ANDO

Optical Spectrum Analyzer AQ6317B

High-accuracy and high-resolution optical spectrum analyzer
for evaluating D-WDM systems and components.

High-accuracy and high-resolution optical spectrum analyzer for evaluating DWDM systems and components.

The AQ6317B is an advanced optical spectrum analyzer for a wide range of applications, including light source evaluation, measurement of loss wavelength characteristics in optical devices, and waveform analysis of WDM systems.

Especially at C and L band, the unit achieves high wavelength accuracy and wavelength linearity, and can evaluate optical devices for WDM. Analysis functions make operation and expandability simple.

In comparison with the former model, the wavelength accuracy of the AQ6317B has been improved to ±20 pm, and this is also specified for the L-band. The WDM analysis function and notch width analysis function have been improved, and a multi-channel NF analysis function and optical filter analysis function are new additions. It has become much easier to use owing to other improvements such as sweep speed-up.

The AQ6317B contains the latest Ando technology for optical spectrum analyzers — reference equipment for the next generation.

Features

● High wavelength accuracy

Provides ±0.02 nm wavelength accuracy at 1520 to 1580 nm, and ±0.04 nm at 1580 to 1620 nm, with ±0.01 nm wavelength linearity, making it especially useful for high-precision loss wavelength characteristics and other evaluation of WDM devices.
The horizontal axis corresponds to air wavelength, vacuum wavelength and frequency.

● High wavelength resolution

Achieves a wavelength resolution of 0.015 nm.
Fig. 1: Measurement example of DFB laser spectrum.

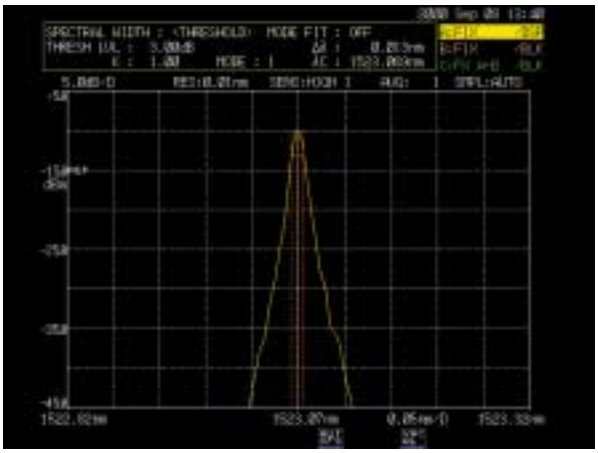


Fig. 1: Example of output wavelength

● Wide dynamic range for 50 GHz WDM signals

The dynamic range is 70 dB at peak ±0.4 nm, and 60 dB at peak ±0.2 nm.
High-resolution measurement achieves wide dynamic range with 50 GHz spacing WDM system.
Fig. 2: Measurement example showing dynamic range.

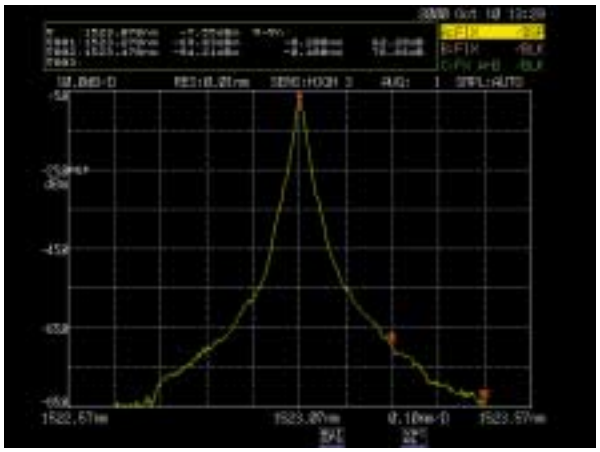


Fig.2: Measurement example of transmission characteristic of 16-channel AWG

● Versatile analysis functions

Analysis functions for WDM and other optical devices (LD, LED, FBG, etc.).

