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Mid-Infrared (MIR) Photodiode

1.8 - 3.6 μm

Lms36PD-05 series

| Device parameters | Symbol | Value | Units |
|-------------------------|------------------|-----------|-------|
| Sensitive area diameter | d | 0,5 | mm |
| Storage temperature | T _{stg} | -50..+80* | °C |
| Operating temperature | T _{opr} | -50..+60* | °C |
| Reverse voltage | V _r | 0.1 | V |



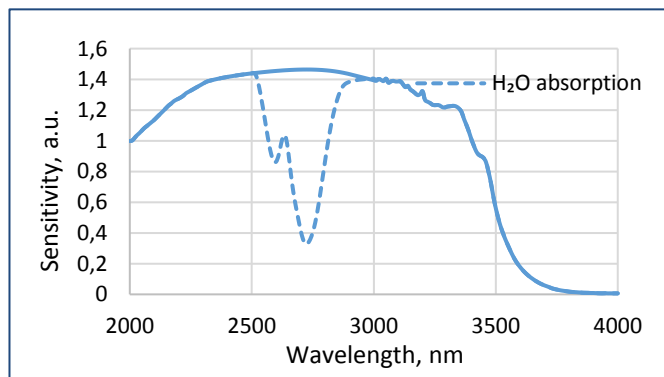
*PD design for higher storage/operating temperature is available under request

| Photodiode parameters | Conditions | Symbol | Value | Units |
|-------------------------------|-----------------------------------|------------------------|--------------------------|---|
| Cut-off wavelength | T = 25 °C | λ_{cut} | 3.6 - 3.7 | μm |
| Max. sensitivity range (>80%) | T = 25 °C | λ_p | 2.2 - 3.4 | μm |
| Dark current | T = 25 °C; V _r = 0.1 V | I _d | 50 - 1000 | μA |
| Shunt resistance | T = 25 °C; V _r = 10 mV | R _{sh} | 0.2 - 0,8 | k Ω |
| Capacitance | T = 25 °C; $\lambda = \lambda_p$ | C | 600 - 1400 | pF |
| Sensitivity | T = 25 °C; $\lambda = \lambda_p$ | S | 1 - 1,5 | A/W |
| Noise equivalent power | T = 25 °C; $\lambda = \lambda_p$ | NEP | (3-9)*10 ⁻¹² | W/Hz ^{1/2} |
| Detectivity | T = 25 °C; $\lambda = \lambda_p$ | D* | (4.5-14)*10 ⁹ | cm ² Hz ^{1/2} W ⁻¹ |

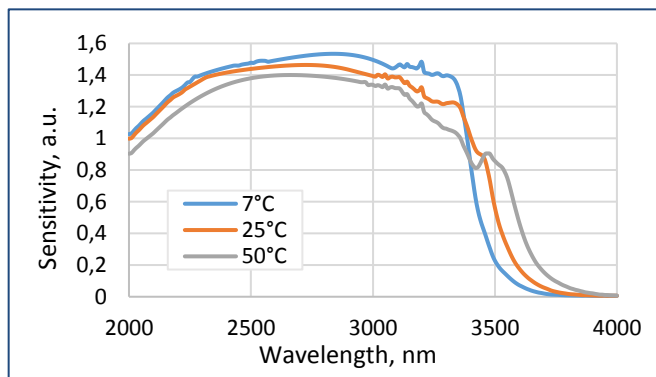
Photodiodes Lms36PD-05 series are fabricated from narrow band-gap InAsSbP/InAs-based heterostructures lattice matched to InAs substrate.

