DKN Access Networks & Consulting

Test Report on Energy-Saving GPON Equipment

AI Overview

GPON equipment demonstrates significant energy-saving potential through low-power modes, optimized ONU/OLT operation, and adherence to ITU-T energy efficiency standards.Overview of GPON Energy EfficiencyGigabit Passive Optical Networks (GPONs) are inherently more energy-efficient than legacy copper-based access technologies due to the use of single-mode optical fiber and passive splitters, which reduce active network elements and power consumption . GPONs support high bandwidth over longer distances while consuming less energy per subscriber, making them a green technology suitable for FTTH deployments .Laboratory Test MethodologyLaboratory tests on GPON equipment typically involve:Test Platforms: Spirent TestCenter or equivalent chassis with multi-port Ethernet modules .Network Components: Optical Line Terminals (OLTs), Optical Network Units (ONUs), and passive optical splitters (commonly 1x16 or 1x32 ratios).Performance Metrics: Upstream and downstream throughput, bidirectional traffic, GPON port-to-port performance, and multiport ONT tests.Energy Metrics: Power consumption of ONTs and OLTs under load, including transformer and power supply losses, with a focus on GPON-specific circuitry .Energy-Saving ModesGPON equipment can implement several power-saving strategies:Sleep Modes: ONUs can switch off GPON-related circuitry when idle, though the GPON portion typically accounts for only 15% of total ONT power consumption, limiting direct savings .Dynamic Power Management: Adjusting OLT and ONU operation based on traffic load and subscriber activity .Low-Power Hardware Design: Optimizing transceivers, MAC functions, and interface modules to reduce energy consumption .Standards and MetricsEnergy efficiency testing and metrics for GPON equipment are guided by ITU-T L.1310, which defines...

Article Content

GPON Equipment Market Size, Competitors, Trends & Forecast

This report provides an analysis of the key trends in each sub-segment of the global GPON equipment market report, along with forecasts at the global, regional and country level from 2026-2034.

Improving Power Efficiency and Down-Up Bandwidth Symmetry in

Abstract: ITU-T PON standards are dominant choices for FTTx in which GPON and XG-PON/XGS-PON are currently deploying by operators in fast pace. They can be co-existed in the same fiber by using

GPON Equipment Market Size, Share, Growth | CAGR Forecast 2033

GPON Equipment Market Overview GPON Equipment market size is estimated at USD 11,500.75 million in 2025 and is projected to reach USD 24,750.40 million by 2033, growing at a CAGR of 10.05% from

GPON Market Size & Share, Statistics Report, 2025 – 2034

The global gigabit passive optical network (GPON) market was valued at USD 7.3 billion in 2024 and is projected to grow at a CAGR of 9.4% between 2025 and 2034.

The next generation of passive optical networks: A review

Abstract Passive Optical Networks (PONs) have become a popular fiber access network solution because of its service transparency, cost effectiveness, energy savings, and higher security

Understand GPON Technology

This document describes the Gigabit Passive Optical Network (GPON) technology and how it functions.

Full article: Reducing Power Consumption in Optical Access Networks ...

However, as these networks expand, energy consumption is becoming an increasingly important economic and environmental issue. In this paper, we analyze the energy savings of the

Full article: Reducing Power Consumption in Optical Access Networks ...

In this paper, we analyze the energy savings of the transition from a point-to-point (P2P) optical architecture to a gigabit-capable passive optical network (GPON) with a point-to-multipoint

GPON OLT Energy Consumption Report | PDF | Bit Rate

The testing confirmed a weighted energy consumption rating of 1.476 W/Gbps, with the equipment passing the relevant standards. The report includes details about the testing laboratory, applicant,

[White Paper] GPON Testing

Xena''s Z01s Odin test module is ideal for testing and verifying GPON transmission equipment including mandatory interoperability and conformance test cases in accordance with TR-255 and TR-247/ATP

Fiber tests in PON networks: commissioning and maintenance

For in-stance, measurement reports should be generated in PDF format and distributable to cloud services (e.g. As FTP upload via WLAN) directly via the GPON interface, without the need for a

Evaluating power saving techniques in passive optical access

Passive optical networks (PONs) are a preferred technology for implementing fiber-to-the-home networks. Though PONs minimize power consumption compared to digital subscriber loops

Table of Contents

14.2 Test methodologies for converged packet optical equipment Annex A – Metrics and measurement methodologies for converged packet optical equipment with both packet signal and TDM signal

Paper Title (use style: paper title)

Because GPON is significantly different than many legacy networking technologies, performance can sometimes become an issue when GPON is used to replace those technologies. This paper

Energy consumption and bandwidth allocation in passive optical

For these next generation equipment, wireless and fixed line technologies are expected to be integrated in the so-called 5 G framework . However, in a scenario where a continuous

Gigabit Passive Optical Network (GPON) Market : Global Industry ...

Gigabit Passive Optical Network (GPON) Market is forecasted to reach USD 13.0 billion by 2035 and exhibiting a remarkable 5.5% CAGR between 2025 and 2035.

A Framework for an Energy-Efficient Bandwidth Allocation Approach ...

PDF | On Jan 1, 2020, Ali A. Hammadi published A Framework for an Energy-Efficient Bandwidth Allocation Approach through Dynamic ONTs Grouping in Flexible GPON Access Networks | Find,

GPON in FTTx Broadband Deployments

Thank you for attending the GPON in FTTx Broadband Deployments Tutorial The Broadband Forum is a non-profit corporation organized to create guidelines for broadband network

Power Saving Modes for GPON and VDSL2

This paper introduces and discusses low-power saving mode proposals as currently discussed for digital subscriber lines (VDSL2) and passive optical networks (GPON) in ITU-T SQ15.

A Framework for an Energy-Efficient Bandwidth Allocation Approach ...

Discover an energy-efficient bandwidth allocation mechanism for Fiber to the Home (FTTH) networks. Minimize power consumption and blocking with optimized Optical Network Terminal (ONT) grouping.

Energy Plane (E-Plane) Test Suites for RAN / vRAN / O-RAN

O-RAN and 3GPP are fast evolving standards and equipment manufacturers have to ensure continuing compliance of their products to the latest versions. Automation of the test cases and report

On the Feasibility of GPON Fiber Light Energy Harvesting for the ...

In this paper, we study the possibility of harvesting energy from the light flowing in the Gigabit Passive Optics Network (GPON) to supply low-power devices.

Investigation on power efficiency of GPON with heterogeneous traffic

In this article, we investigate the performance of Gigabit Passive Optical Network (GPON) with the heterogeneous traffic at Optical Network Unit (ONU) and Optical Line Terminal (OLT) in the presence

A Comprehensive Analysis of Methods for Improving and Estimating

The most important energy management and power-saving methods for Optical Line Terminals (OLTs) and Optical Network Units (ONUs), as key OAN components, are overviewed in the paper.

GB/T 34087-2017 in English

GB/T 34087-2017 English Version - Energy efficiency metrologies and test methods for access equipments-GPON system English Version

GPON Market Size, Share | Industry Report & Forecast 2035

Global GPON market size was USD 8.59 Billion in 2025, is projected to reach USD 15.97 Billion by 2035, growing at a 6.40% CAGR.

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