● Synchronous sweep

In conjunction with an AQ4321 Tunable Laser Source, much higher wavelength resolution/wide dynamic range can be achieved by high-speed synchronous sweep (Max. speed: 10 nm/1 sec) .

● Wide band, high sensitivity and high power measurement

-90 to +20 dBm (1200 to 1600 nm)
-80 to +20 dBm (1600 to 1700 nm)
High sensitivity allows measurement of light at down to -90 dBm, covering from 1200 to 1600 nm.
Optical amplifiers and high-powered laser diodes can be measured directly because measurement of up to +20 dBm per one resolution is possible.

● Low polarization dependency

Measurements such as optical amplifier gain can proceed with accuracy because polarization dependency is suppressed as low as ±0.05 dB.

● High-level accuracy

Accurate within ±0.3 dB.

● 9.4-inch color LCD

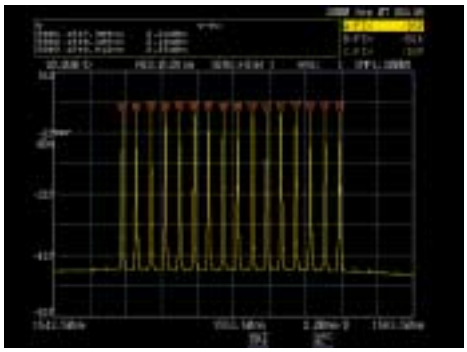
● Pulsed light can be measured

● Three individual trace memories

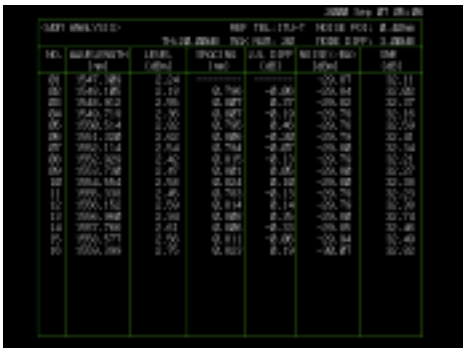
Applications

WDM signal analysis

Simultaneously measure peak wavelength, peak level and SNR of DWDM signals of up to 200 channels. Measurement results can be displayed as wavelength difference/level difference to the reference channel, or wavelength difference/level difference to the ITU-T grid and its fluctuation width, as well as absolute value.
The wavelength of the reference channel can be set through the one-touch GUI screen.



