ADVANTEST

Sales of this product have ended.

Terahertz Wave Spectroscopy and Analysis Platform

Full Coverage of Applications From R&D to Industrial Testing

Optimal for a wide range of terahertz research and applications

The TAS7500TS Terahertz Wave Spectroscopy and Analysis Platform consists of an optical fiber laser module and a data acquisition unit. Flexible source selection and source/detector placement allow the user to build customized configurations

Supports user supplied accessories such as

- Cryostat
- Magnetic field generator
- Translation stage

1 msec/scan super-high-speed terahertz optical sampling measurement

Low frequency, standard, and broadband coverage THz detectors

FEATURES

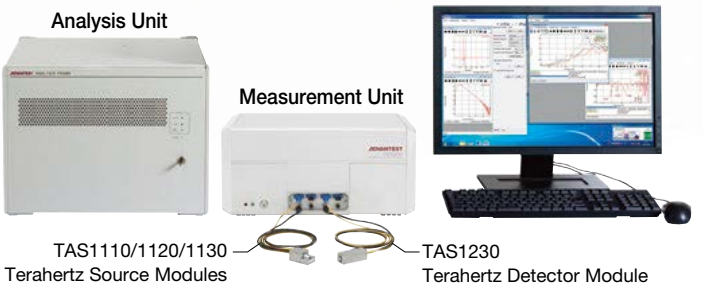
Fiber-coupled THz source/detector modules for flexible optical configuration

Optical path length up to 4 meters

Optional software switchable duplexer supports two-channel operation

Basic Configuration

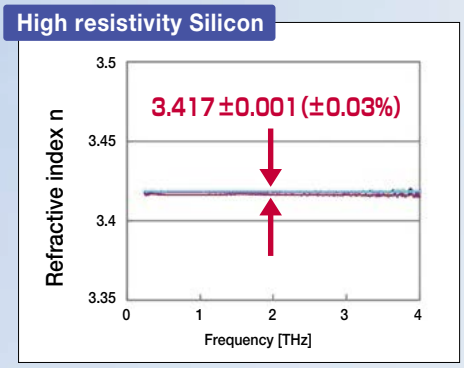
TAS7500TS / TAS7400TS Terahertz Optical Sampling System



TAS7500TS / TAS7400TS : Superior Performance

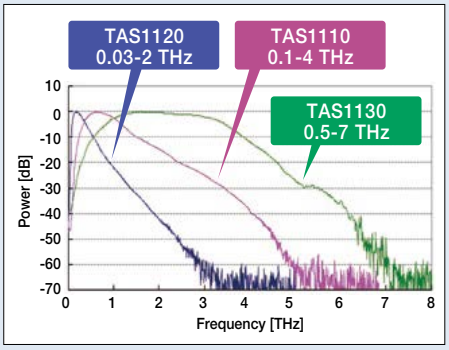
Excellent Reproducibility

Advantest's proprietary low-jitter fiber laser and analog signal analysis technology enable superior refractive index (phase) measurement repeatability of within ±0.03%.



Broadband Terahertz Spectroscopy

In addition to standard type TAS1110, two specialized source modules - the low frequency type TAS1120 and the broadband type TAS1130 - expand the bandwidth coverage of the platform to serve a broad array of applications.



Application	Spectroscopic analysis of terahertz optical devices and chemical materials	Materials research and development in the sub-terahertz range	Spectroscopy and analysis in the terahertz region up to 7 THz
Target Materials	Polymers/polymorphic crystalline forms/biomaterials/ controlled substances/ metamaterials/food/crops/ construction materials	Dielectric materials/paint/ plastics/construction materials	Aqueous solutions/liquid solutions/oxides/biomaterials/ functional devices/graphene/ resinous materials
Frequency Range	0.1 ~ 4 THz	0.03 ~ 2 THz	0.5 ~ 7 THz
THz source Module	TAS1110	TAS1120	TAS1130
THz Detector Module	TAS1230		

Terahertz Optical Sampling System

TAS7500TS 1 ms/scan　TAS7400TS 200 ms/scan

FEATURES

- The system uses two channels of ultra short pulse lasers (1550 nm) with either biased output (for THz generation) or signal input (for THz detection). Advantest's unique optical sampling method, utilizing phase-modulated dual-laser-synchronized control technology without a mechanical optical delay line, enables extremely high speed terahertz spectroscopy.
- The basic configuration has a single channel input and output, and an optional second channel with software controlled duplexer can be added.
- Spectroscopic functionality is implemented by connecting optional fiber-coupled THz source and detector modules.
- Ethernet remote control option enables support for remote programming of THz measurement and analysis functions and peripheral equipment.

