Do you need to see with greater details ?



AP2040 series/AP2050 series Optical Spectrum Analyzer

5 MHz Resolution

+/- 3 pm WL accuracy

2 channels 1 per polarization axis

Optical Spectrum Analyzer principle

BASED ON AN INTERFEROMETRIC PRINCIPLE, APEX TECHNOLOGIES ULTRA HIGH RESOLUTION OPTICAL SPECTRUM ANALYZER CAN ACHIEVE A 500 TIMES BETTER RESOLUTION THAN MONOCHROMATOR OPTICAL SPECTRUM ANALYZER

The APEX Technologies Optical Spectrum Analyzers clearly show much more details than the grating based OSA and leaves any kind of guess work behind.

Features:

- From 250 GHz to 5 MHz resolution
- C & L Band
- +/-3 pm wavelength accuracy
- Close-in dynamic range > 60dB @ +/- 0.3pm
- Rectangular shape resolution filters
- 2 channels, one per polarization axis
- Built in tunable laser source
- Component transmission analysis



Direct comparison between the two different Optical Spectrum Analyzers types measuring a 1.25 GHz modulated signal.



Ultra high resolutions : 140 MHz/1.12 pm ; 20 MHz/0.16 pm ; 5 MHz/0.04 pm...



1- Two internal channels (one OSA per polarization axis)

Optionaly two different aditional PM inputs are available. The user can select between the input independant of polarization or the two PM inputs.

Input independant of polarization:

After splitting the input signal into two orthogonal polarization axis, these polarization axes are analysed simultaneously by two internal independant channels. By using this method, APEX OSA can display the two polarization channels separetely or recombine them and display a polarization independent measurement.

Two PM inputs: The two input signals can be analysed simultaneously by two internal independant channels. By using this method, APEX OSA can display the two signals separetely



2- Tunable Laser Source & Tracking generator

- The built-in Tunable Laser Source local oscillator can also be used as an independent TLS. In option a TLS optical output and a control software can be integrated into the equipment. - The tracking generator option allows the user to synchronise the wavelength TLS output with the OSA measurement. With this combination, active and passive components transmission measurements (insertion loss/gain) are possible with a dynamic range of 63 dB and a resolution of 1 MHz.

3- Wavelength accuracy

The two different internal wavelength calibrators (absolute and relative) furnish to the equipment an accurate wavelength value of the TLS position. This technique provides a very high wavelength accuracy specification of +/- 3 pm.



The absolute wavelength calibrator is a gas cell.

The relative one is a Fabry Perot with a fixed free spectral range.

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Bragg grating profile measurement using the tracking generator option

4- Close-in dynamic range

The resolution of APEX Technologies OSA aren't related to optical filters but electrical ones. These electrical filters are close to rectangular shape. Thanks to these special electrical filter forms, the close-in dynamic range is very high:

- @ +/- 0.4 pm from the peak, the dynamic > 60 dB

-@ +/- 6 pm from the peak, the dynamic > 80 dB



... and typicals resolutions from 250 GHz/2 nm to 140 MHz/1.12 pm



(*) APEX Technologies and grating based OSA wavelength resolution filters shapes comparison

Resolution = 15 pm

APEX Technologies OSA rectangular shape filters allow a nearly perfect integration of the signal over the selected resolution, while a grating based OSA filter integrates inside a wide base triangular shape This sharp integration allows

our OSA to perform a much more realistic level measurement.



INTUITIVE SOFTWARE

APEX Technologies OSA software is apreciated by unexperienced as well as expert users. It combines a full panel of functions with an impressive usability.

STORAGE

The equipment is equiped with a 32 Gb hard drive and 3 USB inputs. bmp, txt and setup file formats are available.



EQUIPMENT CONTROL

The equipment can be controlled by 3 different ways: - The front panel -The sensitive screen - A mouse and a keyboard



REMOTE CONTROL

The remote control allows the operator to set measurement parameters and to execute a measurement. The user can take the control and perform data transfer with a computer through GPIB or ethernet. It is also possible to take the control of the equipment through internet from everywhere in the world.

Optical Spectrum Analyzer software

APEX TECHNOLOGIES TEAM DEVELOPED AN INTUITIVE SOFTWARE. THE GOAL OF THIS SOFTWARE IS TO JOIN SIMPLICITY AND POSSIBILITIES. LINES, MARKERS, AUTO SCALE MODE, 6 DIFFERENT TRACES, ZOOM, SCROLL, SETUP AND ANALYSIS FUNCTION ARE AVAILBLE



3- Scale

The scale can be modifed very quickly. Just press the button corresponding to the value or the unit you want to change and modify it.

The scale values can be modified with this following button type:

192814.336 GHz

The scale units can be modified with this following button type:

FREQUENCY GHz

4- Sweep

Three differents sweep modes are always displayed and available on the screen



Auto Sweep: Automatic search and display of the signal inside the equipment wavelength range.



