OEM Wi-Fi 6 ONU Mesh Inter-Working Compatibility with Huawei Gateways - Official Technical Overview & Hardware Datasheet

PRODUCT OVERVIEW AND HARDWARE DATASHEET

OEM Wi-Fi 6 ONU MESH INTER-WORKING COMPATIBILITY WITH HUAWEI GATEWAYS

EXECUTIVE SUMMARY

This document serves as the official technical overview and datasheet for the OEM Wi-Fi 6 Optical Network Unit (ONU) series, specifically engineered to deliver advanced mesh networking capabilities and seamless inter-working compatibility with Huawei gateway infrastructures. As network operators transition towards high-density, high-throughput access networks, the imperative for standardised, interoperable customer-premises equipment (CPE) has never been greater. This ONU platform addresses the critical need for a future-proof, carrier-grade solution that not only delivers the performance benefits of 802.11ax (Wi-Fi 6) technology but also guarantees operational harmony within existing Huawei-dominated ecosystems.

The platform is meticulously designed to support the Wi-Fi EasyMesh standard, an open protocol developed by the Wi-Fi Alliance that enables certified devices

from different vendors to form a single, cohesive mesh network . This is a strategic departure from proprietary mesh systems, offering network planners the flexibility to avoid vendor lock-in and create a truly best-of-breed access network. The ONU's hardware architecture and firmware stack have been rigorously validated to ensure that when deployed alongside Huawei OLTs and gateways, it functions as a native, high-performance extension of the network, providing a unified management and control plane experience for the service provider.



HARDWARE ARCHITECTURE & SILICON

The platform is built on a high-performance, multi-core processing architecture designed to handle the simultaneous demands of high-speed routing, advanced security, and sophisticated mesh networking. At its heart, the device

utilises a chipset that integrates a powerful network processor with a dedicated Wi-Fi 6 (802.11ax) radio module. This silicon-level integration is paramount for achieving the required line-rate performance for both wired and wireless traffic.

The hardware is optimised for the following key architectural pillars:

- Packet Processing Engine: A dedicated network processor accelerates the forwarding plane, ensuring that even with complex QoS rules and mesh routing protocols active, the device can maintain full wire-speed performance on its Ethernet interfaces. This is crucial for supporting high-bandwidth applications and service level agreements (SLAs).

- Wi-Fi 6 Radio Subsystem: The radio chipset supports dual-band concurrent operation (2.4 GHz and 5 GHz) with 2x2 MIMO technology, capable of delivering aggregate data rates of up to 3000 Mbps. The implementation of OFDMA (Orthogonal Frequency Division Multiple Access) and BSS (Basic Service Set) colouring ensures efficient channel utilisation and reduced latency in high-density subscriber environments. This is a fundamental requirement for meeting the demanding performance metrics of modern, multi-device households .

- Memory and Storage: The ONU is equipped with sufficient high-speed DDR memory and NAND flash storage to host a full-featured operating system, advanced routing tables, and mesh firmware, providing a stable and responsive user experience while also enabling future feature enhancements through

firmware updates.

KEY FEATURES & ROUTING LOGIC

The firmware and feature set of the ONU are designed to provide a robust and versatile platform for network operators. The principal features include:

- Wi-Fi EasyMesh Inter-Working: The device supports the Wi-Fi EasyMesh standard, enabling a self-forming, self-healing mesh network. It is fully capable of operating as either a Controller or an Agent within the mesh topology, depending on the deployment requirement. The Controller function is typically assigned to a primary gateway or router to manage the entire network, while Agents act as satellite nodes to extend coverage. The system leverages the 802.11s and 1905.1 protocols for inter-node communication and network management .
- Seamless Huawei Gateway Compatibility: The ONU has been validated for full inter-operability with a wide range of Huawei OLTs, including but not limited to the MA5680T, MA5606T, and MA5683T series, across multiple firmware revision levels (R11, R13, R15, R17, and R18) . This is achieved through strict adherence to ITU-T G.984.x GPON standards and a comprehensive implementation of the OMCI (ONT Management and Control Interface), ensuring remote management and configuration from the Huawei network management

system .

- Advanced Triple-Play Service Support: The platform is architected to be ideal for triple-play service deployments (voice, video, and data) in FTTH/FTTB applications. The Ethernet ports can be logically separated into different service domains, enabling dedicated ports for IP video and data services. The ONU also includes industry-standard SIP signalling for reliable voice services, making it a true 'all-in-one' solution for the modern digital home .

- Comprehensive Management and Provisioning: The ONU supports full FCAPS (Fault, Configuration, Accounting, Performance, Security) functions, which can be managed from the remote side via OMCI. The device includes a built-in web interface for local configuration and troubleshooting, and is fully compatible with TR-069/ACS (Auto Configuration Server) for remote, zero-touch provisioning, significantly reducing operational overhead for service providers.

