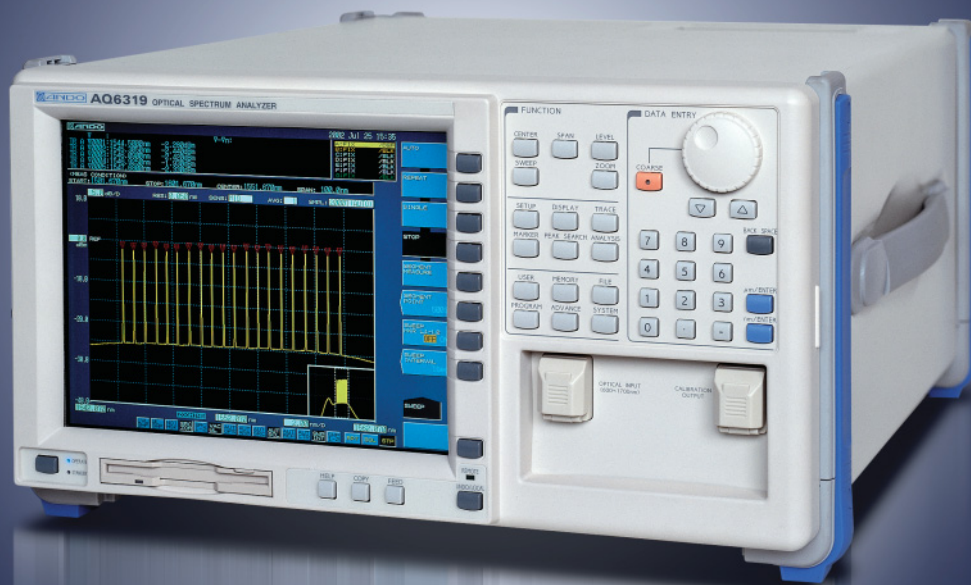


# Optical Spectrum Analyzer AQ6319

A new-generation Optical Spectrum Analyzer  
for high-precision ultra-DWDM signal analysis



# A new-generation OSA for peerless optical performance

In the last few years, the evolution of DWDM systems has led to breathtaking advances in communication systems. Yet, the research toward next-generation optical communication systems such as larger-capacity systems and high-performance photonic networks still progresses. This requires the optical spectrum analyzers to have more advanced performance which is essential to evaluations of such high-performance optical devices and transmission systems.

To meet the demand, Ando applied its experience and technology to develop the AQ6319 — a next-generation optical spectrum analyzer featuring state-of-the-art optical performance — wavelength resolution of 10pm, wavelength accuracy of  $\pm 10\text{pm}$  and close-in dynamic range of 60dB at peak  $\pm 100\text{pm}$ . The measurement time has been drastically reduced to as low as 1/5 compared to conventional models. With such user-friendly features as a new user interface and compatibility with various external interfaces, this OSA offers the best testing conditions with a wide range of applications from R&D through evaluation and production lines.

## Features

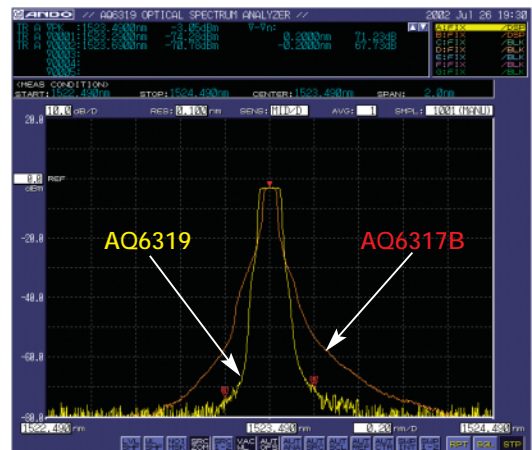
### ● Best optical performance

- High wavelength accuracy:  $\pm 10\text{pm}$
- High wavelength resolution: 10pm
- High wavelength resolution accuracy:  $\pm 2\%$
- Wide close-in dynamic range



Wavelength resolution at 0.01nm

Close-in dynamic range:  
60dB at peak  $\pm 100\text{pm}$   
70dB at peak  $\pm 200\text{pm}$