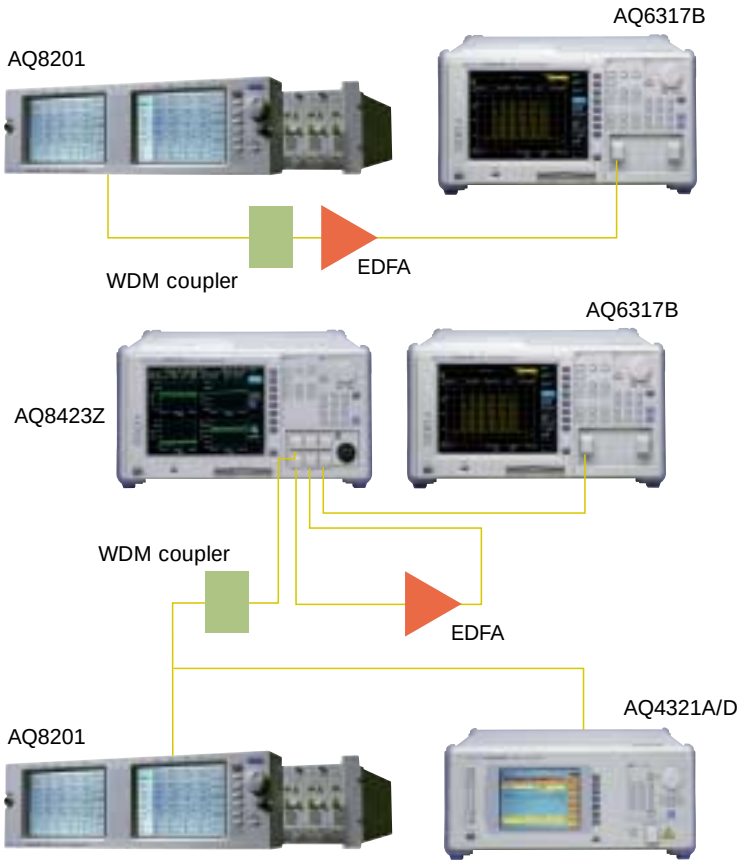
WDM measured waveform

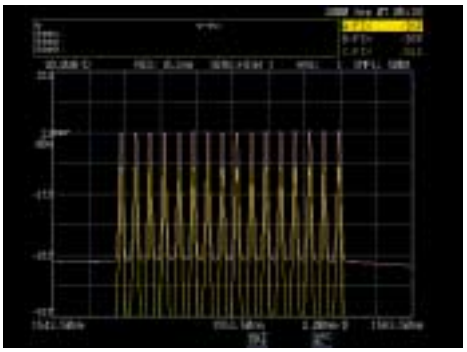


WDM measurement result

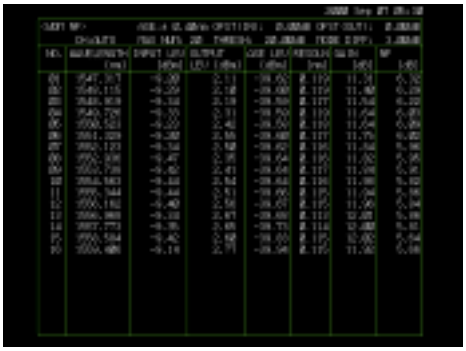
Optical fiber amplifier (EDFA) evaluation

The ASE interpolation method is used to measure gain and NF up to 200 channels, key parameters for optical fiber amplifier evaluation.
In conjunction with the AQ8423Z optical amplifier analyzer, the system can accurately measure gain and NF using the pulse method, which is optimal for evaluating WDM optical fiber amplifiers.

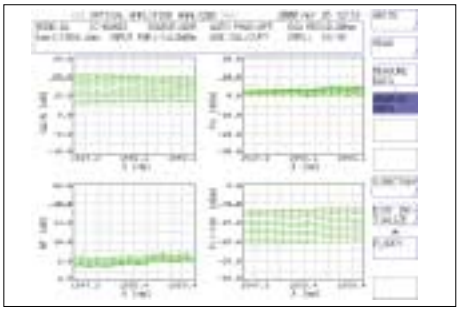




WDM waveform before/after amplification by EDFA



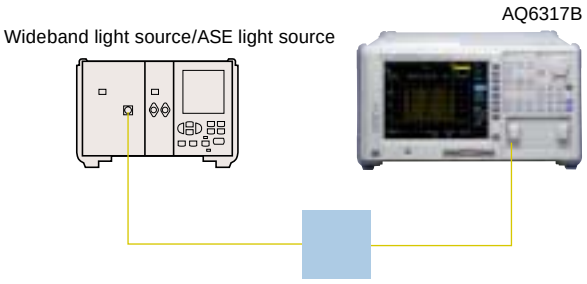
Measurement results of gain and NF

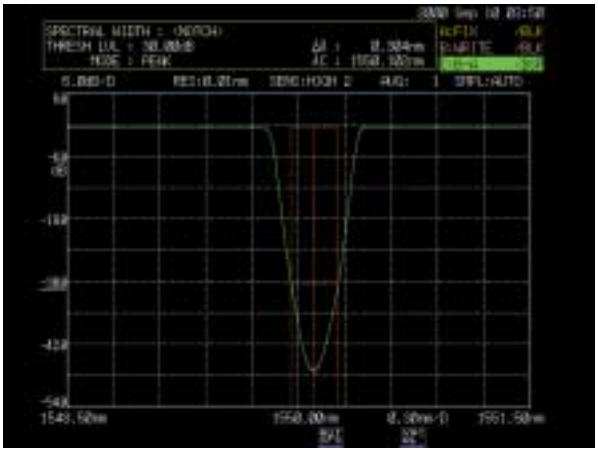


Measurement example of EDFA gain and wavelength dependency of NF (Measurement results displayed on the AQ8423Z's screen)

