W627E Datasheet

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Product Overview

Huawei OptiXstar W627E is a GPON upstream Wi-Fi 7 ONU that provides four GE ports, one POTS port, one USB port, and 2.4 GHz & 5 GHz Wi-Fi 7 functions. The new Wi-Fi 7 technology greatly enhances user experience on wireless networks. It can be used for wired access, voice access, and Wi-Fi coverage in hotels, apartments, schools, enterprises, and governments.

- Provide services simultaneously on both the 2.4 GHz (2x2 MIMO) and 5 GHz (2x2 MIMO) frequency bands, at a data rate of up to 689 Mbps at 2.4 GHz and 2.88 Gbps at 5 GHz, 3.57 Gbps for the entire Wi-Fi ONU.
- Built-in smart antennas that automatically adjust the coverage direction and signal strength based on the intelligent switchover algorithm. Such capability enables the Wi-Fi ONU to flexibly adapt to the application environment changes, providing accurate and stable coverage as STAs move.
- Support Fit and Fat modes.

Feature Descriptions

Wi-Fi 7 (802.11be) Standard

Wi-Fi 7 complies with IEEE 802.11be Extremely High Throughput (EHT) and aims to provide higher throughput and lower latency. Based on Wi-Fi 6, Wi-Fi 7 introduces technologies such as 320 MHz bandwidth, 4096-quadrature amplitude modulation (QAM), multi-resource unit (RU), enhanced multi-user multiple-input multiple-output (MU-MIMO), and multi-AP coordination. Drawing on these cutting-edge technologies, Wi-Fi 7 delivers a higher data transmission rate and lower latency than Wi-Fi 6.

Wi-Fi 7 vs. Wi-Fi 6

Based on the Wi-Fi 6 standard, Wi-Fi 7 introduces a plurality of new technologies. The following compares Wi-Fi 6 and Wi-Fi 7.

	Wi-Fi 6	Wi-Fi 7
IEEE standard	802.11ax	802.11be
Maximum transmission rate	9.6 Gbps	46 Gbps
Frequency band	2.4 GHz, 5 GHz, 6 GHz (Wi-Fi 6E)	2.4 GHz, 5 GHz, and 6 GHz
Security protocol	WPA3	WPA3
Channel bandwidth	20 MHz, 40 MHz, 80 MHz, 160 MHz, 80+80 MHz	Up to 320 MHz
Modulation mode	1024-QAM OFDMA	4096-QAM OFDMA

NOTE

The maximum transmission rate of the picture is the maximum rate of a single radio. It is 5 GHz radio for Wi-Fi 6, while it is 6 GHz radio for Wi-Fi 7.

New Features in Wi-Fi 7

Wi-Fi 7 aims to increase the WLAN throughput and provide low-latency access assurance. To achieve this goal, the Wi-Fi 7 standard defines modifications to both the physical layer (PHY) and MAC layer. Compared with Wi-Fi 6, Wi-Fi 7 brings the following technical innovations:

Multi-RU

- In Wi-Fi 6, each user can send or receive frames only on the RUs allocated to them, which greatly limits the flexibility of spectrum resource scheduling. To resolve this problem and further improve spectrum efficiency, Wi-Fi 7 defines a mechanism for allocating multiple RUs to a single user. To balance the implementation complexity and spectrum utilization, the Wi-Fi 7 standard specifications impose certain restrictions on RU combination. That is, small RUs (containing fewer than 242 tones) can be combined only with small RUs, and large RUs (containing greater than or equal to 242 tones) can be combined only with large RUs. Small RUs and large RUs cannot be combined together.

Higher-Order 4096-QAM

- The highest order modulation supported by Wi-Fi 6 is 1024-QAM, which allows each modulation symbol to carry up to 10 bits. To further improve the rate, Wi-Fi 7 introduces 4096-QAM so that each modulation symbol can carry 12 bits. With the same coding scheme, 4096-QAM in Wi-Fi 7 can achieve a 20% rate increase compared with 1024-QAM in Wi-Fi 6.

