PbSe near-infrared detector

Single-Pixel thin-film encapsulated

trinamiX

A brand of
BASF – We create chemistry

Features

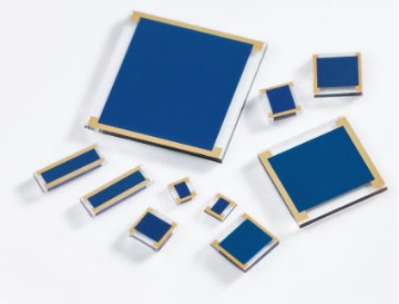
- Bondable electrode for COB mounting
- High durability for rugged operation
- Suitable for automated wire-bonding
- Room temperature operation

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.
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 500 K blackbody
- Measured in a voltage divider circuit with 50 V/mm
- Photo responsivity and detectivity are measured with constant load resistance (R_L = 1 MΩ) and calculated for matched resistance

Element temperature [°C]	Peak wave-length λ_P [µm]	20% cut-off wavelength λ_C [µm]	Peak D* (620 Hz, 1 Hz) [cm·Hz^{½}/W]		Time constant [µs]	Dark resistance R_D [MΩ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	3.8	4.5	$1.8 \cdot 10^{10}$	$1.2 \cdot 10^{10}$	4	0.1 - 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 +90°C

Wire-bonding

- Electrodes are optimized for room temperature Al-wire-bonding
- Element temperature should never exceed +90°C

Storage

- Storage temperature: -55°C to +90°C
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in temporary low dark resistance

Handling

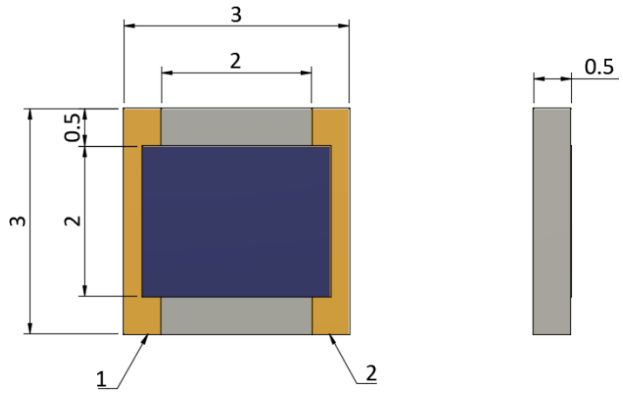
- Active area is scratch sensitive, protect top surface from any mechanical contact
- Ensure dust-free environment for device handling
- Operating temperature: -30°C to +90°C

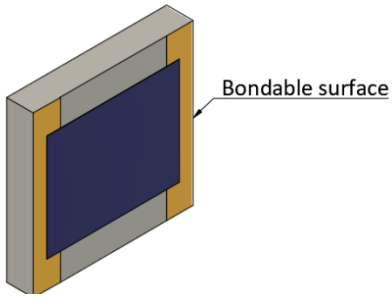
Options

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

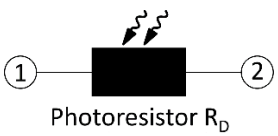
Exemplary mechanical outlines (dimensions in mm)

PbSe020020BC





Schematic



1 Electrode 1
2 Electrode 2

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ver. 1.5

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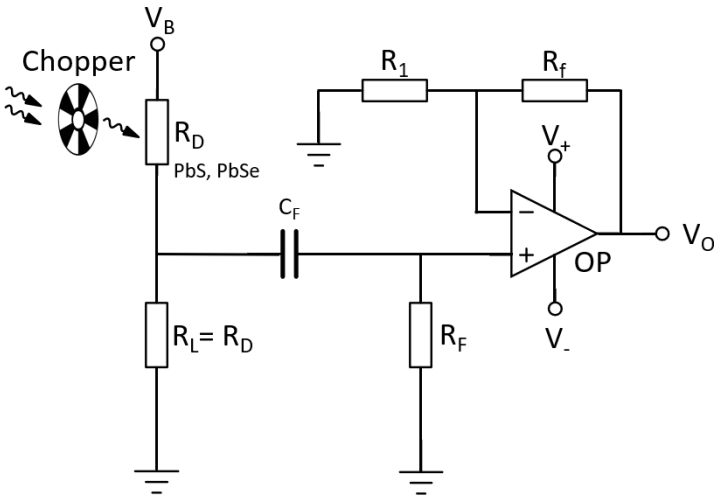
Exemplary circuit



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.