

Q8341 Optical Spectrum Analyzer

Measures LDs with high speed and high accuracy

- High speed measurement option: 0.5 s
- Narrow coherence measurement resolution of 0.001 nm
- More than tenfold high wavelength accuracy of ± 0.01 nm (Option)
- High wavelength resolution option: 0.01 nm at 650 nm
- Wide measurement wavelength range: 350 nm to 1000 nm
- Small, lightweight platform



Q8341



High Throughput Capabilities

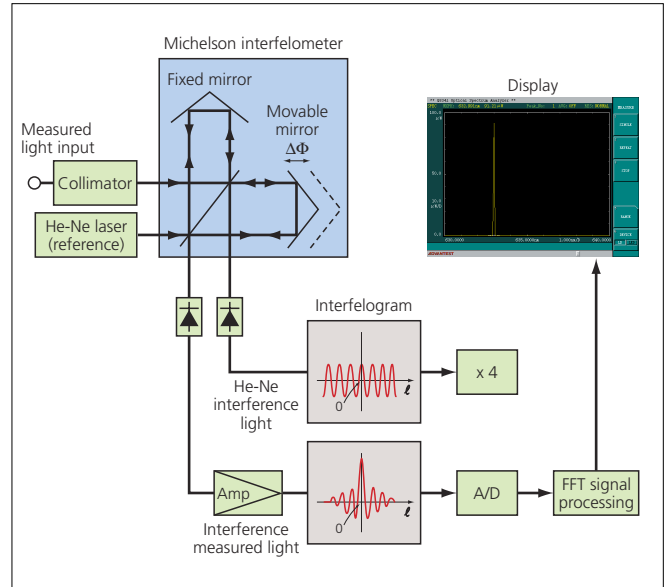
The Q8341 is an optical spectrum analyzer for visible radiation with a wavelength range of 350 nm to 1000 nm. Because it uses a Fourier spectrum system with a Michelson interferometer, the Q8341 can measure coherence. With its narrow wavelength resolution of 0.01 nm*, the Q8341 is very effective for the evaluation of not only CD/DVD laser diodes, but also for blue-violet laser diodes. In addition, the built-in He-Ne laser acts as a wavelength reference to ensure a high wavelength measurement accuracy of $\pm 0.01\text{nm}^*$. Finally, with its fast 0.5 s* measurement speed, the Q8341 is ideal for evaluating temperature characteristics of system components.

*: Option

- Coherence measurement resolution: 0.001 mm
- Wavelength resolution (at 650 nm):
0.05 nm (standard), 0.01 nm (option)
The measured resolution of the peak wavelength is 0.001 nm
- Wavelength measurement accuracy:
 ± 0.05 nm (standard), ± 0.01 nm (option)
- Max. input level: ± 10 dBm
- Max. Coherence measurement length:
Approx. 10 mm (standard), Approx. 40 mm (option)
- Wavelength measurement range: 350 to 1000 nm
- Small and lightweight

Measurement principle

The Q8341 uses a Michelson interferometer. In this arrangement, the light from the device-under-test is split and travels down two paths (with interference introduced between the two resulting light paths). From this, an interferogram is created. The horizontal axis represents the difference in length (i.e., time or phase) of the two light paths. In contrast, the vertical axis represents the interference light intensity. This is the autocorrelation of the device-under-test. Performing an FFT on this function then yields the power spectrum. To help with this, a He-Ne laser is used as the wavelength reference source.



Feature

High-speed measurement option: 0.5 s.

Ideal for manufacturing/production environments

The Q8341 measures a full span in approx. 0.5 seconds. This feature makes the Q8341 ideal for laser and light-emitting diode production lines. In addition, this fast measurement speed is ideal for high throughput environments.