Single Sweep: A one time sweeping is done according to the start/stop or the center/span parameters.



Repeat Sweep: This Sweeping mode repeats a sweep as many times as you need until you press the stop button.

5- Cursors settings

Three differents cursors can be selected:

Zoom function:

Scroll function:



moved by using the scroll function. The

The "zoomed-in" area can easily be

zoom can be keeped and displaced

8- Lines and Markers

the trace.

These 2 functions allow you to

position benchmarks accurately on

- Two horizontal and two vertical

lines can be displayed on the graph

providing the absolute positions and the delta values between them.

- Up to five hundred markers can be

positioned. A marker table can be

displayed with all the marker information and saved in txt format.

inside the entire span.

While the top trace shows the complete span, the larger bottomtrace represents the "zoomed-in" area. The Zoom function can easily be activated by drawing a rectangle at a specific area on the touch sensitive screen and can be repeated multiple times until the desired details become visible.



This function is very useful for performing a quick delta measurement. This function draws a line and give the (WL and power) deltas between the two extreme points of the line.

6- Full span display

This function will enable/disable the panoramic full span graph display.



Up to 6 different traces are available. Each trace can be dispayed or blanked.

TRACE

9- Analysis functions

Useful functions are provided for fast analysis:

- Peak Search
- Line Width
- SMSR
- SNR
- Trace A B

- etc.



TUNABLE LASER SOURCE SOFTWARE

This optional software allows you to control the internal Tunable Laser Source. Fixed wavelength or sweeping modes are possible. Two kinds of sweeps are available, continuous or step by step.



TRACKING GENERATOR

Thanks to this option, the internal TLS and the OSA sweepings are synchronised. The OSA is able to measure the insertion loss/gain of a DUT (Bragg grating, multiplexer, tunable filter, amplifier...) with a dynamic of 70 dB,



POWER METER

The internal power meter measures the average power value of the input signal. The power of the two independent polarization channels and the total power can be displayed simultaneously.



Optical Spectrum Analyzer specifications

AP2040 AND AP2050 SERIES OFFER ULTRA HIGH PERFORMANCES SPECIFICATIONS AND USEFUL FUNCTIONALITIES:

TWO INDEPENDENT OSA (ONE PER POLARIZATION AXIS) IN EACH EQUIPMENT, TWO INDEPENDENT POWER METERS (ONE PER POLARIZATION AXIS) IN EACH EQUIPMENT, TRANSMISSION ANALYSIS, TUNABLE LASER SOURCE, PLUS POWERFUL SOFTWARE ANALYSIS FOR EASE OF MEASUREMENT.



Ultra high resolution OSA AP2040 series

	AP2041B	AP2043B		
Wavelength measurement range	1525 nm to 1607 nm	1520 nm to 1630 nm		
Wavelength span range ^e	80 pm to 82 nm	80 pm to 110 nm		
Wavelength resolution (@ 3 dB) ^d	5MHz/0.04pm 10GHz/80pm 140MHz/1.12pm 20GHz/160pm 2GHz/16pm 50GHz/0.4nm	100GHz/0.8nm Manual setting: 200GHz/1.6nm From 500MHz 400GHz/3.2nm to 250 GHz		
Close-in dynamic range ^{a f}	>40 dB @ +/- 0.1 pm >60 dB @) +/- 0.4 pm >80 dB @ +/- 6 pm		
Spurious free dynamic ^d	55 dB Typical (50 dB min)			
Sweep time ^{d f}	1s for 8 nm			
Wavelength absolute accuracy ^{a c}	+/- 3 pm			
Measurement level range ^{a f}	-73 dBm (monochromatic) to +10dBm			
Absolute level accuracy a b e	+/- 0.3 dB (monochromatic)			
Level repeatability ^{a b d e}	+/- 0.2 dB			
Optical input	FC/PC for SM fiber			
Internal absolute WL calibrator	Yes			
Display capabilities				
X scale	Wavelength in nm or frequency in GHz			
Y scale	Optical power in mW or dBm			
	Option OSA01			
Optical tunable laser source specifications				
Wavelength range	1525 nm to 1607 nm 1520 nm to 1630 nm			
Spectrum line width (@ 3 dB)	500 kHz typical			
Output power	-8 dBm typical			
SMSR	>45 dBc			
ASE	< -40 dBc over 0.1 nm			
RIN	< -135 dB/Hz			
Wavelength stability	+/- 10 pm over 1 hour			
Power stability	+/- 0.09 dB over 1 hour			
Fiber/connector type	Polarization maintaining fiber FC/APC connector			
option OSA02				
Optical tracking generator specifications				
Dynamic ^e	63 dB			
Resolution ^e	1 MHz			
Option OSA08				
Optical inputs	1 FC/PC for SM fiber input	2 FC/PC for PM fiber inputs		

a) At 1550 nm b) At 0 dBm c) After Wavelength calibration d) Typical e) Resolution 140 MHz f) Resolution 5 MHz g) Reolution 20 MHz 1) Relative to total signal power

 $2^{\prime})$ Inside spurious free dynamic Otherwise: possible power offset (mW) < 10 $^{-6}$ x total signal power (mW)

AP2050 SERIES

OSA software functionalities: Auto measuremnet, zoom function, zoom to scale, auto calibration, peak search, line width, SMSR, SNR, markers, horizontals and verticals lines, peak center

Tunable Laser Source

...

