Qualcomm® Application Processors Selector Guide

Application processors powering the next generation of high-tech devices for the Internet of Things (IoT)

Materials are subject to change without notice.
87-PN002-1 Rev. E

Qualcomm

Compare Qualcomm® IoT Application Processors

Qualcomm Technologies' Application Processors are driving innovation beyond the smartphone and powering the next generation of high-tech devices for the Internet of Things, making them more aware, connected, intelligent, and interactive.

	Processor	CPU Cores	AI Performance (INT 8)	GPU	Wi-Fi Standards	Camera		Display		Video	Peripherals		OS	Expected Product Longevity
Premium Tier	Qualcomm® QCS8550	Qualcomm® Kryo™ Octa-Core	48 TOPS	Qualcomm® Adreno™ 740	2x2 802.11be	5 Cameras (concurrent)	36+36+36 MP30 ZSL 64+36 MP30 ZSL 108 MP30 ZSL 200 MP photo capture	4 Displays	3480 x 2160 @ 120 Hz 3360 x 1600 @ 144 Hz	Decode: 4K240/8K60 Encode: 4K120/8K30 AV1 Decoder	PCIe Gen 3 PCIe Gen 4 SD 3.0	UFS 4.0 Gear 5 USB 3.1 Type-C w/DP eUSB 2.0	Android Linux	2033
	Qualcomm® QRB5165	Kryo 585 Octa-Core	15 TOPS	Adreno 650	2x2 802.11ax	7 Cameras (concurrent)	25+25 MP30 ZSL 64 MP30 ZSL 200 MP photo capture	3 Displays	5040 x 2160 @ 60 Hz 2560 x 2560 @ 120 Hz	Decode: 4K240/8K60 Encode: 4K120/8K30	PCIe Gen 3 SD 3.0 UFS 3.0 Gear 4	USB 3.1 USB 3.1 Type-C w/DP	Linux Ubuntu	2035
	Qualcomm® QCS8250	Kryo 585 Octa-Core	15 TOPS	Adreno 650	2x2 802.11ax	7 Cameras (concurrent)	25+25 MP30 ZSL 64 MP30 ZSL	3 Displays	5040 x 2160 @ 60 Hz 2560 x 2560 @ 120 Hz	Decode: 4K240/8K60 Encode: 4K120/8K30	PCIe Gen 3 SD 3.0 UFS 3.0 Gear 4	USB 3.1 USB 3.1 Type-C w/DP	Android	2036
High Tier	Qualcomm® QCS6490	Kryo 670 Octa-Core	12 TOPS	Adreno 643	2x2 802.11ax	5 Cameras (concurrent)	22+22+22 MP30 ZSL 36+22 MP30 ZSL 64 MP30 ZSL 192 MP NZSL	2 Displays	2520 x 1080 @ 144 Hz	Decode: 4K60 Encode: 4K30	eMMC 5.1 PCIe Gen 3 SD 3.0	UFS 2.x/3.1 Gear 4 USB 2.0 USB 3.1 Type-C w/DP	Android Linux Ubuntu Windows	2036
	Qualcomm® QCS610	Kryo 460 Octa-Core	1 TOPS	Adreno 612	1x1 802.11ac	3 Cameras	16+16 MP 24 MP30	2 Displays	2520 x 1080 @ 60 Hz 1920 x 1200 @ 60 Hz	Decode: 4K30 Encode: 4K30	eMMC 5.1 SD 3.0 UFS 2.1 Gear 3	USB 2.0 USB 3.1 Type-C w/DP	Android Linux	2030
