



# Electro Optical Components, Inc.

5464 Skylane Boulevard, Suite D, Santa Rosa, CA 95403

Toll Free: 855-EOC-6300

[www.eoc-inc.com](http://www.eoc-inc.com) | [info@eoc-inc.com](mailto:info@eoc-inc.com)



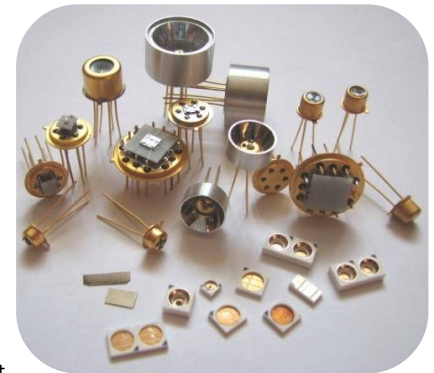
## Mid-Infrared (MIR) Photodiode

3.0 - 4.6  $\mu\text{m}$

### Lms43PD-03 series

Device parameters	Symbol	Value	Units
Sensitive area diameter	d	0,3	mm
Storage temperature	T <sub>stg</sub>	-50..+80*	°C
Operating temperature	T <sub>opr</sub>	-50..+60*	°C
Reverse voltage	V <sub>r</sub>	0.1	V

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

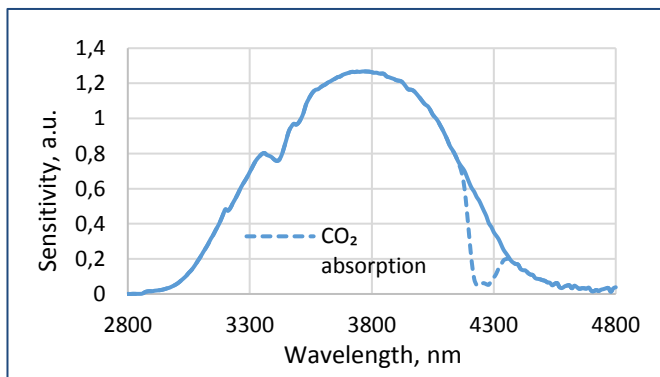


Photodiode parameters	Conditions	Symbol	Value	Units
Cut-off wavelength	T = 25 °C	$\lambda_{\text{cut}}$	4.4 - 4.8	$\mu\text{m}$
Max. sensitivity range (>80%)	T = 25 °C	$\lambda_p$	3.6 - 4.1	$\mu\text{m}$
Dark current	T = 25 °C; V <sub>r</sub> = 0.1 V	I <sub>d</sub>	1 - 6	mA
Shunt resistance	T = 25 °C; V <sub>r</sub> = 10 mV	R <sub>sh</sub>	10 - 50	$\Omega$
Capacitance	T = 25 °C; $\lambda = \lambda_p$	C	1300 - 2600	pF
Sensitivity	T = 25 °C; $\lambda = \lambda_p$	S	0,8 - 1,2	A/W
Noise equivalent power	T = 25 °C; $\lambda = \lambda_p$	NEP	(1.5-5.0)*10 <sup>-11</sup>	W/Hz <sup>1/2</sup>
Detectivity	T = 25 °C; $\lambda = \lambda_p$	D*	(0.6-2.0)*10 <sup>9</sup>	cm <sup>2</sup> Hz <sup>1/2</sup> ·W <sup>-1</sup>

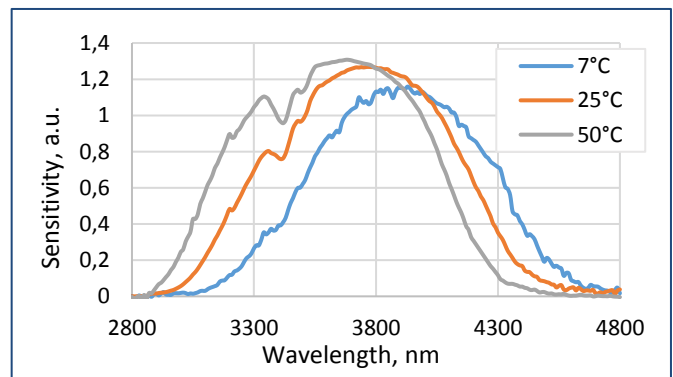
Photodiodes Lms43PD-03 series are fabricated from narrow band-gap InAsSbP/InAs-based heterostructures lattice matched to InAs substrate.