Multi-Link Mechanism

- To efficiently utilize all available spectrum resources, the Wi-Fi 7 standard defines multi-link aggregation technologies, including the MAC architecture of enhanced multi-link aggregation, multi-link channel access, and multi-link transmission.

Hardware Specifications

Specification	Parameters
Dimensions (W x D x H)	227 mm x 165 mm x 36 mm
NNI	GPON
UNI	4 x GE + 1 x POTS + 1 x USB2.0* + 2.4GHz&5GHz Wi-Fi 7 **NOTE** *: plug-and-play USB port reserved for users.
Rated power supply	DC (powered by the power adapter): 12 V DC, 1.5 A
Static power consumption	5.5 W
Maximum power consumption	20 W
Operating temperature	0°C–40°C
Operating humidity	5%–95% RH, non-condensing
Weight (excluding adapter)	About 0.47 kg
Surge protection	GE ports: 2.5 kV in common mode
Installation mode	Installed on a wall or in a junction box (86 mm)
2.4GHz&5GHz Wi-Fi 7	• IEEE 802.11 b/g/n/ax/be (2.4 GHz) • IEEE 802.11 a/n/ac/ax/be (5 GHz) • 2 x 2 MIMO (2.4 GHz & 5 GHz) • Antenna type: Built-in antenna • Antenna gain: 2dBi(2.4GHz); 2dBi(5GHz) • Air interface rate: 688 Mbit/s (2.4 GHz); 2882 Mbit/s (5 GHz) • Maximum transmit power: 26.5dB(2.4GHz), 28.5dB(5GHz) **NOTE** The actual transmit power varies according to local laws and regulations. • 4096 QAM • 20/40/80/160 MHz frequency band • Maximum number of SSIDs for each radio: 8 • Maximum number of access users: 128 • OFDMA • MU-MIMO • WMM(Wi-Fi Multi Media) • Multiple SSIDs • WPS • DCM • BSS Coloring • Beamforming • Band steering • WPA3 • Multi-RU

Port Parameters

Name	Parameter
PON port	• Port mode: GPON • Port type: SC/UPC • Standards compliance: ITU-T G.984.2, Class B+ • Receiver sensitivity: –27 dBm • Overload optical power: –8 dBm • Transmission rate: 2.488 Gbit/s downstream and 1.244 Gbit/s upstream
LAN port	• RJ-45 port • Standards compliance: IEEE802.3 • 10/100/1000 Mbit/s auto-sensing • Half duplex/full duplex auto-negotiation and configuration • VLAN tag/tag removal, VLAN transparent transmission, and VLAN filtering based on Ethernet ports
TEL port	• G.711A/u, G.729a/b, and G.722 codec • T.30, T.38, and G.711 fax • DTMF • Emergency call (SIP)
USB port	• USB2.0

Product Functions

Item	Description
WLAN features	• Compliance with IEEE 802.11be and compatibility with IEEE 802.11a/b/g/n/ac/ax • Beamforming • Multi-user multiple-input multiple-output (MU-MIMO) • Multi-RU • Orthogonal frequency division multiple access (OFDMA) • Preamble puncturing • BSS Color • Compliance with 4096-quadrature amplitude modulation (QAM) and compatibility with 1024-QAM, 256-QAM, 64-QAM, 16-QAM, 8-QAM, quadrature phase shift keying (QPSK), and binary phase shift keying (BPSK) • Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) • 802.11 dynamic frequency selection (DFS) • Wi-Fi multimedia (WMM) for priority-based data processing and forwarding • WLAN channel management and channel rate adjustment • Automatic channel scanning and interference avoidance • Service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs • 802.11k and 802.11v smart roaming
Network features	• SSID-based VLAN assignment • Management channel of the AP's uplink port in tagged or untagged mode