	Qualcomm® QCS6125	Kryo 260 Octa-Core	1 TOPS	Adreno 610	1x1 802.11ac	2 Cameras (concurrent)	16+16 MP 25 MP30 ZSL 48 MP	1 Display	2520 x 1080 @ 60 Hz	Decode: 4K30 Encode: 4K30	eMMC 5.1 SD 3.0 UFS 2.1 Gear 3	USB 2.0 USB 3.1 Type-C w/DP	Android Linux	N/A
	Qualcomm® QCS5430	Kryo 670	Up to 13 TOPS	Adreno 642L	2x2 802.11ax	4 Cameras	22+22 MP30 ZSL 64 MP30 (scalable)	2 Displays	2520 x 1080 @ 120 Hz (scalable)	Decode: 4K60 Encode: 4K30	eMMC 5.1 PCIe Gen 3 SD 3.0	UFS 2.x/3.1 Gear 4 USB 2.0 USB 3.1 Type-C w/DP	Android Linux Ubuntu Windows	2032
Medium Tier	Qualcomm® QCS4490	Kryo Octa-Core	N/A	Adreno 613	2x2 802.11ax	3 Cameras	16+16 MP30 ZSL 25 MP30 ZSL 64 MP NZSL	1 Display	2520 x 1080 @ 90/120 Hz	Decode: 1080p60 Encode: 1080p60	eMMC 5.1 PCIe Gen 3 SD 3.0	UFS 3.1 Gear 4/UFS 2.2 USB 3.1 Type-C	Android	2030
	Qualcomm® QCS4290	Kryo 260 Octa-Core	1 TOPS	Adreno 610	1x1 802.11ac 1x1 802.11ax-ready	3 Cameras	13+13 MP30 25+5 MP30 16+16 MP24	1 Display	2520 x 1080 @ 90 Hz 1600 x 900 @ 60 Hz	Decode: 1080p60 Encode: 1080p60	eMMC 5.1 SD 3.0	UFS 2.1 Gear 3 USB 3.1 Type-C	Android Linux	2027
	Qualcomm® QRB4210	Kryo 260 Octa-Core	1 TOPS	Adreno 610	1x1 802.11ac 1x1 802.11ax-ready	3 Cameras	13+13 MP30 25+5 MP30 16+16 MP24	1 Display	2520 x 1080 @ 90 Hz 1600 x 900 @ 60 Hz	Decode: 1080p60 Encode: 1080p60	eMMC 5.1 SD 3.0	UFS 2.1 Gear 3 USB 3.1 Type-C	Linux ROS	2032
	Qualcomm® QCS410	Kryo 460 Quad-Core	1.7 TOPS	Adreno 612	1x1 802.11ac	3 Cameras	16+16 MP 21 MP	2 Displays	2520 x 1080 @ 60 Hz 1920 x 1200 @ 60 Hz	Decode: 1080p90 Encode: 1080p90	eMMC 5.1 SD 3.0 UFS 2.1 Gear 3	USB 2.0 USB 3.1 Type-C w/DP	Android Linux	2030
Entry Tier	Qualcomm® QCS2290	4x Arm® Cortex®-A53 CPU @ up to 2.0 GHz	N/A	Adreno 702	1x1 802.11ac	2 Cameras	13+13 MP30 ZSL 25 MP30 ZSL	1 Display	1680 x 720 @ 60Hz	Decode: 1080p30 Encode: 1080p30	eMMC 5.1 SD 3.0	USB 3.1 Type-C/ Micro USB	Android Linux	2030
	Qualcomm® QRB2210	4x Cortex®-A53 CPU @ up to 2.0 GHz	N/A	Adreno 702	1x1 802.11ac	2 Cameras (concurrent)	13+13 MP30 ZSL 25 MP30 ZSL	1 Display	1680 x 720 @ 60 Hz	Decode: 1080p30 Encode: 1080p30	eMMC 5.1 SD 3.0	USB 3.1 Type-C/ Micro USB	Linux ROS	2032

