



6433P

Lightwave Component Analyzer

(10MHz - 110GHz)



Ceyear Technologies Co., Ltd

Product Overview

Ceyear 6433P Lightwave Component Analyzer is designed specifically for testing the modulation characteristics of high-speed electro-optical (EO) devices, optical-electro (O/E) devices, and optical-optical (O/O) devices. It covers a frequency range from 10 MHz up to 110 GHz, integrating four test modes: electrical-electrical test, electro-optical test, optical-electrical test and optical-optical test. With display formats including logarithmic or linear amplitude, phase, group delay, Smith chart, polar coordinates among others, it can accurately measure the magnitude and phase response over frequency ranges in an optoelectronic network.

The primary applications include measuring bandwidth, magnitude vs frequency, phase vs frequency responses, and group delays on various components such as high-speed electro-optical devices like intensity modulators, directly modulated lasers, transmitter modules; optical–electro devices like detectors, light emitting assemblies, detector chips; optical-optical devices like attenuators & Erbium Doped Fiber Amplifier (EDFAs).

Main Features

- Broadband coaxial coverage ranging from 10MHz to 110GHz
- Minimum frequency resolution of 1 Hz
- Rich test functions, with transmission, reflection and other parameter test functions;
- Integrated multi-functional operation interface
- Guided calibration and one-click quick sweep test
- Multiple window display and fast analysis
- Automatic probe removal with rapid data acquisition
- Support USB, LAN interface, SCPI programmable command set for autonomous measurements



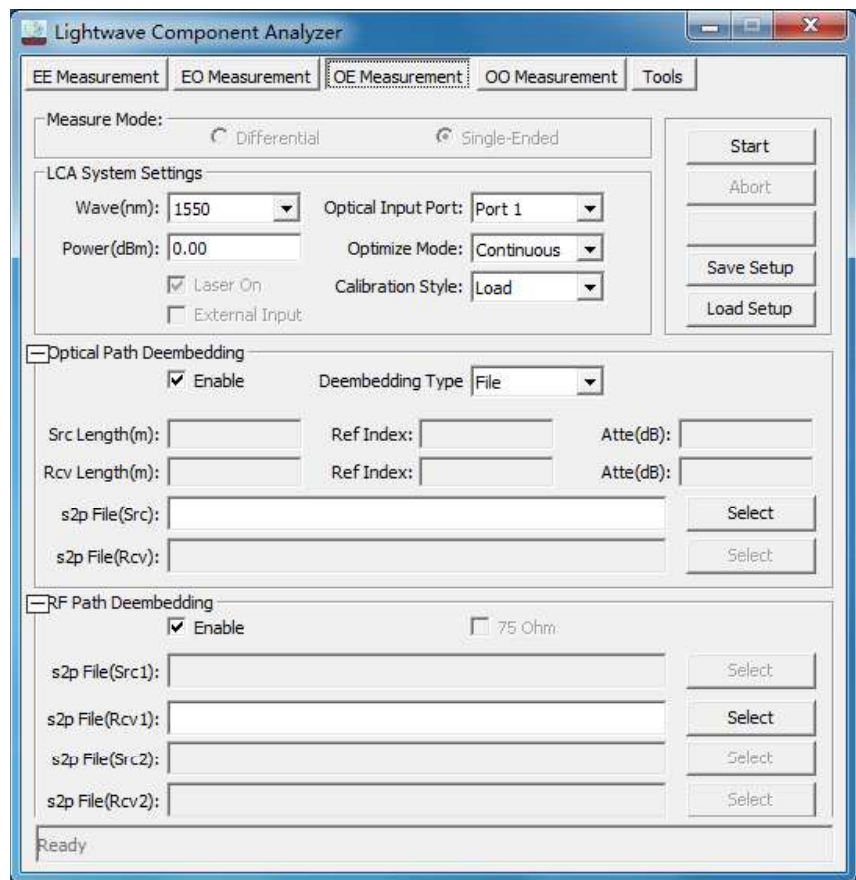
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Broadband Coaxial Coverage Ranging From 10MHz to 110GHz

6433P Lightwave Component Analyzer supports modulation frequencies up to 110GHz and features a minimum frequency resolution of just 1Hz for high-speed wide band optical device and chips assessment of modulation characteristic.