Item	Description
	• DHCP client, obtaining IP addresses through DHCP • Tunnel data forwarding and direct data forwarding • STA isolation in the same VLAN • ACL • Link layer discovery protocol (LLDP) • Uninterrupted service forwarding upon CAPWAP tunnel disconnection in Fit AP mode • Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters • IPv6 in Fit AP mode
QoS	• WMM power save • Priority mapping for upstream packets and flow-based mapping for downstream packets • Queue mapping and scheduling • User-based bandwidth limiting • Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment) to improve user experience • Airtime scheduling • Air interface HQoS scheduling
WLAN Security	• Open system authentication • WEP authentication and encryption using a 64-bit or 128-bit encryption key • WPA2-PSK authentication and encryption • WPA3-SAE authentication and encryption • WPA-WPA2 hybrid authentication • WPA2-WPA3 hybrid authentication • 802.1X and MAC address authentication • Wi-Fi management frame encryption
EAP types	EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-CHAP, EAP-SIM, EAP-AKA, EAP-GTC, EAP-FAST, EAP-PEAP, EAP-MD5, EAP-MSCHAPv2, PEAPv0, PEAPv1
Maintenance features	• Supports centralized management and maintenance of Wi-Fi ONUs on the OLT in FIT mode • Automatic login, automatic configuration loading, and plug-and-play (PnP) in Fit AP mode • Automatic batch upgrade in Fit AP mode • Web system-based AP management and login through HTTP or HTTPS in Fat AP mode • Network Time Protocol (NTP) in Fat AP mode • System status alarm • OMCI/Web UI/TR069 • Variable-length OMCI • Software dual-backup and rollback • IPTV video simulation test • Rogue ONT detection and isolation initiated by OLT • Call simulation test, circuit test, and loop line test • PPPoE and DHCP simulation tests

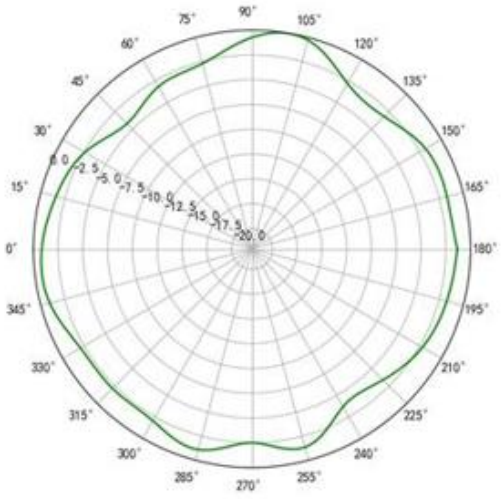
Item	Description
	• One-click diagnosis (web) • Ring network detection
Multicast	• IGMP v2/v3 snooping • IGMP v2/v3 proxy • MLD v1/v2 snooping
Security	• Anti-DoS • MAC and IP address filtering • MAC address and IP address binding • MAC address authentication, 802.1X authentication, MAB authentication, and dynamic delivery of user policies (VLANs and ACLs) • ONU Port-Level Hard-Isolated. Different ports of an ONU can be securely connected to multiple networks through the hard-isolated technology
L3 Feature	• PPPoE, static IP address, DHCP • NAT/NAPT • Port forwarding • ALG,UPnP • DDNS/DNS server/DNS Client • IPv6/IPv4 dual stack, DS-Lite • Static route/default route • Multiple services carried over one WAN port
Networking Protection	• Type B single-homing protection • Type B dual-homing protection