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

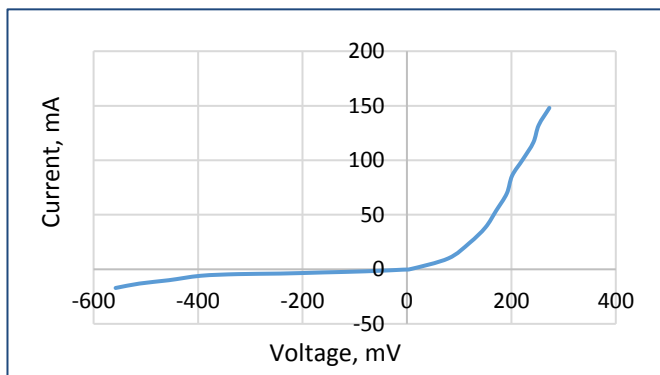
Typical spectral response



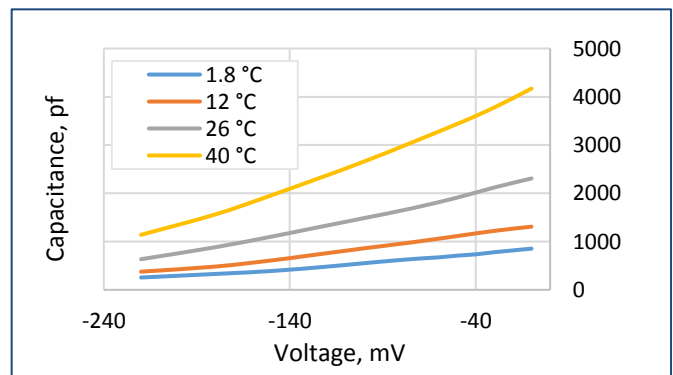
Temperature shift of spectral response



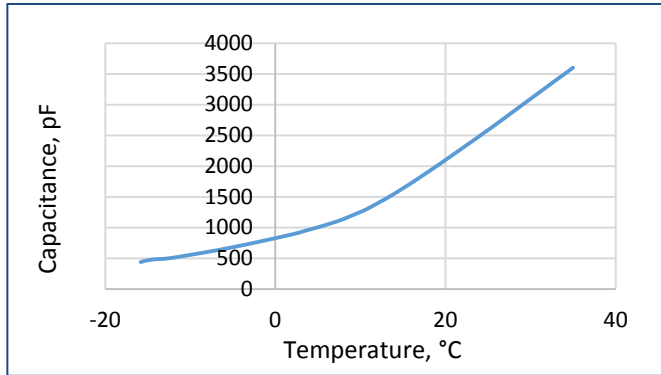
Typical current-voltage characteristic



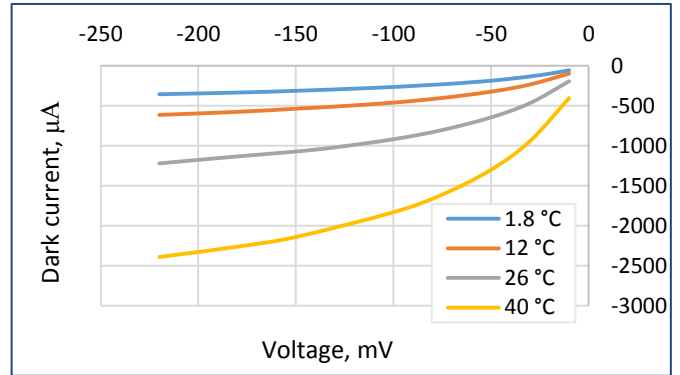
Capacitance vs. voltage



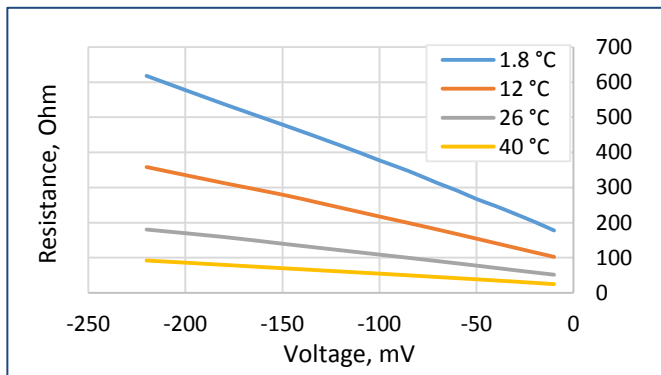
Capacitance vs. temperature



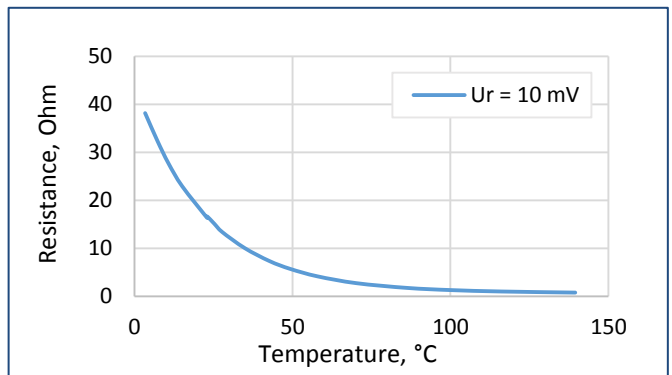
Dark current vs. voltage



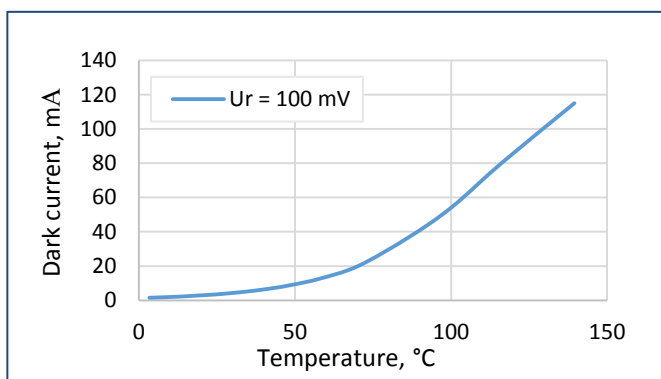