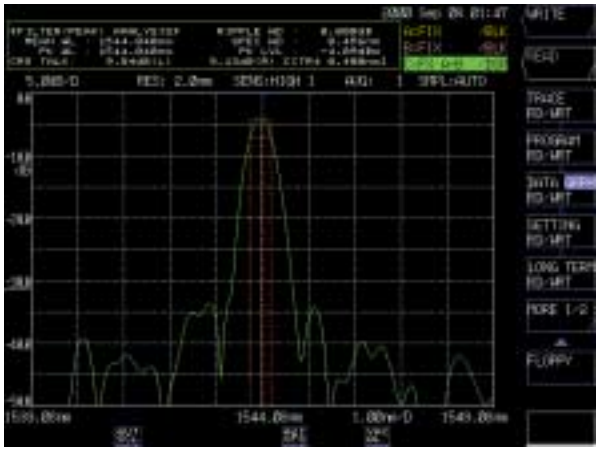
● Characteristic evaluation of optical passive devices

In conjunction with ASE light source, wide band light source, etc., users can simply proceed with fiber grating (FGB) and evaluation of passive devices such as the WDM filter. Peak/bottom wavelength, level, crosstalk, and ripple width can be simultaneously measured using the optical filter analysis function.





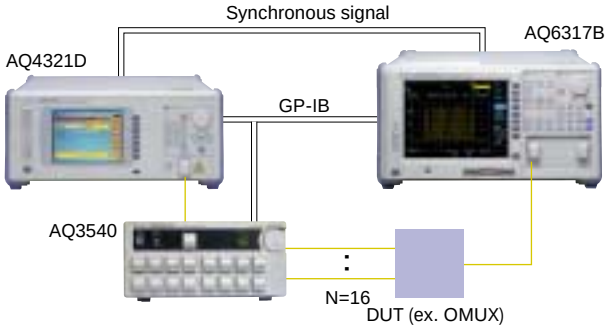
Measurement example of fiber grating notch width

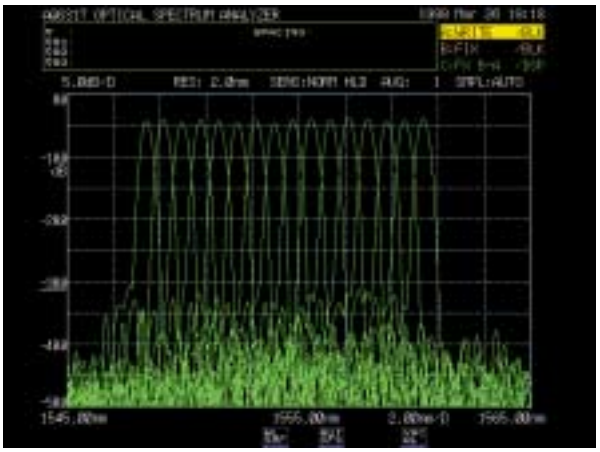


Measurement example of transmission characteristics of WDM filter

● Characteristic evaluation of optical multiplexer (OMUX) using synchronous sweep

In conjunction with the AQ4321 Tunable Laser Source, the AQ6317B achieves high wavelength resolution/wide dynamic range with high-speed synchronous sweep function, and result insertion loss, passed central wavelength and linearity as evaluation parameters of optical MUX/DEMUX.



