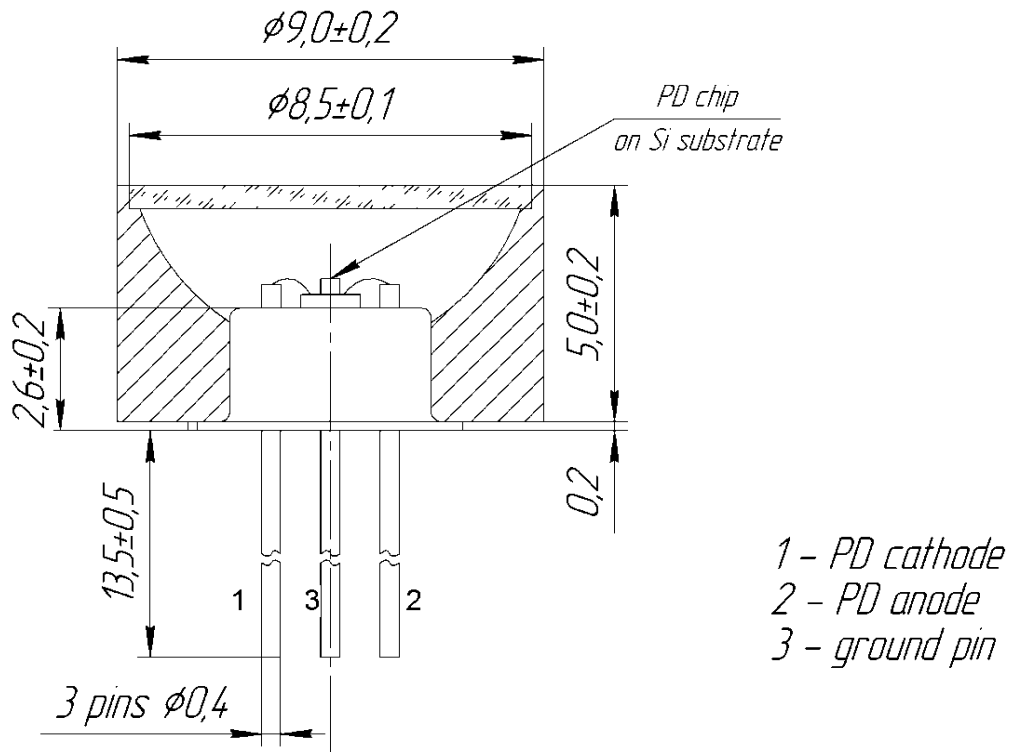
TOP VIEW

BOTTOM VIEW



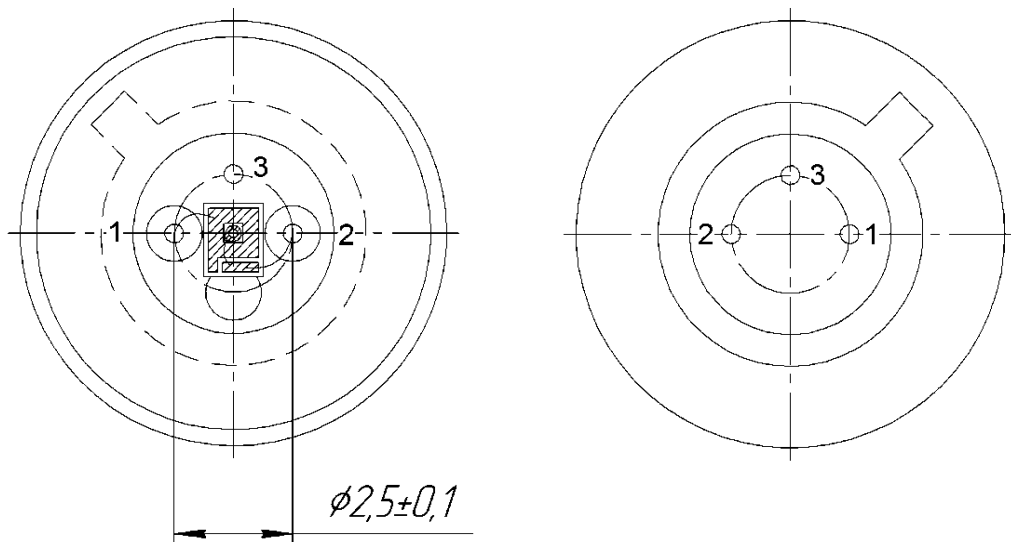
Technical Drawings

Lms41PD-03-RW



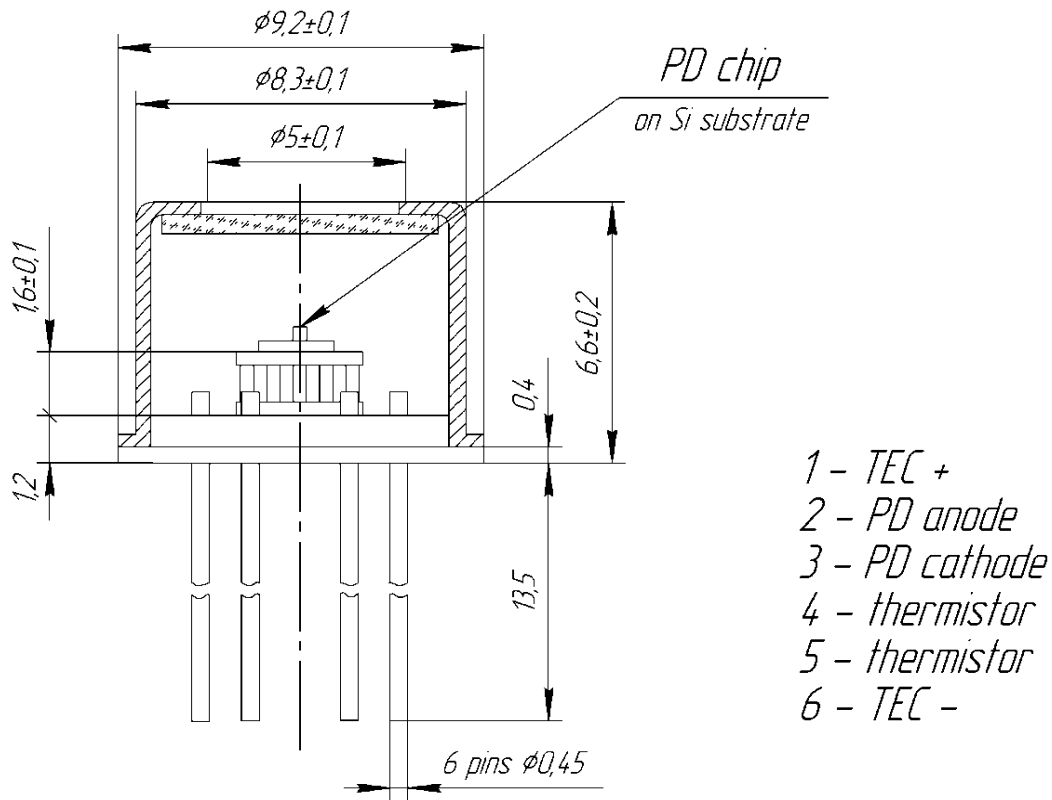
TOP VIEW

BOTTOM VIEW



