

# PbSe near-infrared detector

## Multi-Single-Pixel thin-film encapsulated

**trinamiX**

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BASF – We create chemistry

### Features

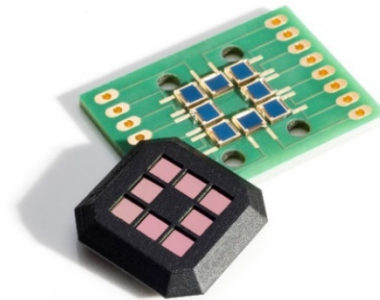
- Wire-bonded on PCB
- High durability for rugged operation
- Room temperature operation

### 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.
PbSe010010BC	1 x 1	$4.5 \cdot 10^4$	$2.3 \cdot 10^4$
PbSe020020BC	2 x 2	$4 \cdot 10^4$	$2 \cdot 10^4$
PbSe030030BC	3 x 3	$1.5 \cdot 10^4$	$8 \cdot 10^3$
PbSe060060BC	6 x 6	$8 \cdot 10^3$	$4 \cdot 10^3$



- Measured with 500K blackbody
- 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 $\lambda_p$ [ $\mu\text{m}$ ]	20% cut-off wavelength $\lambda_c$ [ $\mu\text{m}$ ]	Peak $D^*$ (620 Hz, 1 Hz) [ $\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$ ]		Time constant [ $\mu\text{s}$ ]	Dark resistance $R_D$ [ $\text{M}\Omega$ ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	3.8	4.5	$1.8 \cdot 10^{10}$	$1.2 \cdot 10^{10}$	4	0.1 - 3

### Mechanical characteristics

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

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#### Storage

- Storage temperature:  $-55^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in temporary low dark resistance

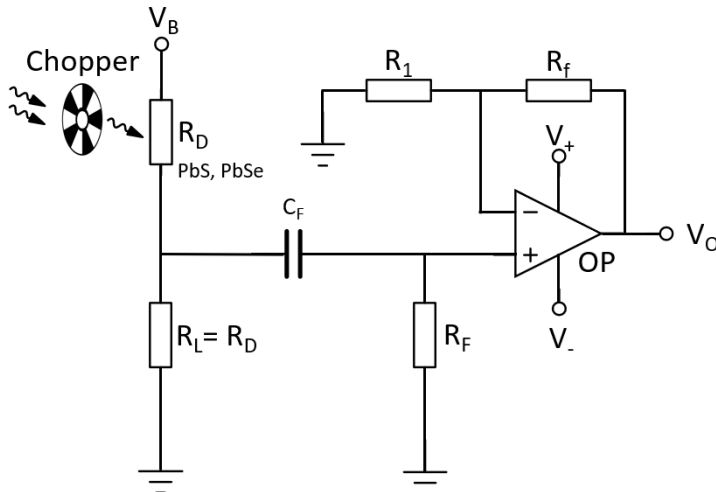
#### Handling

- Active area is scratch sensitive, protect top surface from any mechanical contact
- Ensure dust-free environment for device handling
- Operating temperature:  $-30^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$

#### 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.