

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

### Features

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

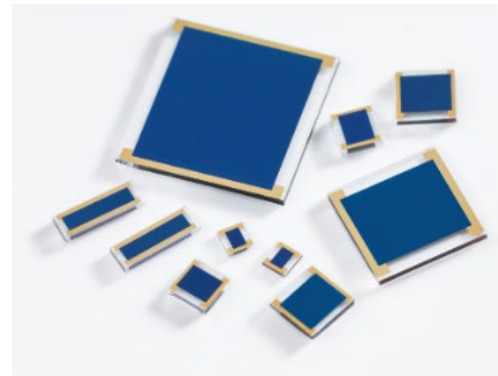
### Applications

- 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]	
		Typ.	Min.
PbS005005BC	0.5 x 0.5	$16 \cdot 10^5$	$10 \cdot 10^5$
PbS010010BC	1 x 1	$8 \cdot 10^5$	$5.6 \cdot 10^5$
PbS020020BC	2 x 2	$4 \cdot 10^5$	$2.8 \cdot 10^5$
PbS030030BC	3 x 3	$3 \cdot 10^5$	$1.8 \cdot 10^5$
PbS060060BC	6 x 6	$1.4 \cdot 10^5$	$0.9 \cdot 10^5$
PbS100100BC	10 x 10	$0.6 \cdot 10^5$	$0.4 \cdot 10^5$
PbS010050BC*	1 x 5	$3.5 \cdot 10^5$	$2 \cdot 10^5$

\* Dark resistance  $R_D$  [MΩ] = 0.05 - 1



- Measured with 1550 nm LED, incident power  $16 \mu\text{W}/\text{cm}^2$
- 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 $\lambda_P$ [μm]	20% cut-off wavelength $\lambda_C$ [μm]	Peak $D^*$ (620 Hz, 1 Hz) [cm·Hz <sup>1/2</sup> /W]		Time constant [μs]	Dark resistance $R_D$ [MΩ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	2.7	2.9	$1 \cdot 10^{11}$	$0.8 \cdot 10^{11}$	200	0.3 - 3

### Die attach

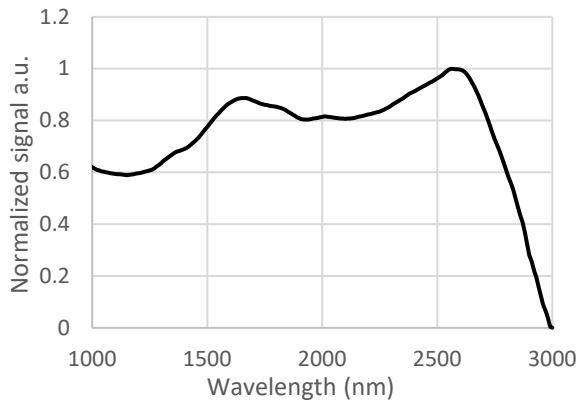
- Use clean, soft rubber tip for pick and place handling
- UV-curing is not suitable due to permanent damage by UV light exposure
- Element temperature should never exceed +70°C

### Wire-bonding

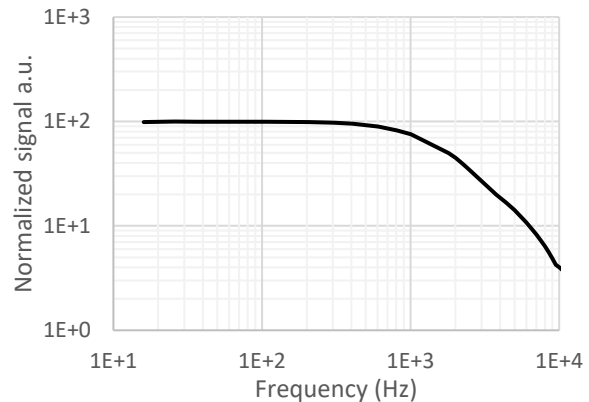
- Electrodes are optimized for room temperature Al-wire-bonding
- Element temperature should never exceed +70°C