Integrated Multi-functional Operation Interface

6433P Lightwave Component Analyzer offers four types of measurement modes: electro-electro, electro-optical, optical-electro, and optical-optical; The function mode can be switched at will to satisfy the parameter measurement requirements of S parameters, impedance, and time domain of the most common devices. The integrated multi-function interface enables users to quickly set measurement mode, optical wave parameters, optical path de-embedding parameters, RF de-embedding parameters and other parameters.



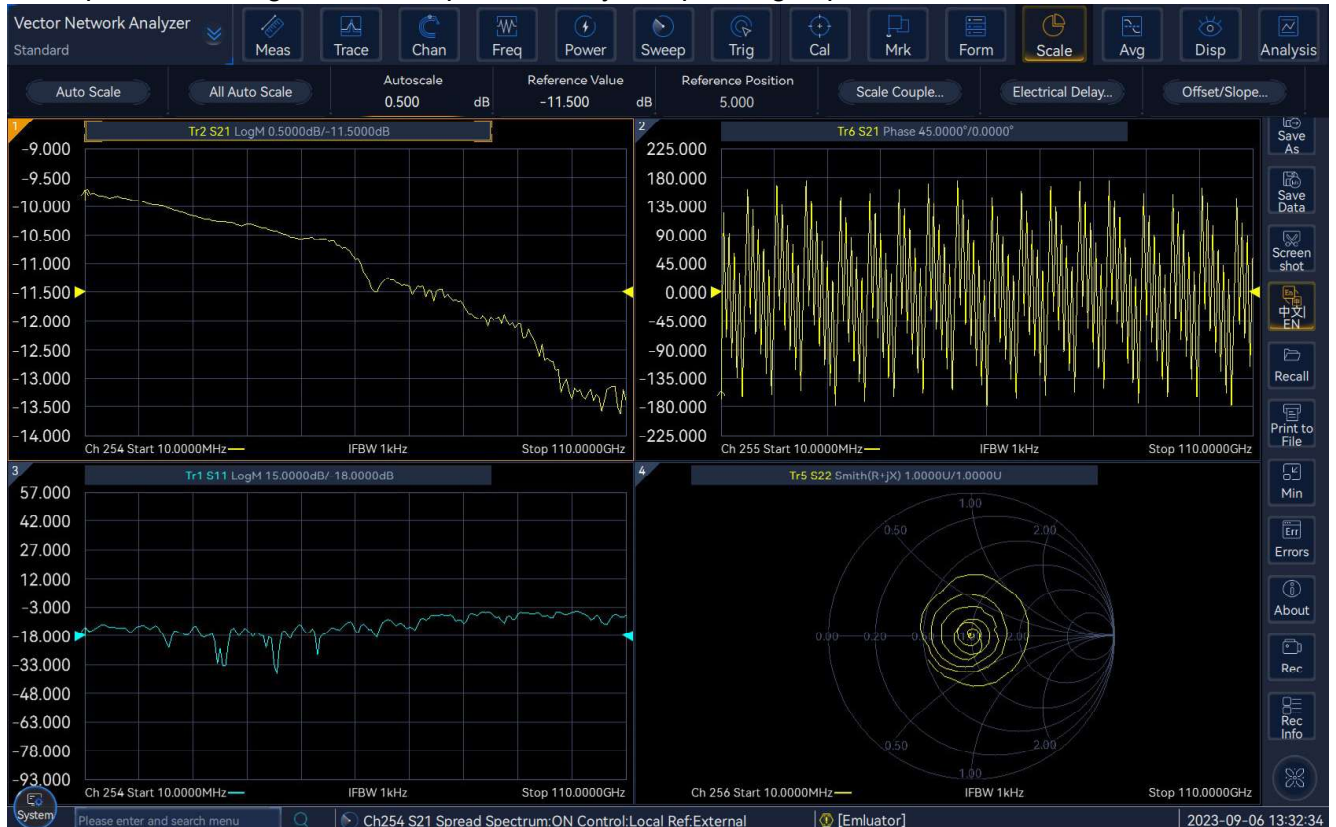
Guided Calibration and One-click Quick Sweep Test

When the 6433P Lightwave Component Analyzer performs electrical-electrical calibration in microwave domain and optical path calibration in optical wave domain, it adopts guided calibration, which is convenient for users to quickly calibrate the instrument and obtain accurate test results of the tested part. At the same time, the integrated design scheme and the core algorithm are used to realize the one-click wideband quick sweep frequency test of electro-optical/ optical-electro/ optical-optical devices.

