

## PbS near-infrared detector

### Multi-Single-Pixel thin-film encapsulated

#### Features

- Wire-bonded on PCB
- High durability for rugged operation
- Very high sensitivity
- Room temperature operation

#### Applications

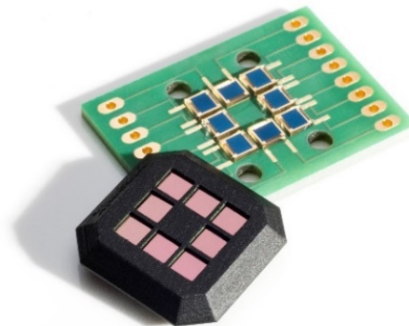
- Spectroscopy
- Gas detection and analysis
- Flame monitoring
- Flame and spark detection
- Temperature measurement
- Moisture measurement
- Rapid prototyping

#### Electrical and optical characteristics per pixel

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  $R_D$  [M $\Omega$ ] = 0.05 - 1

- 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 ( $R_L = 1$  M $\Omega$ ) and calculated for matched resistance



Element temperature [°C]	Peak wave-length $\lambda_P$ [ $\mu$ m]	20% cut-off wavelength $\lambda_C$ [ $\mu$ m]	Peak D* (620 Hz, 1 Hz) [cm $\cdot$ Hz <sup>1/2</sup> /W]		Time constant [ $\mu$ s]	Dark resistance $R_D$ [M $\Omega$ ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	2.7	2.9	$1 \cdot 10^{11}$	$0.8 \cdot 10^{11}$	200	0.3 - 3

#### Mechanical characteristics

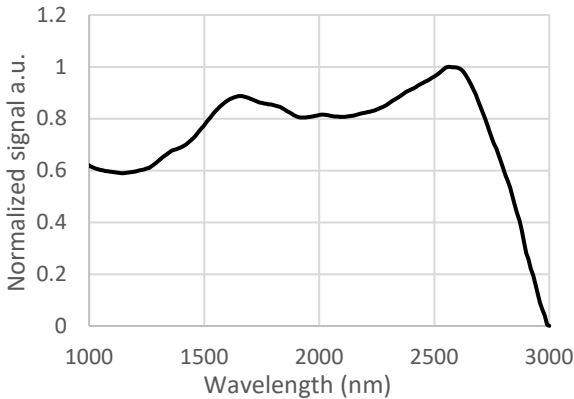
- Number of lines 1 - 3
- Number of pixels 2 - 8
- Minimum pixel width 1000  $\mu$ m
- Minimum pixel height 1000  $\mu$ m

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

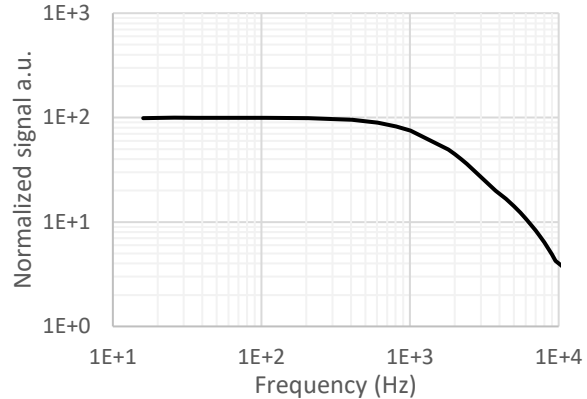
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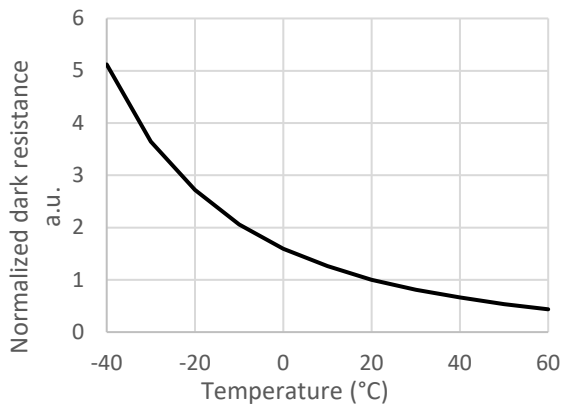
#### Typical spectral response per pixel



#### Typical frequency response per pixel



#### 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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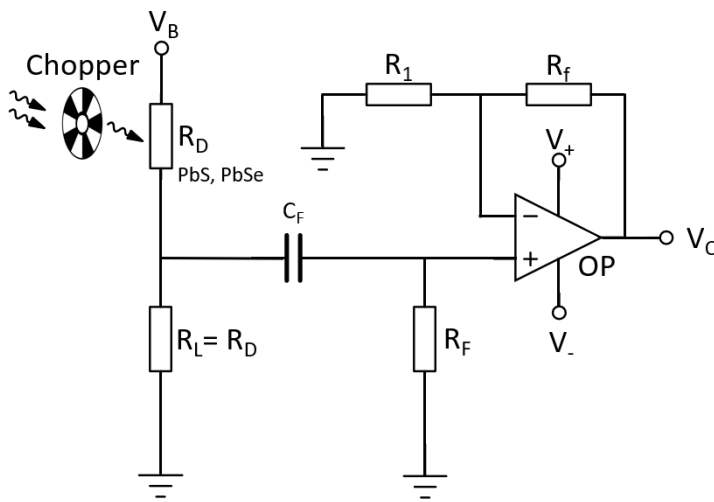
trinamiX

A brand of  
BASF – We create chemistry

### Options

- Individual housing
- Integrated filters
- Individual PCB
- Evaluation Kit available

### 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.