# PbS near-infrared detector Single-Pixel thin-film encapsulated on PCB



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### **Features**

- COB for direct PCB mounting
- Castellated holes for easy soldering
- High durability for rugged operation
- Very high sensitivity
- Room temperature operation

# 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.	
PbS030030 BC PCB	3 x 3	3 · 10 <sup>5</sup>	1.8 · 10 <sup>5</sup>	

- Measured with 1550 nm LED, incident power 16  $\mu W/cm^2$
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance (R<sub>L</sub> = 1 MΩ) and calculated for matched resistance

Element temperature [°C]	Peak wave- length λ <sub>P</sub> [μm]	20% cut-off wavelength $\lambda_c$	Peak D* (620 Hz, 1 Hz) [cm·Hz <sup>½</sup> /W]		Time constant	Dark resistance $R_D$ [M $\Omega$ ]
[ C]	ιμmj	[µm]			[µs]	
	Тур.	Тур.	Тур.	Min.	Тур.	
22	2.7	2.9	$1 \cdot 10^{11}$	$0.8 \cdot 10^{11}$	200	0.3 - 3

## **COB on PCB attachment**

- Use clean, soft rubber tip for pick and place handling
- UV-curing is not suitable due to permanent damage by UV light exposure
- Element temperature should never exceed +70°C

#### Soldering

- Product is not compatible with reflow soldering
- Element temperature should never exceed +70°C
- Detector should not be exposed to prolonged heat
- Exposing detector to flux damages thin-film encapsulation
- Recommendation: Careful hand soldering with low flux solder and short soldering time

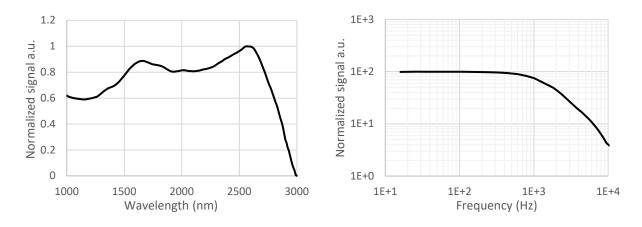




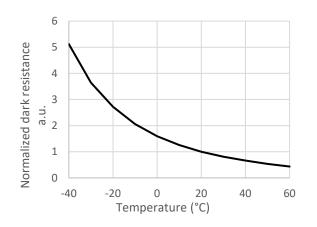
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**Typical frequency response** 

### **Typical spectral 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

- Active area is scratch sensitive, protect top surface from any mechanical contact
- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +70°C

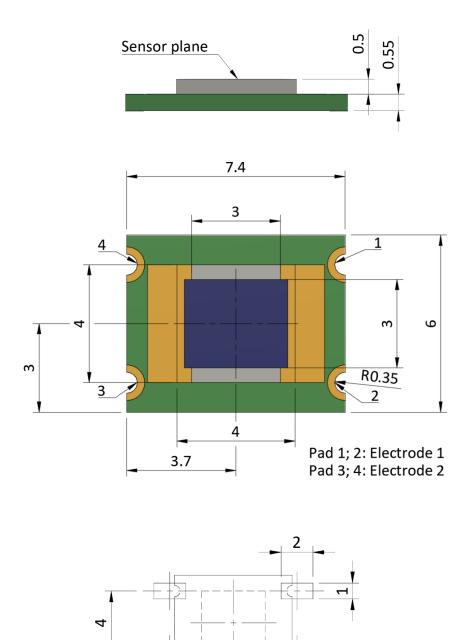
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# Mechanical outlines and land pattern (mm)



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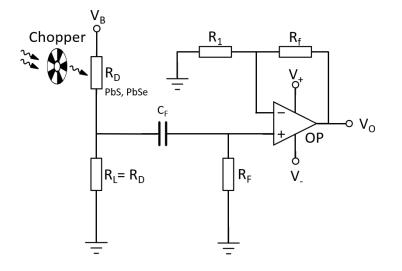
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## **Exemplary circuit**



- V<sub>B</sub>: Bias voltage
- V<sub>o</sub>: Output voltage
- R<sub>D</sub>: Dark resistance of the detector
- R<sub>L</sub>: Load resistor
- C<sub>F</sub>: Filter capacitor
- R<sub>F</sub>: Filter resistor
- R<sub>f</sub>: Feedback resistor
- R<sub>1</sub>: Gain resistor

# Regulatory

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

For automotive applications Hertzstück<sup>™</sup> PbS and PbSe infrared photodetectors fall under ELV exemption.

