

Qualcomm Dragonwing™ QCS8550/QCM8550 Processors



Premium processor combines powerful computing, extreme edge AI processing, Wi-Fi 7, and robust video and graphics for a wide range of use cases for the Internet of Things (IoT).

The QCS8550 and QCM8550 processors let you do more with less. We combine low-power, maximum heterogeneous computing, Wi-Fi 7 connectivity, and vivid graphics and video with optimized AI architecture for extreme edge AI processing. With just one system, you can develop a wide range of performance-heavy IoT applications including autonomous mobile robots, industrial drones, camera, edge AI box, video collaboration, video transcoding, and cloud gaming.

Highlights

SUPERIOR PERFORMANCE

- Provides a single, flagship processor enabling next-generation features and best-in-class performance across connectivity, compute processing, camera, AI, security, and audio for performance-heavy IoT applications
- Enterprise-level connectivity with Wi-Fi 7 delivering speeds up to 5.8 Gbps
- 8th gen AI engine provides 10x performance over previous gen



OPTIMIZED AI ARCHITECTURE

- AI architecture is optimized to deliver extreme processing throughput or compute requirements for IoT applications across a wide range of use cases
- Increases throughput of AI in addition to performance so you can do more with less
- Enables new use cases and business models by supporting how AI models are evolving

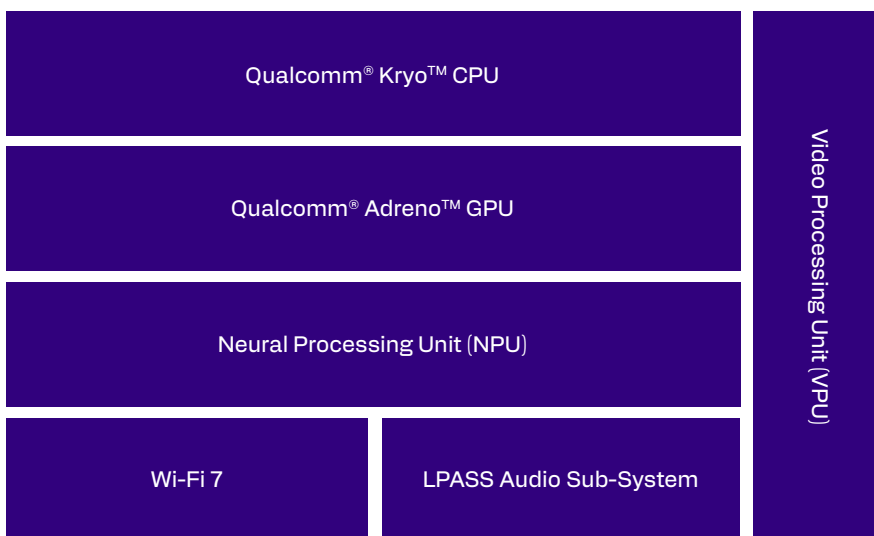


ROBUST VIDEO AND GRAPHICS

- Robust video and graphics processing enables immersive gaming, video collaboration, and video streaming experiences
- Powerful graphics processing unit (GPU) allows for multiple gaming applications to run concurrently with richer game content over the cloud



Block Diagram





Features

- Kryo CPU; 64-bit architecture
 - 1x Prime core, up to 3.36 GHz
 - 4x Performance cores, up to 2.8 GHz
 - 3x Efficiency cores, up to 2.0 GHz
- Support for LP-DDR5x memory up to 4200 MHz - Memory Density: up to 16 GB
- Adreno 740 GPU
- Concurrent GPS, Glonass, BeiDou, Galileo, QZSS, NavIC
- Sensor-Assisted Positioning 6.0
- EVA: Computer vision processor for improved video denoising, digital video stabilization, and image correction adjustment
- Qualcomm Spectra™ Image Signal Processor - Cognitive ISP, Triple 18-bit ISPs
 - Up to 36 MP triple camera @ 30 FPS ZSL
 - Up to 64+36 MP dual camera @ 30 FPS ZSL
 - Up to 108 MP single camera @ 30 FPS ZSL
 - Up to 200 MP Photo Capture
- NPU: Qualcomm® Hexagon™ Tensor Processor (HTP) with Hexagon Vector eXtensions (HVX) and Hexagon Matrix eXtensions (HMX)
- Modem: Only with QCM8550
 - 5G mmWave and sub-6 GHz, standalone (SA) & non-standalone (NSA) modes, standalone mmWave & mmWave-sub6 dual connectivity, FDD, TDD; mmWave: 8 carriers, 2x2 MIMO; Sub-6 GHz: 4x4 MIMO
- Qualcomm Aqstic™ audio codec
 - Qualcomm Aqstic smart speaker amplifier
 - Total Harmonic Distortion + Noise (THD+N), Playback: -108dB
 - Qualcomm® Audio and Voice Communication Suite

Target Applications

- Autonomous Mobile Robots (AMRs)
- Industrial Drones
- Retail
- Video Collaboration
- Video Transcoding
- Cloud Gaming
- Edge AI Gateways

Specifications

Process Node	4 nm, 15.6 x 14.0 mm
CPU	1x GoldPlus @ 3.2 GHz + (2+2) Gold @ 2.8 GHz + 3x Silver @ 2.0 GHz
Memory	4 x 16 LPDDR5/5x @ 4200 MHz
Modem	Release 16 3GPP (sub-6 + mmW) (Only with QCM8550)
Location	Gen 9 v5, GPS L1/L5/L2C, GLO G1, BDS B1I/B1C/B2A/B2B, GAL E1/E5A/E5B, QZSS L1/L5/L2C, NavIC L5
Connectivity	WLAN: 802.11be, 2x2 MIMO, Bluetooth® 5.3
GPU	Adreno 740 GPU Ray tracing, OpenGL ES 3.2, Vulkan 1.2, OpenCL 3.0 full profile, Adreno NN direct
Compute DSP	V73 AI-optimized tensor processor, six threads scalar DSP
Sensor DSP	Qualcomm® Sensing Hub 3.0
AI	Dual eNPU V3, 4 x HVX, HMX, 48 INT8, 12 FP16 TOPs
Camera	18 bpp, 64 + 36 MP30, or 3 x 36 MP30 or 1 x 108 MP30 fps ZSL, 8 x DPHY 1.2/CPHY 2.0; 3 IFE + 2 IFE Lite; Always-On
Display Technology	QHD240 (embedded) + 1 x 4K60 (external) w/ MST; 2 x DSI, 1 x DP1.4 over USB-C
Video	Video decode up to 4K240/8K60; Video encode up to 4K120/8K30, AV1 decoder
Audio DSP	Hexagon V73M 2Cluster – 4-Thread DSP, 5.5 MB of LPI memory, AI Processor (eNPU) v3, to accelerate neural networking use cases
Storage/Peripherals	1x PCIe 2-lane Gen 4, 1x PCIe 2-lane Gen 3, UFS 4.0, USB 3.1 Gen 2 with DP + data, eUSB
Security Features	Qualcomm® Trusted Execution Environment (TEE) v5.3, Qualcomm® Type-1 Hypervisor enables multiple trusted VMs (TVMs)

To learn more visit: [qualcomm.com](https://www.qualcomm.com)



Expected Product Longevity: April 2033

The QCS8550 processor is a part of the Product Longevity Program for Qualcomm IoT Portfolio. These products are developed and engineered with product longevity and durability in mind, helping to bring stability to our customer product designs. Product longevity dates are subject to change without notice.

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