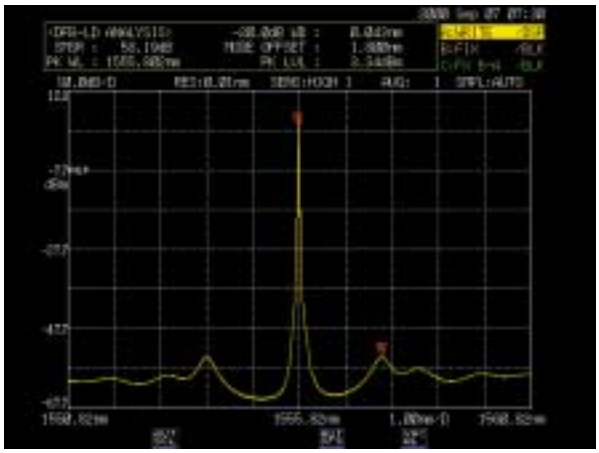


Measurement example of transmission characteristics of 16-channel AWG

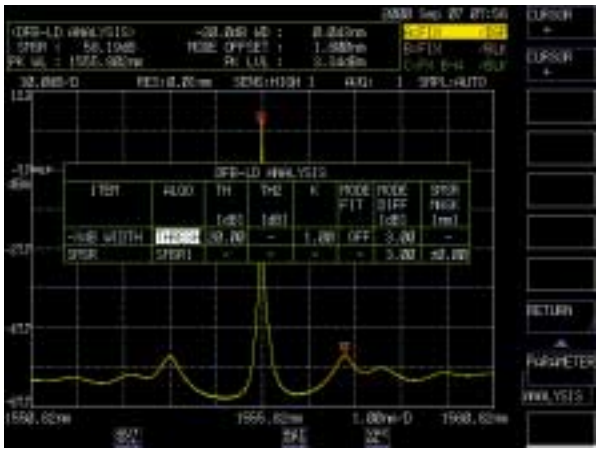
Applications

● Various parameter evaluations of LED, FP-LD and DFB-LD

SMSR of LED, FP-LD and DFB-LD. Parameter evaluations such as side mode suppression ratio, etc. can proceed with one-touch operation.



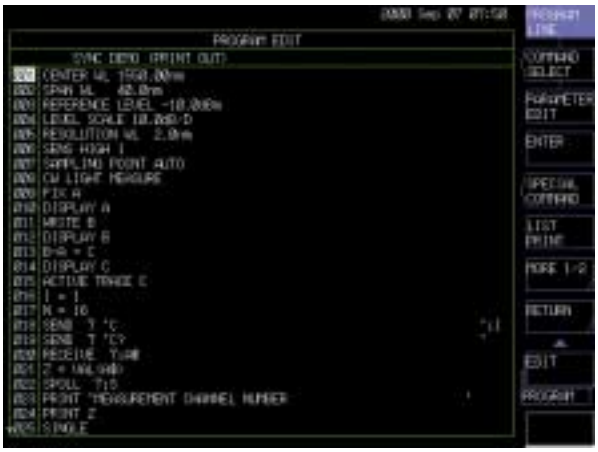
DFB-LD measurement example



Example showing measurement parameterchange

● Programming function

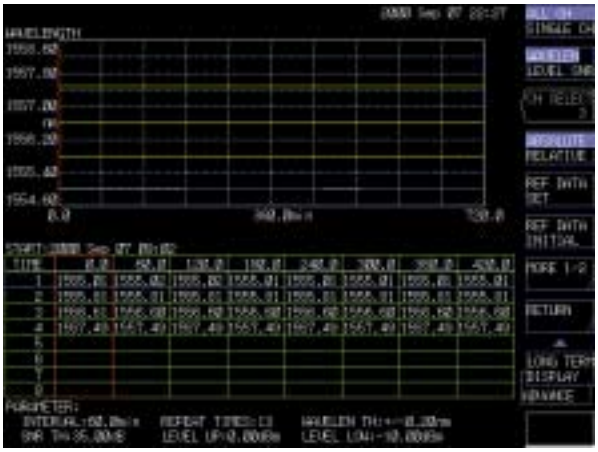
Memorizes measurement conditions, the measurement process, etc. at the outset. Enables a measurement system without use of the external controller by employing the AQ6317B as controller for external equipment.
Program anything from measurement conditions of wavelength sweep width, set resolution, etc. to various analysis functions, printer output and floppy disk storage.
Memorizes up to 20 programs, and eliminates complicated manufacturing operations.



