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



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#### **Features**

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

### **Applications**

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

## **Electrical and optical characteristics per pixel**

Element	Peak wave-	20% cut-off	Peak D*		Time constant	Dark resistance R <sub>D</sub>
temperature	length $\lambda_P$	wavelength $\lambda_{C}$	(620 Hz, 1 Hz)		[µs]	[MΩ]
[°C]	[µm]	[µm]	[cm·Hz <sup>½</sup> /W]			
	Тур.	Тур.	Тур.	Min.	Тур.	
22	2.7	2.9	$1 \cdot 10^{11}$	$0.5 \cdot 10^{11}$	200	0.3 - 15*

\*depends on pixel geometry

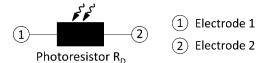
- Measured with 1550 nm LED, incident power 16  $\mu$ W/cm<sup>2</sup>
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance (R<sub>L</sub> = 1 MΩ) and calculated for matched resistance

# **Possible mechanical characteristics**

- Number of lines 1 4
- Number of pixels 2 16
- Minimum pixel width 20 μm
- Minimum pixel height 20 μm
- Minimum pixel pitch 50 μm
- Minimal chip length 3000 μm
- Minimal chip height 3000 μm

Please contact us for an individual design: info@hertzstueck.de

Schematic

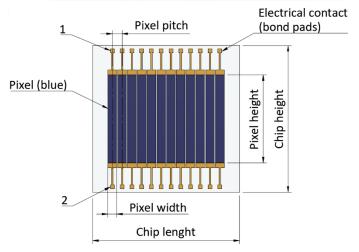


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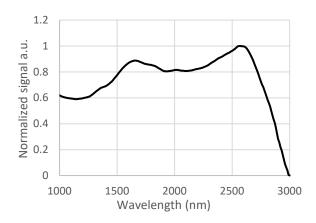
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#### **Exemplary mechanical characteristics**

Type No.	Number	Number	Pixel	Pixel	Pixel	Operating
	of lines	of pixels	pitch	width	height	temperature
			[µm]	[µm]	[µm]	[°C]
PbS_MP_01x12_0200_0180x1800	1	12	200	180	x 1800	-30 to +70

## Typical spectral response per pixel Typical frequency response per pixel

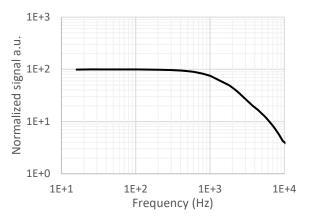


## **Die attach**

- 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

#### **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



# Wire-bonding

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

#### 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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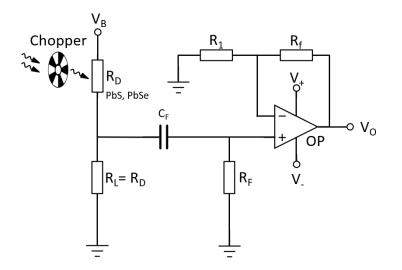


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#### **Options**

- Individual housing
- Bonding onto PCB
- Integrated optics
- Evaluation-Kit available

## **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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