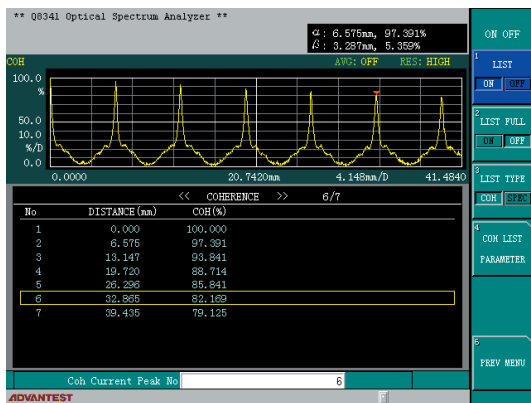
Excellent coherence analysis length

Analysis length: Approx. 40 mm, MAX (option)

Approx. 10 mm, MAX (standard)

Max. length resolution: 0.001 mm

The Q8341 also evaluates the laser diode's coherence for optical discs. With a long analysis length of up to 40 mm and a narrow resolution of 0.001 mm, the Q8341 is best suited to evaluate blue-violet laser diodes and other compact optical components.

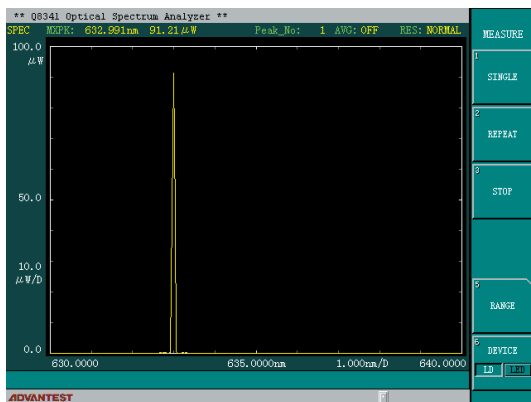


Coherence analysis

High wavelength accuracy

Wavelength accuracy: ± 0.01 nm (option), ± 0.05 nm (standard)

With its built-in Ne-He laser reference light source, the Q8341 measures spectrum with high wavelength accuracy.



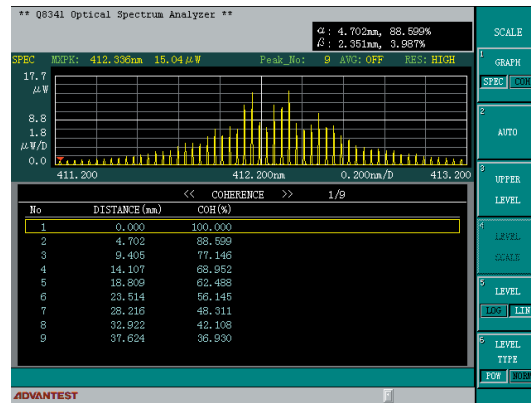
He-Ne laser measurement

Narrow-resolution to measure the oscillation mode of blue-violet laser diodes

Wavelength resolution (at 650 nm): 0.01 nm (option)

0.05 nm (standard)

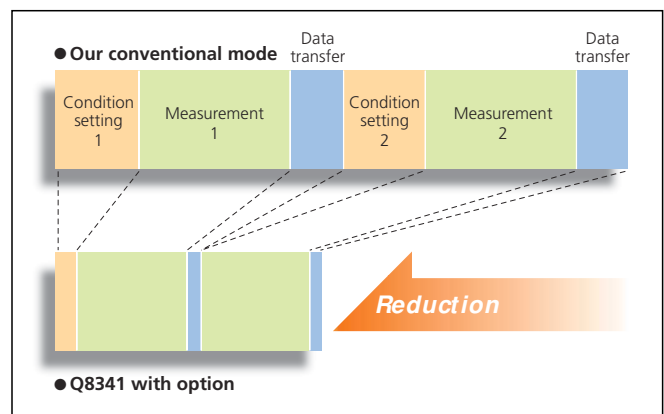
With its narrow resolution, the Q8341 separates the oscillation mode of blue-violet laser diodes. In addition, the measured resolution of the peak wavelength of 0.001 nm is ideal for monitoring measurement result affected by the ambient environment of the DUT.



Blue-violet laser diode measurement

For high-throughput measurement

Employing the large-capacity memory and high-performance calculation unit, the Q8341 quickly stores data. This data is then calculated by the unit to reveal the specified wavelength and span. For example, if the Q8341 analyzes the spectrums of two wavelength ranges (650 nm ± 50 nm and 780 nm ± 50 nm), it executes the spectrum analysis of the 2 separate LDs by changing only its display range. All of this is done without reconfiguring the system. Hence, the Q8341 reduces the index time for mass production system use.

