

# Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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## 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  $\pm 0.01$  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:  
 $\pm 0.05$  nm (standard),  $\pm 0.01$  nm (option)

- Max. input level:  $\pm 10$  dBm

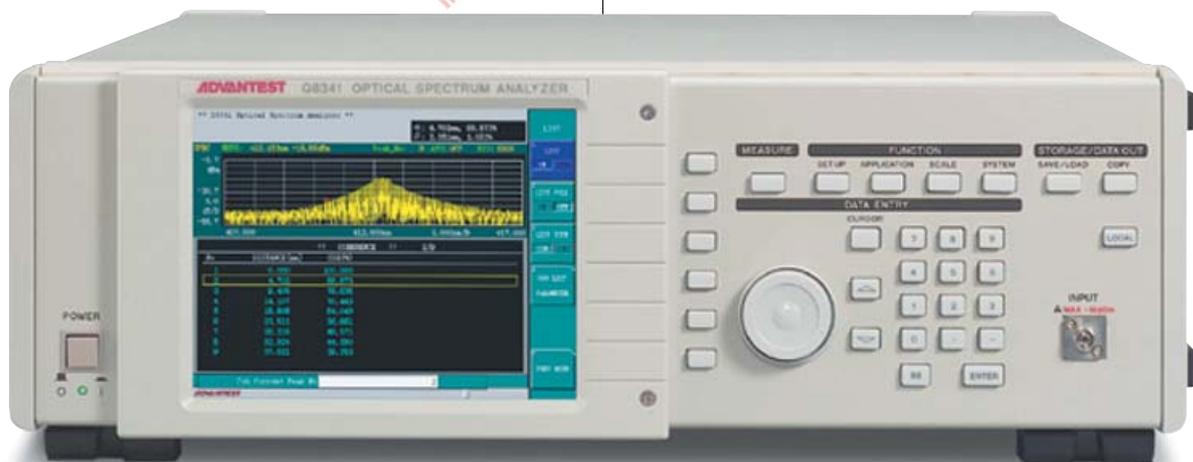
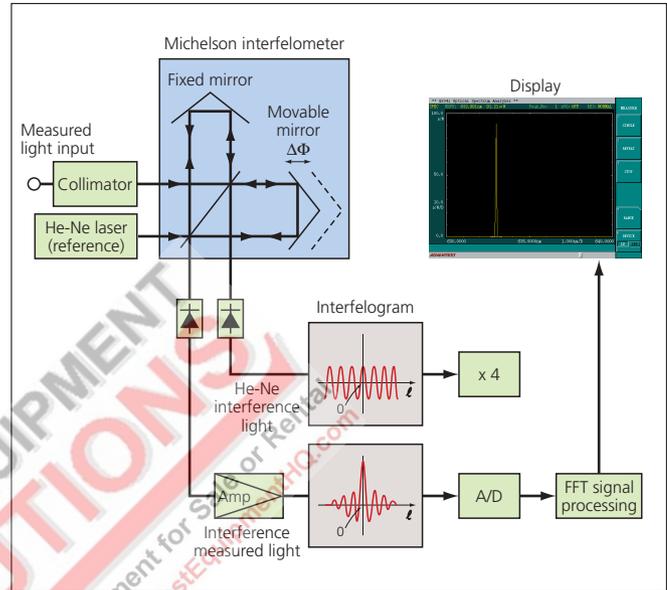
- Max. Coherence measurement length:  
Approx. 10 mm (standard), Approx. 40 mm (option)

- 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.