TAS7500TS

Terahertz Source Modules

TAS1110
Standard: 0.1～4 THz

TAS1120
Low frequency type: 0.03～2 THz

TAS1130
Broadband type: 0.5～7 THz

FEATURES

- Easy to use all-in-one THz source modules complete with a fiber pigtailed compact housing.
- TAS1110 and TAS1120 consist of a photoconductive antenna and a hyper-hemispherical silicon lens. Current monitor and thermistor on the built-in bias circuit deliver stable output
- intensity regardless of environmental temperature changes. TAS1130 is a Cherenkov THz source module that utilizes non-linear optical crystal $LiNbO_3$ waveguides.

Usage:
- Broadband THz source for THz spectroscopy and spatial mapping
- Difference frequency THz generation
- THz frequency comb generation


TAS1130

Terahertz Detector Module

TAS1230

FEATURES

- Easy to use all-in-one photoconductive THz detector complete with hyper-hemispherical silicon lens and fiber
- pigtailed compact housing.
  THz waves are sampled by introducing 1550 nm ultra short
- laser pulses.
  Built-in trans-impedance (current-voltage transfer) amplifier with 500 kHz bandwidth simplifies implementation.

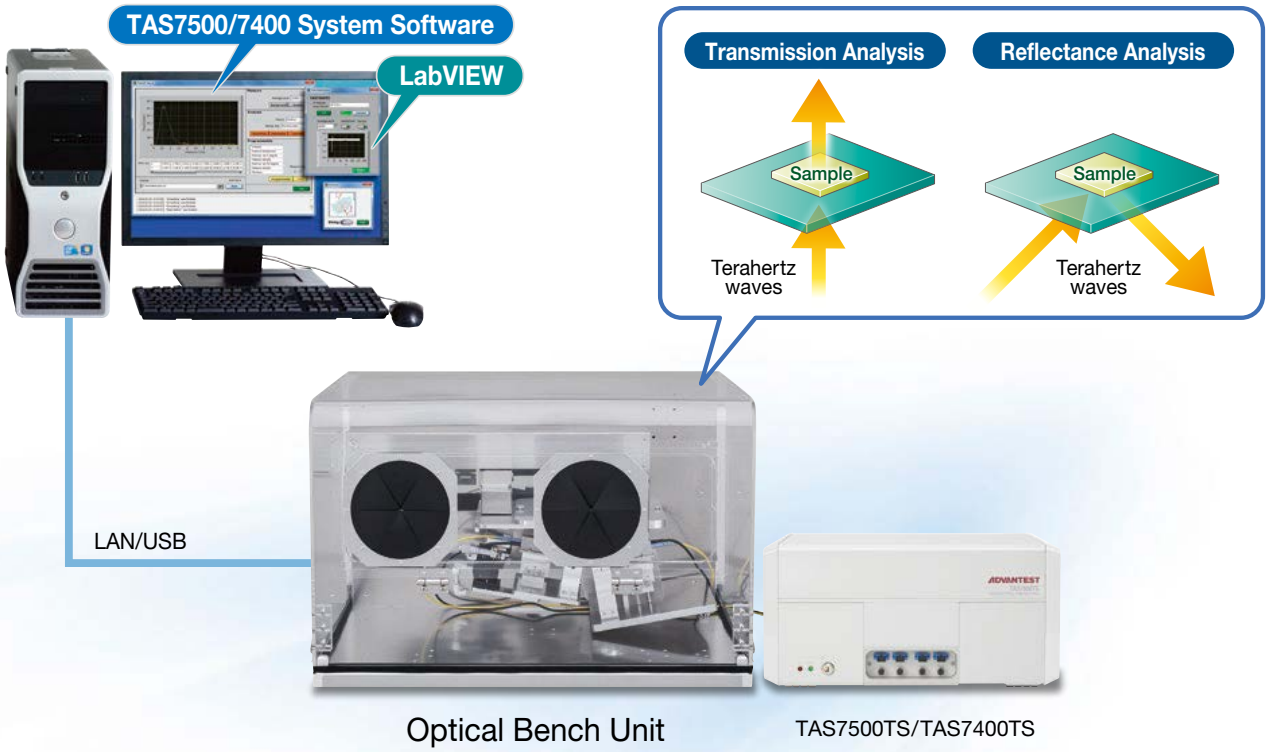
Usage:
- THz wave generation for time domain spectroscopy (TDS), etc.


