PRELIMINARY

PR No1 Pyroelectric Detector Receiver

Description

PR No1 is a very fast and compact pyroelectric detector for sensitive radiation measurements from the UV to THz range. Due to it's extended electronic bandwidth it can be used without a chopper for sources with up to 100 kHz repetition rate.

The PR No1 receiver series is the smart combination of state of the art pyroelectric detectors with high end electronics.
Two versions are available:

- PR No1 IR for standard IR applications with KBr window
- PR No1 THz for THz applications with HDPE window

Physical Properties

Detection principle	Pyroelectric
Detector material	$LiTaO_3$
Weight	80 g
Operating temperature	-20 °C to +50 °C
Dimensions (H x B x T)	62.8 mm x 45.3 mm x 23.0 mm
Detector window dimensions	dia. 5.28 mm
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
Output signal	Analog
Output signal level	-8 V to +8 V

Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

France
Laser Components S.A.S.
Tel: +33 1 39 59 52 25
Fax: +33 1 39 59 53 50
info@lasercomponents.fr
www.lasercomponents.fr

United Kingdom
Laser Components (UK) Ltd.
Tel: +44 1245 491 499
Fax: +44 1245 491 801
info@lasercomponents.co.uk
www.lasercomponents.co.uk

Nordic Countries
Laser Components Nordic AB
Tel: +46 31 703 71 73
Fax: +46 31 703 71 01
info@lasercomponents.se
www.lasercomponents.se

USA
Laser Components USA, Inc.
Tel: +1 603 821–7040
Fax: +1 603 821–7041
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Measuring Properties

Voltage responsivity	typ. 70000 V/W (f = 1 kHz)**
Frequency range	1 Hz – 100 kHz (typ. 3 dB cut-off frequency: 8 kHz)*
Noise equivalent power (NEP)	typ. 400 pW/√Hz (*f* = 20 Hz, 20 °C)**
Noise density	typ. 25 µV/√Hz (rms, *f* = 20 Hz, BW = 1 Hz, 20 °C)
Detectivity	typ. $5x10^8$ cm √(Hz)/W (f = 20 Hz)** typ. $2x10^8$ cm √(Hz)/W (f = 1 kHz)**
Maximum measurable power	230 µW (*f* = 1 kHz, KBr window)
Damage threshold (max. avg. power density)	60 mW/cm²
Spectral bandwidth	UV – THz (real bandwidth depends on the window used)

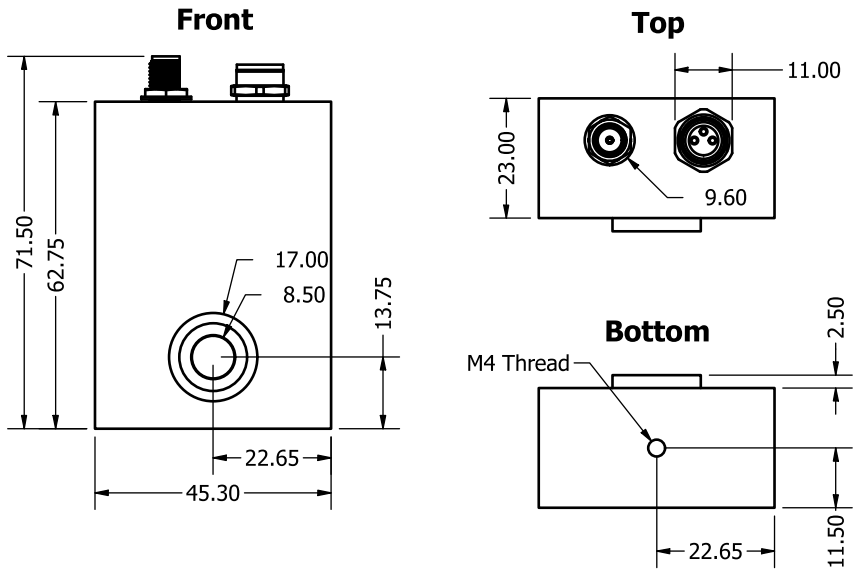
Window options

- KBr-window uncoated λ = 200 nm – 25 µm
- HDPE-window λ > 60 µm

* Detector only sees signal changes – a chopper is required for CW applications!
** Measured with broadband black body source at 150 °C, central wavelength λ = 6.8 µm and KBr window

Further window materials on request.
Depending on the window material a safety datasheet and handling requirements need to be considered.