Transmission analysis

Input trigger (typ. recirculating loop application)

Up to 6 traces

10.4 Inch, color TFT screen

Front keybord

3 USB connectors

80 Gb internal hard drive

File format:

Trace file (.dat, .txt) setup file screen copy (.bmp) marker table

Mouse & keyboard USB type in front panel

GPIB

Ethernet

Operating temperature: +10°C to +35°C

Power requirement: AC 100 to 120V/200 to 250V 50/60Hz



Compact high resolution OSA AP2050 series

	AP2050A	AP2052A	AP2051A	
Wavelength measurement range	1526 nm to 1567 nm	1567 nm to 1607 nm	1526 nm to 1607 nm	
Wavelength span range	170 pm to 41 nm	170 pm to 40 nm	170 pm to 81 nm	
Wavelength resolution (@ 3 dB) ^d	20MHz/0.16pm 10 140MHz/1.12pm 200 2GHz/16pm 500	GHz/80pm 100GHz/ GHz/160pm 200GHz/ GHz/0.4nm 400GHz/	0.8nm Manual setting: 1.6nm From 500MHz 3.2nm to 250 GHz	
Close-in dynamic range ^{a g}	>40 dB @ +/- 1.3 pm >60 dB @ +/- 8 pm >70 dB @ +/- 30 pm			
Spurious free dynamic ^{d g}	50 dB ⁽¹⁾			
Sweep time ^d	Between 0.4 nm/s (min) & 1.2 nm/s (max)			
Wavelength absolute accuracy ^{a c}	+/- 3 pm			
Measurement level range ^{a g}	-73 dBm (monochromatic) to +10 dBm			
Absolute level accuracy a e	+/- 0.3dB ⁽²⁾			
Level repeatability ^{a b d e}	+/- 0.2dB			
Optical input	FC/PC for SM fiber			
Internal absolute WL calibrator		Yes		
Display capabilities				
X scale	Wavelength in nm or frequency in GHz			
Y scale	Optical power in mW or dBm			
	Option OSA0	7		
Optical tunable laser source specifications				
Wavelength range	1526 nm to 1567 nm	1567 nm to 1607 nm	1526 nm to 1607	
Spectrum line width (@ 3 dB)	3 MHz Typical			
Output power	-8 dBm typical			
SMSR	> 50 dBc			
ASE	< - 50 dBc over 0.1 nm			
RIN	-135 dB/Hz			
Wavelength stability	1 pm @ 15 min, 2 pm @ 1 h			
Power stability	0.07 dB @ 15 min, 0.09 dB @ 1 h			
Fiber/connector type	Polarization maintaining fiber FC/APC connector			
Optical tracking generator specifications				
Dynamic ^e	60 dB			
Resolution ^e	10 MHz			
Option OSA08				
3 inputs specifications				
Optical inputs	1 FC/PC for SM	fiber input 2 FC/PC for	r PM fiber inputs	

a) At 1550 nm

- b) At 0 dBm c) After Wavelength calibrationd) Typical

- d) Typical
 e) Resolution 140 MHz
 f) Resolution 5 MHz
 g) Reolution 20 MHz
 1) Relative to total signal power
- 2) Inside spurious free dynamic Otherwise: possible power offset (mW) < 10^{-6} x total signal power (mW)



APEX Technologies

APEX Technologies is located in Marcoussis in the French Optics Valley. The company was founded in 1998 and our first equipment has been shipped in 2001. We develop and produce innovative ultra high performance test equipment intended for fiber optic telecommunications research. Our policy "knowledge is power" reflects our work ethic. APEX Technologies is a company centred around a strong research team, our goal is to stay at the top of the advanced technology...

Related products

Optical Complex Spectrum Analyzer:

This equipment is also based on an interferometric method and is able to measure spectrums with the same specifications as the AP2040 series instruments. It also has the added benefit of measuring phase as a function of frequency. The phase and intensity information can then be used to calculate chirp, phase, alpha parameter or pulse shape as a function of time, furthermore it can display constellation, phase and intensity eye diagrams. This equipment has no modulation format and bit rate limitation.

Multitest platform and plug-in modules:

A mainframe can control several plug-in modules (Tunable Laser Source, Power Meters, Switches, Tunable Attenuators...). Special methods have been developed for these products to be cost effective and still offer ultra high performance.





For further information or to book a demonstration, contact us or your local distributor.

Your local contact.



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