

# Terahertz pyroelectric sensor

## ➤ TeraPyro

A high-performance solution for THz sensing

High sensitivity (up to 2 kV/W) and low NEP

Broad spectral range from 0.1 - 30 THz

High speed detection (up to 2.5 kHz)

Interchangeable pre-aligned optics

High quality THz integrated optics

Sensitivity and bandwidth switch



The TeraPyro sensor is a compact and highly sensitive device, based on the combination of a high-quality absorbing black coating, paired with a LiTaO<sub>3</sub> pyroelectric crystal. The broad absorption range of the coating allows the use of this sensor over a large spectral range (from 0.1 to 30 THz). The high sensitivity and low NEP offer no compromise on performances. The integrated, pre-aligned, high quality THz optics based on AR coated Si-lenses ensures

maximized optical coupling to the sensor. The optics are highly modular allowing three configurations: bare sensor, collimated input or focused input with 50 mm working distance. A sensitivity switch allows to reduce the response of the detector and gain in response time for faster measurements. A BNC output ensures fast and standard connectivity for data recovery. The sensor operates on a common +/-12 V DC power supply.



#### Connection:

- ✓ BNC output connection
- ✓ +12/-12 V DC Power supply

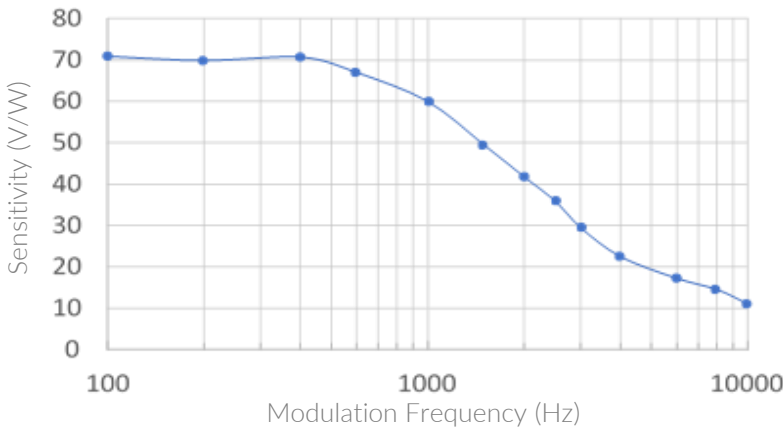
#### Plus

- ✓ Interchangeable optics
- ✓ Sensitivity selection switch
  - 3 positions: High, Medium, Low

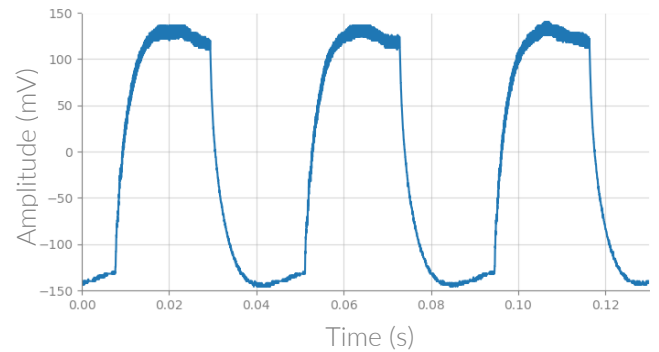
#### Performances

- ✓ Stability: <1% over 1h
- ✓ SNR on lock in: > 300
- ✓ Detection up to 2.5 kHz mod.

Sensitivity on low gain channel



Typical waveform



#### Features:

- High quality HRFZ-Si THz optics with anti-reflective (AR) coating or broadband Zeonex polymer optics
- Modular optics:
  - Bare sensor
  - Collimated input
  - Focused input with 50mm working distance
- 3 channels sensitivity switch for optimized dynamics and response time
- Standard M4 optical post assembly

#### Applications:

- THz sensing
- High definition imaging
- Optical sources characterization
- Power measurements
- High frequency signal detection

Specifications	TeraPyro		
<b>Optical data</b>			
Frequency range	From 0.1 to 30 THz		
Wavelength	From 10 to 3000 $\mu\text{m}$		
Maximum power density	50 mW/cm <sup>2</sup>		
Noise equivalent power	1.6 nW/ $\sqrt{\text{Hz}}$		
<b>Sensitivity switch</b>			
	High	Medium	Low
Sensitivity at 2.5 THz	1.8 kV/W	390 V/W	70 V/W
Rise time	80 ms	10 ms	1.5 ms
Maximum chopper frequency	15 Hz	150 Hz	2.5 kHz
<b>Options</b>			
Optical collection lenses	✓		
Power supply connector	✓		
Optical post assembly	✓		
<b>Dimension and weight</b>			
Working distance	50 mm		
Sensor area	2x2 mm		
Diameter	67 mm		
Length	125 mm		
Weight	300 g		