All specifications are for photodiode operation at 25°C unless otherwise stated

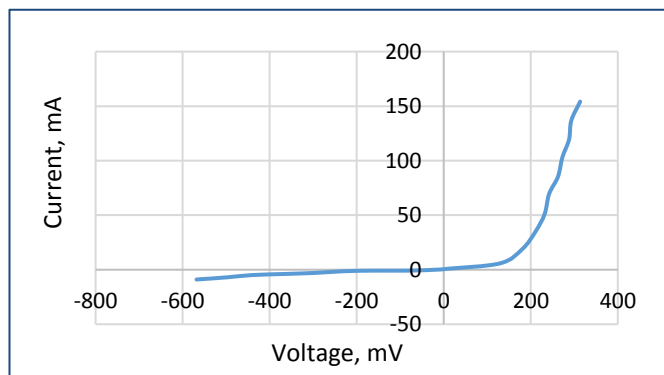
Typical spectral response



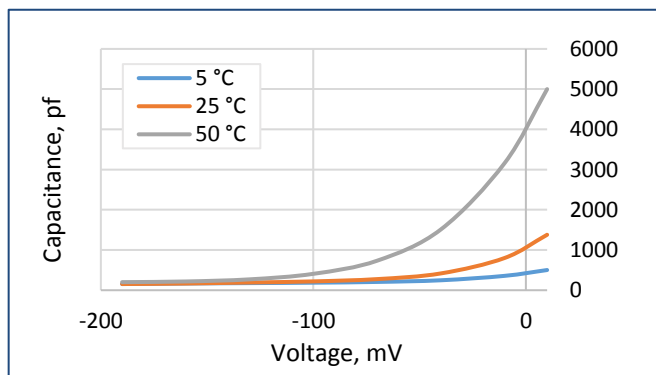
Temperature shift of spectral response



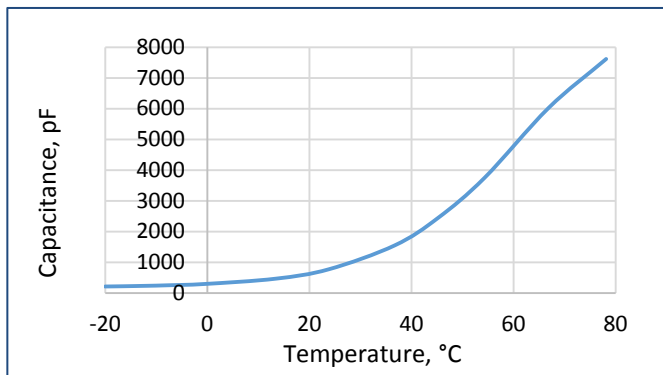
Typical current-voltage characteristic



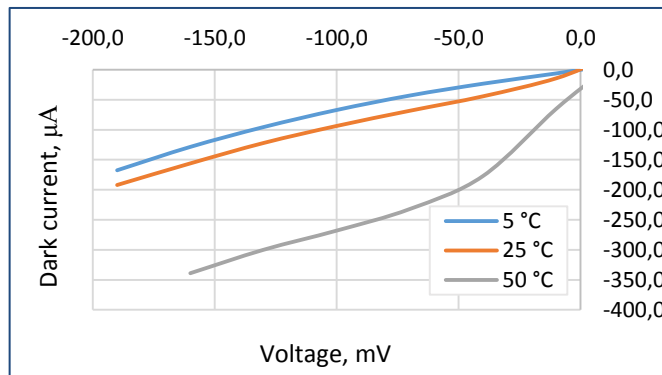
Capacitance vs. voltage



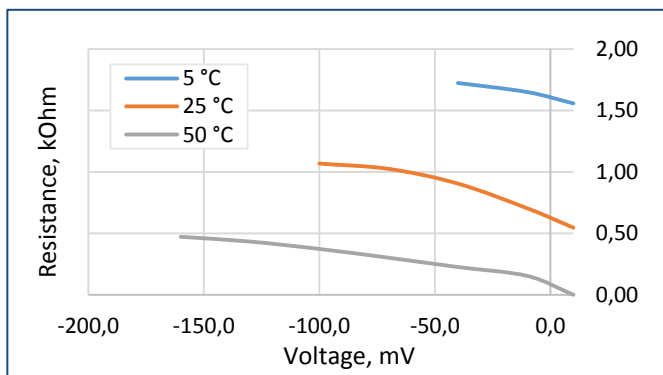
Capacitance vs. temperature



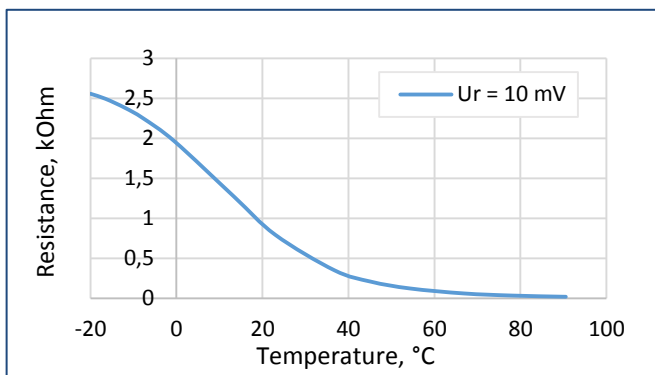
Dark current vs. voltage



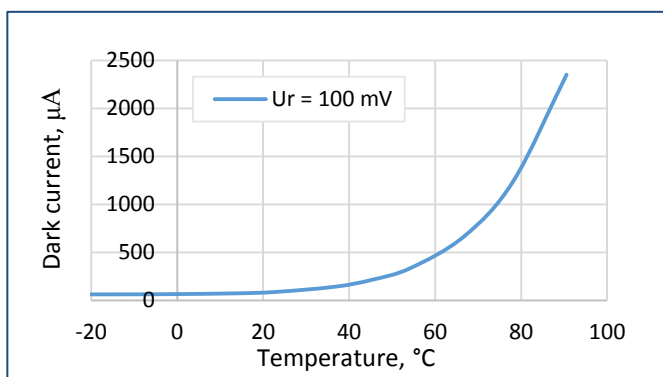
Shunt resistance vs. voltage



Shunt resistance vs. temperature



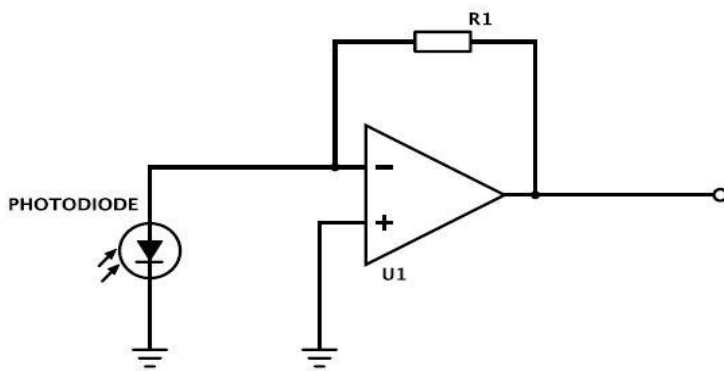
Dark current vs. temperature



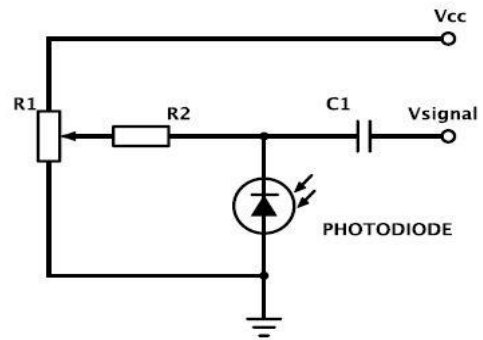
| Packages | Model |
|--|---------------------|
| TO-18 with a cap without a glass window | Lms MIR PD-05 |
| TO-18 with a parabolic reflector without a window | Lms MIR PD-05-R |
| TO-18 with a parabolic reflector with a glass window | Lms MIR PD-05-RW |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window | Lms MIR PD-05-TEM |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a parabolic reflector with a glass window | Lms MIR PD-05-TEM-R |
| PD with a built-in preamplifier; TO-18 with a parabolic reflector without a window in an aluminium tube | Lms MIR PD-05-R-PA |
| PD with a built-in preamplifier; TO-18 with a parabolic reflector with a window in an aluminium tube | Lms MIR PD-05-RW-PA |

Recommended modes of PD operation

PD used as a current source (photovoltaic mode)



PD used in a photoconductive mode (under reverse bias)



