FiberHome AN5516-04 Mini OLT System Architecture - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The FiberHome AN5516-04 represents a compact, carrier-class optical line terminal purpose-engineered for high-density Fiber-to-the-Home, Fiber-to-the-Building, and Fiber-to-the-Curb deployments where rack space and operational efficiency are paramount. As a modular 2RU platform, the AN5516-04 integrates a high-capacity switching backplane with dual service slot flexibility, delivering up to 32 active GPON ports when populated with 16-port line cards. This document serves as an authoritative technical reference for network architects and procurement engineers, detailing the system's silicon-level forwarding architecture, SFP transceiver verification protocols, and carrier-grade redundancy mechanisms. The platform's 1.04 Tbit/s uplink switching capacity and native interoperability with third-party optical network units position the AN5516-04 as a strategic asset for service providers seeking to balance capital expenditure discipline with uncompromised access performance.



HARDWARE ARCHITECTURE & SILICON

The AN5516-04 chassis is constructed around an 800 Gbit/s backplane bus that facilitates non-blocking communication between the control plane, service interface cards, and uplink aggregation modules. The system employs a modular two-slot service architecture, each slot capable of hosting a GCOB-series 16-port GPON interface board, thereby achieving a maximum density of 32 GPON subscribers-facing ports within a single 2RU rack footprint. The control and switching fabric are anchored by a redundant core card design, ensuring that a single point of failure does not compromise subscriber traffic forwarding. Uplink connectivity is provisioned through dedicated uplink cards supporting a mix of 10GE and GE optical interfaces, with the platform's shared-load uplink switching capacity rated at 1.04 Tbit/s — a figure that underscores the system's suitability for dense subscriber aggregation even

under peak-hour contention.

The GPON line cards themselves — specifically the GCOB variant — integrate burst-mode optical transceivers that conform to ITU-T G.984.2 specifications, supporting 2.488 Gbit/s downstream and 1.244 Gbit/s upstream data rates. Each PON port is equipped with hot-pluggable SFP cages, enabling in-service maintenance and capacity upgrades without disrupting adjacent subscriber services. The ASIC forwarding pipeline within the line card is responsible for GEM frame encapsulation and de-encapsulation, mapping PON-side traffic to Ethernet frames at the uplink interface with line-rate throughput and minimal jitter introduction.

KEY FEATURES & ROUTING LOGIC

- **Dual-Slot Modular Service Architecture**: Accommodates two 16-port GPON service cards, scaling to 32 active PON ports per chassis without chassis replacement.
- **1.04 Tbit/s Uplink Switching Capacity**: Shared-load uplink forwarding engine engineered for high-density subscriber aggregation and sustained line-rate throughput.
- **Hot-Pluggable PON Ports**: All GPON interfaces support in-service SFP module replacement, eliminating maintenance windows for transceiver swaps

or fault isolation.

- **Redundant Core Card Design**: 1+1 core card redundancy ensures continuity of forwarding operations in the event of a control plane fault.

- **Comprehensive Layer 2/3 Feature Set**: Supports OSPF dual-homing, STP/RSTP/MSTP ring protection, and Trunk/LACP uplink protection for resilient topology design.

- **SFP Transceiver Verification Framework**: The platform maintains a validated compatibility matrix for uplink and PON-side SFP modules, ensuring optical link budget integrity and DDM telemetry accuracy across Class B+, C+, and C++ optics.

- **Unified EPON/GPON/10G PON/P2P Platform**: Service cards and software architecture support multi-access convergence, protecting operator investment as access technologies evolve.

COMPLIANCE & STANDARDS

The AN5516-04 is engineered to satisfy the rigorous interoperability and safety requirements mandated by tier-one carriers. The platform's GPON implementation conforms to the ITU-T G.984 series of recommendations, ensuring multi-vendor ONU interoperability without proprietary licensing encumbrances. Ethernet uplink interfaces comply with IEEE 802.3ah and IEEE 802.3-2005 specifications for EPON and conventional Ethernet transport

respectively. The system supports Synchronous Ethernet and IEEE 1588v2 precision time protocol, with 1PPS plus Time-of-Day output available for applications requiring stringent phase synchronization. Environmental compliance includes RoHS conformance for all field-replaceable units, while electromagnetic compatibility and safety certifications align with prevailing telecom regulatory directives for central office and remote cabinet deployments.

TECHNICAL SPECIFICATIONS

The following parameter registry captures the verified operational envelope of the AN5516-04 as configured for standard carrier deployments. Values reflect nominal conditions at 25 degrees Celsius ambient unless otherwise noted.

Parameter	Specification
Form Factor	2RU, 19-inch rack-mountable modular chassis
Service Slots	2 modular slots, supporting 16-port GPON line cards
Maximum GPON Ports	32 (with 2x GCOB 16-port cards)
Backplane Switching Capacity	800 Gbit/s
Uplink Switching Capacity	1.04 Tbit/s (shared load)

Uplink Interface Options	10GE / GE optical, STM-1, 32x E1 (per uplink card configuration)
GPON Standards Compliance	ITU-T G.984 series
EPON Standards Compliance	IEEE 802.3ah
Split Ratio	1:64 standard; 1:128 with adequate optical power budget
Maximum PON Reach	20 km at 1:64 split ratio (Class B+); extended reach with higher-class optics
SFP Link Budget (Class B+)	28 dB
SFP Link Budget (Class C+)	30 dB
SFP Link Budget (Class C++)	32 dB
Power Supply	AC 90-290 V universal input (AC variant); DC options available per configuration
Power Consumption	Static: 214 W; Typical: 328 W; Maximum: 422 W
Redundancy	1+1 core card redundancy; Trunk/LACP uplink protection
Synchronization	Synchronous Ethernet, IEEE 1588v2, 1PPS+ToD output
Layer 2/3 Features	OSPF dual-homing, STP/RSTP/MSTP,

	VLAN, multicast
Management	UNM2000 network management software; CLI via CONSOLE; SNMP
Operating Temperature	Carrier-grade central office environment (0 to 50 degrees Celsius typical)

ORDERING SKU INFORMATION

SKU Designation	Description
AN5516-04-AC	2RU chassis with dual service slots, AC power, includes 2x 16-port GPON cards with C+ SFPs, UNM2000 management software
GCOB (S1B)	16-port GPON service card with C+ SFP modules, compatible with AN5516-04/06 and AN5116-06B
GE-OM10KM	Uplink SFP, 1000BASE-LX, 1.25 Gbit/s, 10 km reach, LC duplex, validated for AN5516-04
GE-OM40KM	Uplink SFP, 1000BASE-EX, 1.25 Gbit/s, 40 km reach, LC duplex, validated for AN5516-04

