XPONSHOP Cross-Vendor Interoperability Manual: OEM ONUs on Huawei MA5800 OLTs - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document serves as the definitive technical reference for the XPONSHOP Cross-Vendor Interoperability Manual, detailing the seamless integration and operational parameters of Original Equipment Manufacturer (OEM) Optical Network Units (ONUs) when deployed within Huawei MA5800 series Optical Line Terminal (OLT) environments. Designed for carriers, system integrators, and enterprise network architects, this whitepaper validates the hardware-level compatibility, management protocol alignment, and service provisioning capabilities that enable network operators to diversify their ONU supply chain without compromising on the performance, stability, or advanced feature sets of the Huawei MA5800 access platform. By adhering to the established ITU-T G.984 and G.988 standards and implementing a robust OMCI (ONU Management and Control Interface) adaptation layer, XPONSHOP OEM ONUs provide a turnkey, carrier-grade solution for GPON and XG-PON deployments, ensuring service continuity, simplified operations, and a significantly improved total cost of ownership.



HARDWARE ARCHITECTURE & SILICON

The XPONSHOP OEM ONU family is engineered around a purpose-built, energy-efficient system-on-chip (SoC) architecture that integrates a high-performance packet forwarding engine, a hardware-accelerated encryption module, and a versatile service processing unit. The physical layer interface is compliant with Class B+ and Class C+ optics, providing an optical power budget suitable for a wide range of last-mile fiber deployments, from dense urban multi-dwelling units to suburban and rural installations. The hardware design emphasizes robustness and passive cooling for reduced operational expenditures, while the silicon integrates advanced traffic management features, including hierarchical QoS (HQoS) and sophisticated buffer management to support next-generation triple-play services. A critical architectural achievement is the sophisticated OMCI stack that fully interprets

and responds to the Huawei MA5800's management commands, enabling comprehensive remote management, fault isolation, and performance monitoring identical to native Huawei ONUs.

KEY FEATURES & ROUTING LOGIC

- Seamless Cross-Vendor Interoperability: Native-level compatibility with Huawei MA5800 OLTs, leveraging a proprietary yet fully compliant OMCI adaptation layer to ensure plug-and-play operation, automatic software version alignment, and full management plane integration.
- Comprehensive Service Support: Simultaneous support for GPON (G.984) and XG-PON (G.987) standards, enabling smooth network migration and unified management of mixed PON technologies on a single platform.
- Advanced QoS and Traffic Shaping: Hierarchical traffic scheduling with support for up to 8 T-CONTs and 256 GEM Ports per ONU, ensuring precise service-level agreement (SLA) fulfillment for voice, video, and data services.
- Robust Security and Encryption: Hardware-based AES-128 encryption for downstream traffic, coupled with secure key exchange and authentication mechanisms compliant with the Huawei MA5800's security framework.
- Carrier-Grade Reliability: Passive thermal design, industrial temperature range components, and a high Mean Time Between Failures (MTBF) rating guarantee uninterrupted service in harsh operating environments.
- Simplified Operations and Maintenance: Full OMCI management enables

remote software upgrades, fault detection, loopback testing, and performance monitoring, significantly reducing field visits and operational overhead.

- Flexible LAN Connectivity: Integrated 4-port or 8-port Gigabit Ethernet switches with support for VLAN tagging, 802.1p prioritization, and advanced filtering to satisfy diverse customer premises equipment (CPE) requirements.

COMPLIANCE & STANDARDS

XPONSHOP OEM ONUs are meticulously designed and validated to conform to a comprehensive suite of international and industry-specific standards. This ensures not only interoperability with the Huawei MA5800 but also global regulatory acceptance. The device carries CE, FCC, and RoHS certifications, confirming adherence to electromagnetic compatibility (EMC), safety, and environmental directives. From a telecommunications perspective, the ONUs are fully compliant with the ITU-T G.984.1, G.984.2, G.984.3, and G.984.4 series of recommendations for GPON, and with ITU-T G.987 for XG-PON. The OMCI implementation strictly follows the ITU-T G.988 specification, utilizing managed entities to represent all hardware and software components. Furthermore, the ONUs support TR-069 for remote CPE management, providing an additional layer of operational flexibility. The comprehensive compliance matrix validates the XPONSHOP ONU as a safe, reliable, and universally deployable component within the global telecommunications infrastructure.

TECHNICAL SPECIFICATIONS

Optical Interface: ITU-T G.984.2/G.987.2 compliant, 2.5Gbps downstream, 1.25Gbps upstream (GPON) or 10Gbps downstream, 2.5Gbps upstream (XG-PON).

Optical Power Budget: Class B+ (up to 28dB) and Class C+ (up to 32dB) options available.

Receiver Sensitivity: -28dBm for Class B+, -32dBm for Class C+.

LAN Interface: 4x / 8x 10/100/1000BASE-T RJ45 ports with auto-sensing and auto-MDI/MDIX.

POTS Interface: 2x / 4x FXS ports (optional), supporting G.711, G.729, G.722 vocoders and T.38 fax relay.

Forwarding Capacity: 4.2 Mpps for GPON, 14.88 Mpps for XG-PON.

Packet Buffer: 128MB dedicated SDRAM for packet buffering.

Management: Full OMCI (G.988) and TR-069.

Security: AES-128 encryption, secure boot, and hardware root of trust.

Power Supply: External 12V DC, 1.5A; optional PoE support on LAN ports.

Power Consumption: < 15W typical.

Operating Temperature: -5°C to 55°C.

Storage Temperature: -40°C to 85°C.

Operating Humidity: 10% to 95% (non-condensing).

Dimensions: 210mm x 140mm x 35mm (Standard form factor).

Weight: < 0.8 kg.

Parameter	**Specification**
Model	XPONSHOP-ONU-4F / XPONSHOP-ONU-8F
PON Interface	GPON or XG-PON (G.984/G.987)
LAN Ports	4 or 8 x Gigabit Ethernet (10/100/1000BASE-T)
POTS Ports	Optional: 2 or 4 x FXS
Forwarding Capacity	4.2 Mpps (GPON) / 14.88 Mpps (XG-PON)
Operating Temperature Range	-5°C to 55°C
Power Supply	External 12V DC Adapter (Optional PoE)
MTBF (Mean Time Between Failures)	> 150,000 hours
Compliance	CE, FCC, RoHS, ITU-T G.984/G.987/G.988, TR-069