Shunt resistance vs. voltage



Shunt resistance vs. temperature



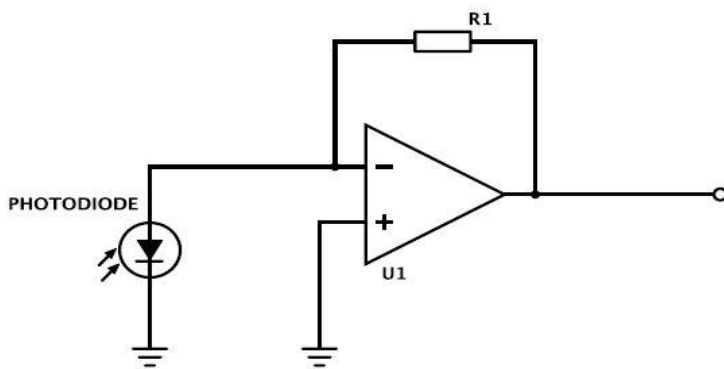
Dark current vs. temperature



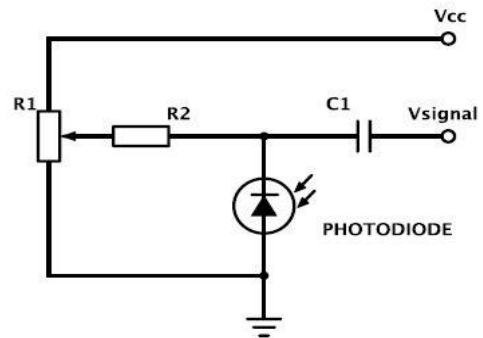
Packages	Model
TO-18 with a cap without a glass window	Lms MIR PD-03
TO-18 with a parabolic reflector without a window	Lms MIR PD-03-R
TO-18 with a parabolic reflector with a glass window	Lms MIR PD-03-RW
TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window	Lms MIR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