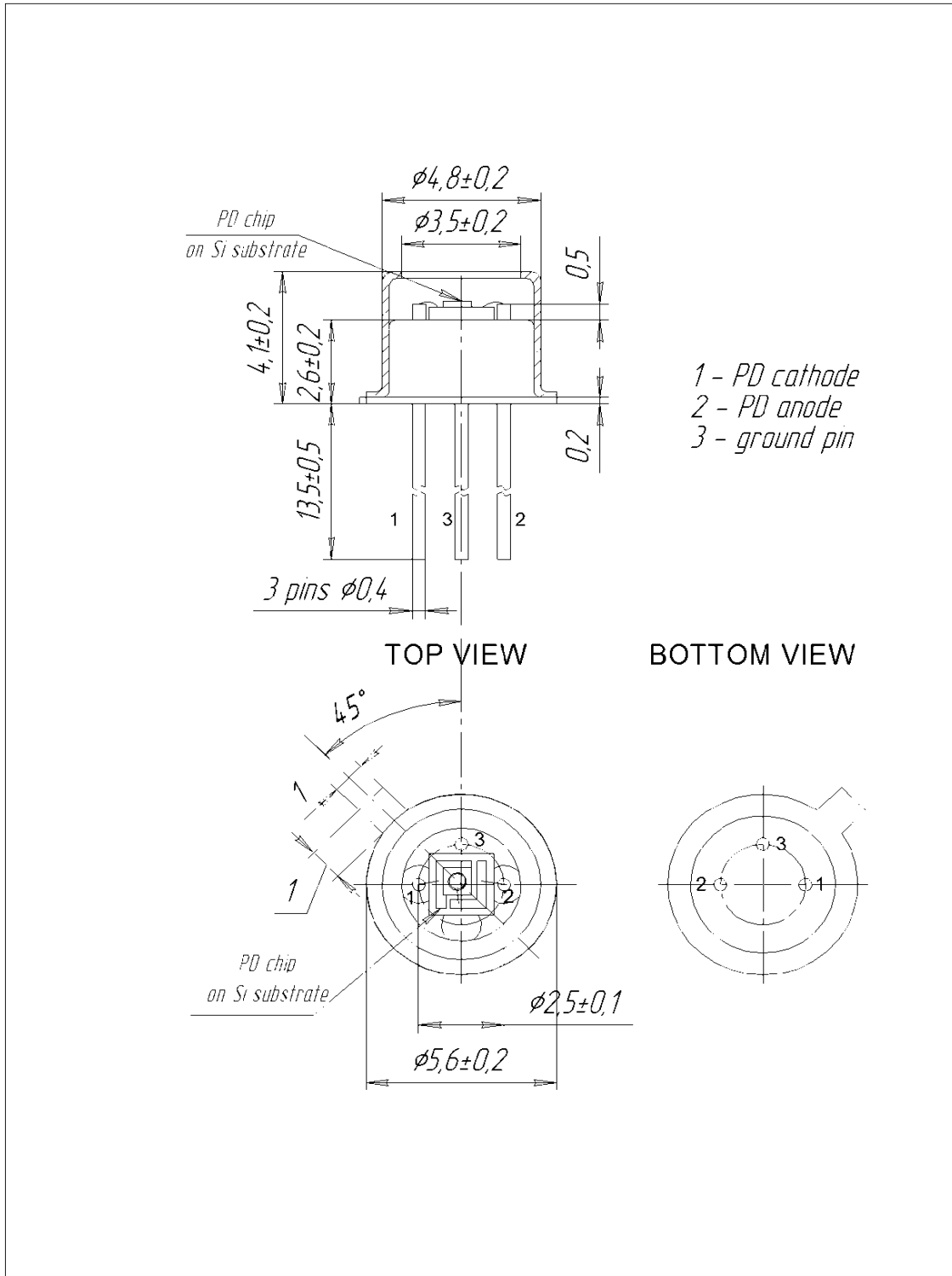
We recommend using **photovoltaic mode**, when PD is used under no reverse bias.
Use photoconductive mode (mode with reverse bias) with caution.

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.

