

PR No2 PYROELECTRIC RECEIVER

Infrared Detectors



PR No2 is a very fast and compact pyroelectric detector for sensitive radiation measurements from the UV to THz range. Due to its extended electronic bandwidth it can be used without a chopper for sources with up to 100 kHz repetition rate.

The PR No2 receiver series is the smart combination of state of the art pyroelectric detectors with high end electronics. Two versions are available:

- / PR No2 IR for standard IR applications with KBr window
- / PR No2 THz for THz applications with HDPE window

REFERENCE:

J. Mnich, J. Kunsch, M. Budden, T. Gebert, M. Schossig, J. Sotor, and Ł. Sterczewski
»Ultra-broadband room-temperature Fourier transform spectrometer with watt-level power consumption«, Opt. Express 32, 45801-45815 (2024).

<https://doi.org/10.1364/OE.541395>

INFRARED DETECTORS

PR No2 Pyroelectric Receiver



PRELIMINARY

SPECIFICATIONS

Physical Properties

Detection principle	Pyroelectric
Detector material	LiTaO ₃
Weight [g]	80
Operating temperature [°C]	-20 to +50
Dimensions (HxBxT) [mm]	62.8x45.3x23.0
Detector window dimensions [mm]	Ø 5.28
Active detector area [mm²]	2.0x2.0
Thread of detector cap	SM05 (compatible to Thorlabs components)

Electrical Properties

Power supply [V]	±12 (Linear low noise power supply (Thorlabs LDS12B))
Power socket	3-pole, M8
Output socket	SMA
Output signal	Analog
Output signal level [V]	-8 to +8

Measuring Properties

Voltage responsivity typ. [V/W]	6000 (f = 1kHz) ^a
Frequency range	1Hz - 100 kHz THz-version: (typ. 3 dB cut-off frequency: 50 kHz) ^b IR-version: (3 dB cut-off frequency: min. 35 kHz, typ. 50 kHz) ^b
Noise equivalent power (NEP)	typ. 1000 pW/√Hz (f = 20 Hz, 20 °C) ^a
Noise density	typ. 6 μV/√Hz (rms, f = 20 Hz, BW = 1 Hz, 20 °C)
Detectivity	typ. 2x10 ⁸ cm √(Hz)/W (f = 20 Hz) ^a typ. 1.6 x10 ⁸ cm √(Hz)/W (f = 1 kHz) ^a
Maximum measurable power [mW]	2.3 (f = 1 kHz, KBr window)
Damage threshold (max. avg. power density) [mW/cm²]	60
Spectral bandwidth	UV - THz (real bandwidth depends on the window used)

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

^b Detector only sees signal changes - a chopper is required for CW applications!

Window Options

KBr-window uncoated	λ = 200 nm - 31 μm
HDPE-window	λ: 15 μm - 7.5 mm; frequency f: 40 GHz - 20 THz

Further window materials on request.

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

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PR No2 Pyroelectric Receiver



