Optical Access Architecture Reference Document: ZTE F670L GPON ONT Internal Antenna Gain and Coverage Pattern

TECHNOLOGY OVERVIEW

The ZTE ZXHN F670L is a carrier-grade GPON ONT engineered for residential and SMB triple-play service delivery, integrating dual-band Wi-Fi with GPON uplink capabilities. The device employs a 2×2 MIMO architecture across both 2.4 GHz (802.11n) and 5 GHz (802.11ac) bands, achieving an aggregate PHY rate of up to 1.2 Gbps . Central to the wireless performance envelope is the antenna subsystem, which utilizes external antenna elements specified at a maximum gain of 5 dBi per chain . This document provides a technical reference for the RF front-end configuration, antenna gain characteristics, and resultant coverage behavior of the F670L platform.



OPTICAL TRANSCEIVER INTERFACES

The GPON interface adheres to ITU-T G.984 series specifications, employing a single SC/APC connector with downstream throughput of 2.488 Gbit/s at 1490 nm and upstream throughput of 1.244 Gbit/s at 1310 nm . Receiver sensitivity is rated at -28 dBm, providing margin for typical FTTH optical link budgets . The optical transceiver operates independently of the Wi-Fi subsystem, ensuring that wireless coverage optimization does not compromise PON-layer compliance or OMCI management channel integrity.

REDUNDANT SUBSYSTEMS

While the F670L is a compact desktop ONT rather than a chassis-based platform, its software and power architecture incorporate reliability measures relevant to carrier deployments. The device supports dual-image firmware, enabling uninterrupted service during software downloads or upgrades . Lightning and surge protection is specified at 4 kV for the power adapter input and 1.5 kV for both POTS and Ethernet ports, protecting the internal RF and digital subsystems from common-mode transient events .

CAPABILITY METRICS

The antenna subsystem supports concurrent dual-band operation with the following RF characteristics. The 2.4 GHz chain operates in 2 × 2 MIMO configuration under 802.11n, delivering up to 300 Mbps PHY rate. The 5 GHz chain operates in 2×2 MIMO under 802.11ac, delivering up to 866 Mbps PHY rate . Antenna gain is specified at a maximum of 5 dBi, a figure that applies to the external antenna elements provided with the F670L enclosure . This gain profile is optimized for typical in-premises coverage scenarios, where the objective is to balance directional gain against the need for broad spatial coverage across multiple rooms and floors.

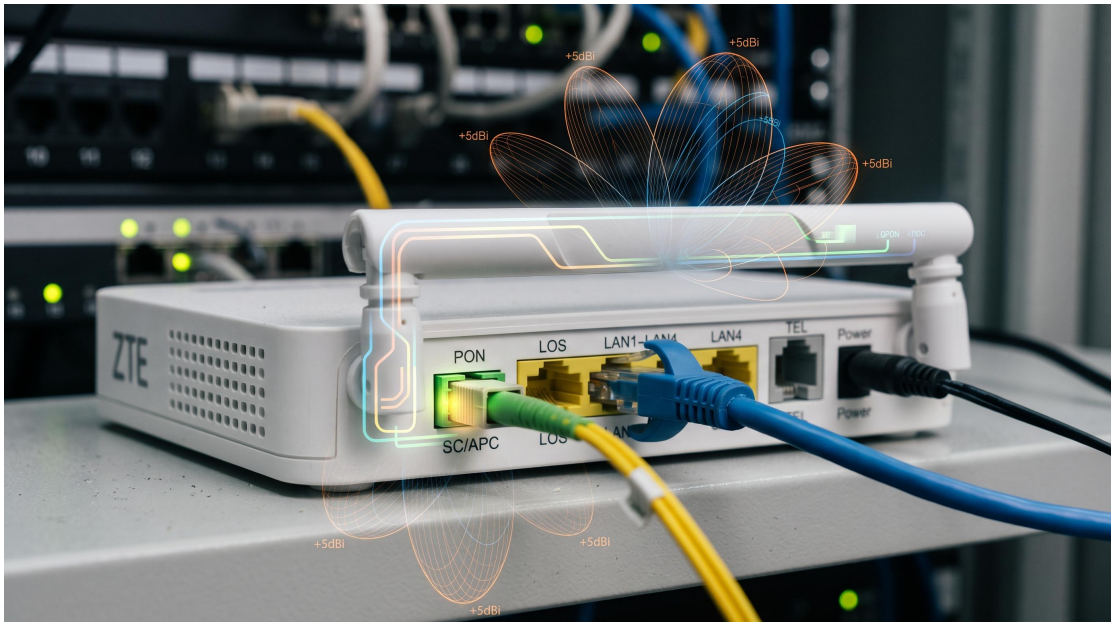
Parameter	**Specification**
Antenna Configuration	2×2 MIMO per band (2.4 GHz and 5 GHz)
Maximum Antenna Gain	5 dBi per antenna element
2.4 GHz Standard / PHY Rate	802.11n 2×2 MIMO / 300 Mbps
5 GHz Standard / PHY Rate	802.11ac 2×2 MIMO / 866 Mbps
GPON Downstream / Upstream	2.488 Gbit/s / 1.244 Gbit/s
Optical Connector / Sensitivity	SC/APC / -28 dBm
Management Protocols	OMCI (G.988), TR-069 (TR-142)
Surge Protection	4 kV adapter / 1.5 kV POTS & Ethernet

COMPLIANCE AUDIT

The F670L platform conforms to ITU-T G.984 GPON standards and supports OMCI management per ITU-T G.988, as well as TR-069 remote management under the BBF TR-142 framework . Wireless operation complies with IEEE 802.11n and 802.11ac specifications for the respective frequency bands. The device is listed with CE and RoHS certifications in distributor documentation, reflecting conformity with European EMC and hazardous substance directives .

SCALING STRATEGY

The F670L is positioned as a fixed-configuration ONT; antenna gain and coverage are therefore determined by the physical antenna design rather than field-replaceable components. Deployment scaling is achieved through service provider provisioning of channel plans and transmit power settings via OMCI or TR-069, allowing operators to tailor coverage density in multi-dwelling unit scenarios. For high-density deployments, the 5 dBi gain profile supports adequate signal penetration through typical interior walls while maintaining manageable co-channel interference through standard 2.4 GHz and 5 GHz channel reuse patterns.


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ZTE
PON
LOS
LAN1-LAN4
LAN4
TEL
Power
SC/APC
LOS
Power