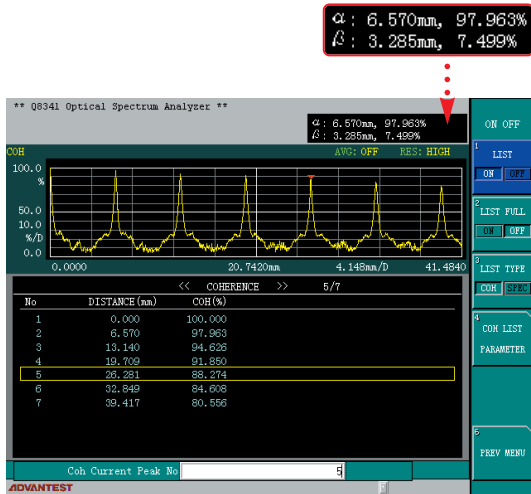


Measurement time of 2 wavelength LD

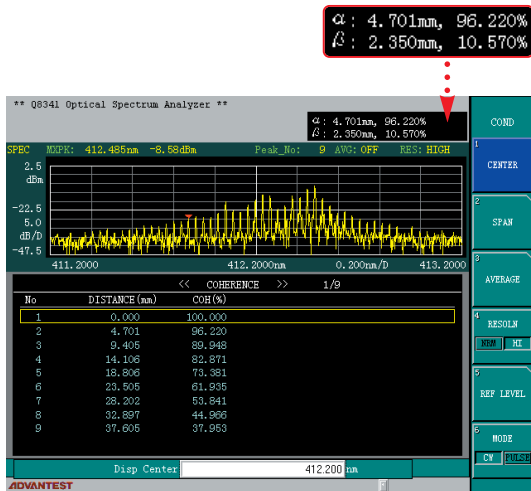
Measurement Examples

Coherent measurement of DVD laser diode

One important coherence characteristic of DVD laser diodes is determining the interference ratio output of the peak to the 2nd peak. The Q8341 measures this by simply pressing a key. It also displays the coherence calculations as result data.



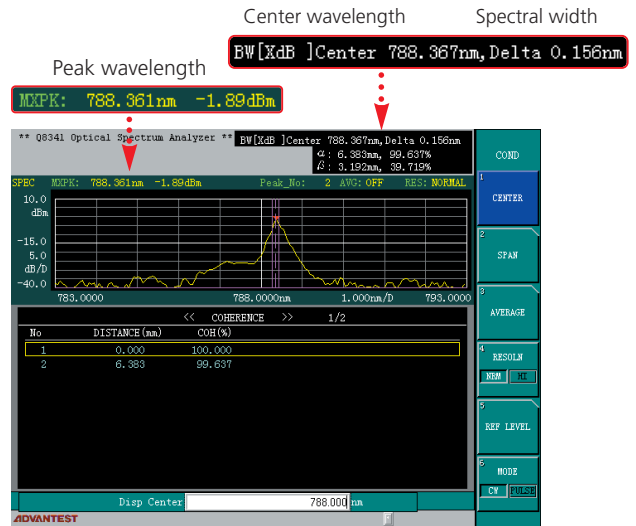
Coherence analysis



Spectrum analysis

Automatic measurements: Peak wavelength, center wavelength and spectral width of laser diodes

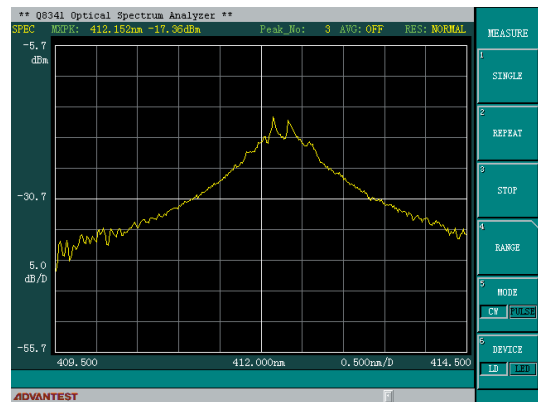
The peak wavelength (λ_p), center wavelength (λ_o) and spectral width ($\Delta\lambda$) are fundamental spectrum measurement parameters for laser diodes. With one key, the Q8341 automatically calculates and displays these results on the CRT.