Multiple Window Display and Fast Analysis

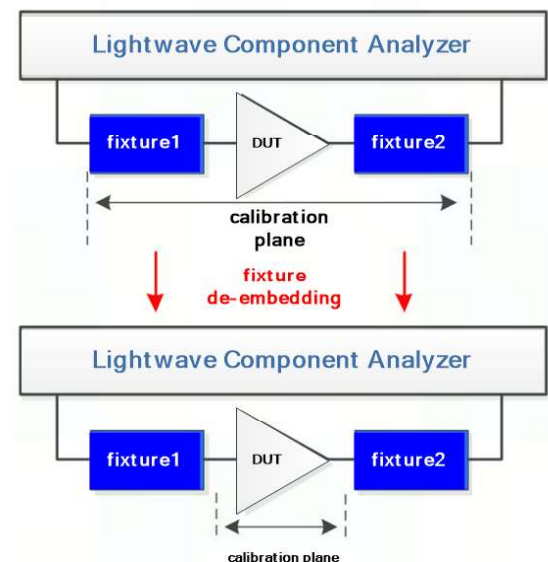
6433P Lightwave Component Analyzer supports up to 64 measurement channels and 32 measurement windows, each window can display up to 16 test tracks at the same time, which can realize multi-window and multi-format display of results.

The high-resolution multi-touch capacitive screen can quickly realize a variety of input and selection operations, fast and efficient, easy for users to quickly analyze data, providing users with a new optical about Lightwave Component Analyzer operating experience.



Automatic Probe Removal with Rapid Data Acquisition

6433P Lightwave Component Analyzer can quickly solve the S parameter testing problems of optical chips with automatic fixture removal. During the test, the high-frequency probe is equivalent to a fixture, the time domain parameters of the high-frequency probe are measured by the automatic fixture removal function, and the frequency domain parameters are extracted by the signal-flow diagram to form an s2p file, which is then embedded by the RF to realize the high-precision S parameter test of the optical chip.



Typical Applications

Single-end Optical Device Test

For the S11 parameter and S21 parameter testing of electro-optical devices such as electro-optical modulator and direct modulated laser, multi-window display can be used to quickly obtain the reflection and transmission characteristics of each frequency of the test object.

For the S22 parameter and S21 parameter test of optical-electro devices such as photodetectors, ROSA, TIA integrated components, the cursor function can be used to quickly analyze 3dB bandwidth and evaluate the frequency response characteristics of the devices.

For the S21 parameter test of optical devices such as optical fiber filters, loss and flatness can be measured quickly.



Testing of amplitude frequency characteristic

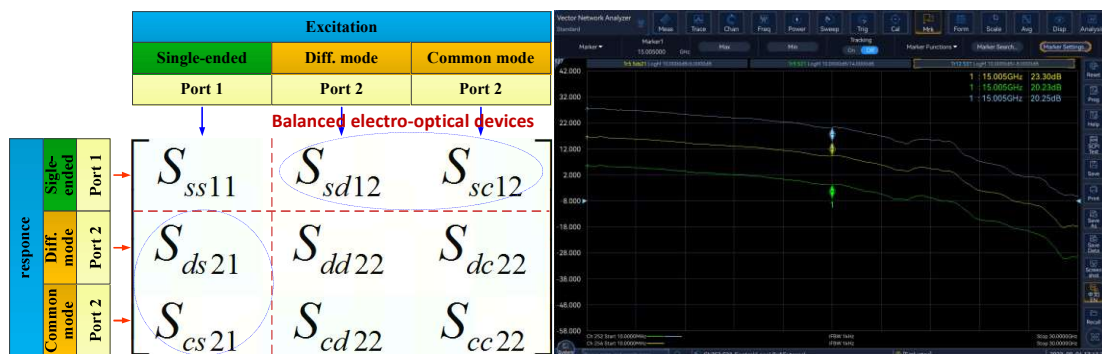
By using various display modes provided by the instrument, the information such as phase and group delay can be displayed, and the phase frequency characteristics can be measured quickly.