To learn more visit: qualcomm.com, developer.qualcomm.com, or qualcomm.com/products/product-longevity-program

Application Processors

IoT Product Segments and Use Cases

Application Processors

IoT Product Segments and Use Cases

Robotics

- In-store service robots to provide directions and product information to customers
- Inventory robots to track shelving stock and even grab objects for customers
- Delivery robots to bring the store to the customer autonomously
- Companion robots to keep an eye on the kids while playing in the yard and send alerts in case of unusual activities
- Household robots to vacuum, clean, and perform other chores around the house

- QRB5165
- QCS8250
- QCS610
- QCS6125
- QCS4290
- QRB4210
- QCS410
- QRB2210

Smart Cameras

- Intelligent Motion Detection can analyze video in real time and detects valid motion in a scene. It filters out "noise" such as lighting changes, natural tree movements, water movements, small animals, and even small video artifact noise
- Object Tracking tracks objects of interest and draws bounding boxes around them
- Camera Tamper Detection identifies any event that significantly changes the field of view of the camera
- Face Detection and Recognition detects and recognizes people from an on-device database
- Body Cams, Dash Cams, Sports Cameras, Surveillance
- Collaboration systems, such as conference systems with high-quality video/audio and AI

- QCS8250
- QCS610
- QCS4290
- QCS410
- QCS2290

Digital Signage/Shelf Labels

- More targeted signage with analytics through facial recognition, edge processing, and AI
- Enhanced interactive and bonding experience by integrating touch, voice, gestures, location, and camera
- Display standards-based bi-directional, secure communication, driving display and sensors
- Camera customer engagement/counting via anonymous edge processing

- QCS8250
- QCS6490
- QCS4490
- QCS2290

Smart Displays/Home Entertainment

- Connected device that responds to voice commands and displays relevant information, including reminders, alerts, to-do lists, stream music and video
- Integrated camera for face detection/recognition and gesture commands, while supporting video calling
- Integrated sensors for temperature and light control as well as other appliances

- QCS8250
- QCS6490
- QCS610
- QCS4290
- QCS410
- QCS2290

Retail and Payments

- Handheld POS, Electronic Cash Registers
- Eliminate overstocks and out-of-stocks
- Adjusting prices
- Product organization on shelves with Multimedia Video ads
- Predict and influence customer behavior
- Self service kiosk & checkout, cashier-free stores

- QCS8250
- QCS6490
- QCS610
- QCS6125
- QCS4490
- QCS4290
- QCS410
- QCS2290

Kiosks/Vending Machines

- Product Locator, Price Checking, Way Finding
- Advertising, Ordering and Checkout, Store Pickup
- Magic Mirror (Augmented Reality)
- Vending machines with Camera, Facial Detection/Recognition

- QCS610
- QCS410
- QCS2290

Control Panels/Industrial Panels

- Automation control
- Remote operation, setup, and control, including ability to see what's going on at home or place of business
- Monitor and control devices such as safety lights, doors, and other sensors
- Program alerts
- Monitor and control power consumption, temperature, access, schedules, and collaboration

- QRB5165
- QCS6490
- QCS610
- QCS4290
- QRB4210
- QCS410
- QCS2290

Industrial Handheld Scanners

- Superior bar code scanning and image capture in low light
- Fast scanning/returns
- Enhanced picture quality with low power usage
- Inventory management which is accurate and real-time
- Staff collaboration

- QCS6490
- QCS6125
- QCS4490
- QCS4290
- QRB4210
- QCS2290

Product Longevity Program

Qualcomm Technologies, Inc. builds Qualcomm® SoCs for certain applications that may require longer life cycles. These products are developed and engineered with product longevity and durability in mind, helping to bring stability to our customer product designs. In support of the foregoing, Qualcomm Technologies has established a Product Longevity Program, which covers a select catalogue of Qualcomm SoCs that have been designed to meet a list of qualifications that are tailored to help address life cycle requirements of certain industrial and enterprise use cases. The processors in this guide* all belong to the Product Longevity Program.

* Excepting the QCS6125 processor

QCS8550 Application Processor

The premium-tier QCS8550 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).