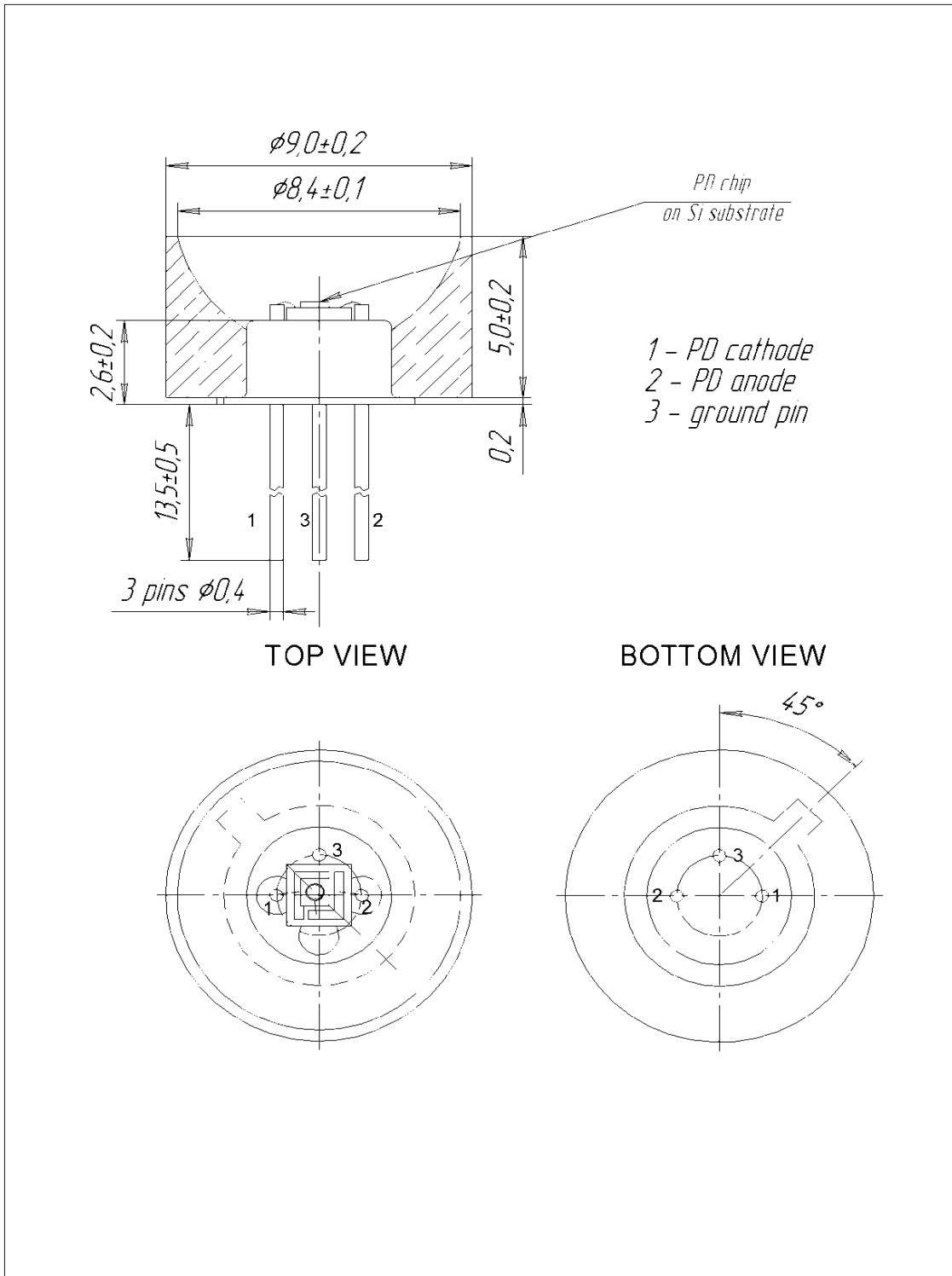
Technical Drawings

Lms36PD-05



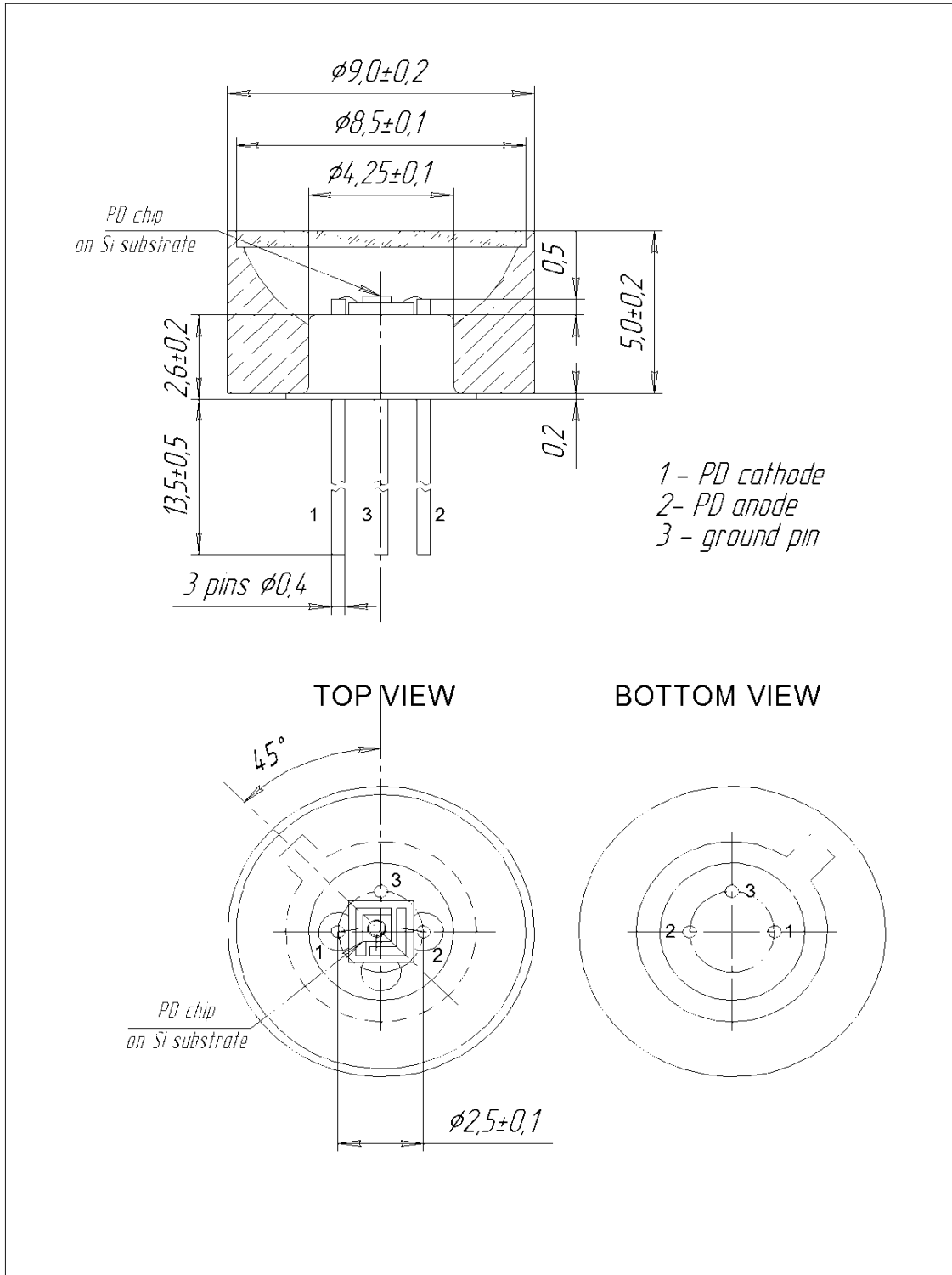
Technical Drawings

Lms36PD-05-R



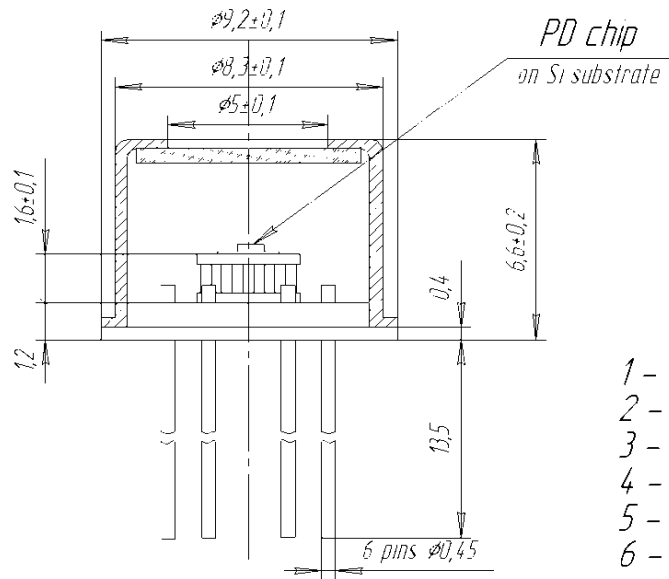
Technical Drawings

Lms36PD-05-RW

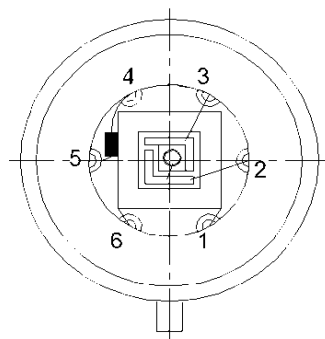


Technical Drawings

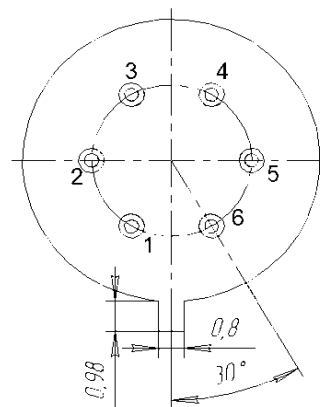