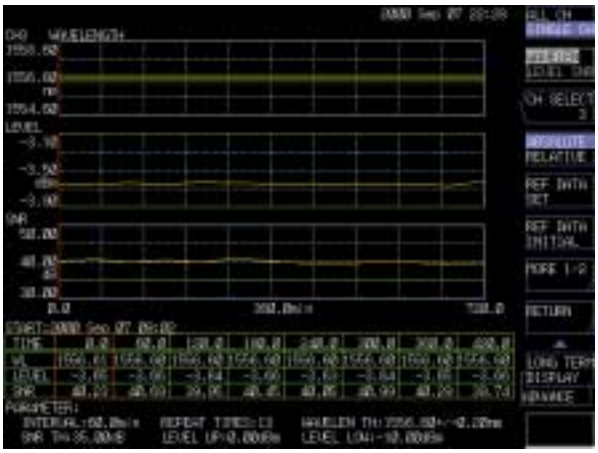
Programming example

● Long-term function

Sweeps all set times and stores (max. 1,000 points) the results of WDM analysis (peak wavelength, peak level and SNR of each channel). An effective function for ascertaining long-term changes of each channel or for cycle testing of devices.



Example of long-term function (all channel display)



Example of long-term function (single channel display)

Specifications

Applicable fibers		SMF, GI (50/125 µm)
Measurement wavelength range [1)]		600 to 1750 nm
Wavelength accuracy [1, 3)]		±0.02 nm (1520 to 1580 nm , after calibration with build-in reference light source) ±0.04 nm (1580 to 1620 nm , after calibration with build-in reference light source) ±0.5 nm (600 to 1750 nm)
Wavelength linearity [1, 3)]		±0.01 nm (1520 to 1580 nm) ±0.02 nm (1580 to 1620 nm)
Wavelength repeatability [1, 3)]		±0.005 nm (1 min)
Wavelength resolution [1, 3)]		Max. resolution: 0.015 nm or better (1520 to 1620 nm, RESOLN: 0.01 nm) Resolution setting: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0 nm
Resolution accuracy [1, 3)]		±5 %: (1300 to 1650 nm, RESOLN: 0.05 nm or more, resolution correction: ON)
Measurement level range [2, 3)]		-90 to +20 dBm (1200 to 1650 nm, SENS: HIGH3) -80 to +20 dBm (1000 to 1200 nm, SENS: HIGH3) -60 to +20 dBm (600 to 1000 nm, SENS: HIGH3)
Level accuracy [2, 3)]		±0.3 dB (1310/1550 nm, input: -30 dBm, SENS:HIGH1-3)
Level linearity [2, 3)]		±0.05 dB (input: +10 to -50 dBm, SENS: HIGH1-3)
Level flatness [2, 3)]		±0.1 dB (1520 to 1580 nm), ±0.2 dB (1580 to 1620 nm)
Polarization dependency [2, 3)]		±0.05 dB (1550/1600 nm), ±0.05 dB typ. (1310 nm)
Dynamic range [3)]		60 dB (1523 nm, peak ±0.2 nm, resolution: 0.01 nm) 70 dB (1523 nm, peak ±0.4 nm, resolution: 0.01 nm) 45 dB (1523 nm, peak ±0.2 nm, resolution: 0.1 nm)
Sweep time		Approx. 500 ms (SPAN: 100 nm or less,SENS: NORM HOLD, AVR: 1, SMPL: 501, resolution correction: OFF) Approx. 0.5 min (SPAN: 100 nm or less, SENS: HIGH2, AVR: 1,SMPL:501, No signal)
Function	Automatic measurement	Program function (20 program, 200 steps), Long-term measurement function
	Setting of measuring conditions	Span setting: 0 to 1200 nm Measuring sensitivity setting: NORMAL HOLD/AUTO, MID, HIGH1/2/3 Number of averaging setting: 1 to 1000 times Sample number setting: 11 to 20001, AUTO Automatic setting function of measuring conditions Sweep-between-marker function 0 nm sweep function Pulse light measurement function Air/vacuum wavelength measurement function TLS synchronized measurement function