QCS8550 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

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

Features

- 8th Gen AI engine
- Concurrent GPS, Glonass, BeiDou, Galileo, QZSS, NavIC
- Sensor-Assisted Positioning 6.0
- 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
- Qualcomm® Hexagon™ Tensor Processor (HTP) with Hexagon Vector eXtensions (HVX) and Hexagon Matrix eXtensions (HMX)
- Qualcomm Aqstic™ audio codec
  - Qualcomm Aqstic smart speaker amplifier
  - Total Harmonic Distortion + Noise (THD+N), Playback: -108 dB
  - Qualcomm® Audio and Voice Communication Suite
- Long-term support expected through April 2033 with the Product Longevity Program

Ordering Information

Product	Part Number*
QCS8550	QCS8550-1-AC

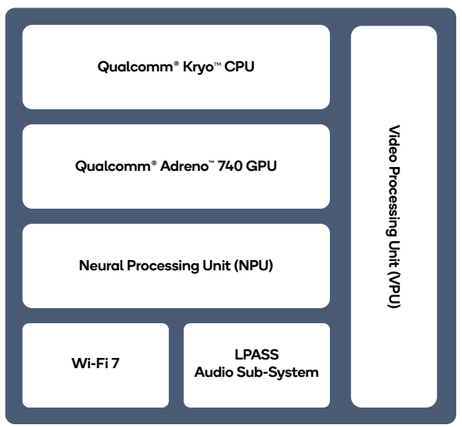
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS8550
Technology/Package	4 nm, 15.6 x 14.0 mm
CPU	Octo-core Kryo CPU, 64-bit: 1x GoldPlus @ 3.2 GHz + (2+2) Gold @ 2.8 GHz + 3x Silver @ 2.0 GHz
Memory	4 x 16 LPDDR5/5x @ 4200 MHz, Memory Density: Up to 16 GB
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
Camera	18 bpp, 64 + 36 MP30, or 3 x 36 MP30 or 1 x 108 MP30 fps ZSL, 8 x D-PHY 1.2/C-PHY 2.0; 3 IFE + 2 IFE Lite; Always-On
Display	QHD240 (embedded) + 1x 4K60 (external) w/ MST, 2x DSI, 1x DP 1.4 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
AI	Dual eNPU V3, 4x HVX, HMX, 48 INT8, 12 FP16 TOPs
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)

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

SNM970 SoM
by MeiG Smart Technology Co.

SG885G-WF Smart Module
by Quectel

TurboX™ C8550 SoM
by Thundercomm Technology

Development Kits

TurboX™ C8550 Dev Kit
by Thundercomm Technology

Reference Designs

TurboX™ EB5Gen2 Edge AI Station
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QRB5165 Application Processor

The premium-tier QRB5165 processor is designed to help you build smarter and powerful consumer, enterprise, or industrial robots with on-device AI, 5G connectivity, and more.

QRB5165 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Autonomous Delivery Vehicles
- Edge AI Box
- Commercial & Enterprise Drones
- CoBots & Intelligent Machines

Features

- **Spectra 480 Image Signal Processor designed to deliver a premium camera experience that can process 2 Gigapixels per second with high-performance capture of 200-megapixel photos, 8K video recording, and 4K HDR video capture**
- **Adreno 650 Visual Processing Subsystem delivers quality graphics for larger-than-life immersive experiences using the Adreno graphics processing unit (GPU) and video processing unit (VPU)**
- **Hexagon 698 DSP with HVX, Hexagon Tensor Accelerator and Hexagon Scalar Accelerator to support sophisticated, on-device AI processing, and delivers mobile-optimized computer vision (CV) experiences for a wide array of use cases**
- **Kryo 585 CPU: Manufactured in 7 nm process node, optimized across four high-performance Kryo Gold cores and four low-power Kryo Silver cores**
- **Qualcomm® Secure Processing Unit offers superior security designed to help safeguard your facial data, iris scan, and other biometric data. It supports hardware root of trust, Qualcomm TEE, Secure boot, and camera security**
- **Long-term support expected through September 2035 with the Product Longevity Program**

Ordering Information

Product	Part Number*
QRB5165 (LPDDR5 PoP)	QRB-5165-0-MPSP1099
QRB5165 (LPDDR4 PoP)	QRB-5165-1-MPSP1017

