



trinamiX

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BASF – We create chemistry

PbS near-infrared detector

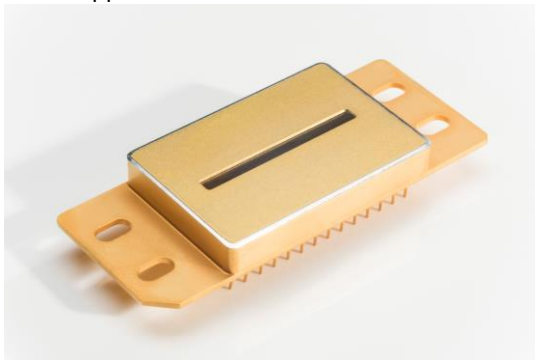
Line array module in PS28 package

Features

- Double encapsulation (thin-film and PS28 housing with 1-stage TE-cooler)
- Very high sensitivity
- Sapphire window

Applications

- NIR spectroscopy
- Fire and spark detection
- Flame and moisture monitoring



Array module specifications

Type No.	Package	Number of pixels	Pixel pitch [μm]	Pixel width [μm]	Pixel height [μm]	Operating temperature [°C]
PbS_Mod_256_0050_0040x0380	PS28	256	50	40	x 380	-30 to +70

- Pixel operability > 95%
- Array length: 12.8 mm (active area)
- Chip (Glass wafer) size: 15 x 2.5 mm

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) [cm·Hz ^{1/2} /W]		Time constant [μs]	Dark resistance R ₀ [MΩ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	2.7	2.9	1 · 10 ¹¹	0.5 · 10 ¹¹	200	3 - 30

- Measured with 1550 nm LED, incident power 16 μW/cm²
- 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

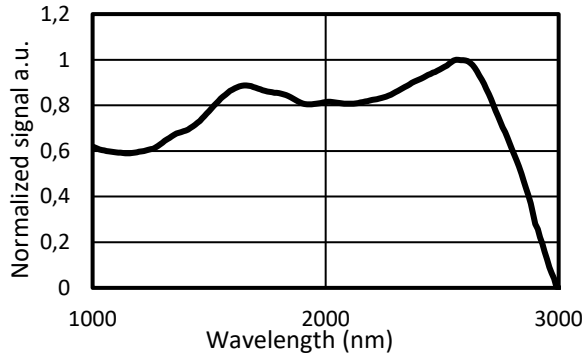
1-stage TE-cooler specifications

Ambient temperature [K]	dT _{max} [K]	Q _{max} [K]	I _{max} [A]	U _{max} [V]	ACR [Ohm]
300	70	5.0	1.3	6.1	3.5
323	72	5.4	1.3	6.8	3.9

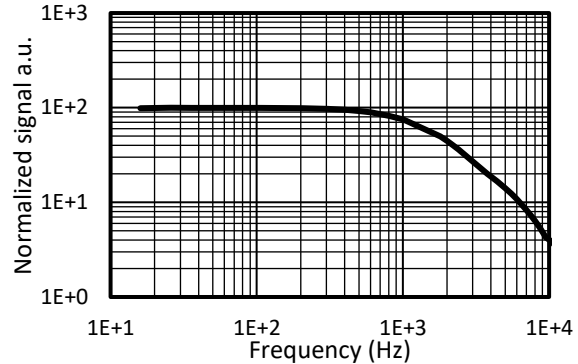
PbS near-infrared detector

Line array module in PS28 package

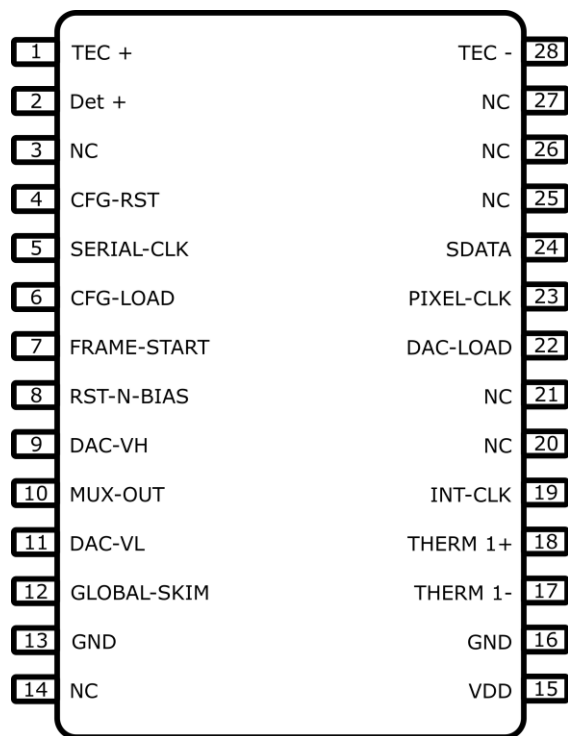
Typical spectral response per pixel



Typical frequency response per pixel



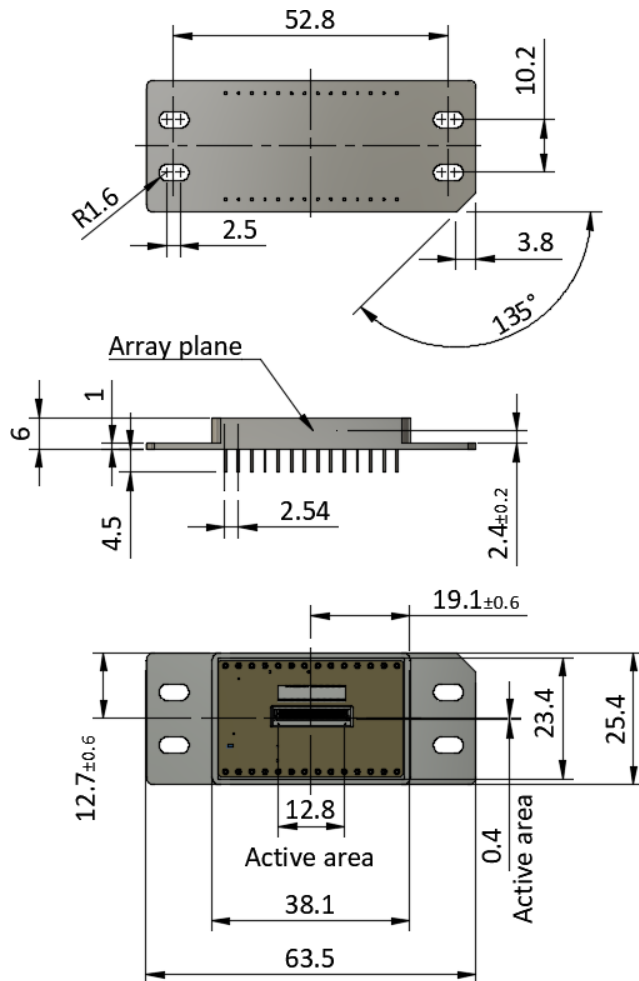
Pin connections



Other functionalities

- Integration time range: 4.025 μ s - 210 ms (digitally selectable in 3.2 μ s steps)
- Frame rate: sample rates up to 1,000 frames per second (maximum frame rate is achieved at the minimum integration time)

Mechanical outlines (dimensions in mm)



Storage

- Storage temperature: -30°C to +70°C
- Exposure to UV light results in permanent damage
- Prolonged exposure to visible light results in low dark resistance

Options

- Filter
- Variable pixel geometry
- Variable number of pixels
- Other packaging options

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.