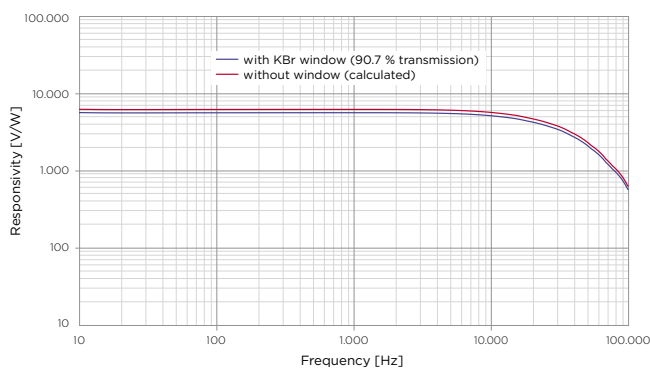
PRELIMINARY

SPECIFICATIONS

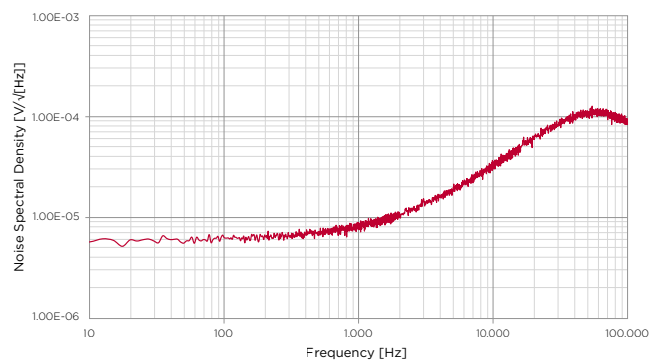
Typical Performance

Accuracy of measurement setup estimated to be 0.5%

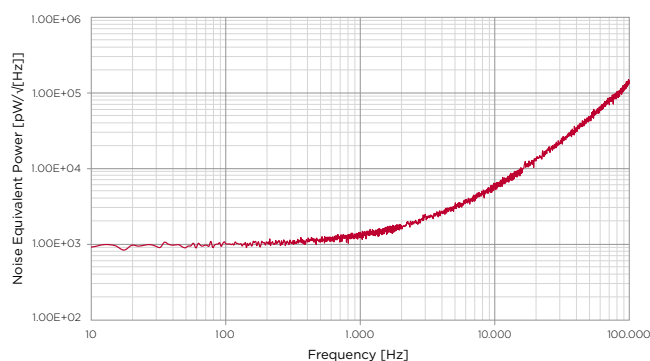
*DC-Input power of source chopping rate at 50%



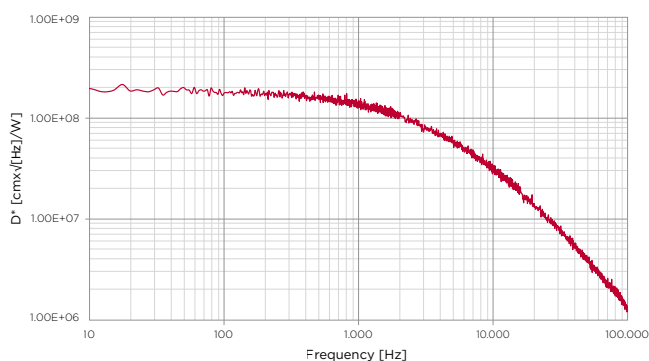
Frequency Response ($\lambda = 6.8 \mu\text{m}$)



Dark Noise



Noise Equivalent Power (NEP)



Detectivity

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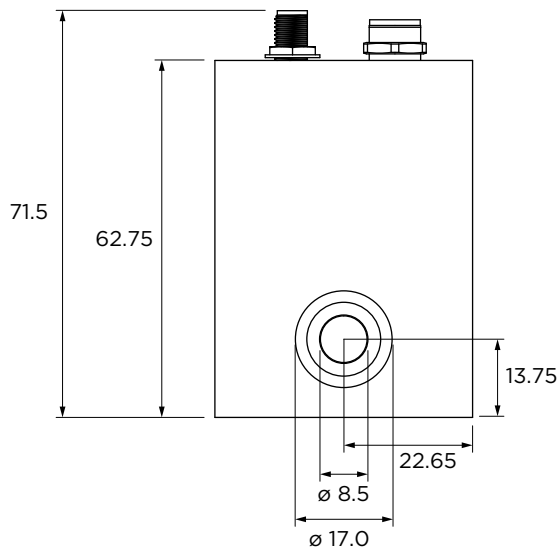
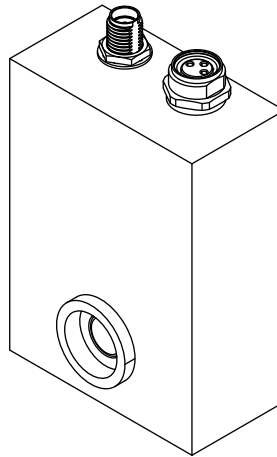
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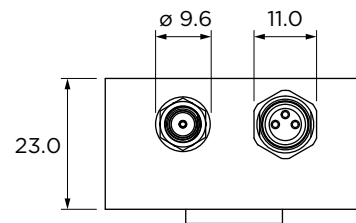
PRELIMINARY

TECHNICAL DRAWING

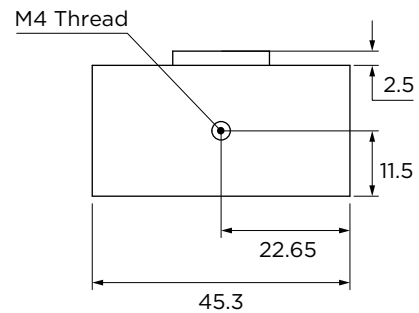
Geometric Dimensions



Front View



Top View



Bottom View

Units: mm

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PRODUCT CHANGES

LASER COMPONENTS reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application.

ORDERING INFORMATION

Products can be ordered directly from LASER COMPONENTS or its representatives.
For a complete listing of representatives, visit our website at www.lasercomponents.com
Custom designed products are available on request.

This product is a cooperation with Wired Sense GmbH.



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