Testing of phase frequency characteristic

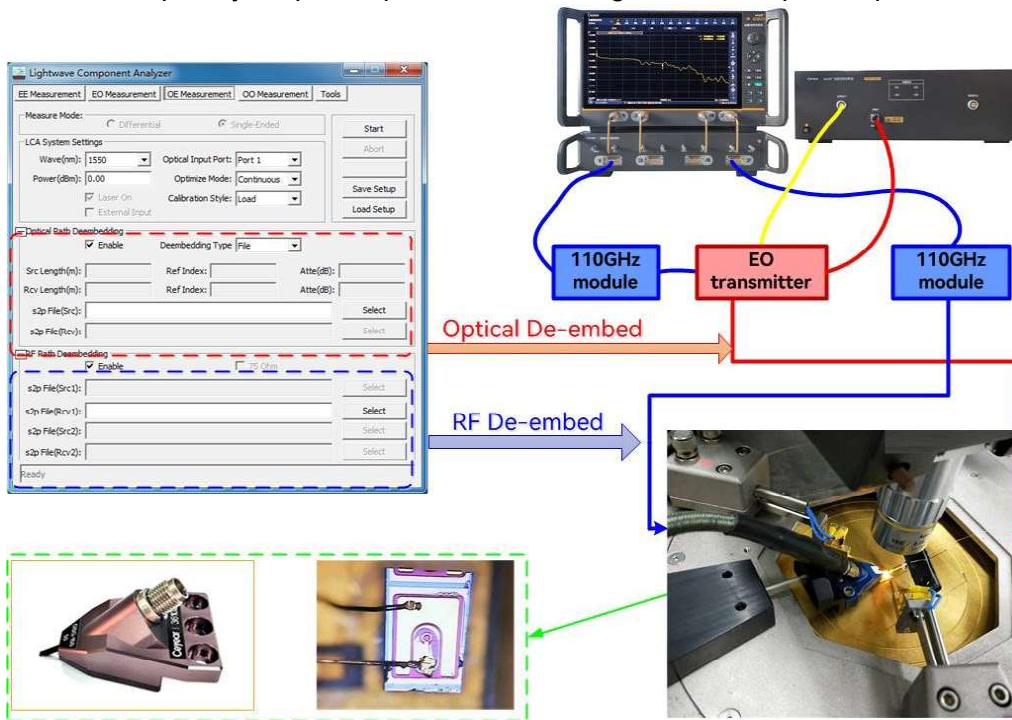
Balanced Optical Devices Test

Lightwave Component Analyzer is configured with a quadruple port type to balance the differential gain and common mode rejection parameters of optical transmitting or receiving devices, and is more suitable for existing and future multi-port parameter measurement applications in the field of high-speed fiber communication.



