Wi-Fi 7 Solutions │ Product Overview

V1.0

Wi-Fi 7

Advanced Connectivity for the Next Generation

Wi-Fi 7 based on the IEEE 802.11be standard, represents the seventh and most modern generation of Wi-Fi technology. It's designed to deliver unparalleled performance, making it a game-changer for wireless connectivity. With Wi-Fi 7, manufacturers can customize Wi-Fi clients for different applications, price and performance categories. This is similar to the device categories of LTE and 5G specifications in mobile communications. With Wi-Fi 7, the basis for this is formed by new operating modes under the overall term Multi-Link Operation (MLO). With MLO, Wi-Fi 7 devices are able to utilize the same network resources much more than their predecessors. Wi-Fi 7 accommodates the ever-growing demands of modern connectivity, allowing for massive capacity gains.
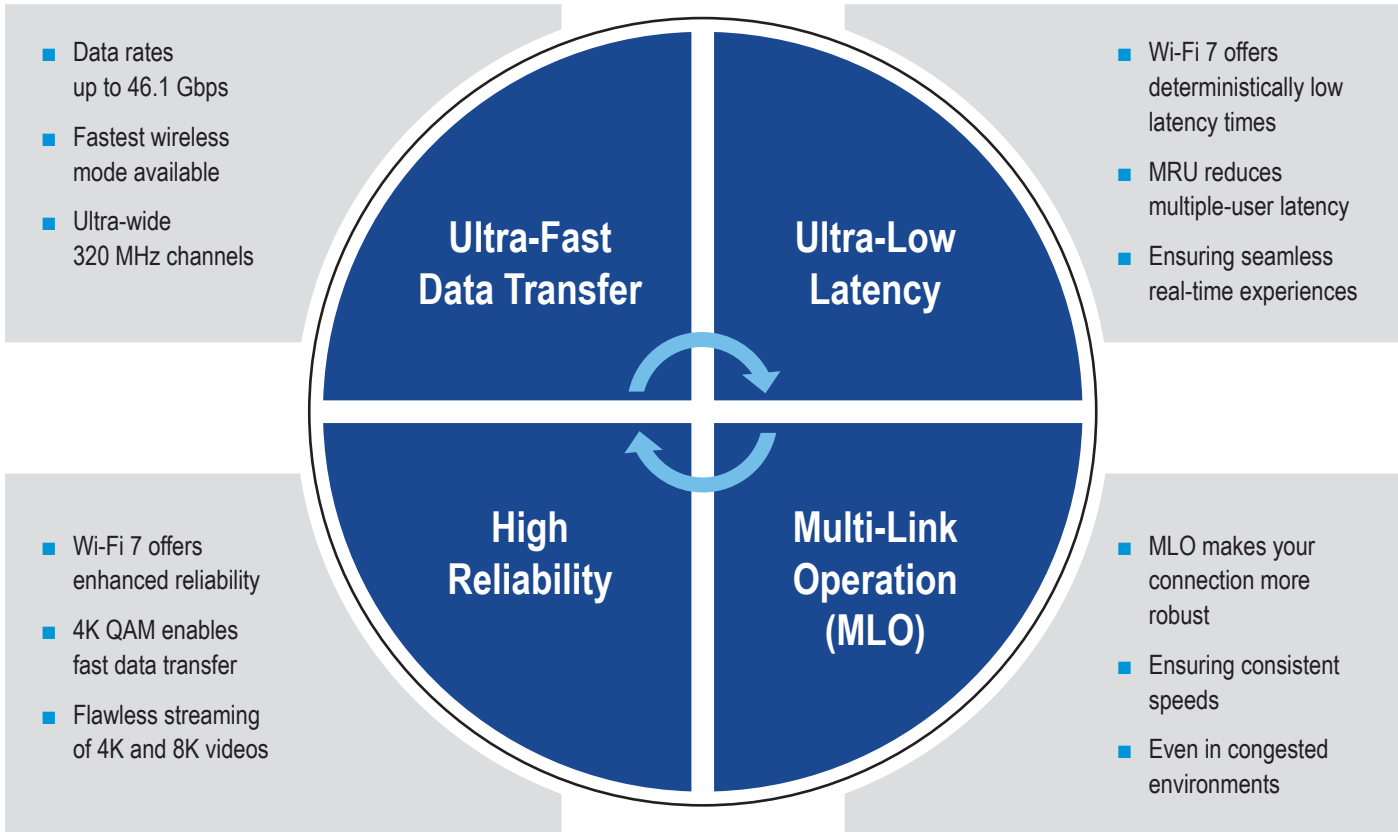
Target applications