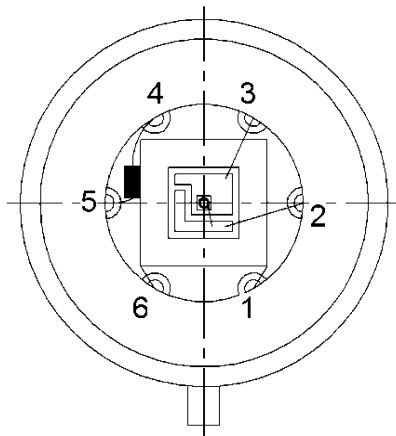
Technical Drawings

Lms41PD-03-TEM

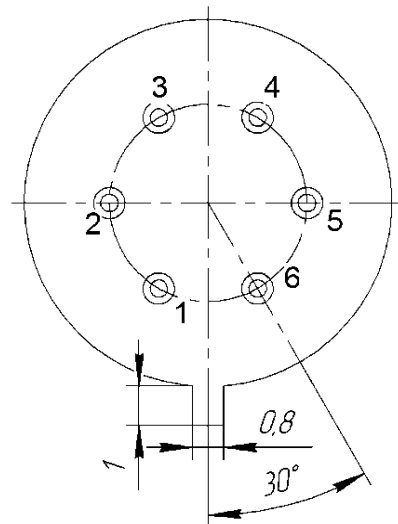


- 1 - TEC +
- 2 - PD anode
- 3 - PD cathode
- 4 - thermistor
- 5 - thermistor
- 6 - TEC -

