

Qualcomm® X85 5G Modem-RF

World's most advanced modem-RF solution with on-chip AI processing for leading 5G Advanced performance, superior user experience, and unrivaled spectrum versatility.

The **Qualcomm X85 5G Modem-RF** is the leading 5G platform, leveraging integrated AI for unrivaled performance, efficiency, speeds, and spectrum flexibility. It can accelerate 5G Advanced adoption across segments like smartphones, mobile broadband, fixed wireless access, compute, industrial IoT, and 5G private networks.

At the heart of this 8th generation 5G solution lies the Qualcomm® 5G AI Processor, an integrated AI tensor accelerator. This processor **achieves 30%* faster AI inference**, enhancing AI-driven peak performance, user experience, coverage, latency, and power efficiency.

Representing the pinnacle of 5G innovation, the Qualcomm X85 5G Modem-RF delivers leading performance, speeds, efficiency, and flexibility through integrated AI and advanced Modem-RF technologies.

* In comparison to previous generation

Highlights

Driving 5G Advanced across segments

Qualcomm X85 5G Modem-RF's 5G Advanced architecture allows OEMs to create next-gen 5G Advanced devices in mobile and beyond. Its software upgradability combined with the superior **Qualcomm® Advanced Modem-RF Software Suite** empowers OEMs to create next-gen 5G devices with leading performance.



Leading AI-enhanced 5G Advanced performance

Qualcomm X85 5G Modem-RF is equipped with the **Qualcomm 5G AI Processor**, an on-device, dedicated AI tensor accelerator that performs **AI inference 30%* faster**, dynamically enhancing **latency, coverage, and power efficiency** for the ultimate 5G Advanced user experience.



Unrivaled speeds and spectrum versatility

Qualcomm X85 5G Modem-RF delivers superior 5G performance and flexibility for operators, featuring the **first downlink carrier aggregation with 400MHz bandwidth in Sub-6GHz with 1024 Quadrature Amplitude Modulation (QAM) and the first UL carrier aggregation with 4 layers** for sub-6GHz bands. It also can reach up to 12.5 Gbps with sub-6, mmWave, **Qualcomm® Smart Transmit™ Plus technology with enhanced uplink performance**, and an unmatched range of advanced features for spectrum utilization.



Qualcomm®
X85

Qualcomm®
5G AI Processor

Target Applications

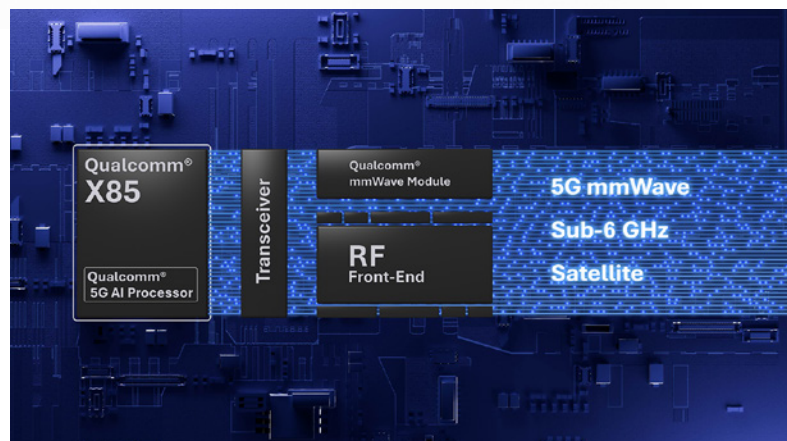
- Smartphones
- Mobile Broadband Devices
- Fixed Wireless Access Devices
- Industrial IoT
- Satellite

Features

- Qualcomm 5G AI Processor with dedicated tensor accelerator hardware optimized for 5G and 5G Advanced use cases with 30%* faster AI inference for better performance
- Qualcomm AI-Powered Data Traffic Engine for better end user experience and performance
 - AI-enhanced, dynamic gaming traffic prioritization
 - AI-enhanced OTT calling for clearer voice and video calls
 - Smooth Wi-Fi Cellular transfer
- Qualcomm Advanced Modem-RF Software Suite—on-device, learning-based network selection
- 5G NR-based GNSS Location
- 6Rx support for Smartphones
- 6x CA with 400MHz Bandwidth
- 1024-QAM sub-6GHz support
- 12.5 Gigabit 5G DL peak rate
- Smart Transmit Plus with enhanced uplink support
- Supports all global 5G bands, from 0.6 to 41GHz
- Switched uplink with Rel-17 (FDD/TDD)
- Supplemental uplink – China
- UL 4 Layer Carrier Aggregation (200MHz)
- Qualcomm QTM565 mmWave module
- Converged mmWave-Sub6 Transceiver
- 3GPP Release 18 support
- Qualcomm RF Downlink Boost
- Turbo DSDA with 3CC + 1CC carriers support for higher throughput* in DL and UL
- Qualcomm 5G PowerSave

* In comparison to previous generation

Block Diagram



Specifications

Modem Name	Qualcomm X85 5G Modem-RF System
5G Peak Download Speed	12.5 Gbps
5G Peak Upload Speed	3.7 Gbps
Cellular Modem-RF Specs	6CC aggregation in 5G sub-6GHz
Performance Enhancement Technologies	Qualcomm 5G AI Processor with dedicated tensor accelerator, with 30% faster AI inference for better performance Advanced Modem-RF Software Suite, Smart Transmit Plus technology, Satellite, Qualcomm RF Uplink Optimization, Qualcomm 5G PowerSave, Qualcomm RF Downlink Boost
Cellular Technology	R18 (5G Advanced), 6xCA sub-6 DL carrier aggregation, DL CA with 400MHz Bandwidth, UL – 2xTDD – 4 Layer Carrier Aggregation (200MHz), 1024-QAM sub-6 GHz TDD, FR1 + FR2 CA, 5G NR TDD/FDD, Sub-6GHz and mmWave, Sub-6 DL and UL CA (TDD-TDD, FDD-FDD, FDD-TDD), 5G SA, 5G NSA, FDD UL MIMO, Switched Uplink, Supplemental Uplink, LTE, WCDMA, LAA, GSM/EDGE, CBRS
Multi-SIM	Turbo DSDA with 3CC + 1CC carriers support for higher throughput in DL and UL (in comparison to previous versions)

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