- Augmented, Virtual & Extended Reality (AR / VR / XR)
- (Cloud-based) Gaming
- Real-time collaboration
- 4K / 8K video streaming
- High-quality video-conferencing

Why upgrade to Wi-Fi 7?

Wi-Fi 7 builds upon the foundation laid by Wi-Fi 6 (IEEE 802.11ax) by introducing even more capacity and performance enhancements.

- Data rates up to 46.1 Gbps
- Fastest wireless mode available
- Ultra-wide 320 MHz channels

Ultra-Fast Data Transfer

Ultra-Low Latency

High Reliability

Multi-Link Operation (MLO)

- Wi-Fi 7 offers deterministically low latency times
- MRU reduces multiple-user latency
- Ensuring seamless real-time experiences

- MLO makes your connection more robust
- Ensuring consistent speeds
- Even in congested environments

- Wi-Fi 7 offers enhanced reliability
- 4K QAM enables fast data transfer
- Flawless streaming of 4K and 8K videos

New Technologies and Performance Enhancements

4K Quadrature Amplitude Modulation (QAM)
The next generation of advanced modulation scheme: 4K QAM (or 4096 QAM), increases throughput by 20%. 4K QAM is capable of carrying 2^{12} symbols (12 bits), compared to 1K QAM used in Wi-Fi 6, which only carries 2^{10} symbols (10 bits).

+ 20%
Increased throughput

320 MHz Bandwidth
Doubling the maximum channel bandwidth available to each device to 320MHz in the 6GHz band effectively doubles the throughput. However, at 320MHz a reduced range has to be expected compared to 160 or 80 MHz.

2x
Max. bandwidth

Multi-Link Operation (MLO)
The newly introduced MLO (Multi-Link Operation) in the MAC layer enables link aggregation across different bands and channels with considerably lower latency. With MLO, Multi-Link Devices (MLDs) can simultaneously use the 2.4GHz, 5GHz and 6GHz bands under different circumstances, including load balancing according to traffic needs, or data aggregation across multiple bands, which significantly improves overall speeds and greatly reduces connection latency for all connected users. Whereas existing Wi-Fi technologies allow a device to connect and jump between either 2.4GHz, 5GHz and 6GHz bands, they can only send data via one band at a time.

3x
greater effective throughput

-80%
latency

Multiple Resource Units (MRU)
MRU is a feature in Wi-Fi 7 that builds upon another feature already introduced in Wi-Fi 6: Orthogonal Frequency Division Multiple Access (OFDMA). OFDMA allows independently modulating subcarriers within frequencies, enabling simultaneous transmissions to and from multiple clients, which boosts throughput and reduces latency. MRU takes OFDMA a step further by providing enhanced interference mitigation and efficiency. It achieves this by selectively puncturing overlapping portions of the spectrum, ensuring data travels only on unique frequencies. MRU reduces multiple-user latency by an additional 25% compared to OFDMA alone. When multiple users transmit data simultaneously, MRU allocates resource units (RUs) more efficiently, resulting in shorter end-to-end latency. Wi-Fi 7 with MRU offers 3X effective data bandwidth availability compared to Wi-Fi 6 in congested networks. It ensures reliable connectivity, faster speeds, and seamless experiences for users. MRU is a game-changer for Wi-Fi performance!

