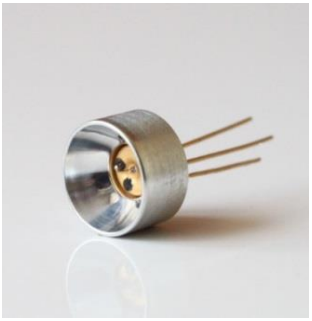
LED Microsensor NT

# Mid-Infrared (MIR) Photodiode

**1.8 - 3.8 µm**

## Lms36PD-03-RW



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

*Photodiode design for different storage/operating temperature range can be considered under request.

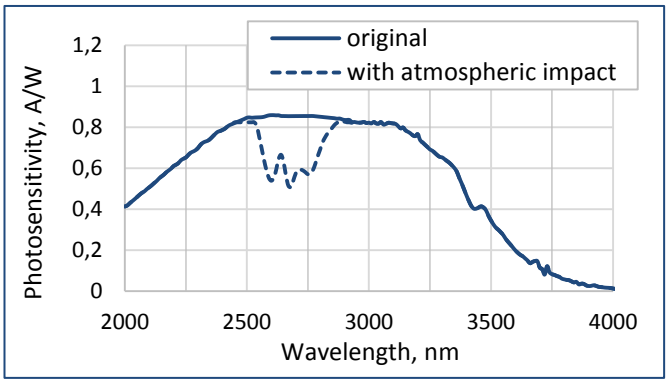
All parameters refer to photodiode operation at ambient temperature 25°C unless otherwise stated.

| Photodiode parameters | Conditions | Symbol | Value | Units |
|---|---|---|---|---|
| Cut-off wavelength (at 10% level)[1] | - | $\lambda_{cut}$ | 3.7 - 3.8 | µm |
| Max. sensitivity range (at 80% level)[1] | - | $\lambda_p$ | 2.45 - 3.30 | µm |
| Dark current (typical/ maximal)[2] | $V_r$ = 0.1 V | $I_d$ | typ 150 / max 600 | µA |
| Shunt resistance (minimal/ typical)[2] | $V_r$ = 10 mV | $R_{sh}$ | min 0.2 / typ 0.6 | kΩ |
| Capacitance (typical/ maximal)[1] | $V_r$ = 10 mV | C | typ 200 / max 300 | pF |
| Photosensitivity (minimal/ typical)[2] | λ = 3.3 µm | S | min 0.7 / typ 0.8 | A/W |
| Noise equivalent power (typical/ maximal)[2] | λ = 3.3 µm | NEP | typ $6.5*10^{-12}$ / max $13*10^{-12}$ | $W/Hz^{1/2}$ |
| Detectivity (minimal/ typical)[2] | λ = 3.3 µm | D* | min $2.4*10^{9}$ / typ $4.7*10^{9}$ | $cm \cdot Hz^{1/2} \cdot W^{-1}$ |

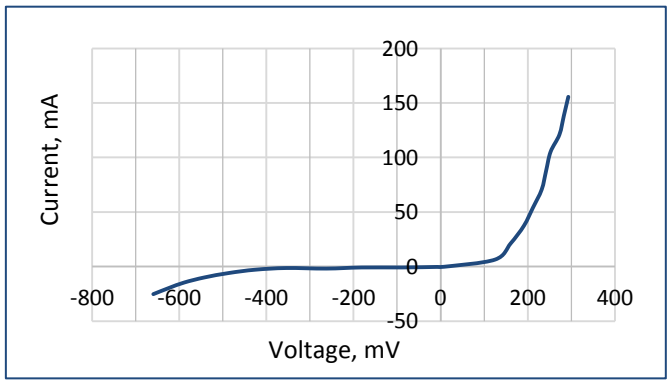
[1] Parameter tested for representative sampling.

[2] Parameter tested for each device.

