THz System™
Advance the future

Portable THz spectrometers

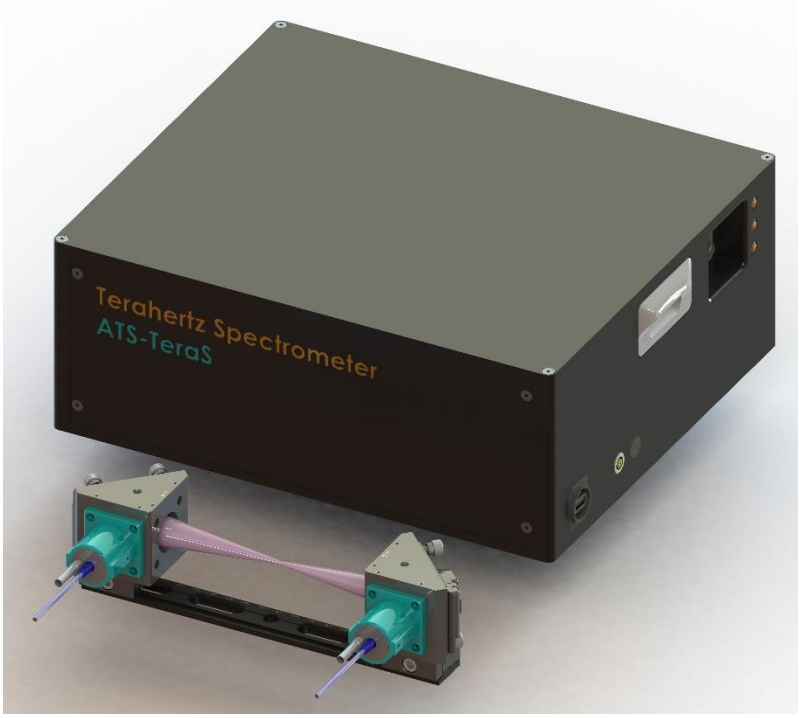
Product model No: ATS-TeraS

Introduction

Terahertz (THz) frequencies are a band of the electromagnetic wave spectrum, ranging from 0.1 THz to 10 THz, corresponding to wavelengths between 3 mm to 0.03 mm (Fig.1). Compared to its neighbors, e.g. microwaves and infrareds, which have been intensively studied during the past century and widely applied in our daily lives, the development of THz technologies is relatively lagged. However, the importance of THz waves should not be underestimated. It has been demonstrated that a wide range of chemicals, such as drugs-of-abuse and explosives, have intrinsic absorption peaks (analogous to fingerprints) at THz spectrum range, which endow these waves unique capabilities in safety surveillance related applications. Additionally, some tumours and medicines also have the distinctive fingerprints which can also be detected by THz waves, confirming the potential of THz techniques in healthcare.

The ATS-TeraS re-defined the THz spectrometers for wide range of characterizations. It is a self-contained, all fiber based "click & run" machine. The researchers can focus on their innovative research rather than the trivial instrumentation. The dynamic range of the system is higher than 85 dB (typical 90 dB), and the bandwidth coverers the spectrum range from 0.1 – 5.0 THz. In the high-speed mode, tens of THz traces are ready in one second for further analysis. These unbeatable features make ATS-TeraS a powerful tool for your research.

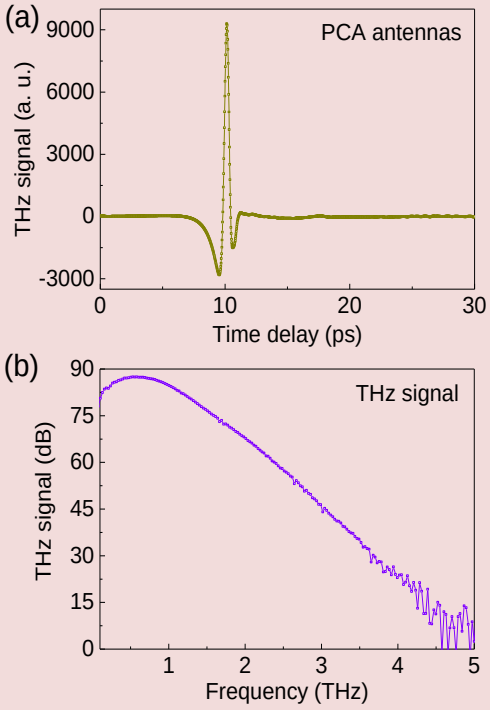
THz Spectrometer



Key Features

- High sensitivity (Dynamic range 85 dB）
- Broadband spectrum（0.1 – 5.0 THz）
- Fast scan（20 ms/scan）
- Robust & stable

An example data from the ATS-TeraS



Upgradable features (Basic)

1. Reflection mode
2. Fully automatic sample loading/unloading

Upgradable features (advanced)

1. 2D sample mapping
2. Near field THz
3. THz beam polarization control
4. Compatible Magnetic field
5. Cryostat & heater

Application examples

The characterization of the THz optical properties of wide range of materials

Non-destructive, non-invasive material identification

Conductivity characterizations

Sample thickness & dielectric properties analysis

Specification

	ATS-TeraS Key spec
THz detector	Photoconductive antennas (InGaAs)
THz emitter	Photoconductive antennas (InGaAs)
THz power	> 50 uW
Laser source	1560 nm, 100 MHz with pulse width <60 fs
Spectrum bandwidth	0.1 – 5.0 THz
Signal to noise ratio	>85 dB (high precision mode)
Signal to noise ratio	>60 dB (high speed mode)
Optical delay management	0 - 150 ps, 1.4 fs resolution (Ultrafast shaker)
Optical delay management	0 -1500 ps, 2 fs resolution (Compensation stage)
Software	Real time data analysis & report generation
Dimensions1	35 cm × 30 cm × 15 cm

Notes:
[1]Power Cord and antennas take extra space.

Installation requirement

Power[1]	220 VAC, 50 Hz, 100 W
Preferred testing environment	RH < 2 %
Space required	> 55 cm × 40 cm

[1]Battery powered version available as a standard choice.

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