-25%
Multiple-user latency

3x
Effective data bandwidth in congested networks

Milestones of the latest Wi-Fi Generations

Wi-Fi 4 (2007)	Wi-Fi 5 (2013)	Wi-Fi 6/6E (2019/21)	Wi-Fi 7 (2024)
0.6 Gbps	7 Gbps	9.6 Gbps	46 Gbps
IEEE 802.11n	IEEE 802.11ac	IEEE 802.11ax	IEEE 802.11be
Band: 2.4G/5GHz	Band: 5GHz	Band: 2.4/5/6GHz	Band: 2.4/5/6GHz
64 QAM	256 QAM	1024 QAM	4096 QAM
40 MHz bandwidth	160 MHz bandwidth	OFDMA	320 MHz bandwidth
4x4 MIMO	DL MU-MIMO	UL MU-MIMO	MLO
	8x8 MIMO	TWT	MRU

Wi-Fi 7 Cards for Mainboards

intel.

Intel® Wi-Fi 7 BE200 / BE202 Modules
Designed for faster connections, improved reliability, wired-like responsiveness for better user experience, enhanced privacy and security. Aligned with the upcoming IEEE 802.11be standard. Legacy standards continue to be supported: Wi-Fi 4, 5, 6, 6E, incl. Wi-Fi 6 R2 features.

1st Generation Wi-Fi 7 support
- Greater Network Flexibility
- Accelerated Connectivity
- Increased Reliability
- Wired-like Responsiveness
- Enhanced Privacy and Security
- Bluetooth® 5.4
- Microsoft Windows 11 OS support
- Form Factors (M.2 2230 and 1216)

Wi-Fi 7 BE200 (Gale Peak 2)
- Wi-Fi 7 Tri-Band 2x2 320MHz
- 4096QAM
- 2.4X higher peak data rates
- Multi-link Operation (MLO - eMLSR)
- Multi-resource unit (Multi-RU)
- Puncturing

Product Brief

intel. Wi-Fi 7 5 Gig
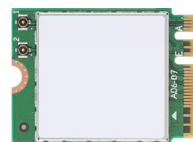
Wi-Fi 7 BE202 (Misty Peak 2)
- Wi-Fi 7 Tri-Band 2x2 160MHz
- 1024QAM
- 2.4 Gbps theoretical data rates
- Multi-link Operation (MLO - eMLSR)
- Multi-resource unit (Multi-RU)
- Puncturing

Product Brief

intel. Wi-Fi 7

intel KILLER

Intel® Killer™ Wi-Fi 7 BE1750
Intel® Killer™ Wi-Fi products combine industry-leading Wi-Fi connectivity with powerful gaming network technology to minimize lag, latency, and packet loss. These intelligent, optimized solutions enable immersive online experiences with minimal user effort.

Wi-Fi 7 Radio Module

silex technology

SX-PCEBE
802.11a/b/g/n/ac/ax/be Tri-band 2Tx2R + BT5.3 PCIe Combo Module

The SX-PCEBE is the industry's first PCIe Wi-Fi 7 plus Bluetooth (BT) combination module designed to meet high-performance connectivity demands for mission-critical applications. It is powered by Qualcomm's QCC2076 chipset which is a highly integrated System-On-Chip (SoC) supporting Wi-Fi 7 and Bluetooth (BT) 5.3. It supports simultaneous operation on 2.4GHz and 5GHz, or 6GHz, also known as Dual Band Simultaneous (DBS).

silex technology SX-PCEBE

silex technology SX-PCEBE

Product Flyer

Wi-Fi 7 Router

ASUS® IN SEARCH OF INCREDIBLE

ROG Rapture GT-BE98 [Pro]
GT-BE98 [Pro] Quad-band Wi-Fi 7 (802.11be) Gaming Router

- Support new 320MHz bandwidth & 4096-QAM
- Dual 10G Ports
- Backup WAN
- Triple-level Game Acceleration / Mobile Game Mode
- AURA RGB
- AiMesh support
- Subscription-free network security
- Comprehensive VPN features

RT-BE96U
BE19000 Tri-band Wi-Fi 7 Router

Next-gen Wi-Fi Standard – Beyond-fast Wi-Fi 7 (802.11be) with new 320MHz channels in the 6 GHz band and 4096-QAM significantly increases network capacity and throughput, with speeds up to 19Gbps. Multi-link Operation – Links to multiple bands simultaneously to ensure stable internet connection and efficient data transfers.