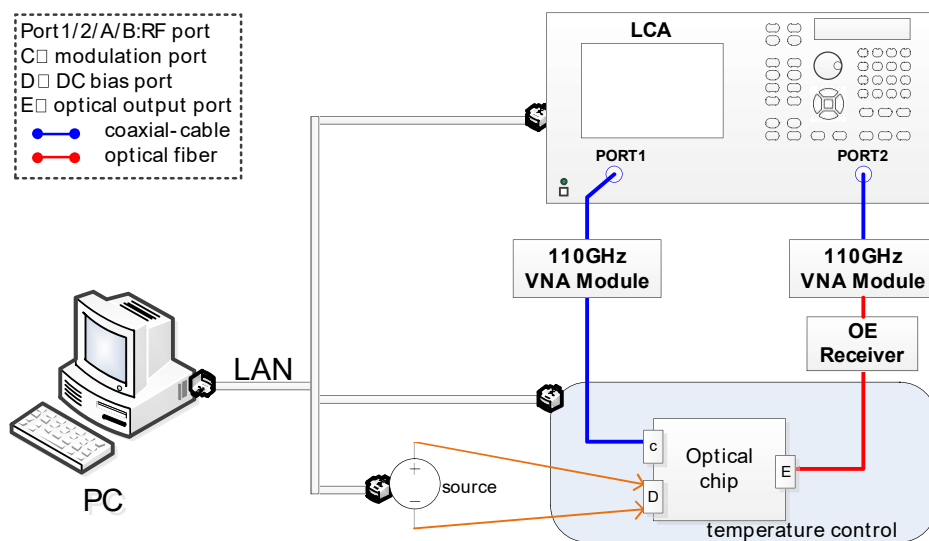
On-chip Test of Optical Chips

6433P Lightwave Component Analyzer configured with probe station and high frequency probe which enables the frequency response parameters testing of electro-optical/optical-electro chips.



Automatic Test

6433P Lightwave Component Analyzer provides a standard SCPI programmable command set for remote control. Through the network port, you only need to complete the interconnection of devices and send commands to achieve an integrated automatic test program, which is convenient for users to build an optical chip test system by combining the Lightwave Component Analyzer together with the temperature control, digital source meter and the measured part.



Technical Specifications

Modulation Frequency Range	10 MHz ~ 110 GHz
Frequency Accuracy	$\pm 1 \times 10^{-7}$
Frequency Resolution	1 Hz
Working Wavelength	1310 \pm 20 nm、1550 \pm 20 nm
Average Output Optical Power Range	-2 dBm ~ +3 dBm (1310 nm)
	-1 dBm ~ +5 dBm (1550 nm)
Maximum Safe Average Input Power	+10 dBm
Average Output Optical Power Accuracy	± 0.5 dB
Average Input Optical Power Measurement Range	-35 dBm ~ + 5dBm
Minimum Measurable Frequency Response	-55 dB
Average Input Optical Power Measurement Accuracy	± 0.5 dB
Relative Frequency Response Accuracy	± 2.7 dB
Frequency Response Repeatability	± 1.2 dB
Phase Measurement Accuracy	$\pm 10.8^\circ$

Order Information

- Main Unit: 6433P Lightwave Component Analyzer

No.	Name	Description
1	6433P Lightwave Component Analyzer	Frequency Range: 10MHz ~ 110GHz. Standard options of 6433-009、6433-011 and 6433P-S20 are mandatory.

- Standard Packing Lists

No.	Name	Description
1	Power cord assembly	Standard three-core power cord
2	User manual	/
3	Product certification	Certificate of Conformance
4	Metrology level optical fiber patch cord	/
5	USB cable	/

- Standard Options

No.	Part No.	Name	Description
1	6433-009	Dual-port frequency expanding controller	It is used with 6433P to expand the frequency of vector network analyzer and realize the expansion function of dual-port vector network analyzer.
2	6433-010	Four-port frequency	It is used with 6433P to expand the frequency of vector

No.	Part No.	Name	Description
		expanding controller	network analyzer and realize the expansion function of four-port vector network analyzer.
3	6433-011	110GHz coaxial extension unit	Used for extending the frequency range of Vector Network Analyzers to achieve measurements of S parameter over the range from 10 MHz up to 110 GHz. It requires configuration of two modules when using dual-port device; four modules are needed when using four-port device. 6433-009+6433P-S20 is required for dual-port LCA, 6433-010+6433P-S20+6433P-400 is required for four-port LCA.