TAS1230

System Configurations with the Optical Bench Unit Option

Supports Measurement & Imaging via Transmittance and Reflectance Methods

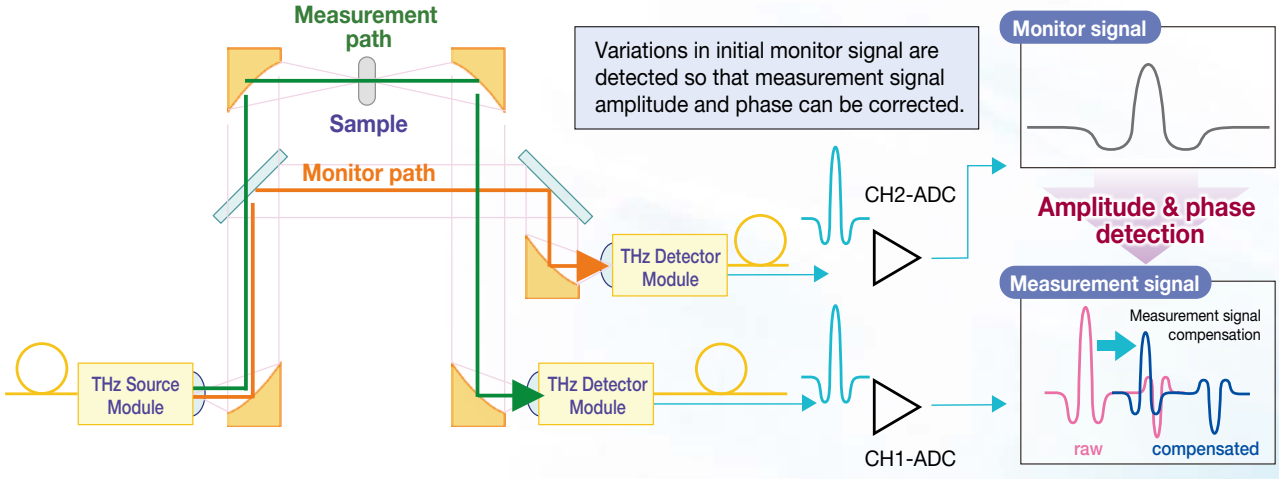
- Can measure and render 2D images of specimens up to a maximum size of 150mm x 150mm
- Remote programming option supports Visual Basic, Excel VBA, C#, and LabVIEW programming languages. Calculation libraries enable users to easily create programs including analysis of acquired data.
- Sample programs are provided for each language, enabling users to build system configurations with linked peripheral equipment.



Dual Channel Monitoring Option

Supports highly stable measurement for long measurement times.

Dual beam path architecture enables highly stable measurement over long periods. By using this option, the system can monitor the amplitude and phase fluctuation during the measurement using the second detector and compensates automatically.