Wavelength resolution at 0.1nm

Close-in dynamic range:  
60dB at peak  $\pm 200\text{pm}$

### ● Fast sweep and quick response

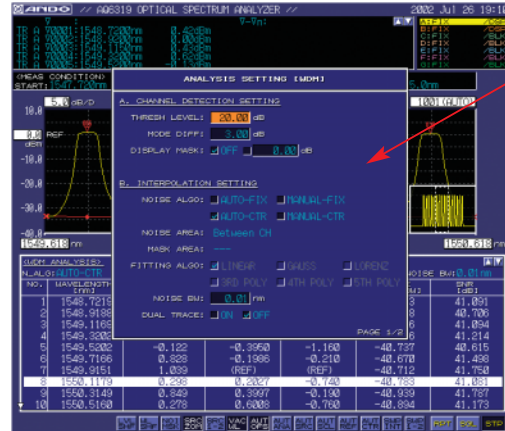
- Measurement time is as low as 1/5 compared to the conventional models (AQ6317 Series)\*
  - Faster auto-ranging in all sensitivities
  - Quicker key response as measurement conditions change
- \*Depends on measurement settings and input light condition.

### ● User-friendly GUI and powerful functions

- Easy operation with mouse/keyboard
- Compatible with multiple interfaces (GP-IB, LAN, printer, etc.)
- Large data storage area and fast data transfer (FTP)
- Enhanced built-in applications

# Optical Spectrum Analyzer AQ6319

## Powerful functions



Parameter dialog box

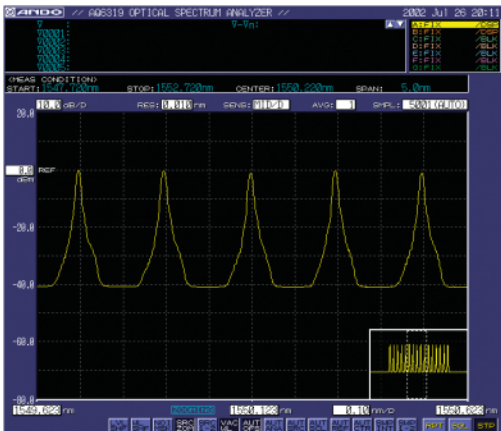
- Waveform zooming and display overview window
- Automatic interpolation setting function
- Selectable display mode (Trace and Table/Table/Trace)

- OSNR/Gain/NF measurement function
- Parameter dialog display simplifies setting

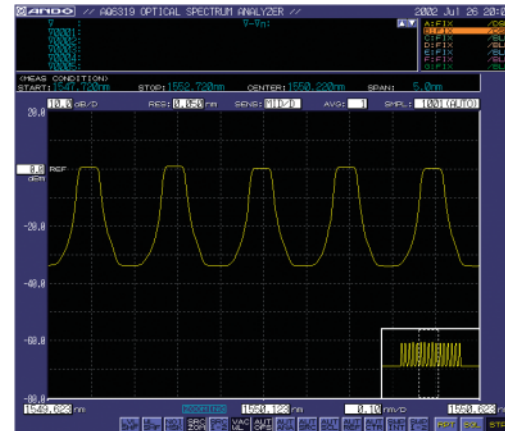
## Measurement examples

### 25GHz spacing DWDM signals

OSNR 40dB (@Noise BW=0.01nm)



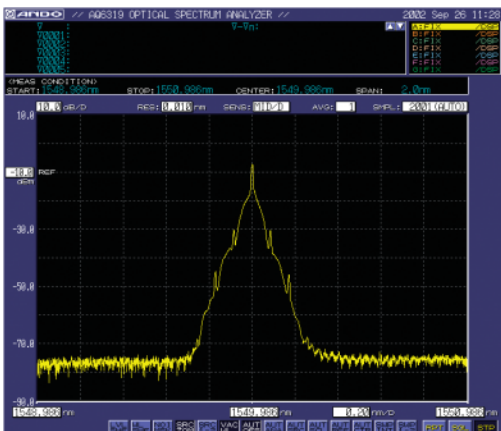
Wavelength resolution at 0.01nm



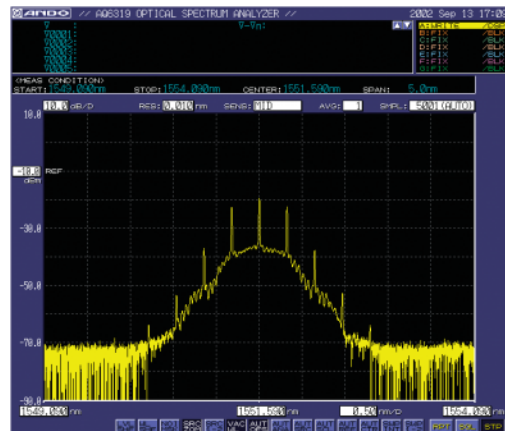
Wavelength resolution at 0.05nm

The wide close-in dynamic range makes it possible to accurately measure OSNR of DWDM signals with 25GHz (or narrower) spacing. Even at 0.05nm resolution setting, ASE noise between channels can be measured flatly.