Geometric Dimensions



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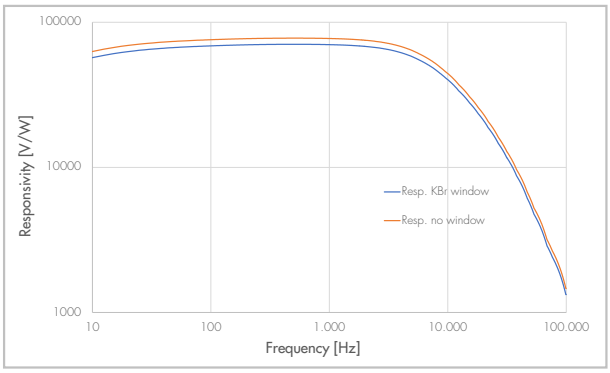
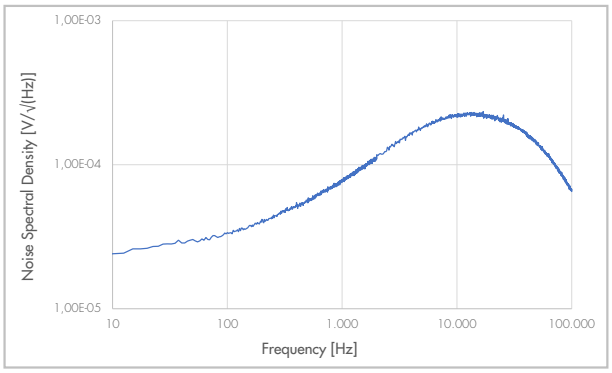
Typical Performance

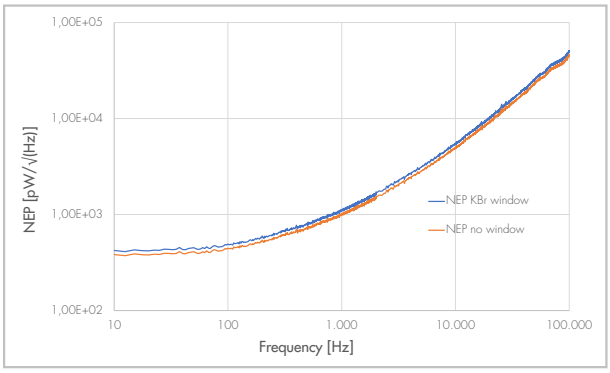
Frequency Response (λ = 6.8 µm)



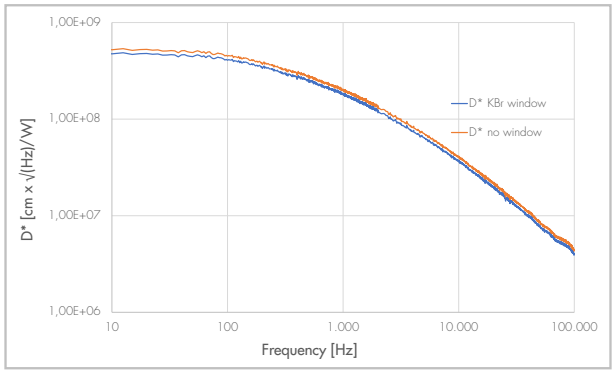
Dark Noise



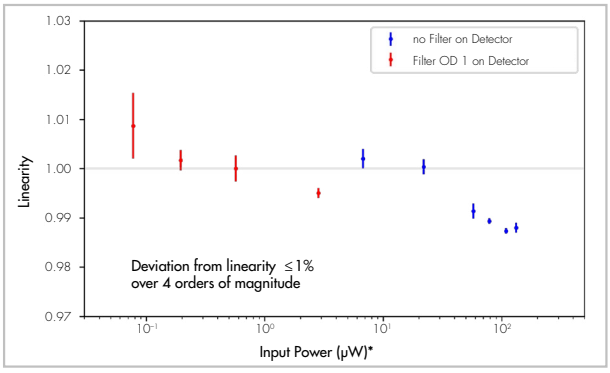
Noise Equivalent Power (NEP)

