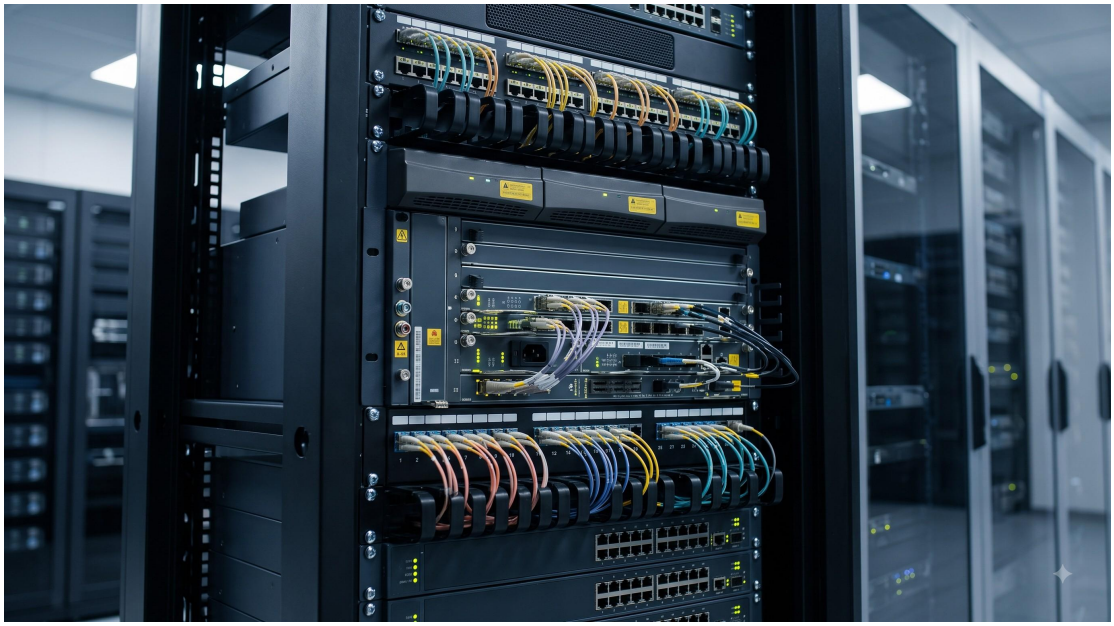
Generic XPON ONU Triple-Play Service Mapping on FiberHome AN5516 OLT Systems - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document serves as the definitive technical reference for the integration and service mapping of Generic XPON Optical Network Units (ONUs) within the FiberHome AN5516 Optical Line Terminal (OLT) ecosystem. It provides a comprehensive overview of the hardware architecture, forwarding logic, and configuration framework necessary to deliver carrier-grade Triple-Play services (Voice, Video, and High-Speed Data) over a unified passive optical network (PON) infrastructure.

The solution detailed herein leverages a mature, standards-compliant interoperability model, enabling service providers to deploy Generic ONUs alongside FiberHome’ s native portfolio. This approach ensures operational flexibility, supply chain diversification, and a streamlined migration path towards next-generation network convergence without compromising the stringent Quality of Service (QoS) required for modern Triple-Play bundles.



HARDWARE ARCHITECTURE & SILICON

The Generic XPON ONU is engineered as a compact, high-efficiency Customer Premises Equipment (CPE) device, designed for seamless registration and management under the FiberHome AN5516 OLT. The device features a highly integrated System-on-Chip (SoC) architecture that incorporates a dedicated packet forwarding engine, a hardware-accelerated QoS classifier, and a robust PON MAC layer. The SoC is designed to process full line-rate traffic with minimal latency, ensuring that voice, video, and data streams are handled with deterministic precision.

From a hardware perspective, the ONU provides a flexible interface set to address varied subscriber environments. Standard models are equipped with a PON optical interface (SC/APC) compliant with G.984 GPON or G.987 XGS-PON

standards, alongside multiple 10/100/1000BASE-T Gigabit Ethernet ports for high-speed data and an FXS port for analog voice connectivity. The internal memory architecture consists of high-speed DDR RAM for packet buffering and a NAND Flash memory for robust firmware storage, which is critical for remote software upgrades and configuration persistence.

