



Tokyo, Japan - January 15, 2020

Yokogawa Test&Measurement Releases AQ6377 Optical Spectrum Analyzer - First dispersive spectroscopy-based benchtop analyzer to support 5- μ m band measurement -

Yokogawa Test & Measurement Corporation announces that it has developed the AQ6377 optical spectrum analyzer and will release it on January 16. The AQ6377 is a benchtop analyzer that employs the dispersive spectroscopy technique^{*1} to measure the optical spectra of laser light in the 1.9–5.5 μ m wavelength range with high accuracy, wide dynamic range, and high resolution. The support of measurements in the 5- μ m band is an industry first^{*2} for instruments of this type.

An optical spectrum analyzer is a measuring instrument that resolves the wavelength components of photonics devices such as semiconductor lasers and fiber lasers to evaluate their wavelength characteristics. The AQ6377 will be used to enhance optical devices in the 5- μ m band and accelerate their use in environmental measurement and other fields.

Development Background

Recently, laser absorption spectroscopy^{*3} has entered wide use in the environmental measurement field for the detection of gases such as carbon oxides (CO_x), nitrogen oxides (NO_x), and hydrocarbons (C_xH_y). Although near-infrared semiconductor lasers have been used as the optical source in such applications, there is an increasing need for mid-infrared lasers because these gases absorb more light at longer wavelengths. The wavelength range around 5 μ m is ideal for such measurements, and devices such as interferometer-type measurement instruments and large-scale measurement systems with spectrometers are available that use 5- μ m semiconductor lasers to measure optical spectra in this range; however, these have disadvantages such as narrow dynamic range and low wavelength resolution that negatively impact measurement accuracy. There is thus a strong demand for compact, high-performance optical spectrum analyzers.

Since entering the optical spectrum analyzer market in 1980, Yokogawa has continued to develop and refine its technologies for the precision measurement of optical spectra in the visible and near-infrared ranges. Based on its expertise in dispersive spectroscopy, Yokogawa has developed the AQ6377 for mid-infrared measurements, including the 5- μ m band.

Product Features

1. Industry-leading measuring range

The AQ6377 features a dynamic range of 73 dB and a close-in dynamic range^{*4} of 50 dB, which are 2,000 times and 10

times greater, respectively, than the dynamic ranges of interferometer-type instruments operating in the 5- μm band. No other instrument on the market offers such high performance^{*5}, which enables the evaluation of the side mode characteristics of semiconductor lasers.

2. Industry's highest wavelength resolution

The wavelength resolution of the AQ6377 is an industry-leading 200 pm^{*6}, which is three times that of interferometer-type instruments operating in the 5- μm band.

3. Accurate measurement of optical spectra

The AQ6377 comes with two additional functions. The first is a function that removes water vapor, which absorbs light at certain wavelengths, from the spectrometer. The second is a function that eliminates artifacts from higher-order diffracted light, a phenomenon intrinsic to all spectrometers in which wavelengths two to three times longer than those of incident light are generated.

Major Target Users

Universities, research institutes, and manufacturers of active and passive optical devices that are engaged in the environmental sensing field

Main Applications

- Emission spectrum evaluation for semiconductor lasers, fiber lasers, and broadband light sources
- Measurement of wavelength transmission characteristics for optical filters such as a fiber bragg grating (FBG)^{*7}

*1 A technique whereby light is dispersed by passing it through a diffraction grating and then directed through a narrow opening to extract a specific range of wavelengths

*2 Based on a December 2019 Yokogawa survey

*3 The use of a laser to irradiate molecules, which, depending on their type, will absorb light of a particular wavelength. This principle is used to analyze the optical spectrum and quantitatively assess molecules in the gas phase.

*4 An indicator of the ability to resolve a weaker signal that is very close (in wavelength) to a stronger signal

*5 Based on a December 2019 Yokogawa survey. The dynamic range is a reference value (typical value), not a guaranteed value.

*6 Based on a December 2019 Yokogawa survey. Two hundred pm is the highest wavelength resolution that can be set for measuring 5- μm light.

*7 A device that utilizes periodic variations in the refractive index to reflect a certain wavelength in an optical fiber

About Yokogawa

Founded in 1915, Yokogawa engages in broad-ranging activities in the areas of measurement, control, and information. The industrial automation business provides vital products, services, and solutions to a diverse range of process industries including oil, chemicals, natural gas, power, iron and steel, and pulp and paper. With the life innovation business, the company aims to radically improve productivity across the pharmaceutical and food industry value chains. The test & measurement, aviation, and other businesses continue to provide essential instruments and equipment with industry-leading precision and reliability. Yokogawa co-innovates with its customers through a global network of 113 companies spanning 60 countries, generating US\$3.6 billion in sales in FY2018. For more information, please visit www.yokogawa.com.

The names of corporations, organizations, products, services and logos herein are either registered trademarks or trademarks of Yokogawa Electric Corporation or their respective holders.