MPY-RS2 Pyroelectric Detector

Description

MPY-RS2 is a very fast and compact pyroelectric detector for sensitive radiation measurements from the UV to the Far-IR.
This advancement of the MPY-RS is not only faster but characterized primarily by a significantly increased detectivity. Due to its extended electronic bandwidth, it can be used without a chopper for sources with up to 100 kHz repetition rate (≈ 2% of maximum signal).

Physical Properties

Detection principle	pyroelectric
Detector material	black coated $LiTaO_3$
Weight	80 g
Operating temperature	-20°C to +50°C
Dimensions (HxWxD)	71.5 mm x 45.3 mm x 25.5 mm
Detector window dimensions	(5.0 x 5.0) mm^2
Active detector area	(2.0 x 2.0) mm^2
Thread of detector cap	SM05 (compatible to Thorlabs components)

Electrical Properties

Power supply	± 12 V linear low noise power supply (Thorlabs LDS12B)
Power socket	3-pole M8
Output socket	SMA (Adapter to BNC included)
Output signal	analog
Output signal level	-8 V to +8 V

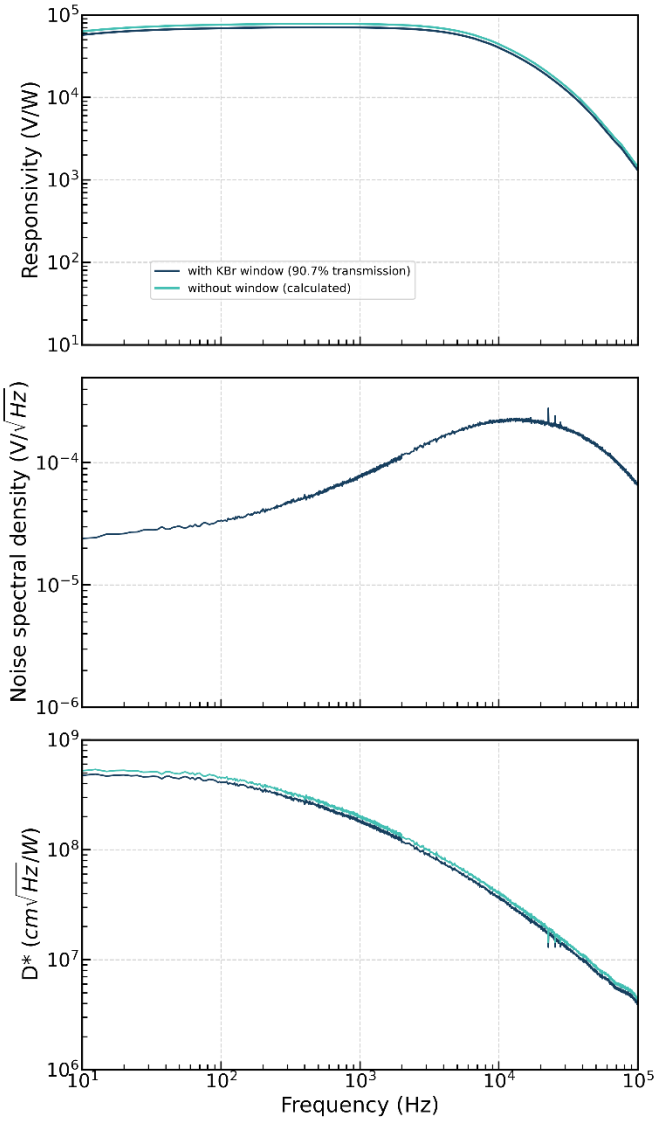
Measuring Properties

Responsivity	typ. 70 kV/W *
Bandwidth (-3 dB)	typ. 8 kHz **
Frequency range (-20 dB)	typ. 1 Hz to 50 kHz ***
Noise equivalent power (NEP)	typ. 400 pW/√Hz *
Noise density	typ. 25 µV/√Hz (rms, f = 20Hz, BW = 1 Hz, 20 °C)
Detectivity @ 10 Hz	5.0 x 10^8 cm√Hz/W *
Detectivity @ 1 kHz	2.0 x 10^8 cm√Hz/W *
Maximum measurable power	230 µW (f = 1 kHz, KBr window)
Damage threshold (max. avg. power density)	60 mW/cm^2
Spectral bandwidth	UV to Far-IR (real bandwidth depends on the window used)
• **KBr window**	λ = 200 nm – 30 µm
• **HDPE window**	λ > 40 µm
• **Diamond window**	λ > 225 µm
Further window materials on request.	