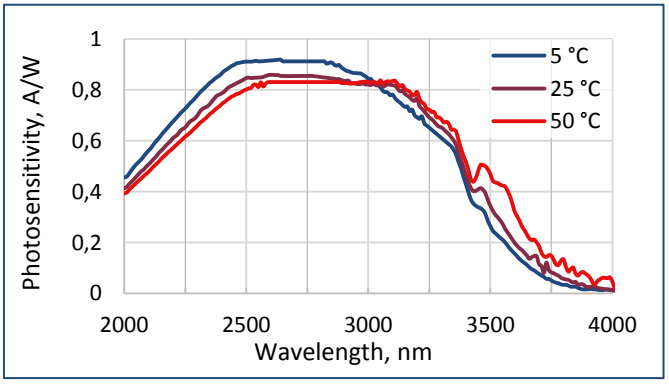
### Typical spectral response



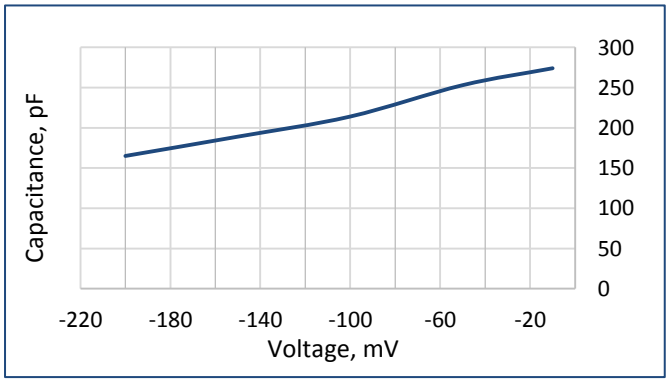

### Typical current-voltage characteristic




### Temperature shift of spectral response




### Capacitance vs. voltage






HEAD OFFICE LED Microsensor NT, LLC and RnD CENTRE Microsensor Technology, LLC
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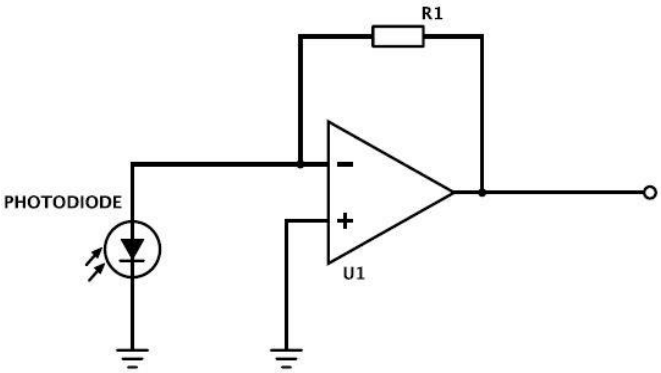
| Packages* | Model |
|---|---|
| TO-18 with a cap without a glass window | Lms36PD-03 |
| TO-18 with a parabolic reflector without a glass window | Lms36PD-03-R |
| TO-18 with a parabolic reflector with a glass window | Lms36PD-03-RW |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a cap with a glass window | Lms36PD-03-TEM |
| TO-5 with a built-in thermocooler and thermoresistor, covered by a parabolic reflector with a glass window | Lms36PD-03-TEM-R |
| PD with a built-in preamplifier; TO-18 with a parabolic reflector without a window in an aluminum tube | Lms36PD-03-R-PA |
| PD with a built-in preamplifier; TO-18 with a parabolic reflector with a window in an aluminum tube | Lms36PD-03-RW-PA |

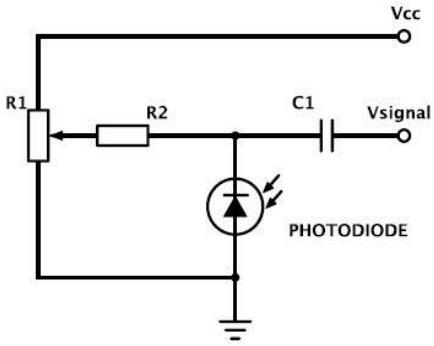
*Standard photodiode packaging is non-hermetical, so that condensation during device operation and storage must be prevented.

## 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 convertion of an output PD preamplifier signal into DC voltage signal.



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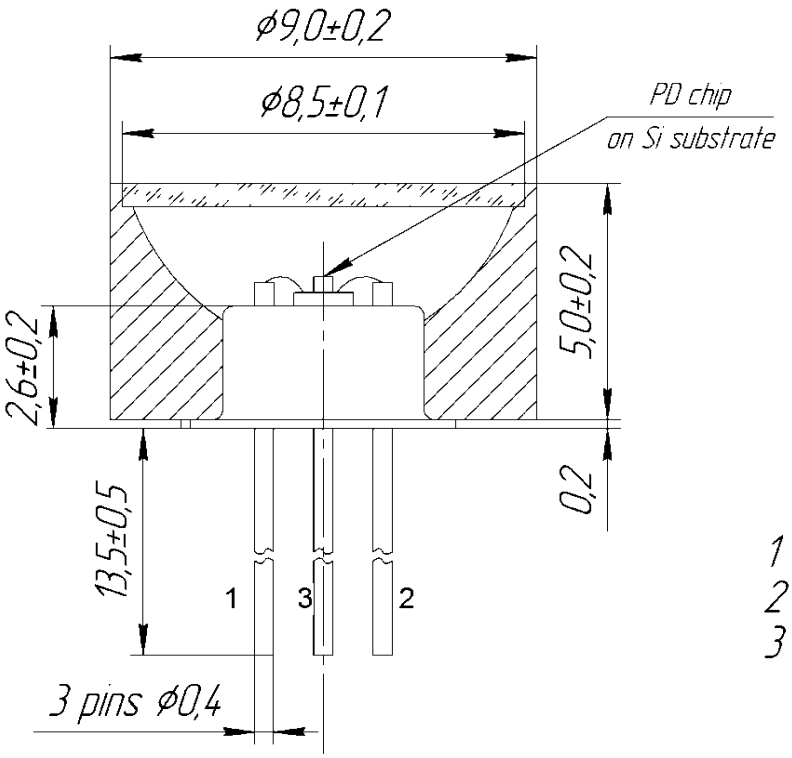
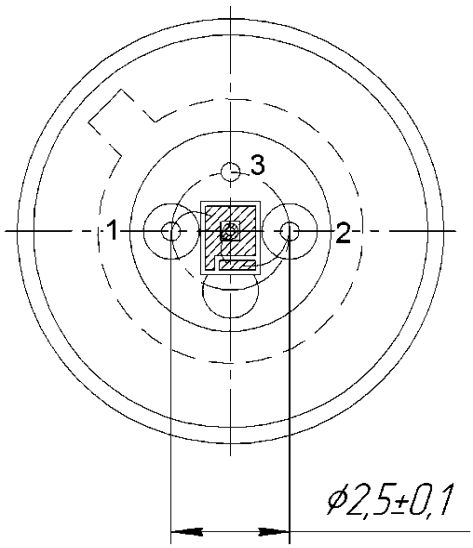
## Technical Drawing

**Lms36PD-03-RW**




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

TOP VIEW




BOTTOM VIEW