- Dual 10 Gbps Ports
- Subscription-free Network Security
- Advanced Parental Controls
- Comprehensive VPN Features
- AiMesh Extendable Router

Mainboards with Wi-Fi 7 built-in

ASUS® IN SEARCH OF INCREDIBLE

ROG Maximus Z790 Hero BTF
- Hidden-connector design
- Graphics card high-power slot
- Up to 600 W for BTF graphics cards
- Wi-Fi 7 and ample PCIe® 5.0

Z790 GAMING WIFI7
- Robust power design
- Comprehensive cooling solutions
- Intelligent tuning options

ROG Strix Z790-E Gaming WiFi II
- Vibrant multi-layered I/O shroud
- VRM cooling
- DDR5 & ample PCIe 5.0 slots
- DIY-friendly Q-Design feature set

TUF GAMING Z790-BTF WIFI
- Hidden-connector design
- Graphics card high-power slot
- Up to 600 W for BTF graphics cards
- Clean cable mgmt. and build appearance

ROG Strix Z790-A Gaming WiFi II
- Robust VRM w/ stout silver
- PCIe 5.0, Wi-Fi 7, high-speed USB flash

ROG Maximus Z790 Dark Hero
- Wi-Fi 7 and ample PCIe 5.0
- Robust cooling
- Stealthy design: new Polymo lighting illuminates I/O shroud w/micro-structural array of dual-layer RGB

ROG Maximus Z790 Formula
- Exclusive HybridChill VRM cooling
- Advanced DDR5 settings & Intel® Wi-Fi 7
- PCIe 5.0 slots for both graphic cards & storage
- Customizable ARGB lightning

Wi-Fi 7 Antennas

2.4/5.0/6.0 GHz ISM Screw Mount

2J4702B-TH19 - Key Features

- 2.4 / 5.0 / 6.0 GHz ISM
  - 2410 - 2490 MHz
  - 4920 - 7125 MHZ
- Screw Mount
- Low Profile
- Ground Plane Dependent
- Customizable Cable and Connector
- Dimensions Ø 52 × 17.5 mm
- Certificates: IP69K

[Datasheet]

2J6902B - Key Features

- Cable 1: 2.4 / 5.0 / 6.0 GHz ISM
  - 2410 - 2490 MHz
  - 4920 - 5925 Mhz
  - 5925 - 7125 MHz
- Screw Mount
- Anti-Rotation Mounting
- High Performance
- Ground Plane Independent
- Customizable Cable and Connector
- Dimensions 80 × 74 × 25.6 mm
- Certificates: IP67, IP69

[Datasheet]