- Carrier-Grade Routing and Security: The embedded routing logic supports advanced features required in carrier environments, including comprehensive QoS (Quality of Service) capabilities for traffic prioritisation, robust IPv6 support, and industry-standard security protocols to protect the network and subscriber data.

COMPLIANCE & STANDARDS

This product is engineered to comply with the most stringent international

standards for telecommunications and networking equipment. The comprehensive compliance profile ensures that the device can be deployed confidently in any carrier-grade network across the globe.

- Optical Network Standards: Fully complies with ITU-T G.984.x GPON standards. This compliance guarantees interoperability with third-party OLTs and provides the foundation for high-speed fibre access .

- Wireless Standards: Complies with IEEE 802.11ax (Wi-Fi 6), IEEE 802.11a/b/g/n/ac standards, ensuring backward compatibility and maximising wireless performance.

- Mesh Standards: Supports the Wi-Fi Alliance's EasyMesh standard, the industry benchmark for interoperable mesh networking. This is critical for ensuring the device's 'Works with Huawei' guarantee and future-proofing the deployment .

- Management Standards: Supports OMCI (ONT Management Control Interface) and OAM (Operations, Administration, and Maintenance) for carrier-grade remote management . Additionally, it supports TR-069/TR-098/TR-140 protocols for ACS-based provisioning .

- VoIP Standards: Uses standard SIP (Session Initiation Protocol) for voice signalling, ensuring interoperability with a wide range of softswitches and IP-PBX systems .

Parameter	Specification
Form Factor	Compact Desktop / Wall-Mountable
LAN Interfaces	4x 10/100/1000BASE-T RJ45 Ports
WAN Interface	1x SC/UPC or SC/APC GPON/EPON
Wi-Fi Data Rate	Up to 3000 Mbps (AX3000)
Voice Interface	1x RJ11 Port (FXS)
Power Supply	External DC 12V / 1.5A
Management	OMCI, TR-069, Web UI, Telnet

ORDERING SKU INFORMATION

The OEM Wi-Fi 6 ONU Mesh Inter-Working solution is available in multiple configuration options to suit diverse network deployment scenarios. The base model is configured as follows:

- Model Name: OEM-WiFi6-ONU-MESH
- Hardware Variants: Available with differing Wi-Fi radio capabilities (e.g., AX3000, AX1800) and LAN port configurations (e.g., 4GE, 2GE+2POTS) to meet specific service provider requirements.
- Firmware: Customisable OEM firmware available to support specific branding, management interfaces, or service provider-specific features.

- Packaging: Available in retail or bulk packaging (OEM) options to suit various distribution channels.



TECHNICAL SPECIFICATIONS

The following section details the hardware and performance specifications for the OEM Wi-Fi 6 ONU series. All specifications are subject to measurement under standard test conditions.

| Parameter | Specification |

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| Form Factor | Compact Desktop / Wall-Mountable |

| WAN Interface | 1x SC/UPC or SC/APC Connector for GPON/EPON |

| LAN Interfaces | 4x 10/100/1000BASE-T RJ45 Ports, Auto-Negotiation, Auto

MDI/MDIX |

| Wi-Fi Standard | IEEE 802.11ax (Wi-Fi 6), Dual-Band 2.4GHz & 5GHz |

| Wi-Fi Data Rate | Up to 3000 Mbps (AX3000) (2.4GHz: 600Mbps; 5GHz: 2400Mbps) |

| Antenna Configuration | 2x2 MIMO Internal Antennas |

| Antenna Gain | 2.4GHz: 5dBi; 5GHz: 5dBi |

| Voice Interface | 1x RJ11 Port (FXS) |

| USB Interface | 1x USB 2.0/3.0 |

| Power Supply | External DC 12V / 1.5A |

| Operating Temperature | 0°C ~ 40°C |

| Storage Temperature | -40°C ~ 70°C |

| Relative Humidity | 10% ~ 90% (non-condensing) |

| Dimensions (W x D x H) | 150mm x 100mm x 40mm (Typical) |

| Weight | ≤ 0.5 kg |

| GPON/EPON Data Rate | Downstream: 2.488 Gbps (GPON) / 1.244 Gbps (EPON) Upstream: 1.244 Gbps |

| Optical Wavelength | Upstream: 1310nm; Downstream: 1490nm |

| Optical Power Level (GPON) | Tx: 0.5 ~ 5 dBm; Rx Sensitivity: -27 dBm; Rx Saturation: -9 dBm |

| Voice Signalling | SIP (Session Initiation Protocol) |

| Management | OMCI, TR-069, Web UI, Telnet