### Recommended modes of PD operation

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



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



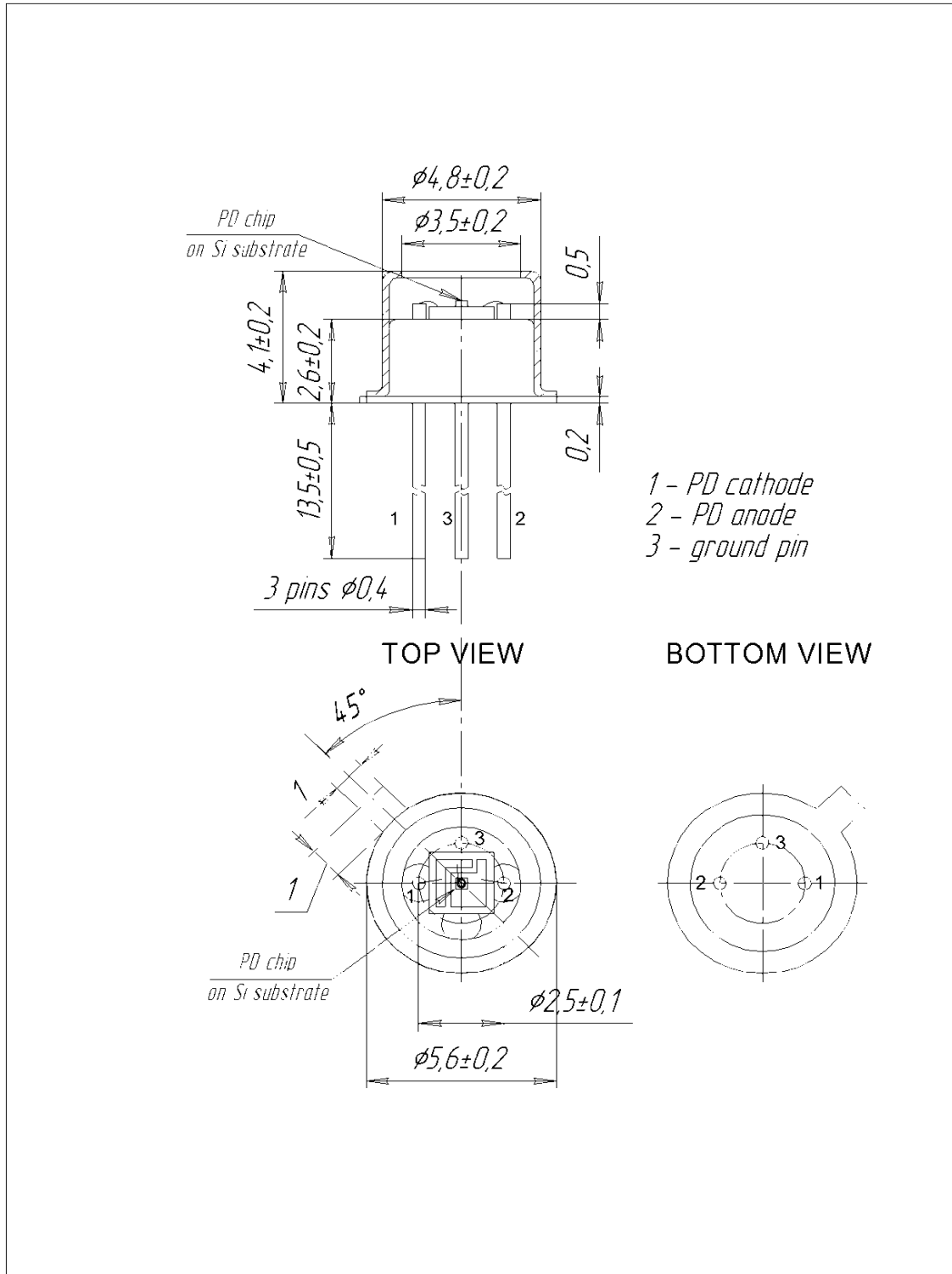
We recommend using **photovoltaic mode**, when PD is used under no reverse bias.  
Use photoconductive mode (mode with reverse bias) with caution.

