

Article Overview

Splitter port test results are analyzed by evaluating insertion loss, excess loss, and port-to-port variability to ensure compliance with PON or POL standards.

Key Parameters in Splitter Testing

Insertion Loss (IL): This measures the reduction in optical power from the input port to a single output port. It includes both the splitting loss and any excess loss due to imperfections in the splitter or connectors. For example, a 1x2 splitter ideally introduces 3 dB of splitting loss, while higher split ratios (1x4, 1x8, 1x32) increase the theoretical splitting loss by 3 dB per doubling of outputs. **Excess Loss (EL):** This is the difference between the total input power and the sum of all output powers. It accounts for inefficiencies in the splitter beyond the ideal splitting ratio. Low excess loss indicates a high-quality splitter. **Port-to-Port Variability:** Variability measures the difference in loss between individual output ports. A well-manufactured splitter should have minimal variability, ensuring consistent signal distribution across all ports.

Testing Methodology

- o **Equipment Preparation:** Use an optical loss test set (OLTS) like CertiFiber(R) Pro or an optical power meter with a light source. Ensure connectors are clean and inspected, as dirty end-faces can cause inaccurate readings.
- o **Reference Calibration:** Establish a 1-jumper reference to avoid negative loss results. Verify test reference cords (TRCs) are in good condition, typically ≤ 0.20 dB loss.
- o **Measurement Procedure:**
 - o Connect the input port of the splitter to the light source.
 - o Measure each output port sequentially using the power meter or automated test set.
 - o Record insertion loss for each port and calculate excess loss if needed.
 - o For bidirectional splitters, measurements are symmetrical; upstream and downstream losses are equivalent.
- o **Data Analysis:** Compare measured IL and EL against manufacturer specifications or industry standards (ANSI/TIA, ISO/IEC, GR-1209 CORE). Identify any ports with unusually high loss or variability, which may indicate defects or connector issues.

Interpretation of Results

- o **Within Specification:** If all ports show insertion loss and excess loss within the recommended limits, the splitter is considered compliant.
- o **High Loss Ports:** Ports with higher-than-expected loss may indicate contamination, connector damage, or internal splitter defects. Re-inspection and cleaning are recommended.
- o **Excessive Variability:** Significant differences between ports suggest manufacturing inconsistencies or

Analysis of Splitter Port Test Results

installation issues. Consistency is critical for PON networks to ensure uniform signal distribution .

Best Practices

- o Always inspect and clean connectors before testing.
- o Use calibrated reference cords and verify TRCs.
- o Document all measurements and save results for traceability, especially when using automated systems like PFP Splitter Power or OCETSPlus .
- o Repeat tests if environmental conditions change significantly, as temperature and humidity can affect optical loss . By following these procedures, splitter port test results can be accurately analyzed to ensure network performance, compliance with standards, and reliable signal distribution across all output ports.

The effect on transmitter (Tx) power measurements of a splitter in the RF path connecting a mobile test system to the Primary and

For other 1xN optical splitters, e.g. 1×32 splitter, this test method can also be used. Just set the light source up on the

There is something different between testing an optical splitter and a patch cable although both of them use an optical

This article describes the correct method for testing a balanced PON splitter for port loss using the CertiFiber® Pro, there will be a

This paper reported performance analysis of four equal port power splitter with second harmonic suppression along with its return

When testing optical splitters, several common issues can arise that may affect the accuracy of your results.

The Optical Link Loss Testing Report conducted by Telecom Fiji Limited compares centralized and cascaded splitter configurations,

The results of the water-splitting tests are sum marized in table 2. The %RSD, an indication of the precision of the cone splitter, was

Testing a splitter or other passive fiber optic devices like switches is little different from testing a patchcord or cable plant using the

Construction Phase: Centralized Test Bad DS power levels Confirm no bends, breaks or excessive losses

within the drop fiber

I am looking for possible ways to measure s-parameters of a 3-port power splitter (1 input and 2 outputs). It is similar

Optical splitters are widely used in passive optical networks. Splitter loss is an important parameter of fiber optic

Figure 1 depicts the typical power splitter application of precision leveling, where a power sensor is connected to one splitter output

Understanding Power Splitters How they work, what parameters are critical, and how to select the best value for your application.

To accurately assess signal loss and verify that splitter installations are performing within expected parameters, you

The loss at each port in a PLC splitter is a fundamental consideration for fiber optic network design. While theoretical

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