

PbSe near-infrared detector

Single-Pixel double encapsulated TO-package

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Features

- Double encapsulation (thin-film + TO package)
- High durability for rugged operation
- Room temperature operation
- Sapphire window

Applications

- Flame monitoring
- Flame and spark detection
- Gas detection and analysis
- Spectroscopy
- Temperature measurement
- Moisture measurement

Electrical and optical characteristics

Type No.	Active area [mm x mm]	Peak responsivity S [V/W]	
		Typ.	Min.
PbSe010010T05	1 x 1	$4.5 \cdot 10^4$	$2.3 \cdot 10^4$
PbSe020020T05	2 x 2	$4 \cdot 10^4$	$2 \cdot 10^4$
PbSe030030T05	3 x 3	$1.5 \cdot 10^4$	$8 \cdot 10^3$
PbSe060060T08	6 x 6	$8 \cdot 10^3$	$4 \cdot 10^3$



- Measured with 500K blackbody
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance ($R_L = 1 \text{ M}\Omega$) and calculated for matched resistance

Element temperature [°C]	Peak wave-length λ_p [μm]	20% cut-off wavelength λ_c [μm]	Peak D* (620 Hz, 1 Hz) [$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$]		Time constant [μs]	Dark resistance R_D [$\text{M}\Omega$]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	3.8	4.5	$1.8 \cdot 10^{10}$	$1.2 \cdot 10^{10}$	4	0.1 - 3

Storage

- Storage temperature: -55°C to $+90^\circ\text{C}$
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in temporary low dark resistance

Handling

- Ensure dust-free environment for device handling
- Operating temperature: -30°C to $+90^\circ\text{C}$

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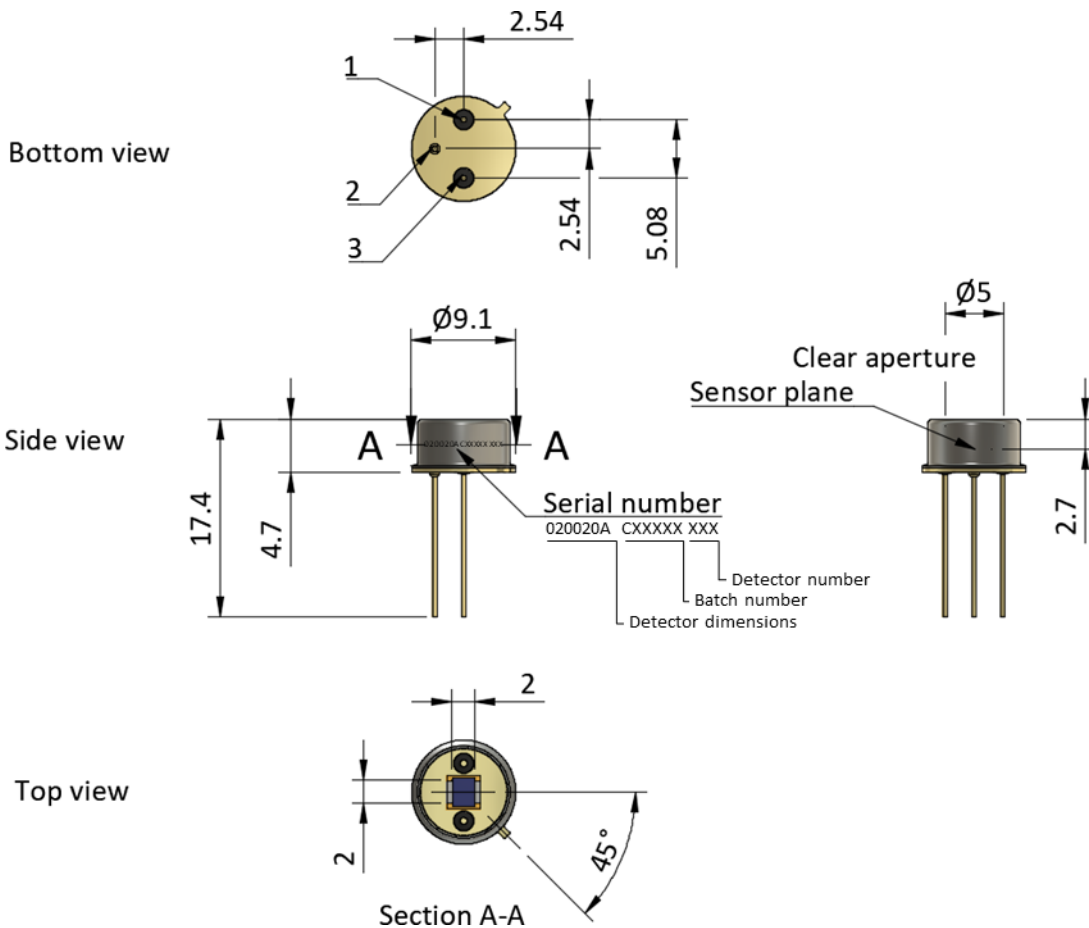
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Options

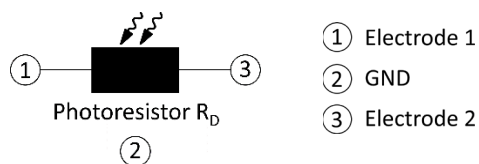
- Custom windows and filters
- 1-stage or 2-stage Thermoelectric cooler (TEC) including thermistor
- Built-in internal LED for illumination and detection
- Custom packages upon request
- Evaluation Kit available

TO5 exemplary package outlines (mm)