Lms36PD-05-TEM



TOP VIEW

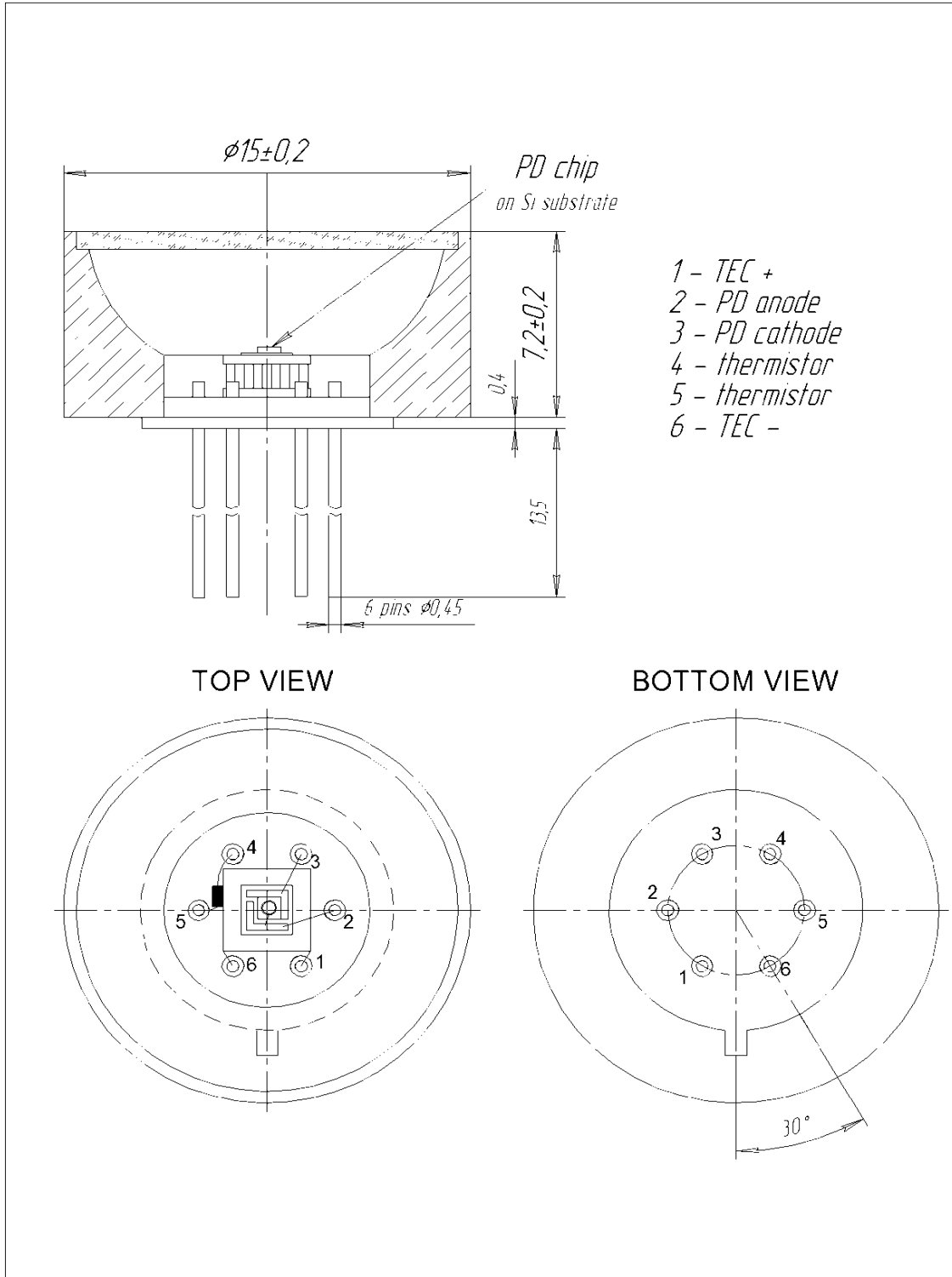


BOTTOM VIEW



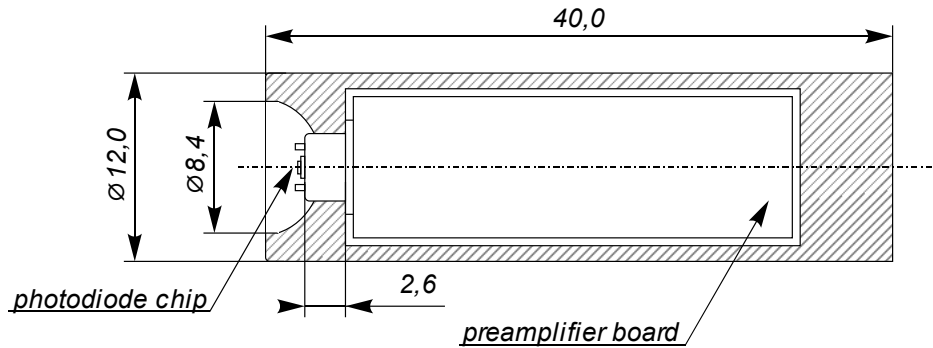
Technical Drawings

Lms36PD-05-TEM-R

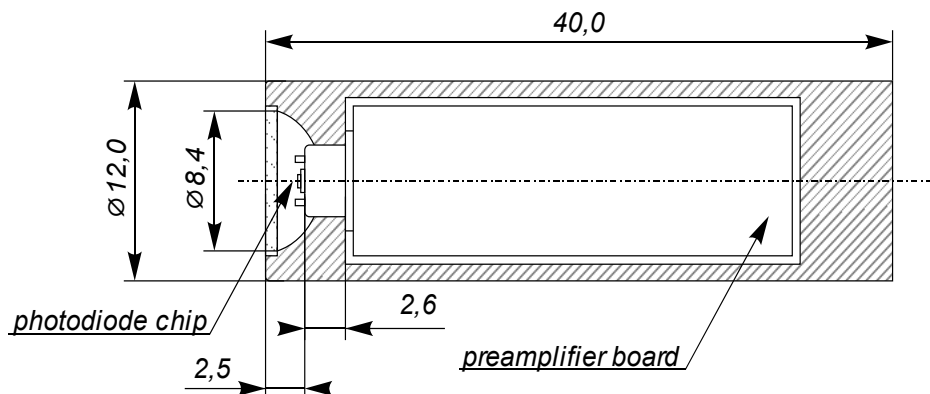


Technical Drawings

Lms36PD-05-R-PA



Lms36PD-05-RW-PA



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

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

Related products:

- **LEDs** - sources of mid-infrared radiation;
- **SDM** - synchronous detector for PD models with preamplifiers - Lms MIR PD-XX-R-PA and Lms MIR PD-XX-RW-PA. SDM synchronous detector measures the voltage signal from the output of photodiode preamplifier and converts it to the DC voltage signal proportional to amplitude of voltage from input.
- **TCM** - thermocontroller for PD models with built-in thermoelectric modules (thermocooler and thermistor) - Lms MIR PD-XX-TEM and Lms MIR PD-XX-TEM-R models. TCM enables control and adjustment of PD temperature.