

What are the standards for testing the loss of optical splitters

Article Overview

Optical splitter loss is tested using insertion loss and excess loss measurements with a light source and optical power meter, following industry standards such as GR-1209 and TIA/FOA guidelines.

Key Concepts

Optical splitters are passive devices used in fiber networks to divide or combine optical signals, commonly in PONs, FTTH, and CATV systems. Splitters can be FBT (fused biconical taper) or PLC (planar lightwave circuit) types, with configurations like 1x2, 1x4, 1x8, etc. Loss in splitters is measured in decibels (dB) and includes:

- o Insertion Loss (IL): The loss from a specific input port to a single output port, including splitting loss and excess loss.
- o Excess Loss (EL): The difference between the input power and the total power from all output ports, ensuring total output is always less than input power .

Testing Procedure

- o Equipment: Use a calibrated optical light source at the operating wavelength and an optical power meter.
- o Reference Setup: Establish a 0 dB reference using a launch reference cable. Methods include:
 - o 1-cable reference: Includes connector losses at both ends.
 - o 2-cable reference: Rarely used, includes one connector.
 - o 3-cable reference: Common for MPO or multi-fiber connectors; excludes end connectors from the loss budget .
- o Connection: Connect the light source to the splitter input and attach the power meter to the output port via a receive reference cable.
- o Measurement: Record the optical power at each output port. The insertion loss is calculated as the difference between the input power and the measured output power. Excess loss is determined by comparing the sum of all output powers to the input power .
- o Symmetry Principle: Splitter attenuation is symmetrical; testing can be performed in either direction (upstream or downstream) with the same results .

Standards and Guidelines

- o GR-1209 CORE Specification: Defines typical loss values and testing procedures for optical splitters, ensuring compliance with manufacturer specifications .
- o TIA and FOA Standards: Require insertion loss testing for all fiber optic components, including splitters, to

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verify that the system meets the loss budget before acceptance .

- o Bidirectional Testing: Recommended to test from both directions to account for connector and splice variations, especially in long PON links .
- o Loss Budget Integration: Splitter loss is included in the overall fiber link loss budget, along with fiber attenuation, connector, and splice losses .

Practical Considerations

- o Test at the wavelength the network will operate (e.g., 1310 nm, 1490 nm, 1550 nm for PONs).
- o Use high-quality test cords to minimize additional connector loss.
- o For multi-output splitters, measure each output port individually and sum for total excess loss.
- o Document results for future troubleshooting and system verification . By following these procedures and standards, optical splitter loss can be accurately measured, ensuring reliable network performance and compliance with industry specifications.

An optical splitter is a crucial passive fiber optic device that splits and combines optical

What you are measuring is the loss of the splitter due to the split ratio, excess loss from the manufacturing process

Insertion Loss Testing the Installed Fiber Optic Cable Plant With A Test Source and Power Meter Typical

These standards also provide the various values used in the loss budgets for the optical line terminals (OLTs) and optical network

Testing is the subject of the majority of industry standards, as there is a need to verify component and system specifications in a

Application note: Practical overview of optical loss testing theory and practice for fiber optic communication systems.

Optical splitters are usually used in passive optical networks (PONs) to distribute fiber to individual homes or businesses. There is

The CertiFiber® Pro Optical Loss Test Set (OLTS) can be used to check that the loss of a PON Splitter (often referred

Understanding Optical Splitter Loss - How to Test Splitter Power Levels To accurately assess signal loss and

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verify

Testing a coupler or splitter (both names are used for the same device) or other passive fiber optic devices like

Learn about insertion loss causes, measurement, budgets, troubleshooting tips, testing, fixing, and what to look for in

Both TIA and ISO standards use the term "Tier 1" to describe testing with an OLTS. An OTDR characterizes the loss of the link for

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

Insertion loss testing of the optical splitter is very important to ensure compliance to the optical parameters of the

Importantly, to achieve accurate absolute loss certification, loss must be measured from each end, and averaged. For craft level

Testing for loss (also called "insertion loss") requires measuring the optical power lost in a cable (including fiber attenuation,

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