### 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.

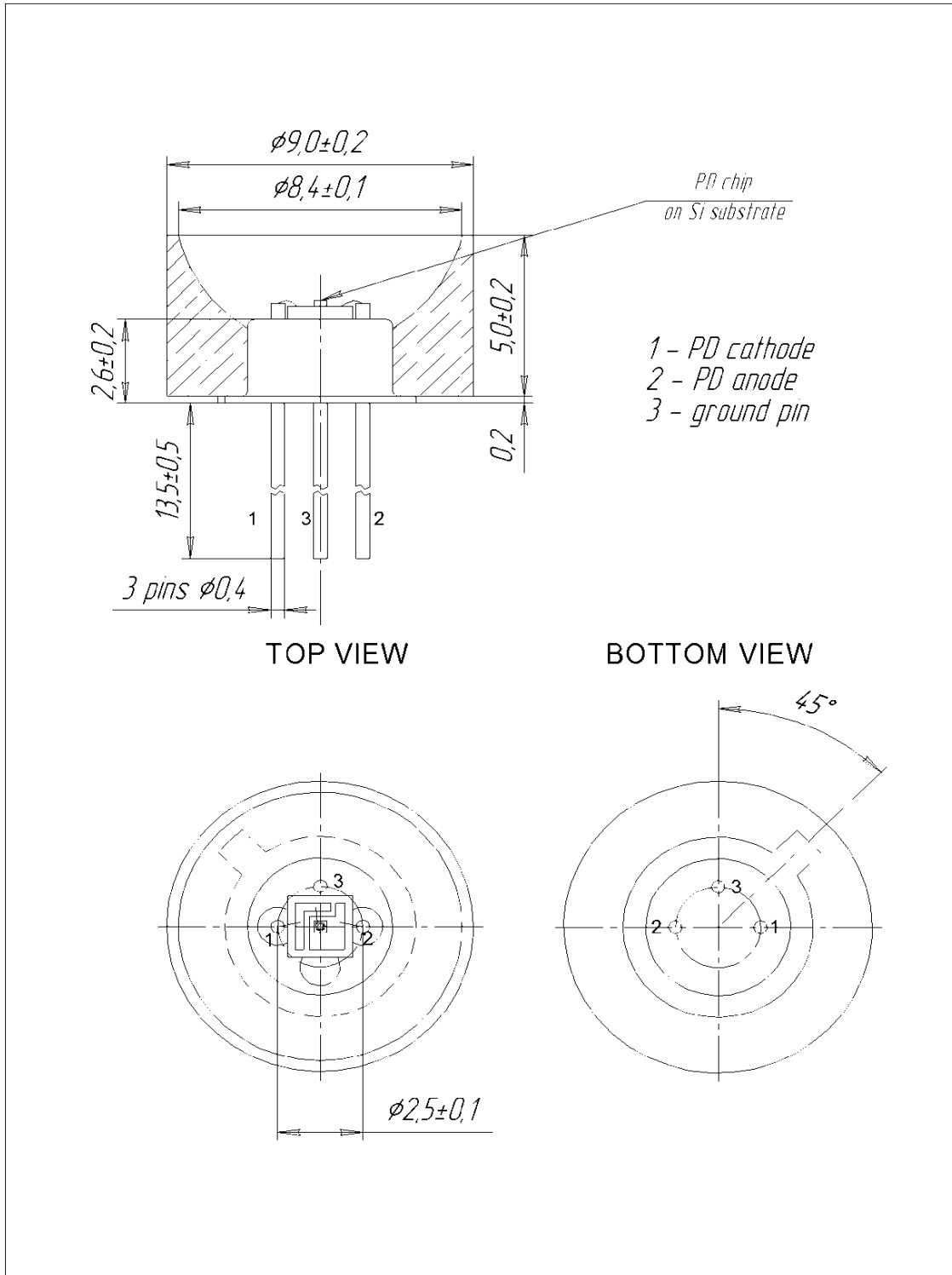
Technical Drawings

Lms43PD-03



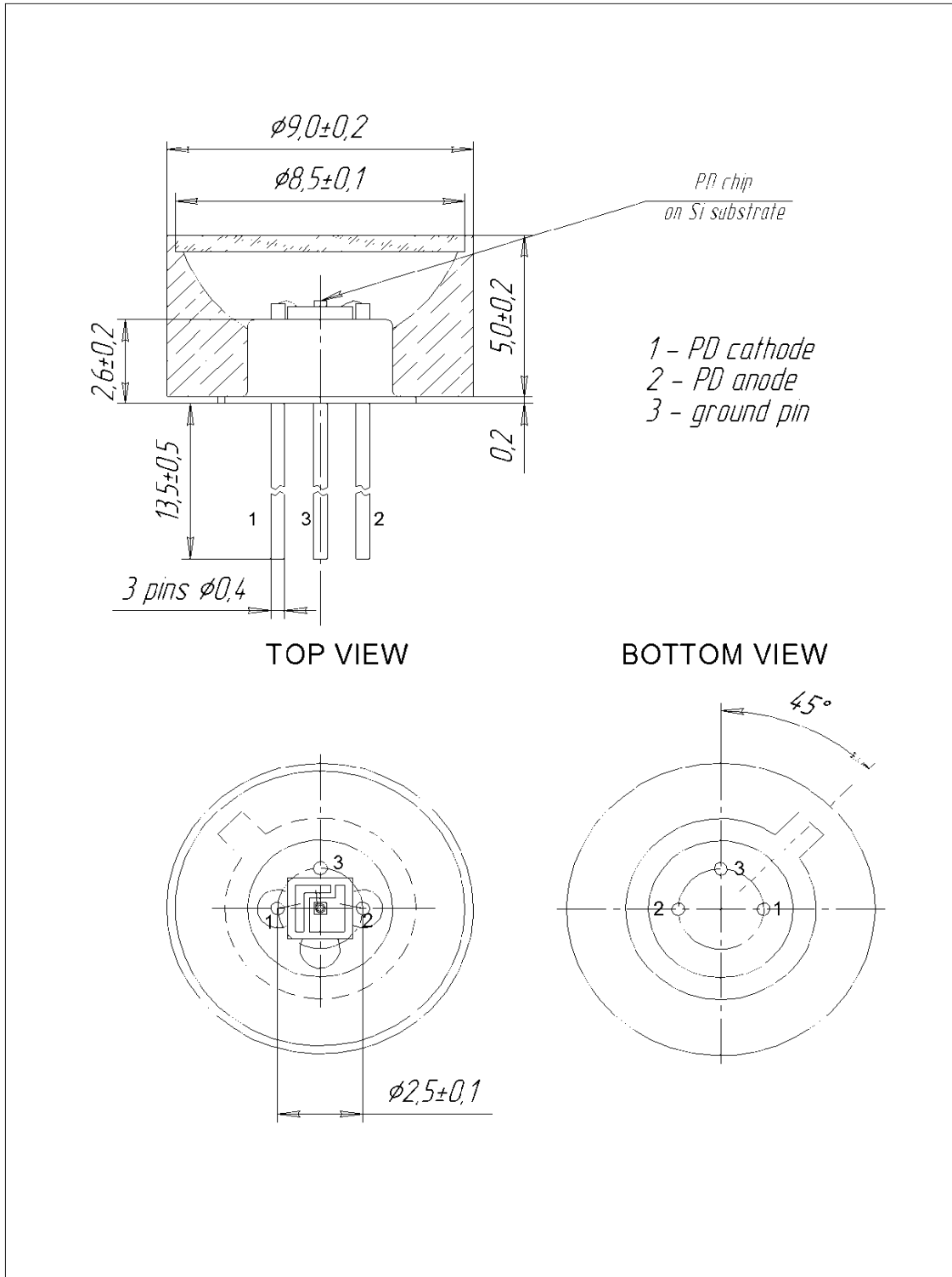
Technical Drawings