Wi-Fi 7 Antennas

2.4/5.0/6.0 GHz Wi-Fi 7 Antennas

	X9003019	X9001879	X1005800	WX Family	W3 Family
	External Hinged Wi-Fi & Wi-Fi 6E Antenna	External Hinged Wi-Fi6 & Wi-Fi6E with FAKRA Connector	External Wi Fi 6E/7 Antenna	Embedded Wi-Fi Dual Band Antenna – Multiple Radiation Patterns	Embedded Wi-Fi 6E & 7 Antenna
Antenna Type	External (Indoor)		External (Outdoor)	Internal (Off Board)	
Technology	Wi-Fi | Wi-Fi 6E	Wi-Fi | Wi-Fi 6/6E | Bluetooth WLAN | BLE | ZigBee	Wi-Fi | Wi-Fi 6E | Wi-Fi 7 | WLAN BLE | Bluetooth | ZigBee	Wi-Fi | Wi-Fi 6E | Bluetooth WLAN | BLE | ZigBee	Wi-Fi | Wi-Fi 6E & 7 | BT WLAN | BLE | ZigBee
Band	802.11 a/b/g/n/ac/ax				
Frequency	2400-2485 MHz 4900-5850 MHz 6000-7125 MHz	2400-2485 MHz 5150-5850 MHz 5925-7125 MHz		2400-2485 MHz 4900-5825 MHz 5925-7125 MHz	2400-2485 MHz 5150-5850 MHz 5925-7127 MHz
Peak Gain	Varies Depending on Frequency	2400-2485 MHz = 1.9 dBi 5150-5850 MHz = 4.8 dBi 5925-7125 MHz = 4.4 dB	2400-2500 MHz = 4.0dBi 5150-5825 MHz = 5.3dBi 5925-7125 MHz = 5.6dBi	Varies Depending on Frequency	Varies Depending on Frequency
Efficiency	Varies Depending on Frequency	2400-2485 MHz = 66% 5150-5850 MHz = 66% 5925-7125 MHz = 57%	2400-2500 MHz = 85% 5150-5825 MHz = 84% 5925-7125 MHz = 73%	Varies Depending on Frequency	Varies Depending on Frequency
Size [mm]	84.0 x 9.35	124.2 ±2.0 straight height 87.5 ±2.0 bent height 7.8 ±0.1 diameter	163.7 x 32.7 x 22.5	30.0 x 15.5 x 0.80	35.20 x 8.50 x 0.40
Weight [grams]	12	15	25.5	N/A	0.3
Mounting	Connector			Adhesive + Cable + Connector	
Datasheet	Link	Link	Link	Link	Link

Specialized Wi-Fi 7 Access Points

Cab-n-Connect™ - WiFi solution for the cabin aircraft system

Kontron's Cab-n-Connect™ wireless access points are the ideal complement to the ACE FLIGHT line of servers in an In-Flight Entertainment (IFE) system. Featuring leading edge WiFi connectivity technology, the Cab-n-Connect™ product line is the ideal WiFi solution for the cabin aircraft system in next generation of IFE.

With aggregated data rates up to 4.8 Gbps in the 6 GHz band, concurrent 1.2 Gbps in the 5 GHz band and concurrent 573Mbps in the 2.4 GHz band, the latest Cab-n-Connect CWAPs provide intelligent edge capabilities with the highest level of client services without compromising security monitoring. Passive cooling (fanless) technology prevents overheating and worldwide operations support is provided.

The solution is optimized for multi-platform video streaming and provides the highest level of efficiency and performance for dense, multi-client applications running onboard.

Cab-n-Connect™ A300
Cabin Wireless Access Point - 802.11be / Wi-Fi 7

- 802.11 a/b/g/n/ac/ax/be backwards compatibility
- Dedicated smart sensor for top-level security and performance
- Support for WPA3 security certifications
- DO-160G qualified hardware
- Two Quadrax circular connectors for retrofit applications

[Datasheet]

Kontron's latest Cab-n-Connect A300 combines into a single enterprise-class solution, powerful 802.11be Wi-Fi 7 technology, advanced security and ML/AI management capabilities that allow customers to deploy high speed, highly secure Wi-Fi in the harshest aircraft environments.

Cab-n-Connect™ A301
Cabin Wireless Access Point - 802.11be / Wi-Fi 7

- 802.11 a/b/g/n/ac/ax/be backwards compatibility
- Dedicated smart sensor for top-level security and performance
- Support for WPA3 security certifications
- DO-160G qualified hardware and OEM Line-Fit ready
- ARINC 628-P1 compliant

[Datasheet]

Kontron's latest ARINC 628-P1 compliant CWAP, the Cab-n-Connect A301 combines powerful 802.11be Wi-Fi 7 technology, advanced security and ML/AI management capabilities into a single enterprise-class solution that allows customers to deploy high speed, highly secure Wi-Fi in the toughest aircraft environments.

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ELECTRONICS WORLDWIDE

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