OSA: Measurement of Reflection Characteristics of Optical Filters

Applicable model*: AQ6370 series/AQ6360

Characterization of optical filters can be done using an optical spectrum analyzer (OSA) and a broadband light source. The reflection characteristic of the optical filter is obtained as the difference between the reflected light spectrum of the standard reflector** and that of the DUT (reflective optical filter) in case of LOG scale. The measurement light source is selected from wide band light sources such as LED, halogen lamp, ASE, SLD, SC, etc. according to the required optical power and wavelength range.

The applicable models have a free space structure inside the optical input port, and can use large-diameter optical fibers with a core diameter of up to 800 µm. The large fiber delivers more light to the OSA, helping to reduce noise on the measurement waveform and reduce measurement time. However, since the actual minimum wavelength resolution gets lower, it is effective for measurements where the optical power is low and high resolution is not required.

* All versions unless otherwise specified.

At the time of measurement, be careful not to let stray light (unnecessary irregular reflection light) or ambient light enter the optical coupler. The smaller the numerical aperture (NA) of the optical fiber and the shorter the optical path length from the collimator to the optical coupler, the smaller the loss, which is advantageous for measurement, but high precision adjustment of angle and optical axis is required. Especially the adjustment of the optical coupler side becomes difficult. Therefore, when the optical power is high, it is easier to adjust it by receiving light directly with the ferrule of the optical fiber.

YOKOGAWA offers a variety of OSA in the wavelength range 350-5500 nm that enables measurement of visible (VIS), near-infrared (NIR), short-wave infrared (SWIR), and medium-wave infrared (MWIR) ND filters and bandpass filters.

** If the wavelength dependence of the collimator and optical coupler is sufficiently small and the polarization characteristics and absolute power can be ignored, the standard reflector measurement can be omitted and the output of the broadband light source can be used as the reference spectrum.