### Modulated signal measurement



10Gbps, NRZ, PRBS 2^31, wavelength resolution at 0.01nm



40Gbps, RZ, PRBS 2^7, wavelength resolution at 0.01nm

With its high resolution and wide close-in dynamic range, a side-band at 10Gbps or 40Gbps modulated signal can be observed clearly.

# Specifications

Applicable fiber	SM (9.5/125μm), GI (50/125μm)	
Measurement wavelength range	600 to 1700nm	
Span	0.1nm to full range and zero span	
Wavelength accuracy <sup>(1), (2), (3), (4)</sup>	±10pm (1520 to 1580nm, after calibration with built-in source) ±20pm (1450 to 1520nm, after calibration with built-in source) ±20pm (1580 to 1620nm, after calibration with built-in source) ±50pm (Full range, after calibration with built-in source)	
Wavelength linearity <sup>(1), (2), (3), (4)</sup>	±10pm (1520 to 1580nm, after calibration with built-in source) ±20pm (1450 to 1520nm, after calibration with built-in source) ±20pm (1580 to 1620nm, after calibration with built-in source)	
Wavelength repeatability <sup>(1), (2), (3), (4)</sup>	±2pm (1min. or less, 1450 to 1620nm)	
Number of samplings	101 to 50001	
Resolution bandwidth	0.01, 0.02, 0.05, 0.1, 0.2, 0.5 and 1nm	
Resolution accuracy <sup>(1), (3), (4), (5)</sup>	±2% (RES.: 0.1nm or wider, 1450 to 1620nm) ±2.5% (RES.: 0.05nm, 1450 to 1620nm) ±6% (RES.: 0.02nm, 1450 to 1620nm)	
Level sensitivity setting <sup>(6)</sup>	NORM_HOLD, NORM_AUTO, MID, HIGH 1, HIGH 2 and HIGH 3	
Level sensitivity <sup>(1), (3), (5), (7)</sup>	-90dBm (1250 to 1620nm, RES.: 0.05nm or wider, SENS.: HIGH 3) -80dBm (1000 to 1250nm, RES.: 0.05nm or wider, SENS.: HIGH 3) -60dBm (800 to 1000nm, 1620 to 1680nm, RES.: 0.05nm or wider, SENS.: HIGH 3)	
Level accuracy <sup>(1), (5), (7), (8)</sup>	±0.3dB (1550/1600nm, 0/-20dBm, RES.: 0.02nm or wider) ±0.3dB (1310nm, 0/-20dBm, RES.: 0.05nm or wider)	
Level linearity <sup>(1), (3), (5), (7)</sup>	±0.05dB (-50 to +10dBm, RES.: 0.02nm or wider, SENS.: HIGH 1 to 3)	
Level flatness <sup>(1), (5), (7), (8)</sup>	±0.1dB (1520 to 1620nm, -20dBm, RES.: 0.02nm or wider)	
Level stability <sup>(1), (5), (7), (8)</sup>	±0.01dB at 1min., ±0.02dB at 15min. (1550/1600nm, -20dBm, RES.: 0.05nm or wider)	
Maximum input power <sup>(1)</sup>	+23dBm (Per channel, Full span, Attenuation on)	
Safe max. input power <sup>(1)</sup>	+27dBm (Total safe power, Attenuation on)	
Close-in dynamic range <sup>(1), (5), (7), (9)</sup>	40dB (±50pm from peak at 1523nm, RES.: 0.01nm) 60dB (±100pm from peak at 1523nm, RES.: 0.01nm) 70dB (±200pm from peak at 1523nm, RES.: 0.01nm) 60dB (±200pm from peak at 1523nm, RES.: 0.1nm)	
Polarization dependency <sup>(1), (5), (7)</sup>	±0.05dB (1520 to 1620nm, RES.: 0.02nm or wider) ±0.07dB (1450 to 1520nm, RES.: 0.02nm or wider) ±0.07dB (typ.) (1310nm, RES.: 0.05nm or wider)	
Sweep time	0.5 sec. (any 100nm, SMPL.: 1001, SENS.: NORM_HOLD) <sup>(10)</sup> 1 sec. (any 100nm, SMPL.: 1001, SENS.: MID) <sup>(10)</sup> 3 sec. (any 100nm, SMPL.: 1001, SENS.: HIGH 1) <sup>(10)</sup> 15 sec. (any 100nm, SMPL.: 1001, SENS.: HIGH 3) <sup>(11)</sup> 120 sec. (any 100nm, SMPL.: 1001, SENS.: HIGH 3 with chop mode on) <sup>(11)</sup>	
Function	Automatic measurement	Program function (64 programs, 200 steps)
	Setting of measuring conditions	Span setting: 0 to 1100nm, Number of averaging setting: 1 to 999 times, Automatic measuring condition setting function, Sweep between line markers function, 0nm sweep function, External trigger measurement function, Air/Vacuum wavelength measurement function