Standards Compliance

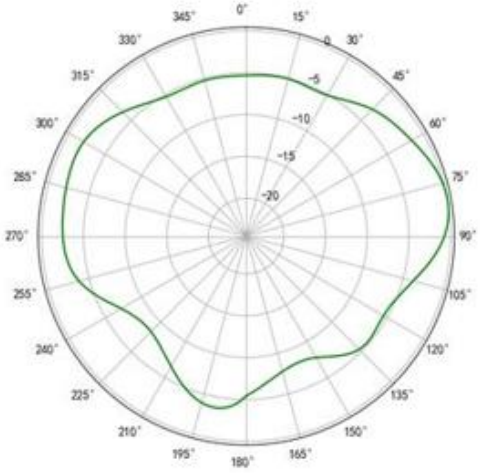
Name	Standard	
Safety standards	• UL 60950-1 • EN 60950-1 • IEC 60950-1 • UL 62368-1	• EN 62368-1 • IEC 62368-1 • GB 4943.1 • CAN/CSA 22.2 No.60950-1
Radio standards	• ETSI EN 300 328 • ETSI EN 301 893 • AS/NZS 4268	
Electromagnetic compatibility standards	• EN 301 489-1 • EN 301 489-17 • EN 60601-1-1 • EN 60601-1-2 • EN 55024 • EN 55032 • EN 55035 • GB 9254 • GB 17625.1	• AS/NZS CISPR32 • CISPR 24 • CISPR 32 • CISPR 35 • IEC/EN61000-4-2 • IEC/EN 61000-4-3 • IEC/EN 61000-4-4 • IEC/EN 61000-4-5 • IEC/EN 61000-4-6

Name	Standard	
	• GB 17625.2	• ICES-003
IEEE standards	• IEEE 802.11a/b/g • IEEE 802.11n • IEEE 802.11ac • IEEE 802.11ax • IEEE 802.11be • IEEE 802.11h	• IEEE 802.11d • IEEE 802.11e • IEEE 802.11k • IEEE 802.11v • IEEE 802.11w
Security standards	• 802.11i, Wi-Fi Protected Access (WPA), WPA2, WPA2-Enterprise, WPA2-PSK, WPA3, WAPI • 802.1X • Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP), WEP, Open • EAP Type(s)	
Electromagnetic field standards	• EN 62311 • EN 50385	
ROHS	• Directive 2002/95/EC & 2011/65/EU • (EU)2015/863	
Reach	• Regulation 1907/2006/EC	
WEEE	• Directive 2002/96/EC & 2012/19/EU	

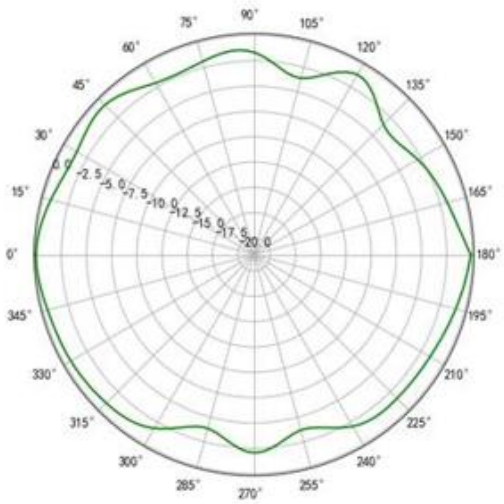
Antennas Pattern



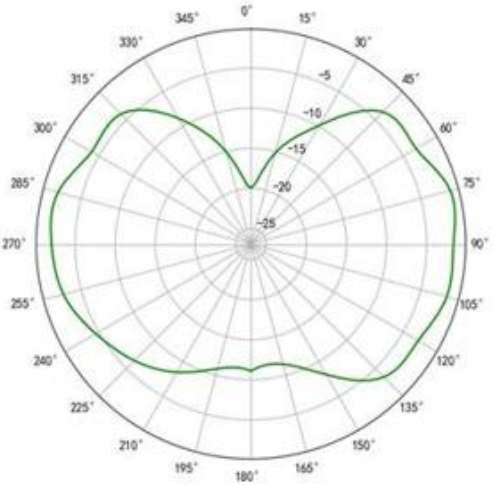
2.4GHz (Horizontal)



2.4GHz (Vertical)



5GHz (Horizontal)



5GHz (Vertical)

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