TOP VIEW

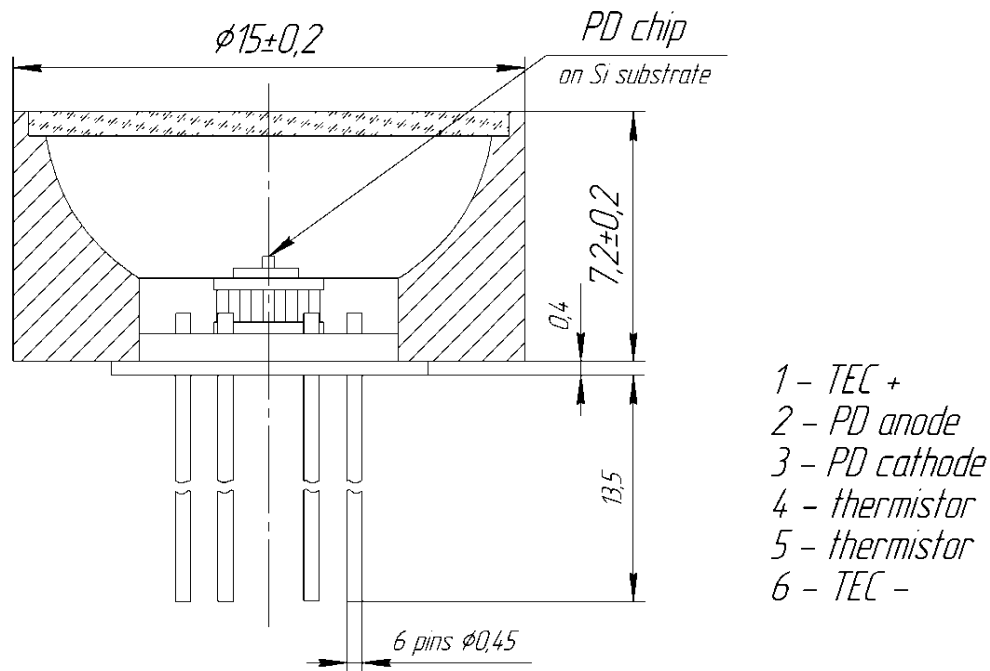


BOTTOM VIEW

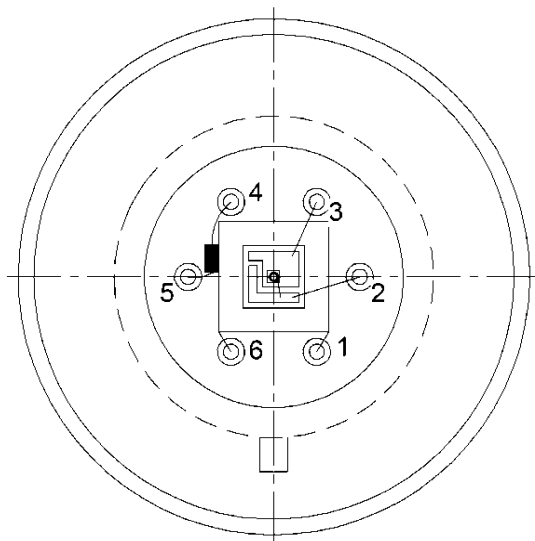


Technical Drawings

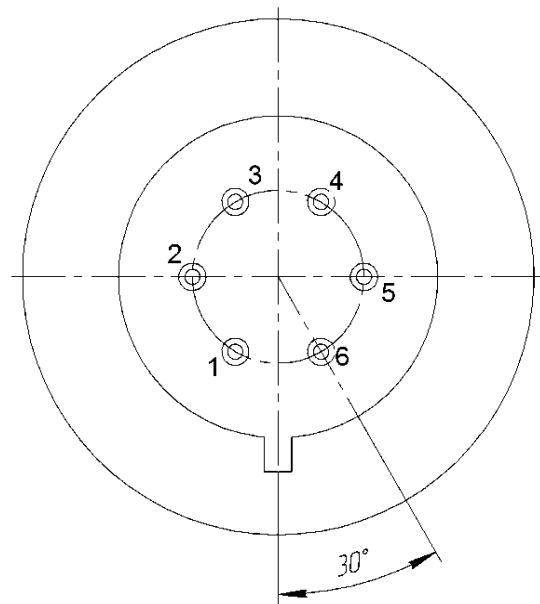
Lms41PD-03-TEM-R



TOP VIEW



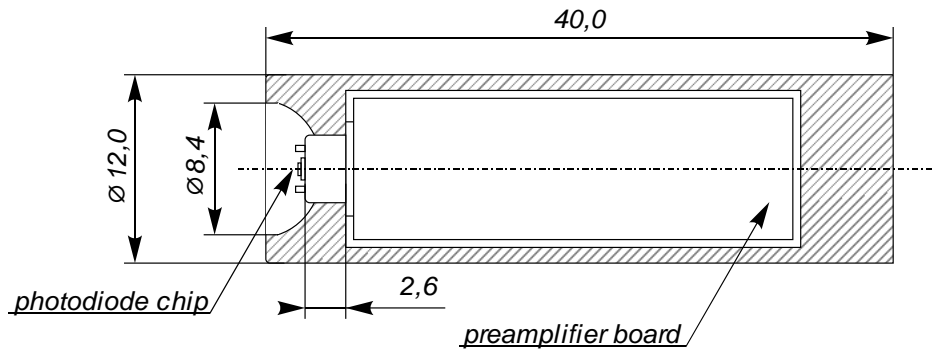
BOTTOM VIEW



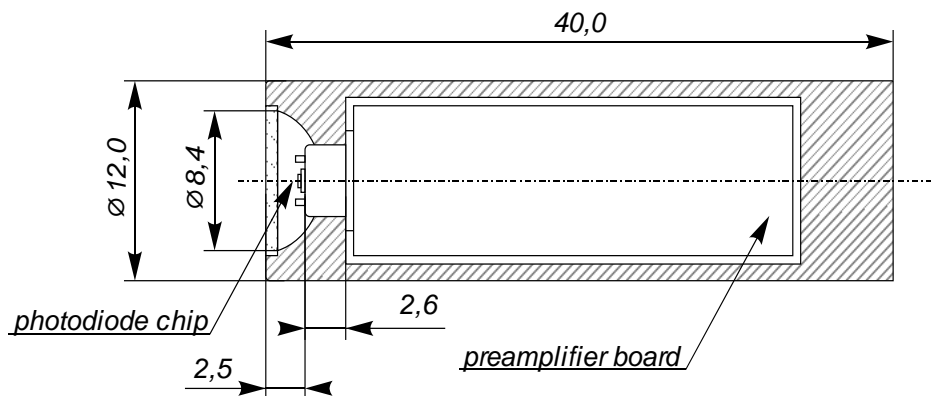


Technical Drawings

Lms41PD-03-R-PA



Lms41PD-03-RW-PA



**Power input voltage:** +5 V, stabilized;

**Connections:**

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

- "+" power input (to the "+5V" of the power output terminal block of the SDM synchronous detector);
- "ground" power input (to the "0V" of the power output terminal block of the SDM synchronous detector);
- "ground" output photodiode signal (to the "0V" of the signal input terminal block of the SDM synchronous detector);
- "+" output photodiode signal (to the "IN" of the signal input terminal block of the SDM synchronous detector).

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