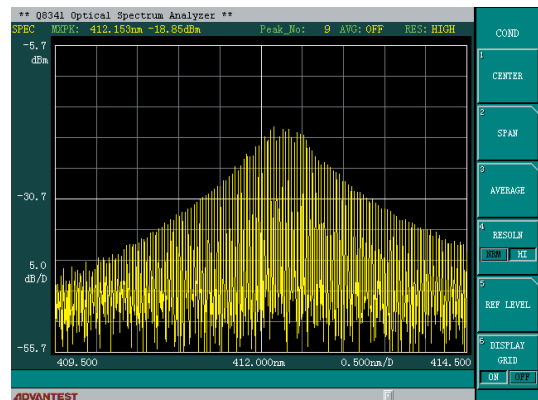
Spectrum analysis

Wide dynamic range

With option 70, the Q8341 performs measurements with narrow resolution. This enables you to separate oscillation modes for 405 nm band LDs.



Spectrum measurement of 405 nm band LD



Spectrum measurement of 405 nm band LD (with Option)

Specifications

Wavelength

Measurement range:	350 to 1000 nm
Accuracy ^{*1}	
Standard:	±0.05 nm
Option:	±0.05 nm (Normal Resolution Mode) ±0.01 nm (High Resolution Mode)
Resolution ^{*2}	
Standard:	0.05 nm
Option:	0.05 nm (Normal Resolution Mode) 0.01 nm (High Resolution Mode)

Level

Input sensitivity:	-50 dBm or less (350 to 1000 nm) -55 dBm or less (400 to 900 nm) +10 dBm
Maximum input power:	
Accuracy ^{*1} :	±1.0 dB (780nm, Input level of -10 dBm)
Scale ^{*3} :	0.2, 0.5, 1.0, 2.0, 5.0, 10 dB/div and Linear
Dynamic range ^{*4} :	30 dB or more

Coherence

Max. analysis length	
Standard:	10.3 mm
Option:	41.4 mm
Measurement resolution:	0.001 mm

Input return loss: 30 dB

Measurement time^{*5}

CW Mode	
Standard:	2 s or less
Option:	0.5 s or less (Normal Resolution Mode) 1.0 s or less (High Resolution Mode)
Pulse Mode:	2 s or less

Functions

Operation/analysis:	Spectral width measurement, Automatic peak search, Peak normalization, Averaging, Total Power, Pulse light measurement mode ^{*6}
Display, Other functions:	Superimpose display, List display, Cursor function, Accumulating operation time verify function
Memory function:	Internal CF memory (50 MB or more): Measurement data (Text), Screen Display data (Bmp), An external storage device is available via USB

Optical input

Connector:	FC type
Applicable fiber:	50/125 GI fiber

I/O interface:

GPIB (IEEE 488.2)
Ethernet (10/100 Base)^{*7}
VGA output
USB port
PS/2 Mouse

Display: 6.5 inch color LCD (640 x 480 dots)

*1: Under peak value. The value of wavelength display in a vacuum.

*2: At a wavelength of 650 nm. The resolution is the wavelength difference between the Nth data and the (N+1)th data point and depends on the center wavelength.
The measured resolution of the peak wavelength is 0.001 nm.

*3: The coherence display is available in linear only.

*4: The value from the peak to the Displayed Average Noise Level (at 8 times averaging).

*5: The time from the start of the measurement to getting peak data via the GPIB.
Measurement condition: PC-AT Compatibility (CPU: Pentium 200 MHz or higher),
Using PCI-GPIB provided by National Instruments.

*6: A function which measures light that pulses approx. every 20 μs or less.

*7: Remote controlling and network sharing of data folders in the internal memory is possible.

General Specifications

Operating environment:	Ambient temperature: +10 to +40°C Relative humidity: 85% max. (no condensation)
Storage environment:	Ambient temperature: -10 to +50°C Relative humidity: 90% max. (no condensation)
Power supply:	100 to 120 VAC/220 to 240 VAC, 50/60 Hz, 150 VA or less Automatic switching between 100 and 200 V systems
Dimensions:	Approx. 424 (H) x 132 (W) x 500 (D) mm
Mass:	16 kg or less

Options

With built-in high-speed sweep and coherence length extension option:	Q8341 + 70
Retrofit high-speed sweep and coherence length extension option:	OPT8341 + 70A



Pentium is a registered trademark of Intel Corporation.

Please be sure to read the product manual thoroughly before using the products.
Specifications may change without notification.

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