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### **Features**

- Double encapsulation (thin-film and TO package)
- High durability for rugged operation
- Very high sensitivity
- 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.
PbS005005TO5	0.5 x 0.5	16 · 10 <sup>5</sup>	10 · 10 <sup>5</sup>
PbS010010TO5	1 x 1	8 · 10 <sup>5</sup>	5.6 · 10 <sup>5</sup>
PbS020020TO5	2 x 2	4 · 10 <sup>5</sup>	2.8 · 10 <sup>5</sup>
PbS030030TO5	3 x 3	3 · 10 <sup>5</sup>	1.8 · 10 <sup>5</sup>
PbS060060TO8	6 x 6	1.4 · 10 <sup>5</sup>	0.9 · 10 <sup>5</sup>
PbS010050TO5*	1 x 5	3.5 · 10 <sup>5</sup>	2 · 10 <sup>5</sup>



- Measured with 1550 nm LED, incident power 16  $\mu$ W/cm<sup>2</sup>
- 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	Dark resistance R <sub>D</sub>
temperature	length λ₽	wavelength	(620 Hz, 1 Hz)		constant	[MΩ]
[°C]	[µm]	λ <sub>c</sub> [μm]	[cm·Hz <sup>½</sup> /W]		[µs]	
	Тур.	Тур.	Тур.	Min.	Тур.	
22	2.7	2.9	$1.1 \cdot 10^{11}$	$0.8 \cdot 10^{11}$	200	0.3 - 3

<sup>\*</sup> Dark resistance  $R_D[M\Omega] = 0.05 - 1$ 

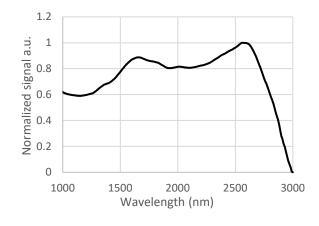
### PbS near-infrared detector

## Single-Pixel double encapsulated in TO package

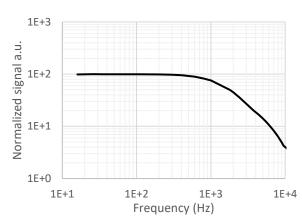


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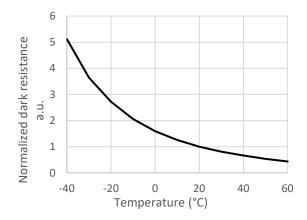
## **Typical spectral response**



## **Typical frequency response**



# Typical resistance change over temperature



### **Storage**

- Storage temperature: -55°C to +70°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 +70°C

## **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**

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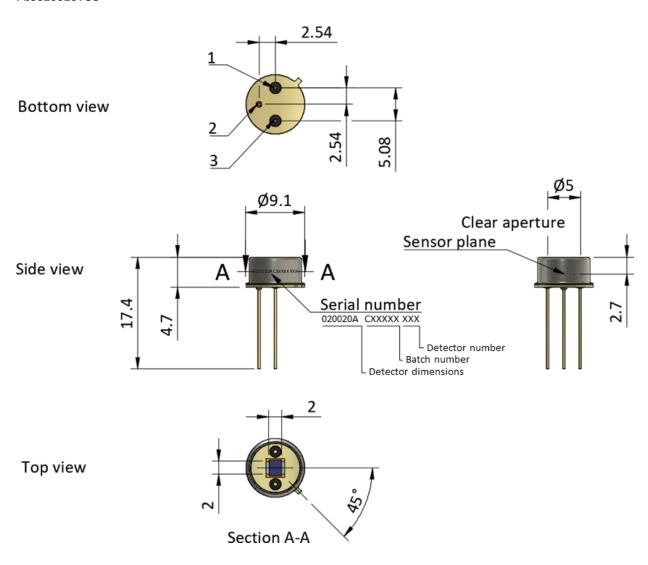
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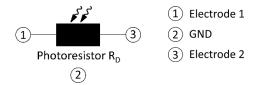
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## TO5 exemplary package outlines (mm)

#### PbS020020TO5



#### **Schematic**



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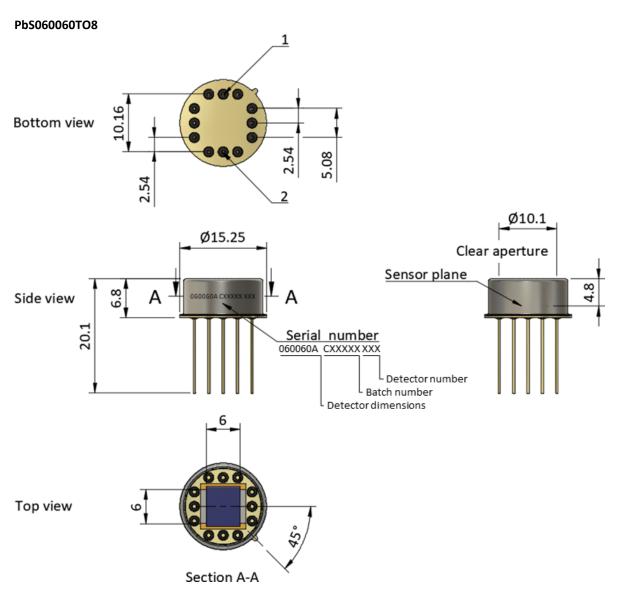
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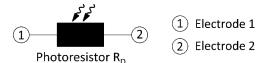


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# TO8 exemplary package outlines (mm)



#### **Schematic**



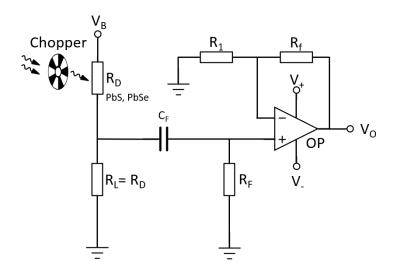
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### **Exemplary circuit**



Bias voltage Output voltage

Dark resistance of the detector

 $R_L$ : Load resistor Filter capacitor Filter resistor Feedback resistor  $R_f$ : 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.