PbSe020020TO5



Schematic



PbSe near-infrared detector

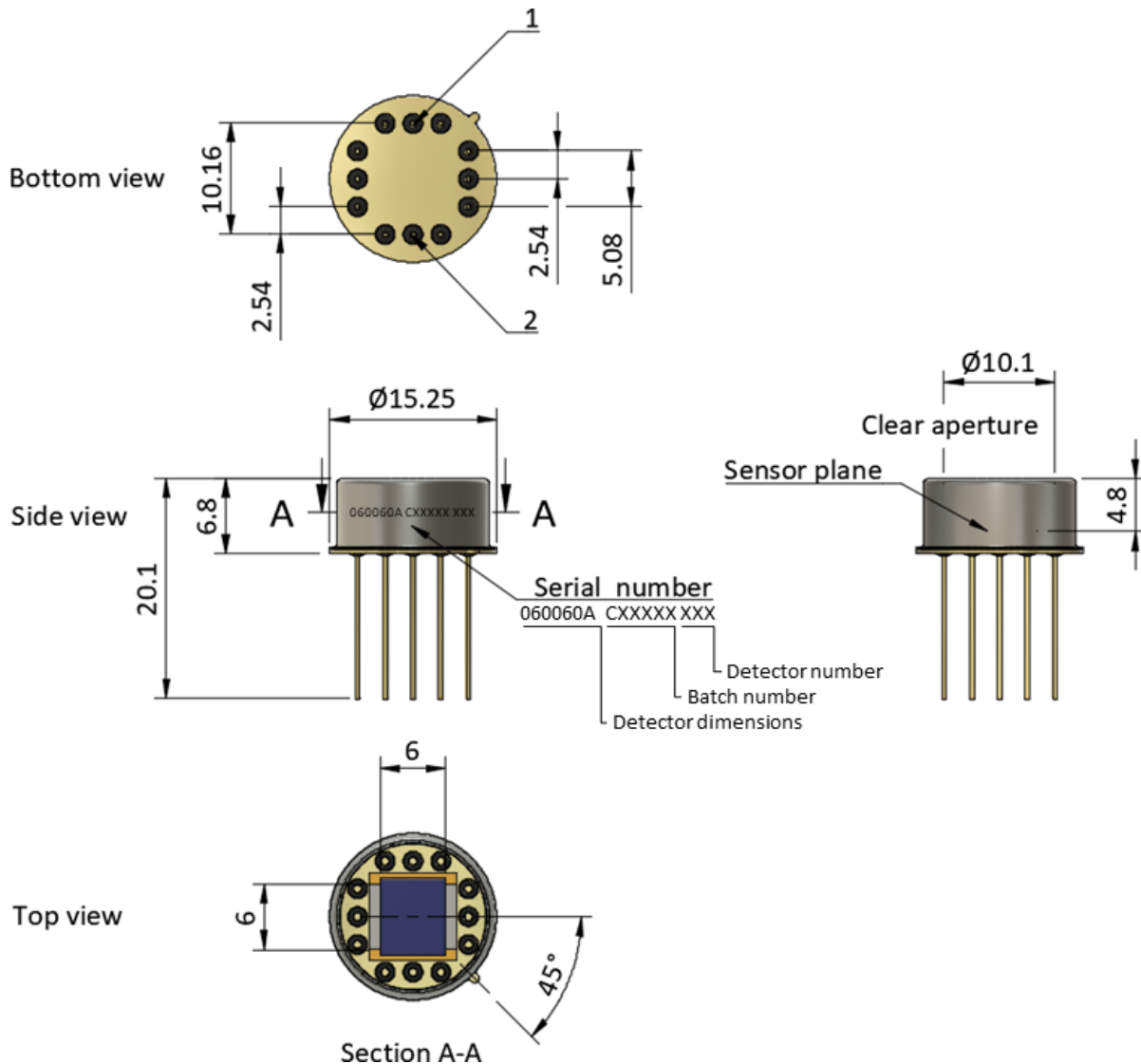
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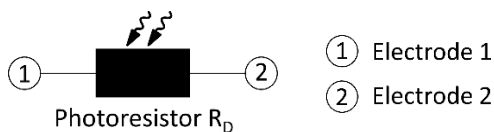
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TO8 exemplary package outlines (mm)

PbSe060060TO8



Schematic



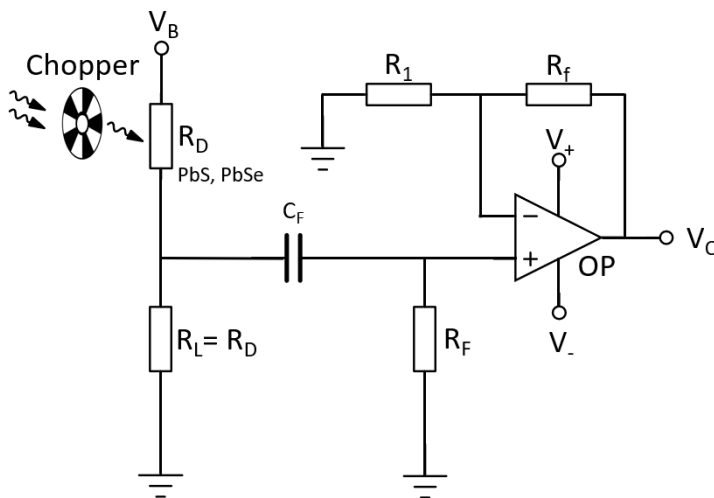
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Exemplary circuit



- V_B : Bias voltage
- V_O : Output voltage
- R_D : Dark resistance of the detector
- R_L : Load resistor
- C_F : Filter capacitor
- R_F : Filter resistor
- R_f : Feedback resistor
- R_1 : Gain resistor

Regulatory

For the use of Hertzstück™ PbS and PbSe infrared photodetectors in medical devices, monitoring and control instruments and consumer applications RoHS exemptions apply.

For automotive applications Hertzstück™ PbS and PbSe infrared photodetectors fall under ELV exemption.