

PbS near-infrared detector

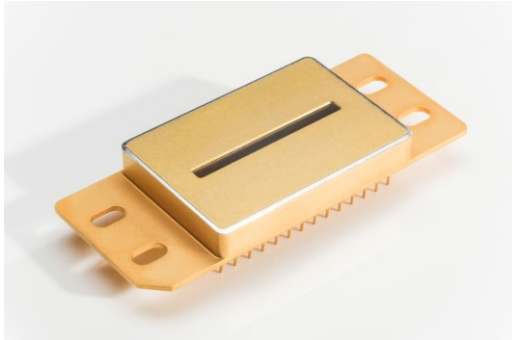
Line array module in PS28 package

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 wave-length 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 _D [MΩ]
	Typ.	Typ.	Typ.	Min.	Typ.	
22	2.7	2.9	1 · 10 ¹¹	0.5 · 10 ¹¹	200	3 - 30 ^a

^adepends on pixel geometry

- Measured with 1550 nm LED, incident power 16 μW/cm²
- Measured in a voltage divider circuit with 10 MΩ load resistor
- Photo responsivity and detectivity calculated for a voltage divider circuit with matched resistance and 50 V/mm

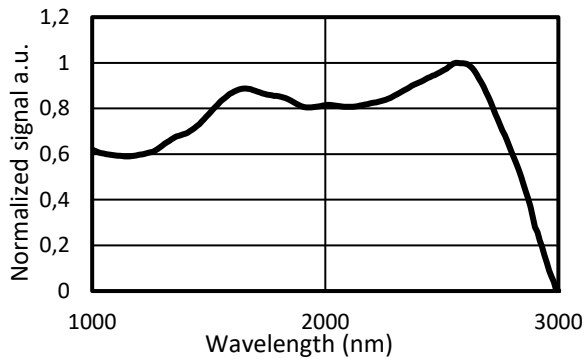
1-stage TE-cooler specifications

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

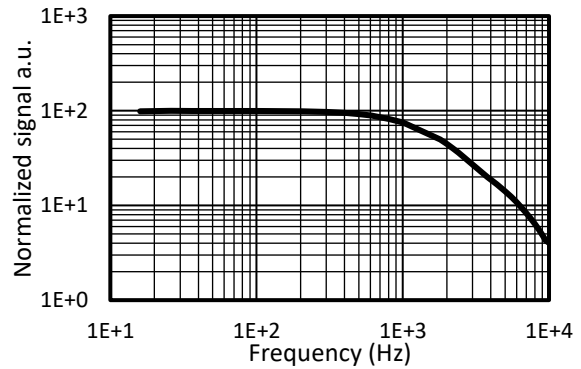
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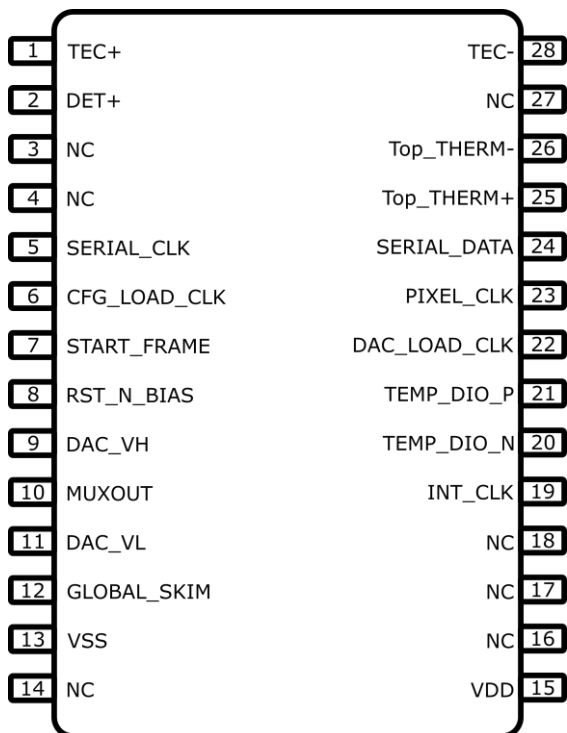
Typical spectral response per pixel



Typical frequency response per pixel



Pin connections

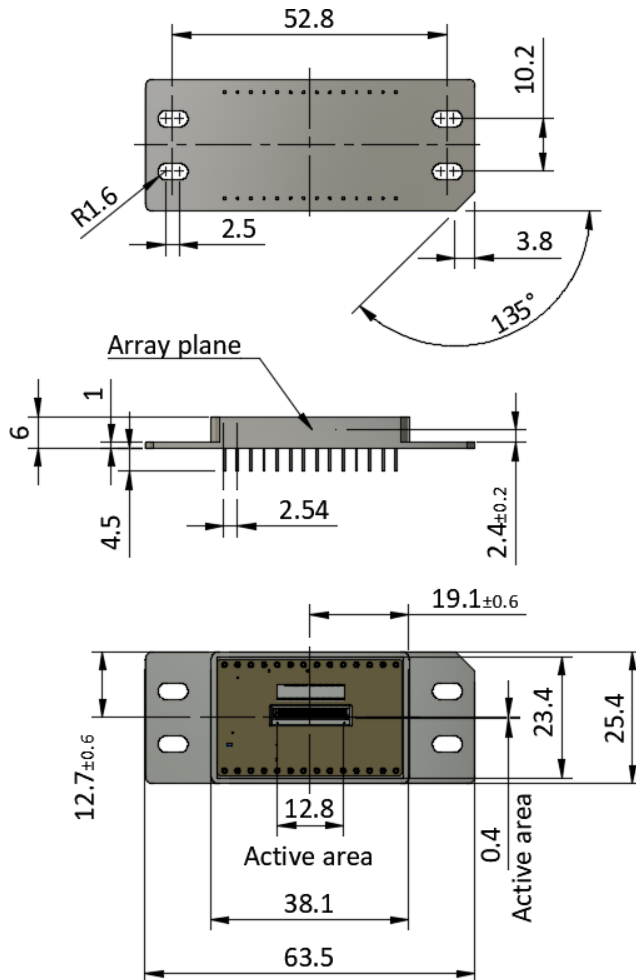


Other functionalities

- 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)

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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 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.