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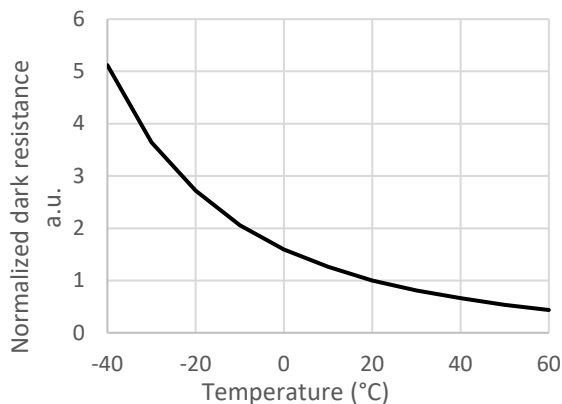
### Typical spectral response



### 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

- 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

### Options

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

# PbS near-infrared detector

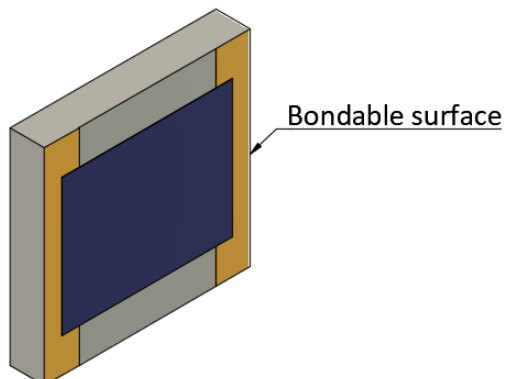
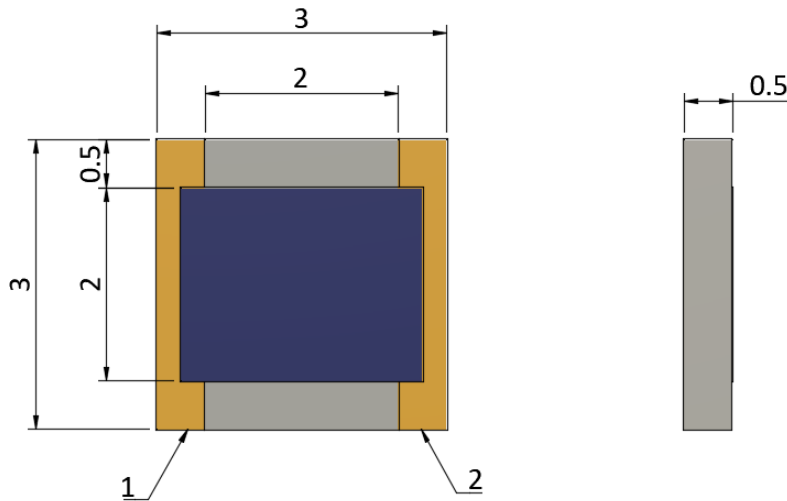
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# trinamiX

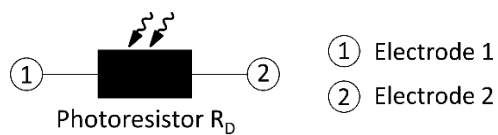
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## Exemplary mechanical outlines (mm)

PbS020020BC



### Schematic



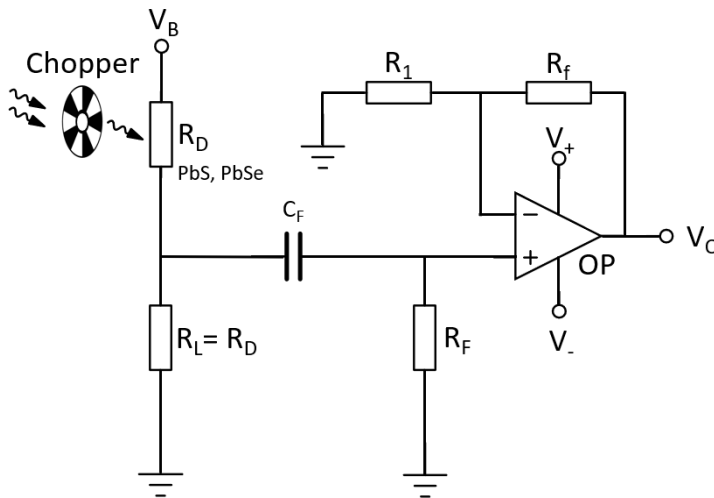
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trinamiX

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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.