

MPY-01 Pyroelectric Detector

Description

MPY-01 is a compact, battery powered pyroelectric detector for sensitive radiation measurements from the UV to the Far-Infrared range.

Physical Properties

| | |
|-----------------------------------|--|
| Detection principle | pyroelectric |
| Detector material | black coated LiTaO ₃ |
| Weight | 80 g (including battery) |
| Operating temperature | -20°C to +50°C |
| Dimensions (HxWxD) | 76.0 mm x 48.5 mm x 22.9 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 | 1 x MN21 battery (12V) |
| Power consumption | typ. 0.3 mA |
| Measuring time per battery | typ. 30 h |
| Output signal | analog |
| Output signal level | -5 V to +5 V |
| Output socket | BNC |

Measuring Properties

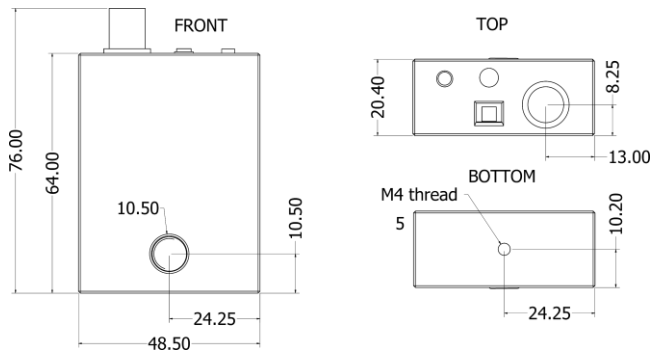
| | |
|---|--|
| Responsivity | 7.5 kV/W * |
| Response time (0-100%) | typ. 150 ms (corresponds to thermal time constant) |
| Bandwidth (-3 dB) | typ. 200 Hz |
| Frequency range (-20 dB) | typ. 1 Hz to 1 kHz ** |
| Noise equivalent power (NEP) | 1500 pW/√Hz * |
| Noise density | 13 μV/√Hz |
| Detectivity @ 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 Far-IR (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.

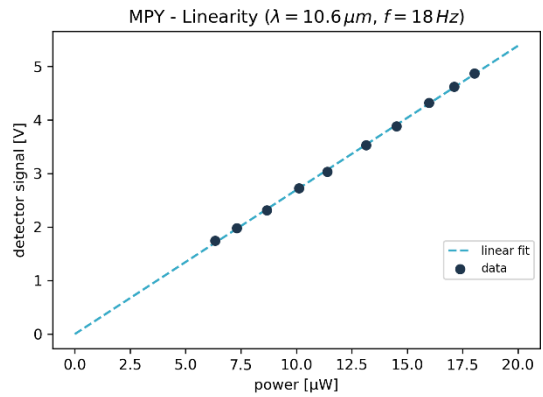
* Measured with broadband black body source at 150°C, central wavelength λ = 6.8 μm and KBr window

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

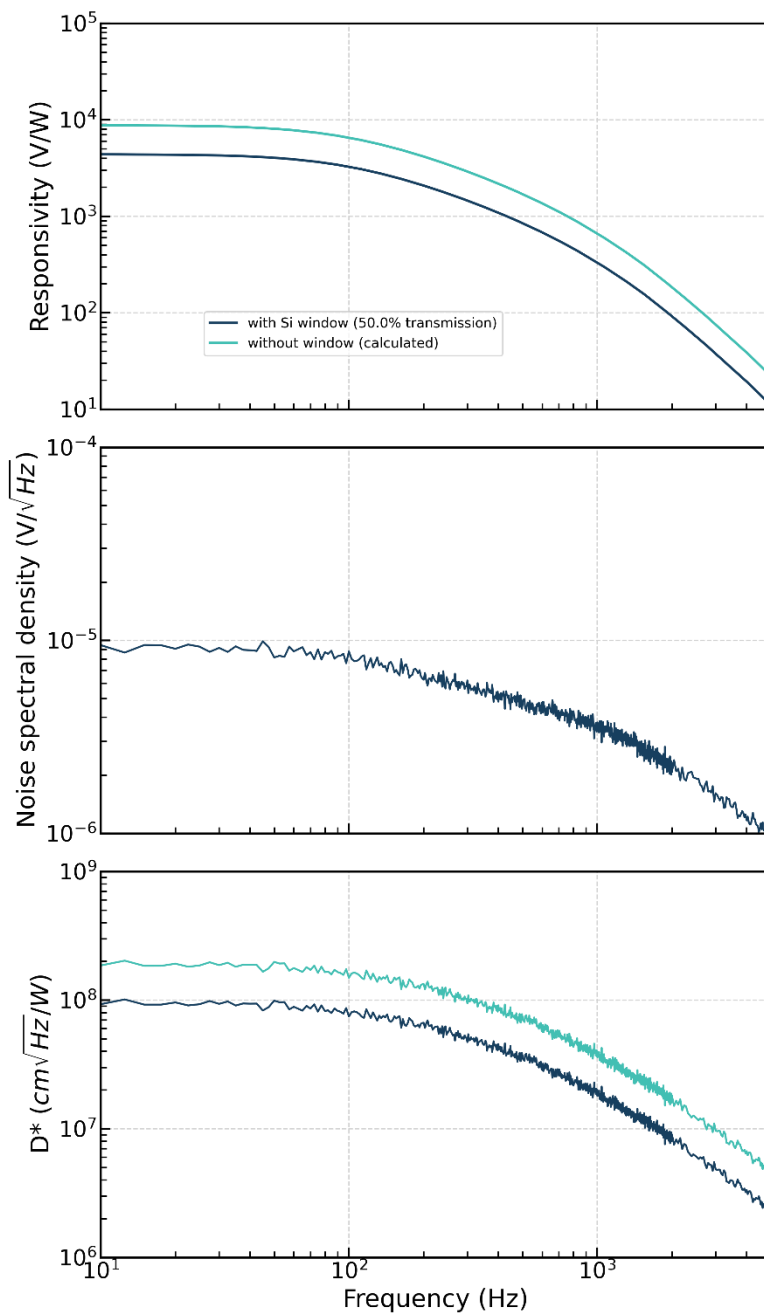
Geometric Dimensions



Linearity



Typical Performance



The responsivity and D^* values are measured with a 150°C blackbody emitter with $6.8 \mu\text{m}$ peak emission and with a detector with silicon window.

The values can change for other wavelengths.