Function	Display	Level scale setting: 0.1 to 10dB/div., Vertical division number setting: 8, 10 or 12, Ref. level position setting function, Linear scale display, Simultaneous display of 7 independent traces, Data table display, Label display, Split display, Normalized display, Curve-fit display,
Function	Display	Power density display, % display, dB/nm display, dB/km display, Template display, Horizontal scale zoom in/out display, Frequency display of horizontal axis scale
	Trace	7 independent traces, Max./Min. hold, Calculate between traces, Roll average, Normalize, Curve-fit
Function	Marker/Search	Delta marker (Max. 1024), Line marker, Peak search, Next peak search, Bottom search, Next bottom search, Auto search, Peak/Bottom search between line markers, Search in the zooming area
	Analysis	WDM analysis, EDFA analysis, Optical filter analysis, WDM filter analysis, Spectral width, Notch width, SMSR analysis, PMD analysis, LED/FP-LD/DFB-LD analysis, Power analysis, Go/NoGo judgment, Auto analysis, Analysis between line markers, Analysis in the area
	Ethernet	TCP/IP Protocol, FTP function
Function	External printer <sup>(12)</sup>	ESC/P
	Others <sup>(13)</sup>	Self wavelength calibration with built-in reference light source Optical alignment with built-in reference light source
	Memory	Build-in FDD (3.5-inch 2HD) MS/DOS format Internal memory 32 traces, 20 programs File format Binary/CSV(Text), BMP/TIFF
Printer		Built-in high-speed thermal printer
Interface	Remote control	AQ6317 Series compliant commands (IEEE488.1), IEEE488.2 full support
	Others	GPIO x 2, RS232C, Printer port, External SVGA, PS/2 x 2, LAN
Display		10.4-inch color LCD (Resolution: 800 x 600 dots)
Optical connector <sup>(14)</sup>		AQ9447 (*) connector adapter: optional
Power requirement		100 to 240 (±10%) V, 50/60Hz, approx. 400VA
Environmental conditions		Operating temperature: +5 to +40°C Storage temperature : -10 to +50°C Humidity: 80%RH or less (no condensation)
Dimensions and mass <sup>(15)</sup>		Approx. 425 (W) x 222 (H) x 500 (D) mm, 33kg
Accessories		Power cord: 1, printer paper: 1, instruction manual: 1

## Notes:

- With 9.5/125μm SMF, after 1 hour warm-up, after optical alignment
- At 15 to 30 °C
- At chop mode off
- Horizontal scale: wavelength display mode
- At 23 ± 3 °C
- Internal chop mode available at HIGH1 to 3 sensitivity settings
- With applied input fiber Type B1.1 9.5/125μm SMF defined on IEC60793-2 (Mode field diameter: 9.5μm, NA: 0.104 to 0.107, PC polished), attenuation off, vertical scale: absolute power display mode
- Sensitivity setting is MID, HIGH1 to 3 and chop mode off
- Sensitivity setting is HIGH3 and chop mode on
- For wavelength resolution ±0.2nm
- For wavelength resolution ±0.5nm
- Please ask local agent for printer type.
- AQ9441 universal adapter (optional) is required for the output port of the reference light source (specify FC, SC or ST for connector type).
- \*: Connector type. Specify FC, SC or ST connector.
- Except protector