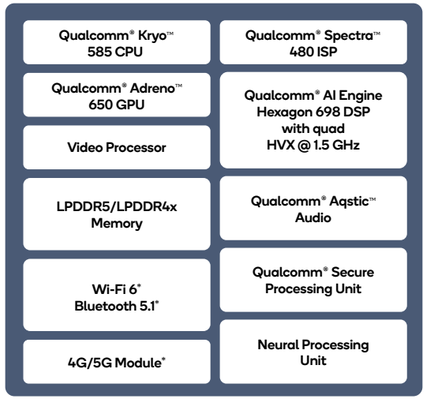
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QRB5165
Technology/Package	12.4 x 12.7 mm LP4, 12.4 x 14 mm LP5 MEP
CPU	Kryo 585 CPU, 64-bit, up to 2.84 GHz
Memory	LPDDR5 up to 2750 MHz, LPDDR4X up to 2133 MHz Memory Density: Up to 16 GB
ISP	Qualcomm Spectra 480 ISP with Dual 14-bit image signal processing
Connectivity	WLAN 2 x 2 802.11ax with DBS, Bluetooth 5.1
GPU	Adreno 650 GPU w/ support for Open GL ES & Open CL
Compute DSP	Hexagon 698 DSP with HVX, Hexagon Tensor Accelerator and Hexagon Scalar Accelerator
Video	8K video capture @ 30 FPS, Up to 10-bit color depth video capture, 4K video capture + 64 MP Photo, 4K video capture @ 120 FPS, 4K HDR video capture Decode: 8K60/4K240; Encode: 8K30/4K120
Camera Support	Up to 200 MP photo capture Up to 25 MP dual camera @ 30 FPS w/ Zero Shutter Lag Up to 64 MP single camera @ 30 FPS w/ Zero Shutter Lag Support for 12 cameras by D-PHY & 18 cameras by C-PHY (7 concurrent)
Security Features	Camera Security, Crypto Engine, Cryptographic Accelerator, Qualcomm TEE, Secure Boot, Qualcomm® Crypto Engine Core is FIPS 140-2 certified
Operating System	Ubuntu, Linux

Block Diagram



* Supported with a companion module

More Info:

SoMs, SiPs, and Smart Modules

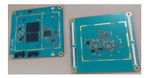
LEC-RB5 SMARC
by Adlink Technology, Inc.

QRB551 SBC
by DFI

Aikri QRB5165: Aikri-51X-65S
by eInfochips

ISQ 5165 SoM
by Innominds Software

SoM 5165
by Insignal



Open-Q™ 5165RB SoM
by Lantronix

TurboX™ C5165 SoM
by Thundercomm Technology

TurboX™ C5165N SoM
by Thundercomm Technology

Development Kits

I-Pi SMARC RB5 Dev Kit
by Adlink Technology Inc.

QRB551 Dev Kit
by DFI

Aikri QRB5165: Aikri-51X-65D
by eInfochips

DVK 5165
by Insignal

Open-Q™ 865 Dev Kit
by Lantronix

VOXL® 2 Dev Kit (Board Only)
by ModalAI

VOXL® 2 Mini Dev Kit (Board Only)
by ModalAI

Qualcomm® Robotics RB5 Dev Kit
by Thundercomm Technology

Qualcomm® Robotics RB6 Platform
by Thundercomm Technology

VVDN-QRB5165 Dev Kit
by VVDN Technologies

Reference Designs

EC700-QRB
by DFI

iDhi 5165
by Innominds Software

VOXL® 2 AI & 5G Development Drone - Sentinel
by ModalAI

Qualcomm Flight™ RB5 5G Platform Drone
by ModalAI

VOXL® 2 Flight Deck
by ModalAI

TurboX™ EB5 Edge AI Cube
by Thundercomm Technology

TurboX™ EB5 Edge AI Station
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS8250 Application Processor

The premium-tier QCS8250 processor is designed to help you deliver maximum performance for compute-intensive camera and Edge AI applications with Wi-Fi 6 and 5G for the Internet of Things (IoT).

