

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

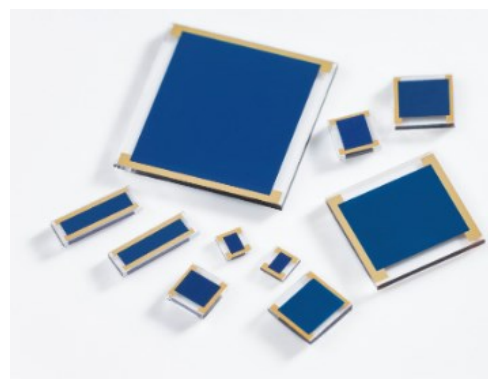
- Flame monitoring
- Flame and spark detection
- Gas detection and analysis
- Spectroscopy
- Temperature measurement
- Moisture measurement

Electrical and optical characteristics

Type No.	Active area [mm x mm]	Peak responsivity S [V/W]	
		Typ.	Min.
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	$1.4 \cdot 10^5$	$0.9 \cdot 10^5$
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 1 MΩ load resistor
- Photo responsivity and detectivity calculated for a voltage divider circuit with matched resistance and 50 V/mm



Element temperature [°C]	Peak wave-length λ_P [μm]	20% cut-off wavelength λ_C [μm]	Peak D* (620 Hz, 1 Hz) [cm·Hz ^{1/2} /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 wedge bonding
- Element temperature should never exceed +70°C

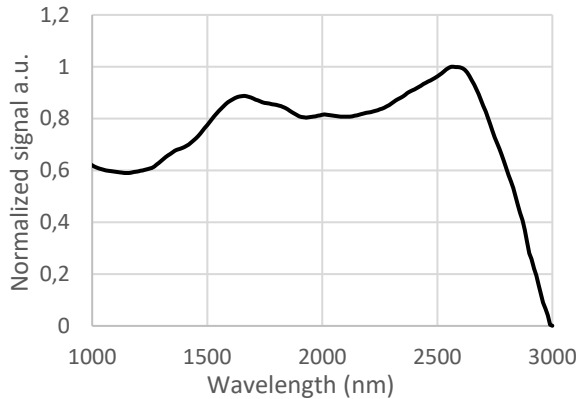
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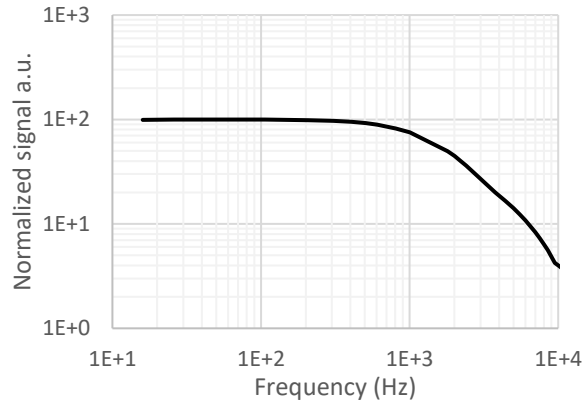
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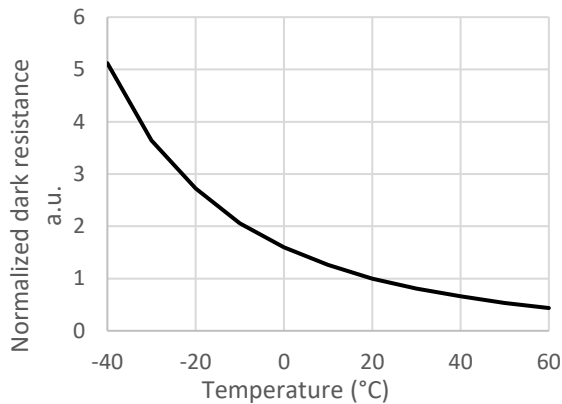
Typical spectral response



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

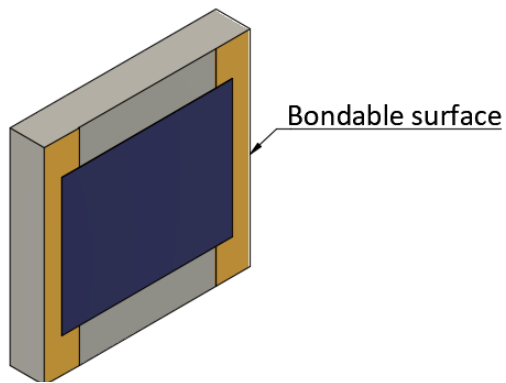
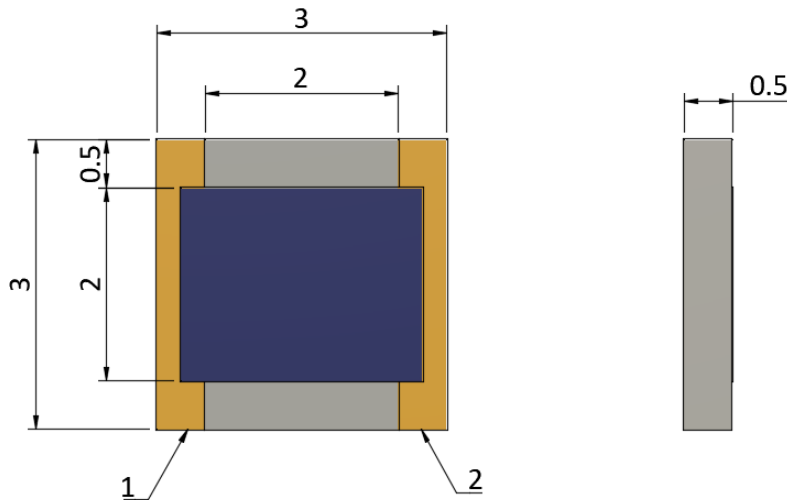
Options

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

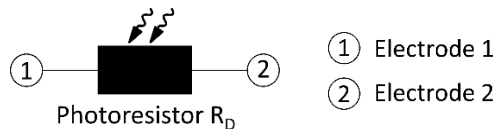
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Exemplary mechanical outlines (dimensions in mm)

PbS020020BC



Schematic

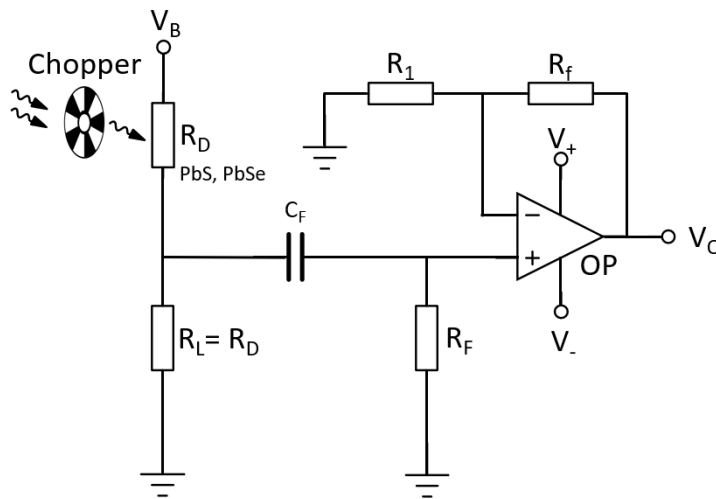


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Exemplary circuit



- 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 trinamiX PbS and PbSe infrared photodetectors in medical devices, monitoring and control instruments and consumer applications RoHS exemptions apply.

For automotive applications trinamiX PbS and PbSe infrared photodetectors fall under ELV exemption.