Optional Accessories

No.	Part No.	Name	Description
1	6433P-008	Pulse Analysis	Designed for measuring S parameter under pulsed stated.
2	6433P-011	OE standard part	Frequency Range:10MHz ~ 110GHz. Used to verify the data of the photoelectric test module.
3	6433P-023	Vector measurement function for Mixers	Used for measuring the parameter of Mixer' s vector. 6433P-204/6433P-404+6433P-S20 is required.
4	6433P-201	Dual-port programmable step attenuator	Configuring two 70dB programmable stepping attenuators in the source path, and two 35dB programmable stepping attenuators in the receiver path. Required to select :6433P-204.
5	6433P-203	Dual-port low-frequency extension	The lower frequency range can be extended to 500Hz while 6433P-204 is required, but 6433P-205 cannot be selected at the same time.
6	6433P-204	Dual-port configurable testing apparatus	The testing apparatus of the dual-port model is extended by adding panel jumpers to enable independent use of A, B, R1 and R2 receivers.
7	6433P-205	Dual-port T-biasing device	Two T-type bias are configured internally for the port output of DC bias voltage while 6433P-201+6433P-204 is required, but 6433P-203 cannot be selected at the same time.
8	6433P-400	Four-port measurement option	four-port electrical channel. By selecting an optional 6433-010 four-port expansion module, along with four units of the 6433-011 110GHz coaxial extensions and the 6433P-S20 phase error measurement function, balanced testing becomes achievable.
9	6433P-401	Four-Port Programmable Step Attenuator	Configuring four 70dB programmable stepping attenuators in the source path, and four 35dB programmable stepping attenuators in the receiver path. Required to select :6433P-400+6433P-404.
10	6433P-402	Active Intermodulation for Distortion Measurement	For measurement of active intermodulation distortion signal. Required to select 6433P-400+6433P-404+6433P-S20.
11	6433P-403	Four-port low-frequency extension	The lower frequency range can be extended to 500Hz while 6433P-400+6433P-404 is required, but 6433P-405 cannot be selected at the same time.
12	6433P-404	Four-port configurable testing apparatus	The testing apparatus of the four-port model is extended by adding panel jumpers to enable independent use of A, B, C, D, R1, R2, R3 and R4 receivers. Required to select 6433P-400.
13	6433P-405	Four-port T-biasing device	Four T-type bias are configured internally for the port output of DC bias voltage while 6433P-400+6433P-401+6433P-404 is required, but 6433P-403 cannot be selected at the same time.

No.	Part No.	Name	Description
14	6433P-S05	Function of S-parameter signal integrity analysis	Used to analyzing the signal integrity characteristics of the system such as frequency domain, time domain TDR and crosstalk, and can automatically convert the graph curve into the test report.
15	6433P-S07	Function of automatically removal about fixture	Used for automatic test and removal of single-ended and balanced device measurement fixtures.
16	6433P-S10	Function of time domain measurement	For time domain measurement to identify and analyze discontinuous locations in devices, fixtures or cables.
17	6433P-S11	Advanced capabilities of time domain analysis	For TDR time domain impedance test, eye diagram analysis.
18	6433P-S16	Function of real difference measurement	Used for real differential mode, common mode stimulus balance parameter measurement. Required to select 6433P-400+6433P-404+6433P-S28.
19	6433P-S18	Rapid continuous wave scanning feature	Using FIFO buffering method, data is read instantly.
20	6433P-S20	Function of frequency offset measurement	Intended for use in frequency offset measurements
21	6433P-S22	Function of Mixer scalar measurement	Used for mixer scalar parameter measurement. 6433P-S20 is required.
22	6433P-S24	Function of embedded local oscillator upconverter measurement	Designed for measurement of integrated local oscillator upconverter. For the dual-port configuration, 6433P-204+6433P-S20 is required. For the four-port configuration, 6433P-404+6433P-S20 or 6433P-S22 or 6433P-023 is required.
23	6433P-S26	Function of gain compression measurement	Used for gain compression measurement of active devices such as amplifiers.
24	6433P-S28	Function of phase scanning measurement	Used for phase scanning measurement. 6433P-400 is required.
25	6433P-S30	Function of frequency spectrum analysis	Used to provide multi-channel frequency spectrum testing function.
26	6433P-EWT1	Extended warranty for 1 year beyond the warranty period.	The warranty is extended for 1 year beyond the warranty period, and the two-year extended warranty is optional for 2 items, and so on. The service does not include calibration and only includes one-way freight.



Focus on Measurement
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Ceyear Technologies Co., Ltd

Tel: +86 532 86896691

Add: No. 98, Xiangjiang Road, Qingdao (266555), China

<http://www.ceyear.com>

Email: sales@ceyear.com zhaohao@ceyear.com