Specifications

TAS7500TS/TAS7400TS Terahertz Optical Sampling System

Items		Specification				
		TAS7500TS			TAS7400TS	
System configuration		Dual ultra-short pulsed optical fiber laser (for THz generation and detection) measurement unit, analysis unit, controller & analysis PC				
Excitation laser	Center wavelength	1550 nm				
	Output power	≧ 20 mW (Option: Max. ≧50 mW)*1				
	Pulse width	≦ 50 fs (Using 1.5 m fiber)*1				
	Repetition rate	50 MHz ± 200 Hz				
	Optical output port	THz generation: 1 port, THz detection: 1 port (can be optionally increased to 2 of each)				
Measurement specifications	Measurement method	Terahertz optical sampling method (phase modulation method)				
	Time resolution	2 fs				
	Frequency resolution	3.8 GHz	7.6 GHz	61.0 GHz	1.9 GHz	7.6 GHz
	Scan range	262 ps	131 ps	16 ps	524 ps	131 ps
	Throughput	16 ms/scan	8 ms/scan	1 ms/scan	200 ms/scan	
	Frequency accuracy	±10 GHz*1				
General specifications	Usage environment	Temperature range: +10℃ to +30℃ Relative humidity: 80% or less (no condensation)				
	Storage environment	Temperature range: -10℃ to +50℃ Relative humidity: 80% or less (no condensation)				
	Power	AC100V(100-120)/200V(220-240)±10%, 50/60 Hz, 250VA (not including analysis PC)				
	Size/Weight	Analysis unit: 430 (W) × 540 (D) × 330 (H) mm / Analysis unit: 30 kg or less Measurement unit: 430 (W) × 240 (D) × 220 (H) mm / Measurement unit: 14 kg or less				

*1: At temperatures of:23℃±5℃

TAS1110/1120/1130 Terahertz Source Module

Items		Specification			Notes
		TAS1110 (Standard)	TAS1120 (Low frequency Type)	TAS1130 (Broadband type)	
Generation method		Photoconductive antenna		Cherenkov type THz wave generation using $LiNbO_3$ waveguide	
Bandwidth (SNR=1)*2*3		0.1 to 4 THz	0.03 to 2 THz	0.5 to 7 THz	Input power: 20 mW (TAS1110 / TAS1120) 50 mW (TAS1130) Laser pulse width: 50 fs
Dynamic range*2*4 (Peak level)	with the TAS7500TS*5	≧ 70 dB	≧ 60 dB	≧ 70 dB	
	with the TAS7400TS*6	≧ 60 dB	≧ 50 dB	≧ 60 dB	
Input optical fiber connector		ø 3 mm 1550 nm Polarization maintaining fiber			Length: 1.5 m
Size		55 mm × 20 mm × 20 mm		43 mm × 24 mm × 21 mm	Without fiber pigtail

*2: Detector: TAS1230 *3: In case of measuring sample with the TAS7500TS, at frequency resolution: 7.6 GHz.
*4: The peak level frequency varies in each system, and the dynamic range on each frequency varies in each system. *5: Number of integration: 262144 *6: Number of integration: 16384

TAS1230 Terahertz Detector Module

Items		Specification	Notes
Detection method		Photoconductive antenna	
Bandwidth (SNR=1)		0.1 to 4 THz (Generator: TAS1110) 0.5 to 7 THz (Generator: TAS1130)	Input power:20 mW Laser pulse width: 50 fs
Dynamic range (Peak level)	with the TAS7500TS	≧ 70 dB (Detector: TAS1110, TAS1130) ≧ 60 dB (Detector: TAS1120)	
	with the TAS7400TS	≧ 60 dB (Detector: TAS1110, TAS1130) ≧ 50 dB (Detector: TAS1120)	
TIA sensitivity		9.7 × 10^6 V/A	
TIA bandwidth		500 kHz	-3 dB bandwidth
Input optical fiber connector		ø 3 mm 1550 nm Polarization maintaining fiber	Length: 1.5 m
Size		55 mm × 20 mm × 20 mm	Without fiber pigtail

ADVANTEST®

https://www.advantest.com/

ADVANTEST CORPORATION

● **Futher Inquiries**

E:mail: info_t@advantest.com
Phone: +81-480-72-6300
Advantest Corporation
1-5, Shin-tone, Kazo-shi, Saitama 349-1158 Japan

 Printed in Japan Bulletin No.TAS7500TS-A5E Oct. '19