FiberHome HG6821M Dual-Band Wi-Fi GPON ONT - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The FiberHome HG6821M is a carrier-grade dual-band Wi-Fi GPON Optical Network Terminal (ONT) engineered for high-performance residential and enterprise FTTx deployments. This document provides an authoritative technical overview of the device's radio frequency layout, hardware architecture, and operational specifications. The HG6821M integrates a powerful GPON MAC with dual-band 802.11ac Wi-Fi, delivering gigabit-class wireless throughput alongside robust Layer 2/3 routing capabilities. Its optimized RF front-end design ensures superior coverage, spectral efficiency, and coexistence in dense deployment scenarios.



HARDWARE ARCHITECTURE & SILICON

The HG6821M is built upon a highly integrated SoC platform that combines a GPON ONU controller, a dual-core network processor, and a dedicated Wi-Fi offload engine. The RF section employs independent 2.4 GHz and 5 GHz transceivers, each paired with high-linearity power amplifiers (PAs) and low-noise amplifiers (LNAs). A diplexer/duplexer network ensures isolation between transmit and receive paths, while the antenna subsystem utilizes a 2x2 MIMO configuration per band. The GPON interface supports ITU-T G.984.2 Class B+ optical budgets. The hardware layout prioritizes thermal dissipation and EMI shielding to maintain signal integrity under continuous load.

KEY FEATURES & ROUTING LOGIC

- Dual-Band Wi-Fi: Concurrent 2.4 GHz (802.11b/g/n) and 5 GHz (802.11a/n/ac) operation with MU-MIMO support.
- GPON Uplink: ITU-T G.984 compliant, 2.488 Gbps downstream / 1.244 Gbps upstream.
- Routing Engine: Hardware-accelerated NAT, DHCP server/client, DNS proxy, and static routing.
- RF Optimization: Automatic channel selection, transmit power control (TPC), and dynamic frequency selection (DFS) for 5 GHz.

- Security: WPA2/WPA3 encryption, 802.1X authentication, and MAC filtering.

- Voice Support: Optional SIP-based VoIP with FXS port.

COMPLIANCE & STANDARDS

The HG6821M complies with major international telecom and safety standards, including ITU-T G.984, IEEE 802.11a/b/g/n/ac, FCC Part 15, CE, and RoHS. It is designed to meet carrier-grade reliability requirements with an MTBF exceeding 100,000 hours. EMC performance is validated against EN 55032 and EN 55035.

TECHNICAL SPECIFICATIONS

The following table summarizes the core technical parameters of the FiberHome HG6821M.

Parameter	**Specification**
Form Factor	Desktop / Wall-mountable
GPON Interface	SC/APC, ITU-T G.984.2 Class B+
Wi-Fi Bands	2.4 GHz (2x2 MIMO) & 5 GHz (2x2 MIMO)
Wi-Fi Standards	802.11b/g/n/ac

Ethernet Ports	4 x 10/100/1000 Mbps RJ45
VoIP Ports	1 x FXS (optional)
USB Ports	1 x USB 2.0
Power Supply	12V DC, 1.5A external adapter
Dimensions (W x D x H)	180 mm x 130 mm x 35 mm
Operating Temperature	0°C to 40°C
Storage Temperature	-20°C to 70°C
Humidity	5% to 95% (non-condensing)

ORDERING SKU INFORMATION

Standard SKU: HG6821M-AC (AC power adapter, no VoIP). Variants: HG6821M-V (with VoIP), HG6821M-DC (DC power). Please consult your FiberHome sales representative for regional variants and customization options.