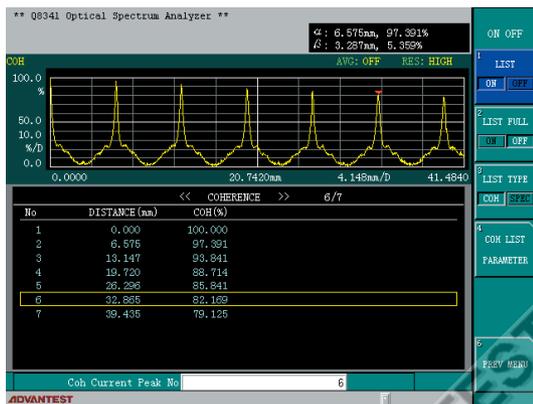
**Excellent coherence analysis length**

**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.

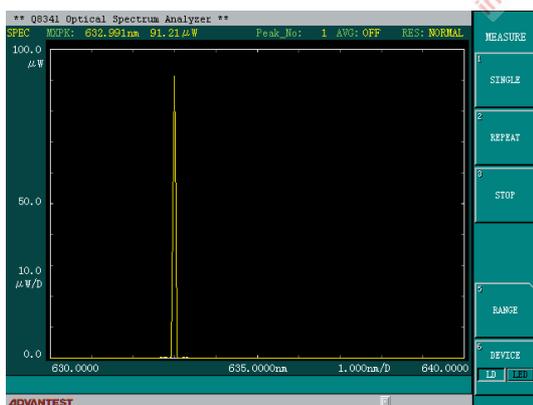


Coherence analysis

**High wavelength accuracy**

**Wavelength accuracy:  $\pm 0.01$  nm (option),  $\pm 0.05$  nm (standard)**

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



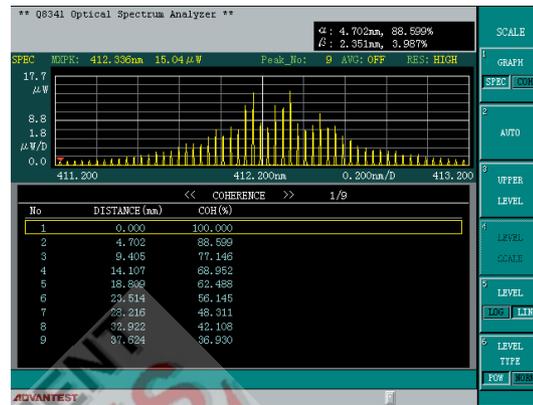
He-Ne laser measurement

**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)**

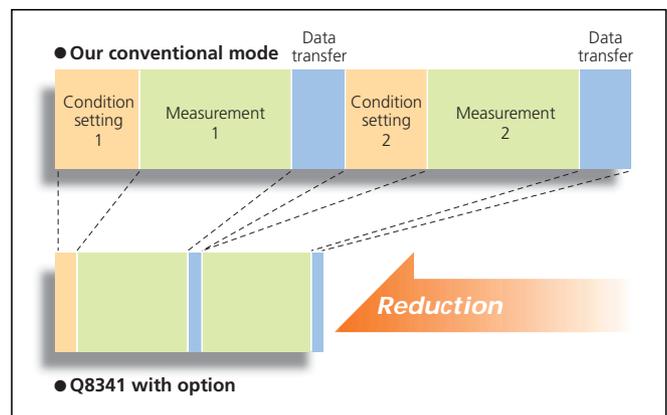
With its narrow resolution, the Q8341 separates the oscillation mode of blue-violet laser diodes. In addition, the measured resolution of the peak wavelength of 0.001 nm is ideal for monitoring measurement result affected by the ambient environment of the DUT.



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  $\pm$  50 nm and 780 nm  $\pm$  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.

