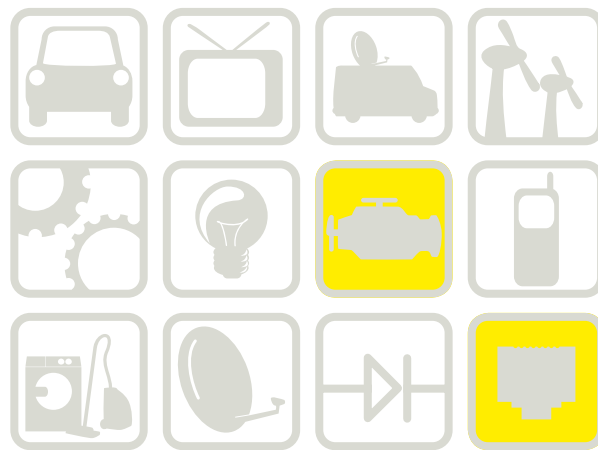


The perfect team for passive optical component characterisation



Introducing Yokogawa's AQ6370 Optical Spectrum Analyser and Broadband Light Source:

During R&D and after production or integration of passive fibre optic components the specifications must be verified at both, pass- and stop- band. There are a number of solutions in the market for testing pass band, but the majority fail to measure the stop band behaviour due to the lack in dynamic. The ability to discover the cross talk behaviour is critical. Yokogawa offers a solution for providing a total measurement dynamic of more than 60dB at 1nm resolution and more than 50 dB at 100pm.

WHAT ARE THE ALTERNATIVE SOLUTIONS?

■ **Tuneable Laser / Power Meter Setup**

This is expensive and limited in terms of wavelength range. The small line width of the LASER can cause interference problems and unstable measurements (maximum of 200nm range possible).

■ **ASE noise source / Optical Spectrum Analyzer**

Can provide a very high dynamic of up to 90dB for filter measurement but again these setups are limited to a wavelength range of typically 1400nm to 1640nm.

■ **Halogeneous white light source / Optical Spectrum Analyser**

Provides a broad spectrum which covers the complete CWDM range and more (600-1700nm). This setup is suitable to measure passive components and providing a dynamic of up to max. 35 dB*

■ **Super Continuum light source / Optical Spectrum Analyzer**

Allows a dynamic of more than 75dB in the range 1200-1700nm. To reach high speed measurements with a modern OSA these light sources are not suitable due to the low modulation rate. Fast OSA's like the Yokogawa AQ6370 measure so quickly that the modulation of the Super Continuum becomes an issue.

■ **SLD cascades / Optical Spectrum Analyzer**

The most flexible solution offering a high dynamic range of more than 60dB. The output of SLDs driven at high current normally is polarisation dependent which can disturb the accuracy of spectral characteristic evaluation of passive components. Our light source provides two depolarized outputs which are well suited for analysis of CWDM components. The Wavelength range covers the area from 1250 nm – 1650 nm and therefore suits perfectly for CWDM and DWDM applications.

SPECIFICATIONS

AQ6370:

- Resolution setting 20 pm to 2 nm
- Top close-in dynamic range of 62 dB at ± 0.4 nm from peak
- Free-space input
- User changeable connector (FC, SC, ST)
- Internal reference light source
- Sensitivity down to -90 dBm
- Enhanced analysis functions covering active and passive component evaluation
- Reduces sweep time by up to 80% compared to conventional OSA and supports highest measurement accuracy

Fibolux:

- Spectral range 1250–1650 nm
- Spectral power density -30 dBm/nm minimum
- Minimum -25 dBm/nm at 360 nm of spectral range
- Total power 40 mW typical
- Power stability 20 mdB at 15 min
- Spectral range 9 SLD: 1250 nm - 1650 nm
- Spectral range 5 SLD: 1280 nm - 1330 nm and 1420 nm - 1650 nm
- Spectral power density: min. -30 dBm/nm @ spectral range min. -25 dBm/nm @ 360 nm of spectral range (9 SLD Version)
- Total power: typ. 40 mW (9 SLD Version)
- Power stability: ± 20 mdB @15 min

Order information:

For order information, please contact your local sales agent.

*Dynamic Range always refers to 1nm resolution.