Function	Trace display	Level scale setting: 0.1 to 10 dB/div, linear Simultaneous display of 3 independent traces Max./Min. hold display Roll averaging display Calculation-between-traces display Normalized display Curve-fit display 3D display Split display Power density display, % display, dB/km display Frequency display of horizontal axis scale
	Data analysis	WDM waveform analysis (Wavelength/Level/SNR list display), Optical fiber amplifier analysis (GAIN/NF, Single/Multi channel), PMD analysis, Optical filter analysis, DFB-LD analysis, FP-LD analysis, LED analysis, SMSR analysis, Peak search, bottom search, spectral width search, notch width search Delta marker (max. 200), line marker (analysis range specification) Graph display of long-term measurement result
	Others	Self-wavelength calibration function (using built-in reference light source)
Memory	Build-in FDD	3.5-inch 2HD
	Internal memory	32 traces, 20 programs
	File format	Trace file, program file, measuring condition file, Text file (trace, analysis data, etc.), Graphics file (BMP,TIFF)
Data output	Printer	Built-in high speed thermal printer
Interface	Remote control	GP-IB (2 ports) TLS control interfaces (TTL)
	Others	Sweep trigger input (TTL) Sample enable input (TTL) Sample trigger input (TTL) Analog output (0 to 5 V) Video output (VGA)
Display		9.4-inch color LCD (Resolution: 640 x 480 dots)
Optical connector		FC (Standard)
Power requirement		AC 100 to 120/200 to 240 V, 50/60 Hz
Environmental conditions		Operating temperature: 5 to 40 ºC Storage temperature: -10 to +50 ºC Humidity: 80 %RH or less (No condensation)
Dimensions and mass [4)]		Approx. 425 (W) x 222 (H) x 450 (D) mm, approx. 30 kg

Notes:
1) Horizontal scale: wavelength display mode
2) Vertical scale: absolute power display mode, RESOLN: 0.05 nm or more, resolution correction: OFF
3) At 15 to 30 °C, with 10/125 µm single mode fiber, after 2 hours of warm-up, after optical alignment
4) Excet protector

Specifications are subject to change without notice.

Ando Electric Co., Ltd.
3-484, Tsukagoshi, Saiwai-ku, Kawasaki, Kanagawa, 212-8519 Japan Phone: +81 (0)44 549 7300 Fax: +81 (0)44 549 7450

Ando Corporation
2021 N. Capitol Avenue, San Jose, CA 95132, U.S.A. Phone: +1 408 941 0100 Fax: +1 408 941 0103
EAST OFFICE: 7617 Standish Place, Rockville, MD 20855, U.S.A. Phone: +1 301 294 3365 Fax: +1 301 294 3359

Ando Europe B.V.
"Vijverdam", Dalsteindreef 57, 1112XC Diemen, The Netherlands Phone: +31(0)20 698 1441 Fax: +31(0)20 699 8938
NIEDERLASSUNG DEUTSCHLAND: Nymphenburger Straße 119 B, D-80636 München, Germany Phone: +49(0)89 143 8150 Fax: +49(0)89 143 81555

Ando Electric Singapore Pte. Ltd.
19 Kim Keat Road #05-03, Jumbo Industrial Building, Singapore 328804 Phone: +65 251 1391 Fax: +65 251 1987

Please visit our website for more information: **www.ando.com**

KT-1865-1 0101 KL250
Printed in Japan