

Qualcomm® QCS8550 and Qualcomm® 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).

Our 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.

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



QCS8550/QCM8550 Target Applications

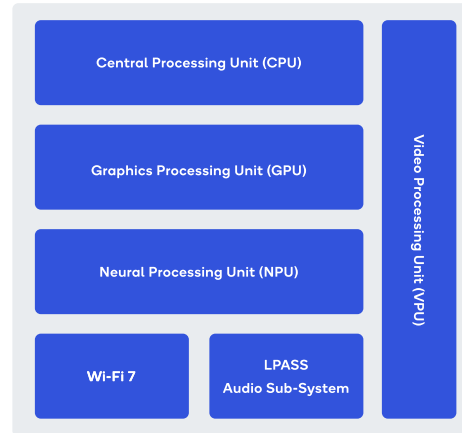
- Autonomous mobile robots (AMRs)
- Industrial drones
- Retail
- Video collaboration
- Video transcoding
- Cloud gaming
- Edge AI gateways



Features

- Qualcomm® Kryo™ CPU; 64-bit architecture
 - 1 Prime core, up to 3.36 GHz with Arm® Cortex®-X3 technology
 - 4 Performance cores, up to 2.8 GHz
 - 3 Efficiency cores, up to 2.0 GHz
- Support for LP-DDR5x memory up to 4200 MHz - Memory Density: up to 16 GB
- Qualcomm® 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
- Extended life for hardware and software support

Block Diagram



QCS8550/QCM8550 Specifications

Process Node/Package	4nm, 15.6 x 14.0mm
CPU	1 GoldPlus @3.2 GHz + (2+2) Gold @2.8 GHz + 3 Silver @2.0 GHz
Memory	4 x 16 LPDDR5/5x @4200MHz
Modem	Release 16 3GPP (sub6 + mmW) (Only with QCM8550)
Location	Gen9 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	1xPCIe 2-lane Gen4, 1xPCIe 2-lane Gen 3, UFS4.0, 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)