KEY FEATURES & ROUTING LOGIC

- Feature 1: Dynamic Service Mapping Engine: The ONU features a hardware-implemented GEM Port (GPON Encapsulation Method) mapping engine. This engine is configured by the AN5516 OLT to dynamically map specific service payloads to corresponding physical ports on the device. For instance, it can separate a High-Definition IPTV stream (VLAN 101) to the Ethernet port dedicated to the Set-Top Box, while directing Voice-over-IP (VoIP) traffic (VLAN 102) to the FXS port, and best-effort internet data to a separate LAN port.

- Feature 2: Strict Priority and WFQ Scheduling: To guarantee a premium subscriber experience, the Generic ONU supports advanced QoS mechanisms, including Strict Priority (SP) and Weighted Fair Queuing (WFQ). This ensures that latency-sensitive traffic, such as VoIP, is always serviced ahead of standard data traffic, especially during periods of high network congestion. The Device is

fully configurable via the AN5516's management system using standard OMCI (ONU Management and Control Interface) protocols.

- Feature 3: Comprehensive VLAN Manipulation: The ONU supports the full range of 802.1Q VLAN operations, including VLAN Tagging, Trunking, and Translation. This allows the FiberHome OLT to enforce end-to-end service segregation across the network, providing a secure and isolated environment for each service type.

- Feature 4: Robust Legacy Support and Autonegotiation: The device ensures backward compatibility with existing infrastructure, supporting 10/100Mbps auto-sensing on its Ethernet ports, facilitating a smooth transition for subscribers yet to adopt Gigabit speeds.

COMPLIANCE & STANDARDS

The Generic XPON ONU is a highly compliant device, engineered to meet the rigorous interoperability requirements of the FiberHome ecosystem and international telecommunications standards. This ensures seamless integration and reliable long-term operation.

- ITU-T G.984.x (GPON) / G.987.x (XGS-PON): Full adherence to PON physical

layer, transmission convergence, and management protocols.

- IEEE 802.3/802.3u/802.3ab: Compliance with Ethernet standards for 10/100/1000BASE-T interfaces.

- IEEE 802.1D, 802.1Q, 802.1p: Conformance to bridging, VLAN, and Quality of Service marking standards.

- ITU-T G.711/G.722/G.729: Codec support for voice services.

- OMCI Specification: Full compliance with the ONU Management and Control Interface, enabling zero-touch provisioning and remote configuration by the AN5516 OLT.

TECHNICAL SPECIFICATIONS

- PON Interface: 1 x SC/APC, PX20+ / N1 Class compliant.

- Downstream / Upstream Line Rate: 2.488 Gbps / 1.244 Gbps (GPON) or 9.953 Gbps / 9.953 Gbps (XGS-PON).

- User Interfaces: 1-4 x 10/100/1000BASE-T (RJ45), 1 x FXS (RJ11, for analog phones).

- Packet Buffer Memory: 128 MB DRAM (minimum).

- Storage: 32 MB NAND Flash.

- Power Supply: External 12V DC, 1A (depending on port density).

- Operating Temperature: 0°C to 40°C (32°F to 104°F).

- Relative Humidity: 5% to 95% (non-condensing).

- Power Consumption: < 10W (Max).

Parameter	Specification
Form Factor	Compact CPE / Desktop
Switching Capacity	2.5 Gbps (GPON) / 10 Gbps (XGS-PON) Non-Blocking
Power Supply	External 12V DC Power Adapter
Downstream Line Rate	2.488 Gbps (GPON) / 9.953 Gbps (XGS-PON)
Upstream Line Rate	1.244 Gbps (GPON) / 9.953 Gbps (XGS-PON)
Maximum PON Distance	20 km
Maximum LAN Ports	4 x Gigabit Ethernet (10/100/1000BASE-T)
Voice Ports	1 x FXS (RJ11)
Packet Buffer Memory	128 MB DRAM
Storage	32 MB NAND Flash
Operating Temperature	0°C to 40°C (32°F to 104°F)
Power Consumption	< 10W (Max)
Management	OMCI (ITU-T G.988)


POWER
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