

OVERVIEW

The CA-250 Bare Ferrule Fiber Optic Adapter is designed for bare FC ferrule connectors and is compatible with the family of measurement heads for the FPM-8220 Fiber Optic Power Meter. This technical note measures the repeatability of measurement when using the CA-250 Bare Ferrule Fiber Optic Adapter and FPM-8220 Fiber Optic Power Meter with the FMH-8715 Fiber Optic Measurement Head.

BACKGROUND

The FPM-8220 Fiber Optic Power Meter and FMH-8700 Series Fiber Optic Measurement Heads are designed to provide highly repeatable and accurate measurements for fiber optic component testing. The CA-250 Bare Ferrule Fiber Optic Adapter was designed for easy insertion and removal of bare FC ferrule connectors.

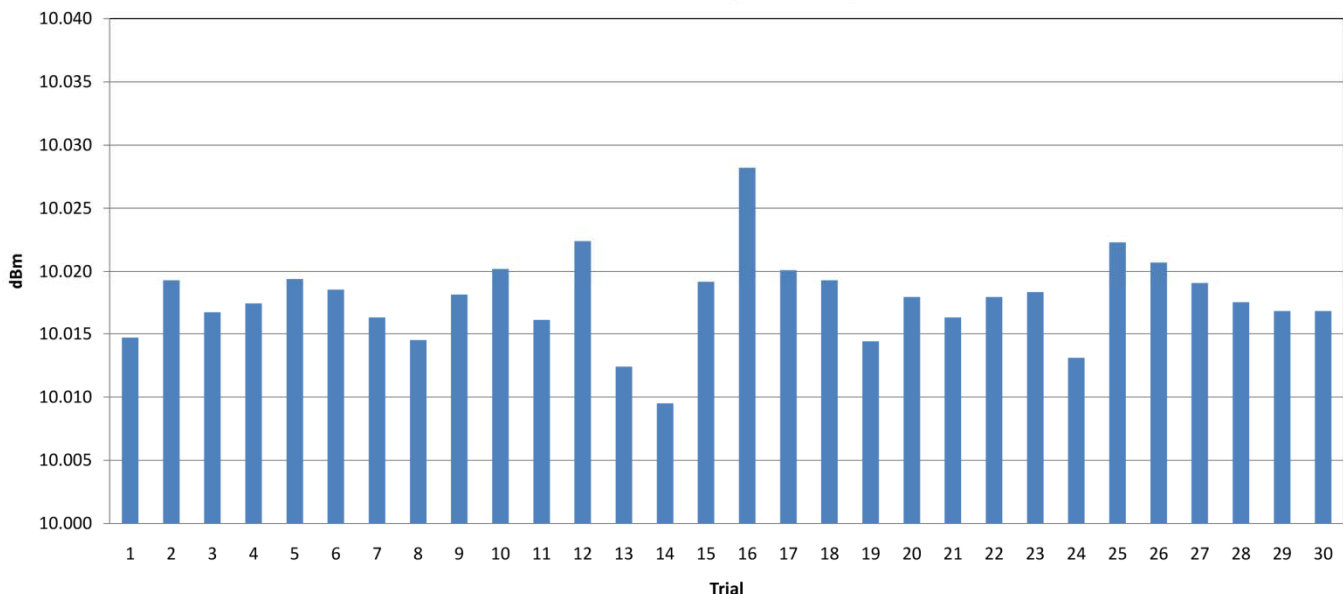
The bare FC ferrule does not include the outer metal screw and key of a standard FC connector which makes it more susceptible to measurement repeatability errors.

TEST PROCEDURE

The CA-250 Bare Ferrule Fiber Optic Adapter was installed in the FMH-8715 which was connected to the FPM-8220. A custom fiber optic cable with a FC/APC connector on one end and a bare FC/APC ferrule connector on the other connected a FOS-79800F Fiber Optic Source Module to the FMH-8715.

All test equipment was warmed up for one hour prior to testing. The fiber optic cable was fastened to the bench to minimize changes in power due to changes in the refraction of the cable and to minimize rotation of the bare FC ferrule connector in the CA-250.

CA-250 Repeatability



TECH NOTE

The FPM-8220 was set to manual range mode and medium filter speed to provide the best results for repeatability.

The bare ferrule connector was inserted into the CA-250 and the average of 100 measurements was recorded. The bare ferrule connector was removed, cleaned, reinserted and the data sampling was repeated. This test process was repeated 30 times.

RESULTS

Repeatability was calculated by subtracting the maximum and minimum values of the series and dividing by two.

$$\text{Repeatability} = \frac{10.0282 - 10.0095}{2} = \pm 0.0094 \text{ dB}$$

CONCLUSION

The CA-250 in this test had a repeatability of ± 0.0094 dB. The same test was performed with a CA-120 FC Fiber Optic Adapter and FC/APC connector and the repeatability was calculated to be ± 0.0050 dB. This value was used to calculate the published repeatability specification of ± 0.01 dB, which also contains additional assumptions on measurement uncertainty.