MPY-01 Pyroelectric Detector

Description

The SPY-01 is a vacuum compatible, extremely compact pyroelectric detector for sensitive radiation measurements from the UV to the Far-IR. It is equipped with an external power supply that enables continuous monitoring applications.

Physical Properties

Detection principle	pyroelectric
Detector material	black coated $LiTaO_3$
Weight	80 g (including cabling)
Operating temperature	-20°C to +50°C
Dimensions (HxWxD)	24.25 mm x 28.0 mm x 12.9 mm
Detector window dimensions	(5.0 x 5.0) mm^2
Active detector area	(2.0 x 2.0) mm^2
Vacuum compatibility	for pressure < 10^{-6} mbar

Electrical Properties

Power supply	± 12 V linear low noise power supply (Thorlabs LDS12B)
Power socket	3-pole, M8
Output socket	SMA
Output signal	analog
Output signal level	-5 V to +5 V

Measuring Properties

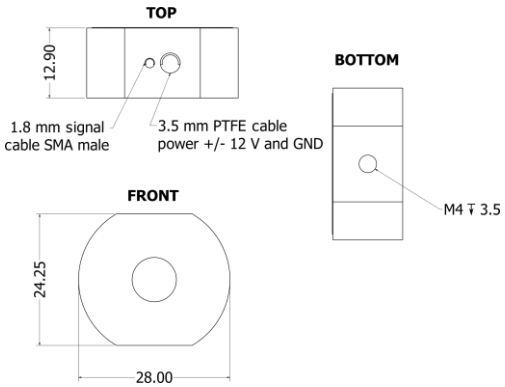
Responsivity	7.5 kV/W *
Response time (0-100%)	typ. 150 ms (corresponds to thermal time constant)
Bandwidth (-3 dB)	typ. 200 Hz
Frequency range (-20 dB)	typ. 1 Hz to 1 kHz **
Noise equivalent power (NEP)	1500 pW/√Hz *
Noise density	13 µV/√Hz
Detectivity @ 10 Hz	1.8 x 10^8 cm√Hz/W *
Detectivity @ 1 kHz	0.4 x 10^8 cm√Hz/W *
Maximum measurable power	250 µW (f = 10 Hz)
Damage threshold (max. avg. power density)	60 mW/cm^2
Spectral bandwidth	UV to THz (real bandwidth depends on the window used)
• **KBr window**	λ = 200 nm – 30 µm
• **Si window**	λ > 1.2 µm
• **PTFE window**	λ = 20 µm – 40 µm & λ > 60 µm
• **HDPE window**	λ > 40 µm
• **Diamond window**	λ > 225 µm
• **without window**	λ = 10 nm – 1000 µm

Further window materials on request.

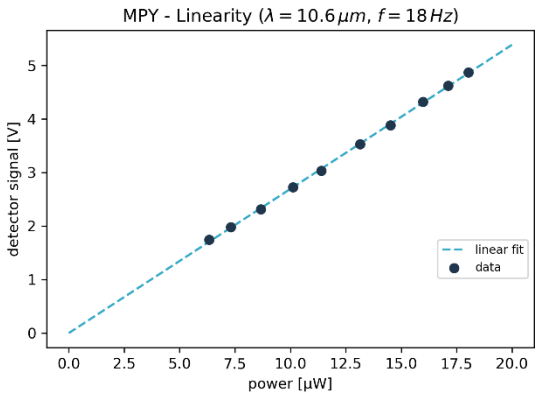
* Measured with broadband black body source at 150°C, central wavelength λ = 6.8 µm and KBr window

** Detector only sees signal changes – a chopper is required for CW applications!

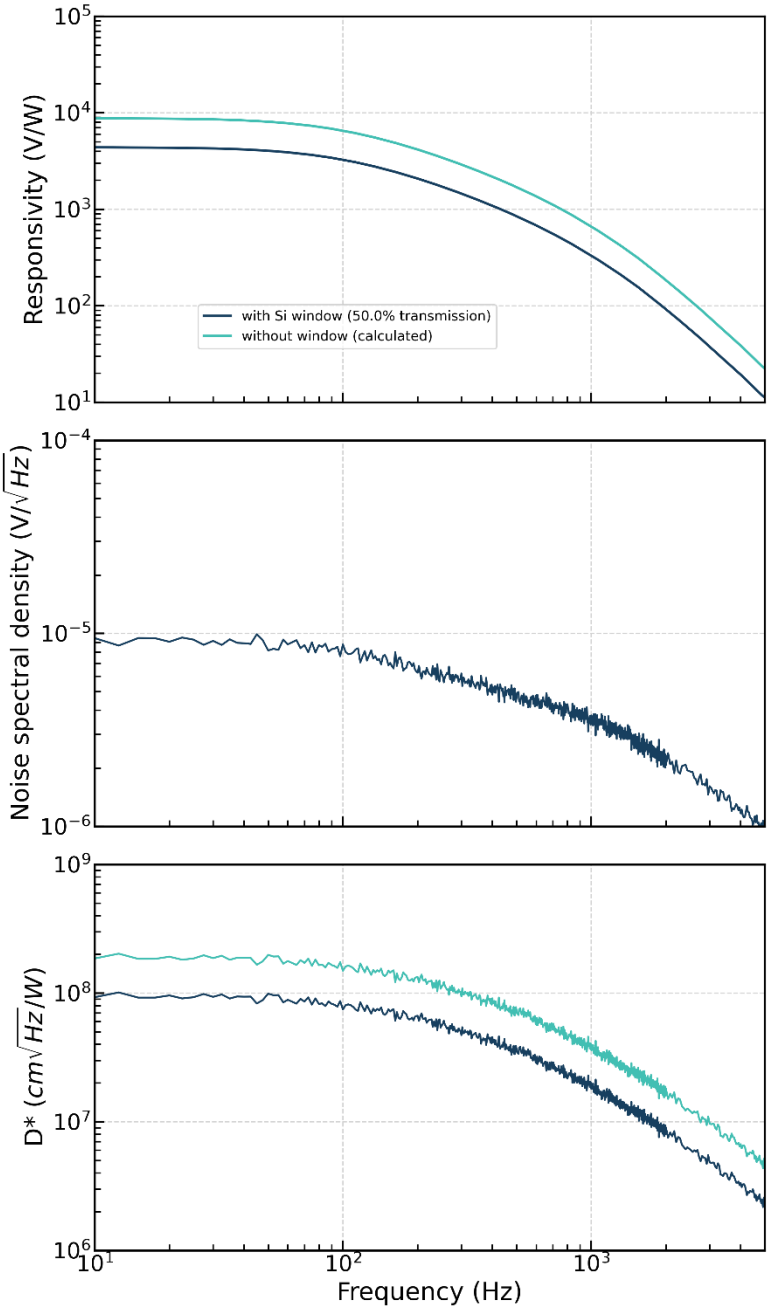
Geometric Dimensions



Linearity



Typical Performance



The responsivity and D* values are measured with a 150°C blackbody emitter with 6.8 µm peak emission and with a detector with silicon window. The values can change for other wave-lengths.

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