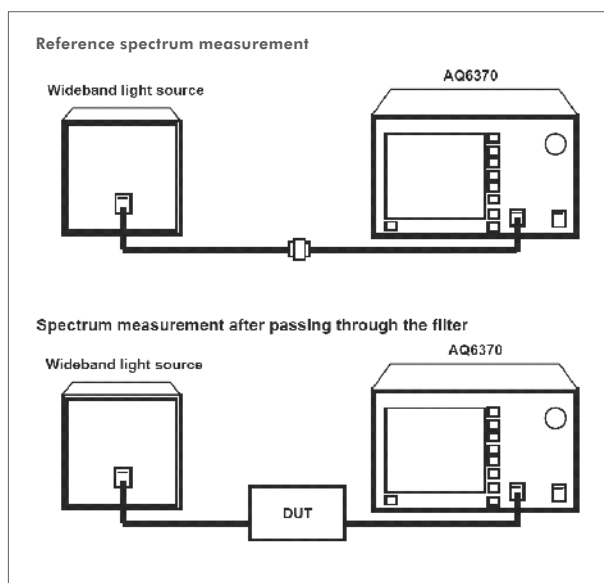
THE ADVANTAGES OF OUR SOLUTION

Due to the high dynamic, continuous signal and the smart design of the light source, our solution is able to provide:

- Up to 10 times faster measurement than previous solutions based on an OSA.
- A resolution of between 20pm and 2nm for each passive component making it suitable for CWDM, DWDM applications.
- A stable reference which requires a calibration just once per working day taking less than one minute.
- The maximum suppression of interferences which may be caused by high reflections.
- A better wavelength accuracy of less than 20pm suitable for DWDM measurements
- An extremely robust system that is able to withstand vibrations and shocks which may occur in production facilities.

THE MEASUREMENT PROCESS

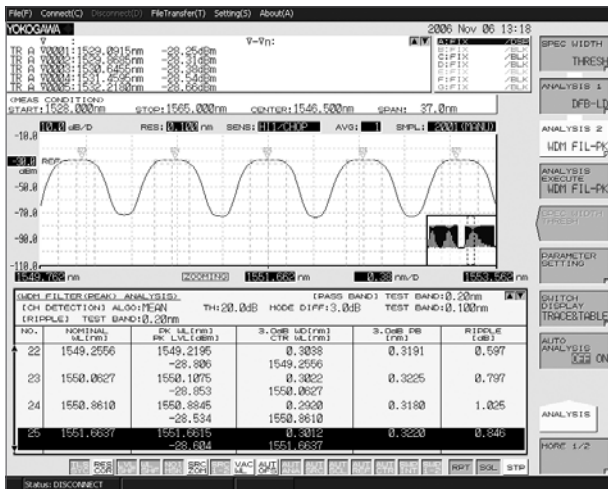
Measurement of passive components by the Fibolux light source and Yokogawa AQ6370



Basic measurement setup for filter tests

The basic setup is shown above.
The measurement is done in three steps.

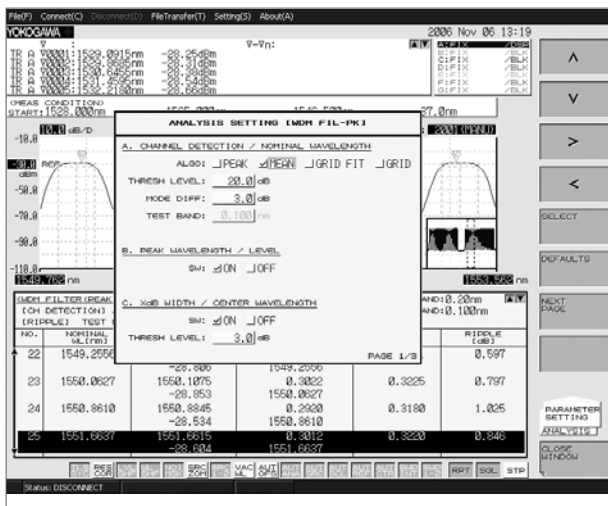
- Connect light source directly to AQ6370 and measurement of light source on Trace A.
- Connect Device Under Test between light source and OSA and measurement of result on Trace B.
- Use calculation function B/A which is available for Trace C and display final result.



typical trace of passive component

Following execution of the above steps, the trace shown here can be seen. "Although this is a multi channel peak filter", the AQ6370 allows auto analysis of:

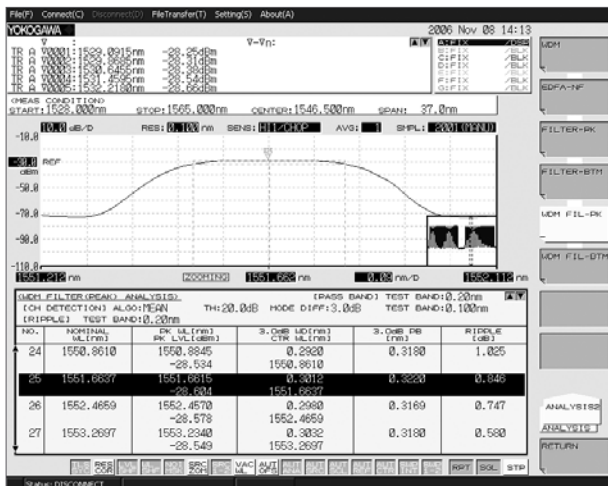
- Single peak filter
- Single bottom filter
- Multi-channel filter (interleavers) peak
- Multi-channel filter bottom



Sample of parameter setting screen

In this example, the AQ6370 allows the modification of parameters such as threshold level i.e. 3dB for half width measurement. Further parameters the AQ6370 supports are:

- 3/20 dB bandwidth.
- Ripple measurement for i.e. flat top filter.
- Cross-talk characterisation.



Zoomed result of Multi channel filter

The screenshot shown here is depicting a zoomed area on a pass band of a multi channel filter. The automatically generated result table provides values about:

- Centre wavelength
- Peak wavelength
- 3dB half width
- xdB half width
- Ripple of filter at pass band

And optional:

- Cross-talk information

DMOptics

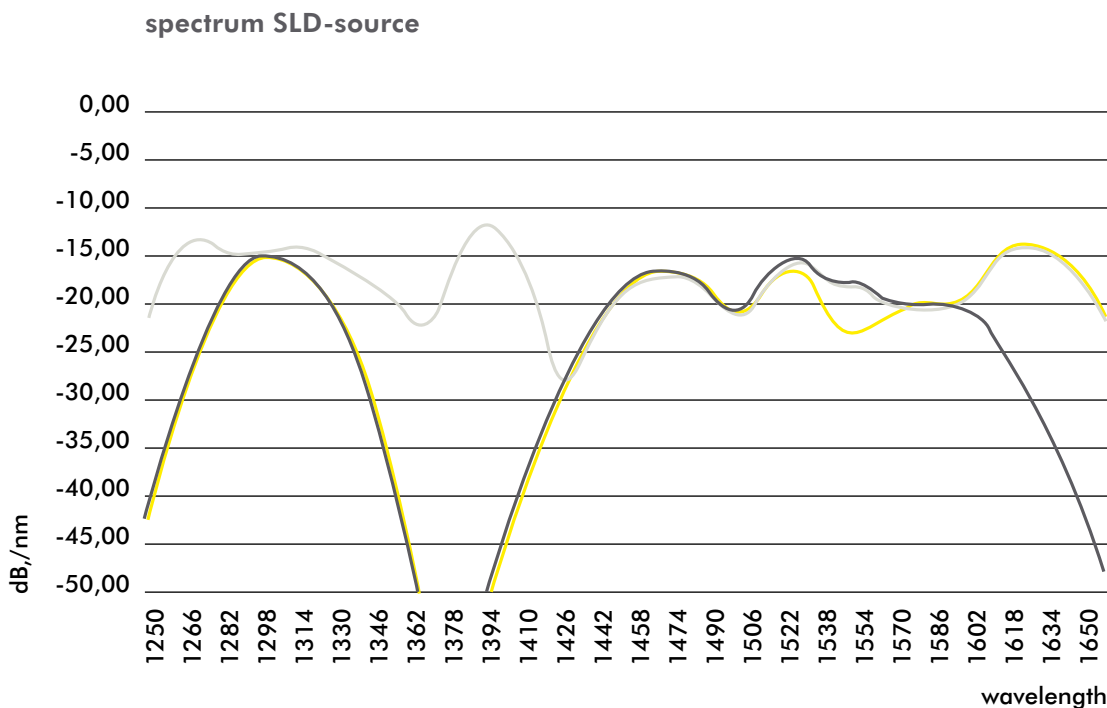
TEST EQUIPMENT SPECIALISTS

THE PERFECT TEAM TO MEET YOUR NEEDS

As we have demonstrated, the AQ6370 by providing a resolution setting of 20pm (typ. 14pm@1550nm) to 2nm combined with the Fibolux light source is the perfect team for passive component characterisation.

Since the AQ6370 provides a sensitivity at the 1200-1700nm range of better than -90dBm, we typically achieve a measurement dynamic of more than 60dB* within a measurement time of less than 1 minute. A dynamic of 30dB will be provided by a measurement time of less than 1 second together with the AQ6370 and Fibolux.

This setup therefore is the fastest solution to measure passive SM components at 1200 – 1700nm.



*Dynamic Range always refers to 1nm resolution.