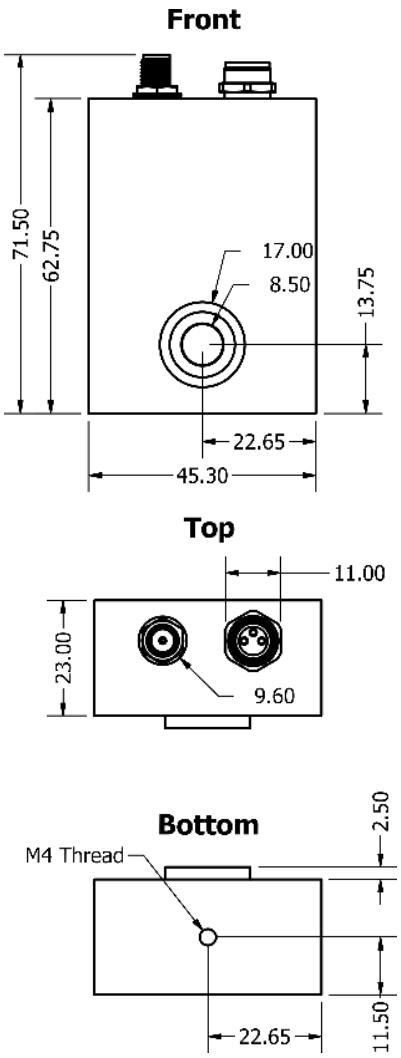
* Measured with broadband black body source at 150°C, central wavelength λ = 6.8 µm and KBr window
** Further customized bandwidth options up to 200 kHz upon request.
*** Detector only sees signal changes – a chopper is required for CW applications!

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 KBr window. The values can change for other wavelengths.

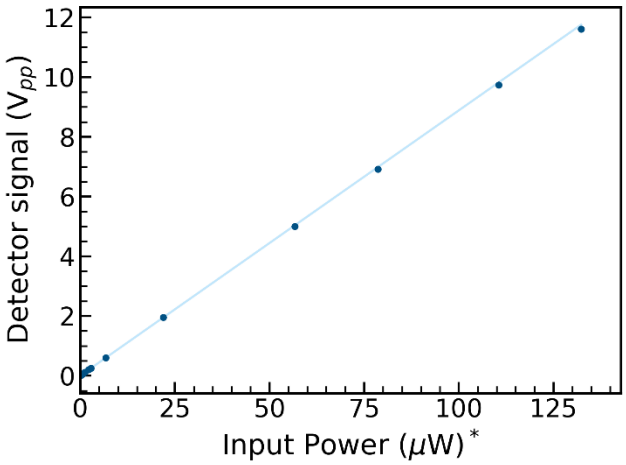


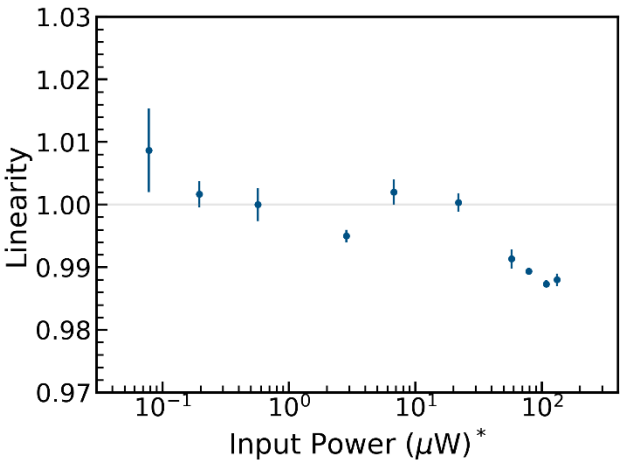
Geometric Dimensions



Linearity

The deviation from ideal linearity is < 1% over 4 orders of magnitude.





* DC-Input power at a source chopping of 50%

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