QCS8250 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Connected Cameras
- Retail Self Checkout
- Video Collaboration
- Digital Signage
- Fleet Management
- Healthcare

Features

- Adreno 650 GPU with improved[1] GPU performance and power efficiency
- Native 8-bit integer support for efficient GPU DNN
- Hexagon DSP with Quad Hexagon Vector eXtensions (HVX) V66Q, 1.5 GHz, for machine learning, integrated DNN for advanced VA and Qualcomm® Neural Processing SDK framework
- Kryo 585 CPU with 4x Kryo Gold (2.85 GHz) + 4x Kryo Silver (1.8 GHz) w/ 4MB L3 cache
- Camera: Dual 14-bit Spectra 480 ISP supports 64 MP single camera capture
- Support for up to 24 cameras or seven concurrent cameras
- Superior image quality in zzHDR, video denoising, mid/low frequency denoising, lens shading correction, video super resolution
- Supports triple 4K display
- Video/display: Concurrent UHD encode/decode, 3x DisplayPort, MIPI-DSI
- Long-term support expected through February 2036 with the Product Longevity Program

[1] All comparisons to previous generations

Ordering Information

Product	Part Number*
QCS8250 (LPDDR5 PoP)	QCS-8250-0-MPSP1099
QCS8250 (LPDDR4 PoP)	QCS-8250-1-MPSP1017

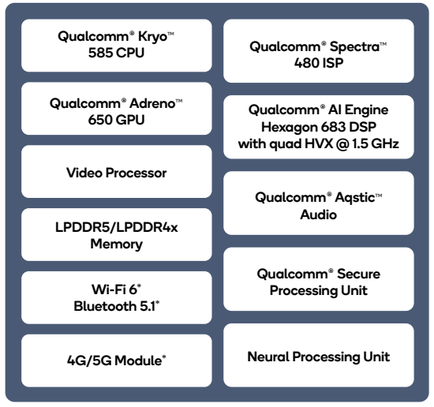
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS8250
Technology/Package	7 nm FFP, 12.4 x 12.7 mm LP4, 12.4 x 14 mm LP5 MEP
CPU	Kryo 585, Octa-core 64-bit Arm® v8-M processor
Memory	Quad-channel PoP high-speed LPDDR5/LPDDR4x SDRAM up to 2750 MHz (LPDDR5)
Connectivity	WLAN 2 x 2 802.11ax with DBS, Bluetooth® 5.1
Modem	5G modem attachment with support for sub-6 GHz and mmWave
GPU	Adreno 650 GPU
Compute DSP	Hexagon DSP with Quad HVX V66Q, 1.5 GHz
Display	Adreno 995 DPU, supports up to three 4K display, 2x 4-Lane DSI, DisplayPort and Miracast support
Camera	Dual ISP: 64 MP @ 30 fps ZSL
Video	Decode: 8K60/4K240; Encode: 8K30/4K120
Machine Learning	Dedicated NPU 230
I/O Storage	UFS 3.0 gear 4 (2 lane) + UFS 2.1, SD 3.0, Two USB 3.1 ports, support Type-C with DisplayPort v1.4 in one port
Security Features	Dedicated SPU with Improved Crypto
Operating System	Android 10

Block Diagram



* Supported with a companion module

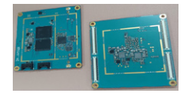
More Info:

SoMs, SiPs, and Smart Modules

Aikri QCS8250: Aikri-82X-50S
by eInfochips

ISQ 8250 SoM
by Innominds Software

SoM 8250
by Insignal



Open-Q™ 8250CS SoM
by Lantronix

SNM950 SoM
by MeiG Smart Technology Co.

SNM951 SoM
by MeiG Smart Technology Co.