Lms43PD-03-R



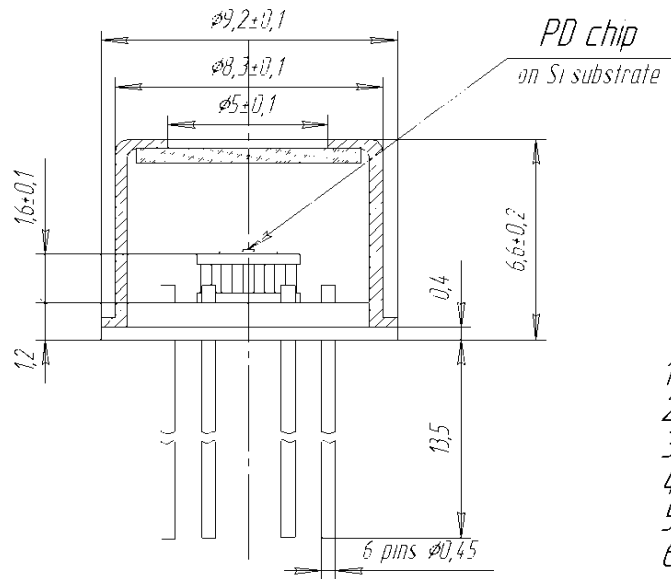
Technical Drawings

Lms43PD-03-RW



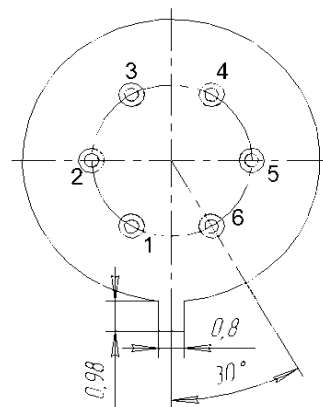
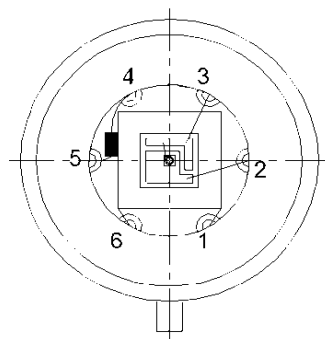
Technical Drawings

