# PbSe near-infrared detector Single-Pixel thin-film encapsulated



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#### **Features**

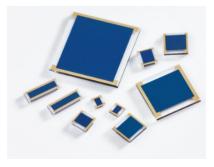
- Bondable electrode for COB mounting
- High durability for rugged operation
- Suitable for automated wire-bonding
- Room temperature operation

## **Applications**

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

Type No.	Active area [mm x mm]	Peak responsivity S [V/W]	
		Тур.	Min.
PbSe010010BC	1 x 1	$4.5 \cdot 10^{4}$	$2.3 \cdot 10^{4}$
PbSe020020BC	2 x 2	$4 \cdot 10^{4}$	2 · 10 <sup>4</sup>
PbSe030030BC	3 x 3	$1.5 \cdot 10^{4}$	8 · 10 <sup>3</sup>
PbSe060060BC	6 x 6	8 · 10 <sup>3</sup>	4 · 10 <sup>3</sup>

### **Electrical and optical characteristics**



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

Element temperature [°C]	Peak wave- length λ <sub>P</sub> [μm]	20% cut-off wavelength $\lambda_c$ [µm]	Peak D* (620 Hz, 1 Hz) [cm·Hz <sup>½</sup> /W]		Time constant [µs]	Dark resistance R <sub>D</sub> [MΩ]
	Тур.	Тур.	Тур.	Min.	Тур.	
22	3.8	4.5	$1.8 \cdot 10^{10}$	1.2 · 10 <sup>10</sup>	4	0.1 - 3

### **Die attach**

- 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 +90°C

### Wire-bonding

- Electrodes are optimized for room temperature Al-wire-bonding
- Element temperature should never exceed +90°C

 trinamiX GmbH
 Contact

 Industriestr. 35
 W www.trinamixsensing.com

 67063 Ludwigshafen
 E info@hertzstueck.de

 Germany
 E

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#### 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

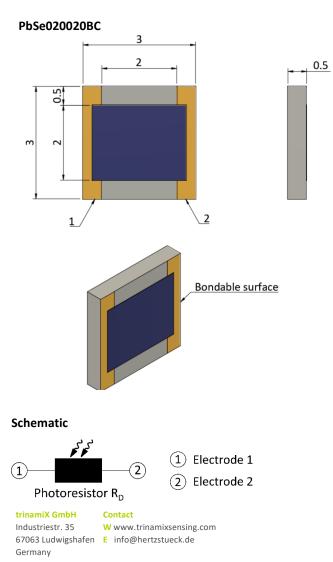
## Handling

- Active area is scratch sensitive, protect top surface from any mechanical contact
- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +90°C

### **Options**

- Custom filters
- Custom packages upon request
- Evaluation Kit available

# **Exemplary mechanical outlines (dimensions in mm)**

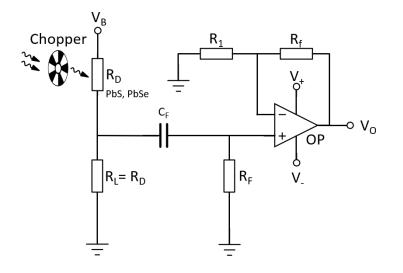


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### **Exemplary circuit**



- V<sub>B</sub>: Bias voltage
- V<sub>o</sub>: Output voltage
- R<sub>D</sub>: Dark resistance of the detector
- R<sub>1</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.

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