

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

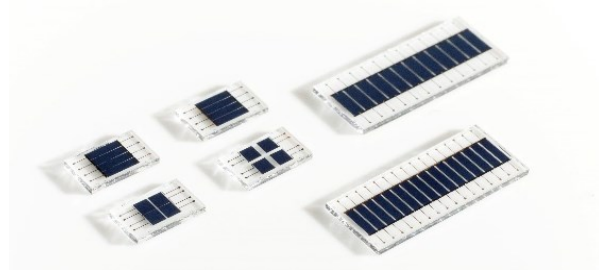
Element temperature [°C]	Peak wavelength λ_p [μm]	20% cut-off wavelength λ_c [μm]	Peak D^* (620 Hz, 1 Hz) [$\text{cm}\cdot\text{Hz}^{1/2}/\text{W}$]		Time constant [μs]	Dark resistance R_D [$\text{M}\Omega$]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	2.7	2.9	$1 \cdot 10^{11}$	$0.5 \cdot 10^{11}$	200	0.3 - 15 ^a

^adepends on pixel geometry

- Measured with 1550 nm LED, incident power 16 $\mu\text{W}/\text{cm}^2$
- Measured in a voltage divider circuit with fixed load resistor
- Photo responsivity and detectivity calculated for a voltage divider circuit with matched resistance and 50 V/mm

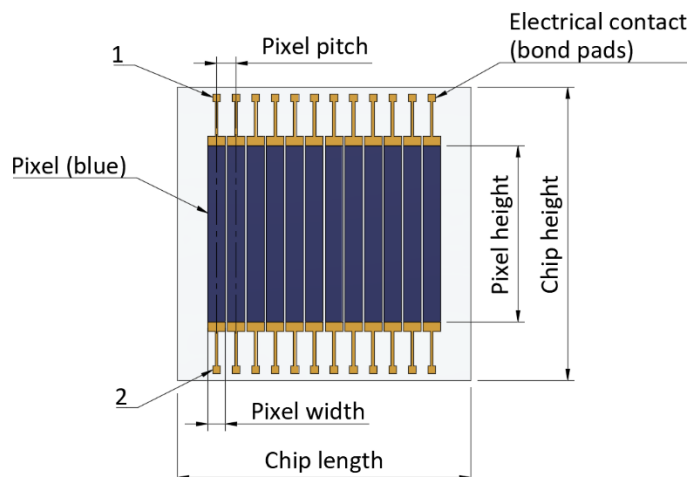
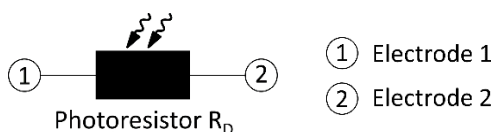
Possible mechanical characteristics

- 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:
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Schematic



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Release Date: April 14th, 2022
ver. 1.9

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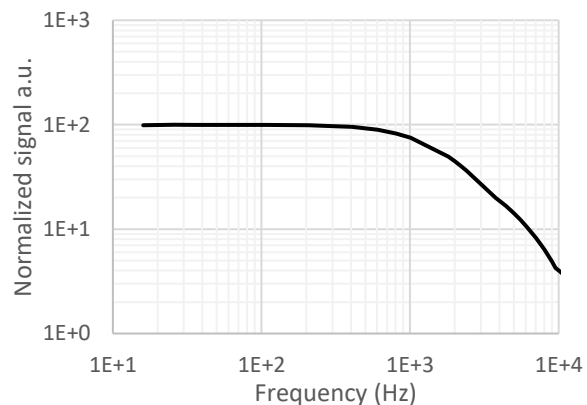
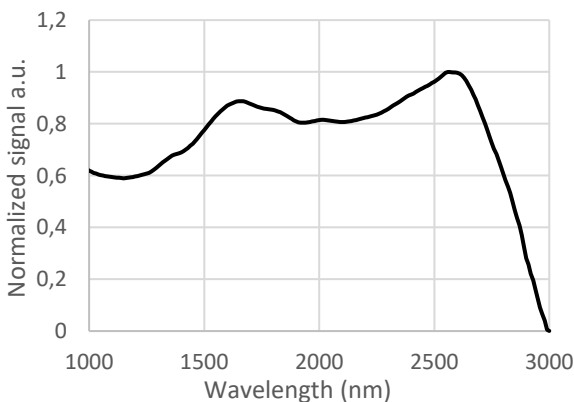
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Exemplary mechanical characteristics

Type No.	Number of lines	Number of pixels	Pixel pitch [μm]	Pixel width [μm]	Pixel height [μm]	Operating temperature [°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

Wire-bonding

- Electrodes are optimized for room temperature Al wire wedge bonding
- 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

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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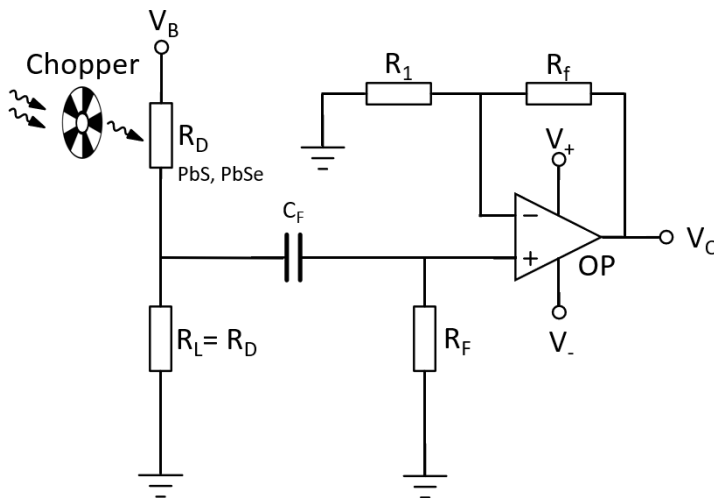
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Options

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

Exemplary circuit



- V_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.