Lms43PD-03-TEM



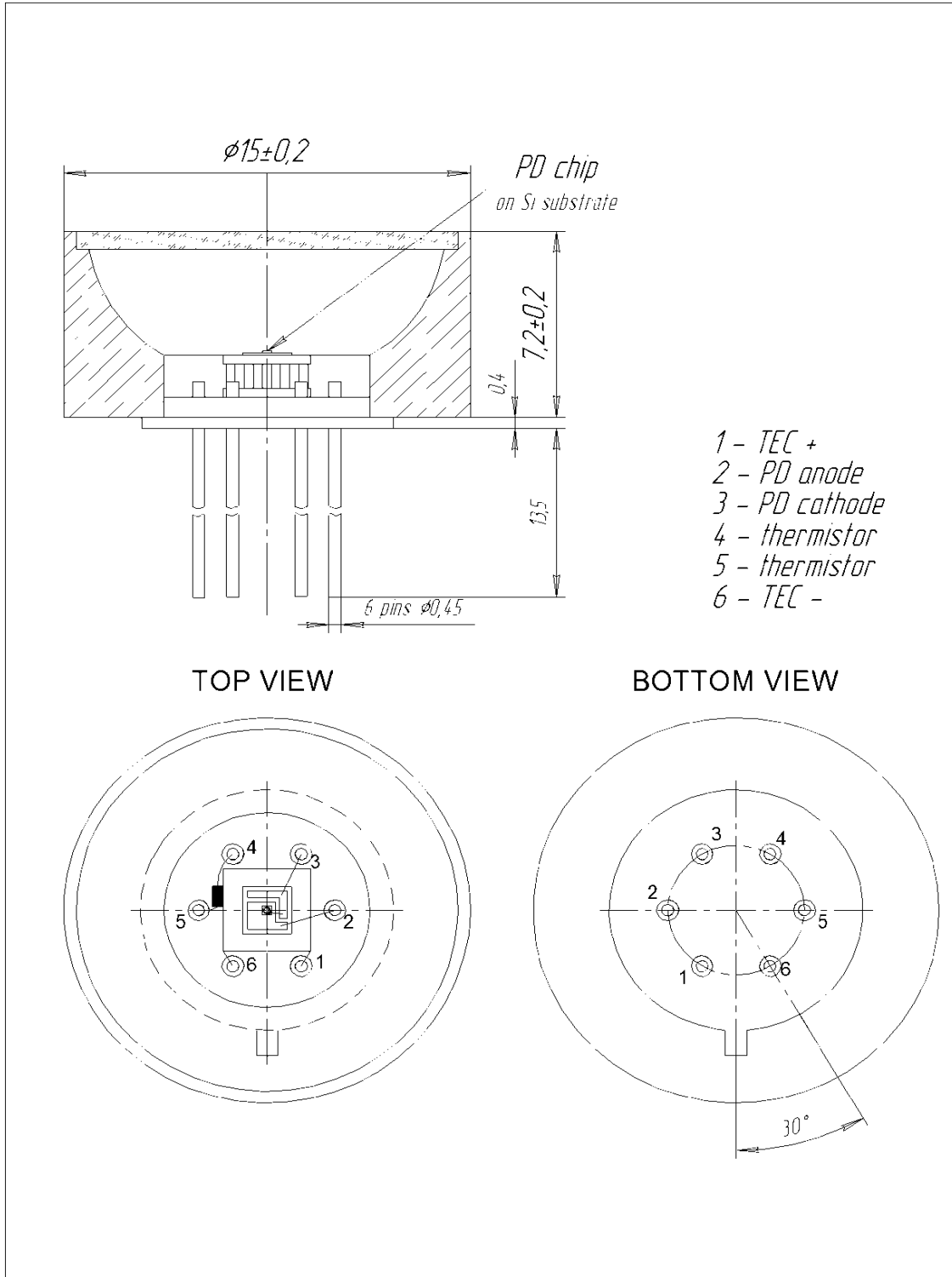
TOP VIEW

BOTTOM VIEW



Technical Drawings

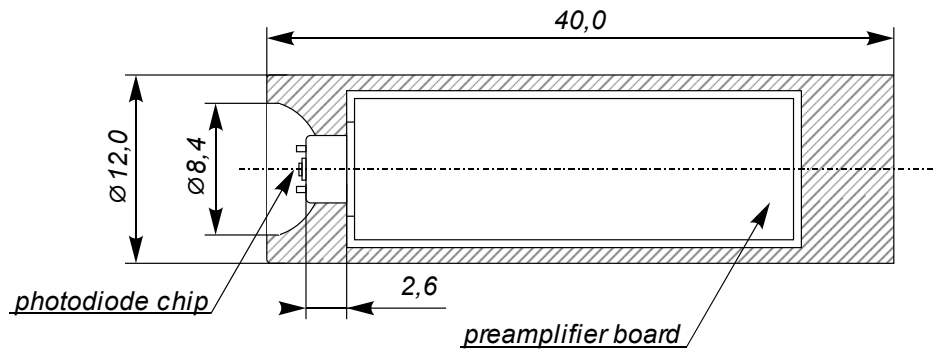
Lms43PD-03-TEM-R