SG865W-WF Smart EVB
by Quectel

TurboX™ C865 SoM
by Thundercomm Technology

TurboX™ C865C SoM
by Thundercomm Technology

Development Kits

Aikri QCS8250: Aikri-82X-50D
by eInfochips

Multimedia Industrial Board
by FAIOT Co.,LTD

DVK 8250
by Insignal

Open-Q™ 865 Dev Kit
by Lantronix

TurboX™ C865 Dev Kit
by Thundercomm Technology

TurboX™ C865C Dev Kit
by Thundercomm Technology

VVDN-QCS8250 Dev Kit
by VVDN Technologies

Reference Designs

QCS8250 Video Collaboration Ref Design
by AmTRAN

5G Edge Computing Device Solution
by FAIOT Co.,LTD

iDhi 8250
by Innominds Software

TurboX™ EB5 Edge AI Station
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS6490 Application Processor

The high-tier QCS6490 processor is designed for Enterprise and IoT applications including support for 5G and Wi-Fi 6E for ubiquitous coverage, powerful AI, and expanded interfaces for industrial use cases.

QCS6490 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Transportation & Logistics
- Smart Warehousing
- Retail
- Manufacturing
- Healthcare
- E-Commerce

Features

- Qualcomm® AI Engine features a fused AI-accelerator architecture and brings the total performance up to 12 TOPS
- Adreno 633 VPU for high-quality, ultra HD video encode and decode
- Qualcomm® Universal Bandwidth Compression with camera, display, GPU, video, and compute DSP
- Display support: FHD+, 10-bit DisplayPort, eight hardware layers, improved HDR10+, and wide color Gamut, Qualcomm® Low-Power Picture Enhancement display feature, and Qualcomm® True Palette Display feature
- One 4-lane DSI DSC 1.2, D-PHY 1.2, or C-PHY 1.0; VESA DSC 1.2
- Triple 14-bit image signal processing (ISP) + two lite ISP 22 + 22 + 22 MP, 64 MP/30 fps
- Five 4-lane CSIs (4/4/4/4/4) D-PHY 1.2 or C-PHY 1.2
- Support for USB 3.1 Type-C with DisplayPort and USB 2.0
- Long-term support for Android OS upgrades, Linux, Ubuntu, Windows 11 IoT Enterprise, security updates, and enterprise-grade hardware
- Long-term support expected through July 2036 with the Product Longevity Program

Ordering Information

Product	Part Number*
QCS6490	QCS6490-1-AA
QCM6490	QCM6490-1-AA

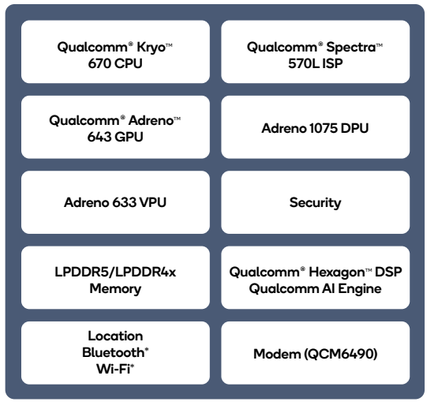
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS6490
Technology/Package	6 nm, 12 x 14 mm
CPU	8x Kryo 670 CPU from 1.9 up to 2.7 GHz
Memory/Storage	Dual-channel, non-PoP LPDDR5/LPDDR4X SDRAM, UFS 2.x/3.1, two-lane HS gear 4, SD v3.0, eMMC 5.1, PCIe two-lane NVMe
Location	GPS, GLONASS, NavIC, BeiDou, Galileo, QZSS, and SBAS
Connectivity	WLAN: Wi-Fi 6 (802.11ax) and Wi-Fi 6E (6 GHz), Bluetooth® 5.2 and FM supported. Uplink/Downlink MU-MIMO, 4K QAM, 160 MHz channels (5 & 6 GHz)
Modem	2G/3G/4G/5G – mmWave and sub-6 GHz bands (Rel. 15) 3.7 Gbps DL, 2.5 Gbps UL, 400 MHz mmW, 100 MHz sub-6 (QCM6490 only)
GPU	Adreno GPU 643 @ 812 MHz with support for Open GL ES 3.2, Open CL 2.0, Vulkan 1.x, DX FL 12
DSP	Compute Hexagon DSP with dual HVX and 4K HMX
Display Support	Adreno 1075 DPU
Camera Support	Spectra ISP 570L 64 MP / 36 + 22 MP / 3 x 22 MP @ 30 fps ZSL 192 MP non-ZSL
Video	Up to 4K60 decode for H.264/H.265/VP9, Up to 4K30 encode for H.264/H.265; Support for HDR10 and HDR10+ playback
AI	6th Gen Qualcomm AI Engine
Operating System	Android, Linux, Ubuntu, Windows 11 IoT Enterprise

