# 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]	
		Тур.	Min.
PbSe010010T05	1 x 1	$4.5 \cdot 10^4$	$2.3 \cdot 10^4$
PbSe020020T05	2 x 2	4 · 10 <sup>4</sup>	$2 \cdot 10^{4}$
PbSe030030T05	3 x 3	$1.5 \cdot 10^4$	8 · 10 <sup>3</sup>
PbSe060060T08	6 x 6	8 · 10 <sup>3</sup>	4 · 10 <sup>3</sup>



- 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	Peak wave-	20% cut-off	Peak D*		Time constant	Dark resistance R <sub>D</sub>
temperature	length λ₽	wavelength λ <sub>C</sub>	(620 Hz, 1 Hz)		[µs]	[MΩ]
[°C]	[µm]	[µm]	[cm·Hz½/W]			
	Тур.	Тур.	Тур.	Min.	Тур.	
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°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°C

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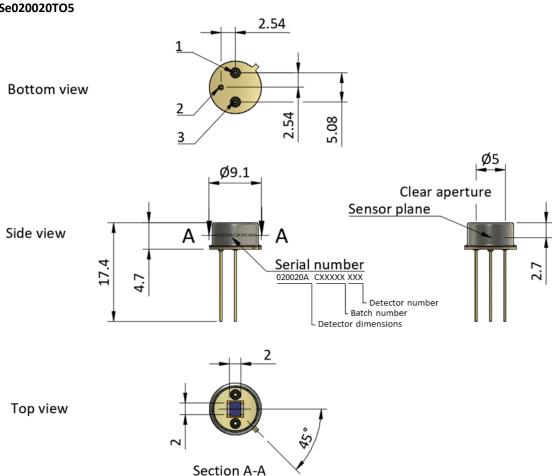
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## **Options**

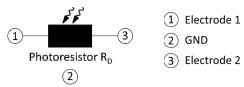
- Custom windows and filters
- 1-stage or 2-stage Thermoelectric cooler (TEC) including thermistor
- Built-in internal LED for illumination and detection
- Custom packages upon request
- Evaluation Kit available

## TO5 exemplary package outlines (mm)

#### PbSe020020TO5



#### **Schematic**



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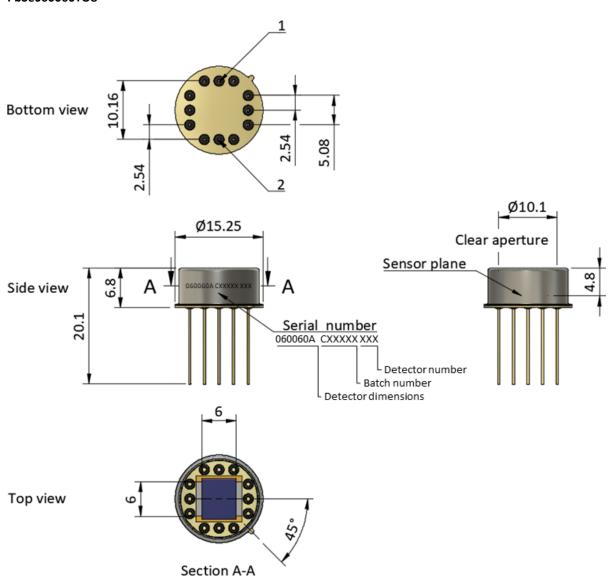
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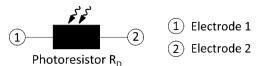
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## TO8 exemplary package outlines (mm)

#### PbSe060060TO8



### Schematic



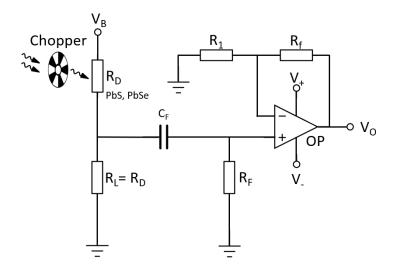
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## **Exemplary circuit**



Bias voltage Output voltage

Dark resistance of the detector

Load resistor  $R_i$ : Filter capacitor Filter resistor Feedback resistor  $R_f$ : R₁: 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.