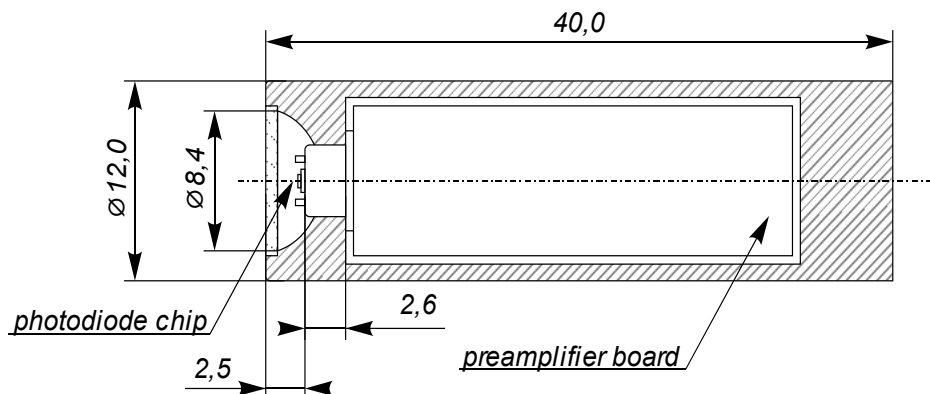


Technical Drawings

Lms43PD-03-R-PA



Lms43PD-03-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.