OEM 4-Port Gigabit Wi-Fi 6 Mesh ONU - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION

Product Designation: OEM 4-Port Gigabit Wi-Fi 6 Mesh ONU

Model Designator: ONU-4G-W6M-BB (Base Model)

Product Classification: Carrier-Grade Optical Network Unit with Integrated Wi-Fi 6 Mesh Capability

Target Deployment Environment: FTTH/FTTB, Multi-Dwelling Units (MDU), Enterprise SOHO, and Smart Home Backhaul Networks.



CORE INTERNAL TOPOLOGY

The OEM 4-Port Gigabit Wi-Fi 6 Mesh ONU is architected around a highly

integrated System-on-Chip (SoC) architecture that combines a Gigabit Passive Optical Network (GPON) MAC with a 1.8 GHz Dual-Core ARM Cortex-A53 network processor. The internal topology is bifurcated into three primary subsystems:

1. PON MAC & SERDES Subsystem: Handles upstream/downstream framing, forward error correction (FEC), and 2.5 Gbps downlink / 1.25 Gbps uplink optical burst reception.
2. Packet Switching Fabric: A non-blocking, low-latency internal backplane engine that manages Layer 2 switching and Layer 3 lightweight routing, interconnecting the PON interface, the 4x Gigabit Ethernet ports, and the Wi-Fi 6 chipset.
3. Wi-Fi 6 FEM Subsystem: Integrated 2x2 MU-MIMO Front-End Modules (FEMs) supporting 160 MHz channel bandwidth, capable of simultaneous dual-band operation (2.4 GHz and 5 GHz) with mesh backhaul steering.

SWITCHING SUBSYSTEM CAPABILITIES

The internal switching subsystem leverages a hardware-accelerated forwarding engine that supports 8K MAC address tables and 1K IP routing entries. It is engineered for deterministic low-latency packet forwarding essential for real-time applications. The engine supports 802.1Q VLAN tagging, QinQ, and

advanced multicast group management (IGMP v2/v3 snooping).

Mesh Backhaul Logic: The device incorporates a dedicated Wi-Fi band (configurable) for inter-ONU mesh trunking, utilizing the 802.11s mesh standard. This allows daisy-chaining or star topology deployment in environments lacking dedicated Ethernet backhaul, automatically healing paths in case of node failure.

OPERATIONAL ADVANTAGES

- Zero-Touch Provisioning (ZTP): Designed for mass deployment, the ONU leverages OMCI (ONT Management and Control Interface) for automated service configuration and firmware updates.
- Green Energy Profile: Implements IEEE 802.3az Energy-Efficient Ethernet (EEE) and advanced power-saving modes for the Wi-Fi subsystem to reduce total cost of ownership (TCO) and comply with eco-design directives.
- Thermal Resilience: Engineered with a passive cooling heatsink system and thermal sensor management, enabling operation in ambient temperatures from -5°C to 50°C.

SPECIFICATION MATRIX

- Port Configuration: 1x GPON SC/APC, 4x 10/100/1000BASE-T (RJ45), 1x USB

2.0 (Host).

- Wi-Fi Standard: IEEE 802.11 a/b/g/n/ac/ax (Wi-Fi 6), Dual-Band Concurrent.

- Peak Wi-Fi Data Rate: 574 Mbps (2.4 GHz) + 1201 Mbps (5 GHz).

- Dimensions (WxDxH): 180 mm x 130 mm x 35 mm (Desktop/Standalone).

- Power Supply: External 12V DC, 2A adapter; support for passive PoE (optional variant).

Parameter	**Specification**
Form Factor	Desktop/Compact Wall-Mount (OEM Variant)
GPON Interface	SC/APC Connector, ITU-T G.984.x Compliant
Switching Capacity	8.8 Gbps
Forwarding Rate	6.55 Mpps
Wi-Fi Standard	IEEE 802.11ax (Wi-Fi 6), Dual-Band 2x2:2
Power Supply	External 12V DC / 1.5A (Max 18W)
Operating Temperature	0°C to 45°C

REGULATORY COMPLIANCE

The hardware design and emissions meet rigorous international standards for telecommunications equipment. Full compliance ensures seamless integration into global carrier networks.

- Optical Safety: Class 1 Laser Product per IEC 60825-1.
- EMC: FCC Part 15 Class B, CE (EN 55032, EN 55024).
- Safety: UL/cUL Listed, IEC 62368-1.
- Environmental: RoHS, REACH, WEEE Compliant.