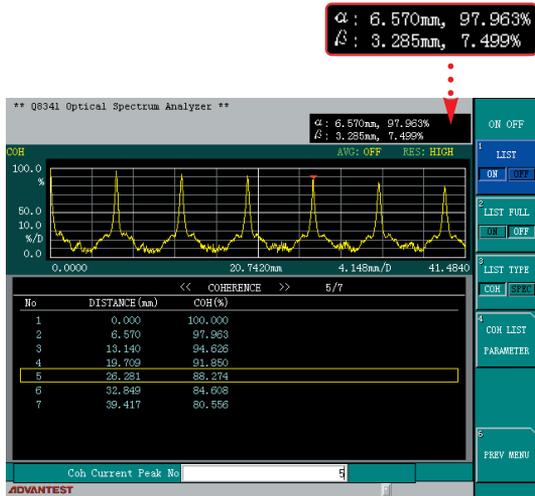


Measurement time of 2 wavelength LD

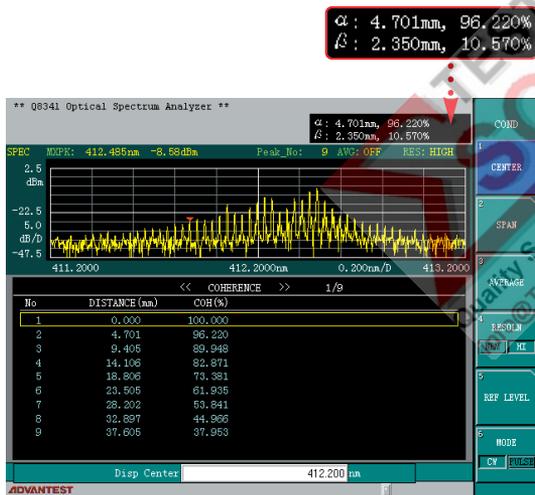
## Measurement Examples

### 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.



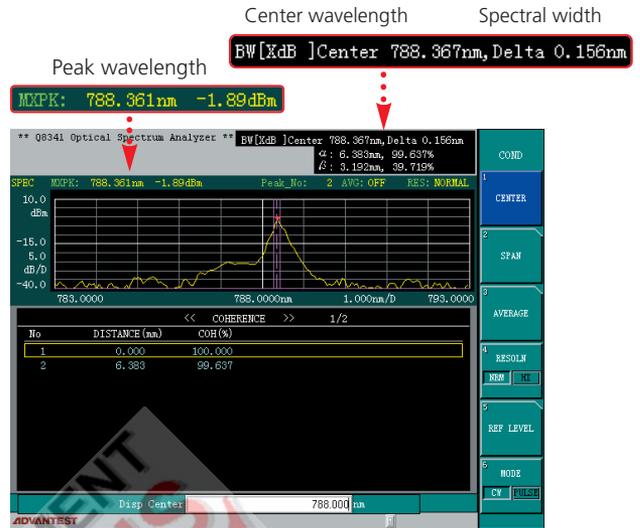
Coherence analysis



Spectrum analysis

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

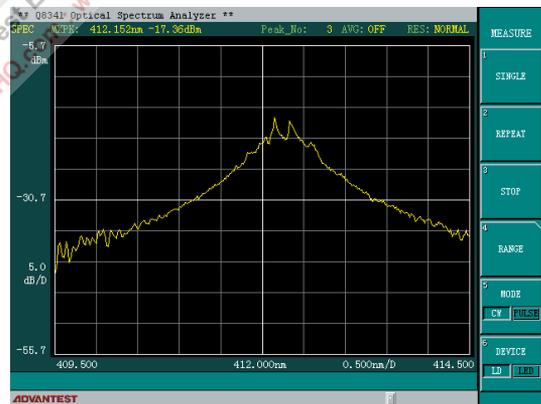
The peak wavelength ( $\lambda_p$ ), center wavelength ( $\lambda_o$ ) and spectral width ( $\Delta\lambda$ ) are fundamental spectrum measurement parameters for laser diodes. With one key, the Q8341 automatically calculates and displays these results on the CRT.



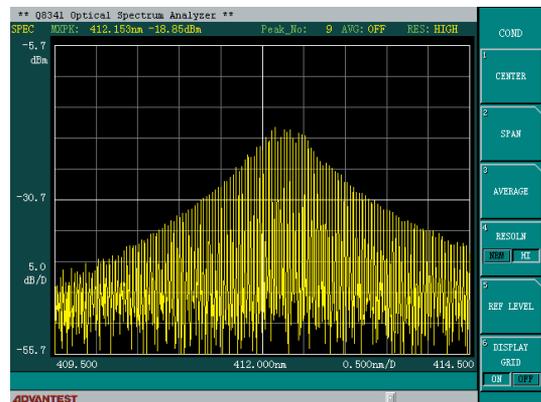
Spectrum analysis

### 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 <sup>*1</sup>	
Standard:	±0.05 nm
Option:	±0.05 nm (Normal Resolution Mode) ±0.01 nm (High Resolution Mode)
Resolution <sup>*2</sup>	
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:	+10 dBm
Accuracy <sup>*1</sup> :	±1.0 dB (780nm, Input level of -10 dBm)
Scale <sup>*3</sup> :	0.2, 0.5, 1.0, 2.0, 5.0, 10 dB/div and Linear
Dynamic range <sup>*4</sup> :	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<sup>\*5</sup>

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 <sup>*6</sup>
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)<sup>\*7</sup>  
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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