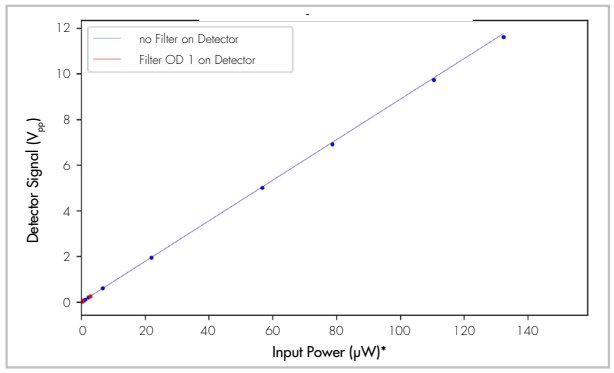


Detectivity



Linearity





Accuracy of measurement setup estimated to be 0.5%

Systematic errors: Size of apertures, drifts of source

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

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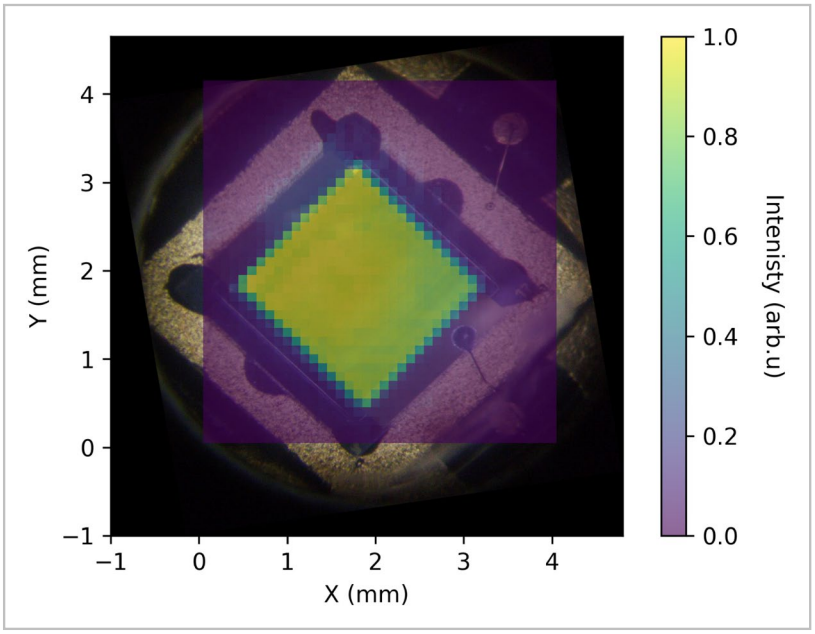
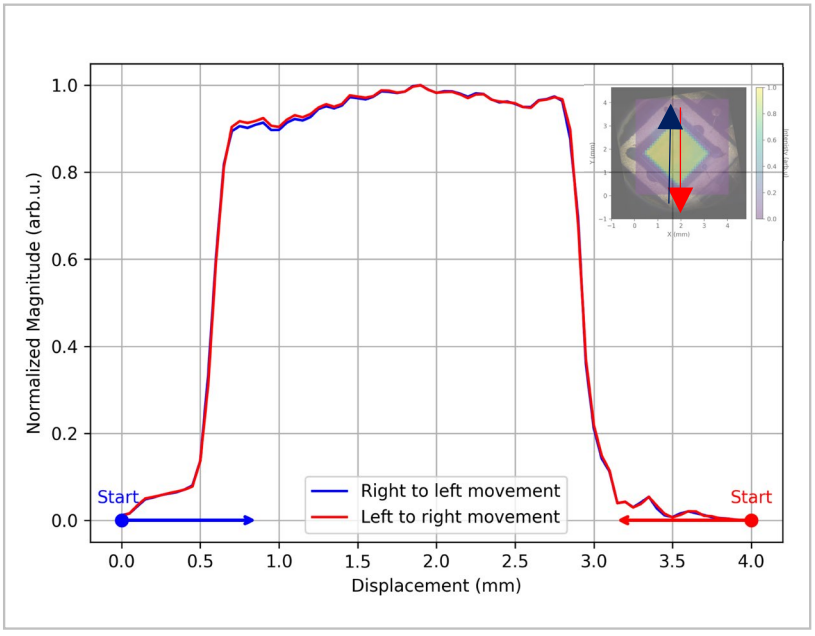
Spatial Homogenity of PR No1 Detector Element



Sensitivity map overlay over sensor



Reproducibility scanning up ↔ down

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This product is a cooperation with Wired Sense GmbH.

Product Changes

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Ordering Information

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