Block Diagram



* Supported with a companion module

More Info:

SoMs, SiPs, and Smart Modules

ISQ 6490 SoM
by Innominds Software

5G Smart Module SRM955
by MeiG Smart Technology Co.

AI Computing Module SNM930
by MeiG Smart Technology Co.

5G Smart Module SRM930
by MeiG Smart Technology Co.

5G SG560D Smart Module
by Quectel

TurboX™ C6490 SoM
by Thundercomm Technology

TurboX™ C6490P SoM
by Thundercomm Technology

VVDN-QCS6490 SoM
by VVDN Technologies

Development Kits

AI Computing Solution
by FAIOT Co.,LTD

TurboX™ C6490 Dev Kit
by Thundercomm Technology

TurboX™ C6490P Dev Kit
by Thundercomm Technology

Reference Designs

Industry Handheld Terminal
by FAIOT Co.,LTD

QCM6490 Reference Design
by Sigma Group

TurboX™ EB3Gen2 Edge AI Station
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS610 Application Processor

The QCS610 processor is purpose-built to deliver high-performing, power-efficient edge computing for next-gen smart cameras and smart enterprise, home, and automotive IoT applications.

QCS610 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Industrial IoT
- Smart AI Home Security
- Home IP Cameras
- Enterprise Security Cameras
- Dash Cams and Body Cams
- Smart Display, Videoconferencing

Features

- **Dual 14-bit Spectra 250L ISP capable of supporting up to dual sensors. 24 MP @ 30 fps with dual ISPs; each ISP capable of 16 MP**
- **Fabricated using the advanced 11 nm FinFET process for exceptional thermal and power efficiency**
- **Adreno 612 GPU with 64-bit addressing @ up to 845 MHz with latest API support**
- **Hexagon DSP with dual HVX, 1.1 GHz for running DNN models and advanced Qualcomm Neural Processing SDK support**
- **Eight Kryo 460 CPU cores optimized for power and DMIPS**
- **Qualcomm AI Engine designed to support on-device machine learning**
- **Low-power sensor core helps support always-on use cases at reduced power levels**
- **Long-term support expected through June 2030 with the Product Longevity Program**

Ordering Information

Product	Part Number*
QCS610	QCS-610-0-PSP806-MT-01-0-AC
PMIC	PM6150, PM6150L
Connectivity	WCN-3980

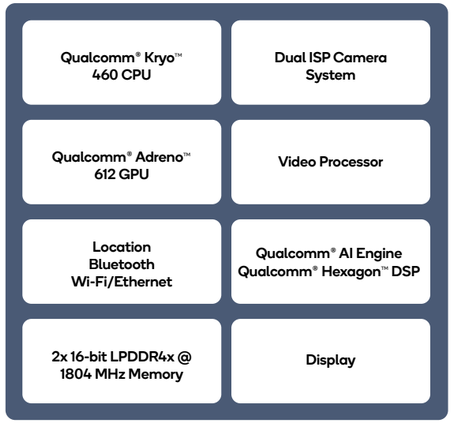
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

		QCS610
Technology/Package		11 nm, 12 x 11.1 mm non-PoP
CPU		Kryo 460: 64-bit Octa-cores, 2x Gold (2.2 GHz) + 6x Silver (1.8 GHz)
Memory		2 x 16-bit LPDDR4x @ 1804 MHz
Location		GPS/GLONASS, BeiDou, Galileo
Connectivity		Ethernet RGMII, Integrated 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, FM
GPU		Adreno 612 GPU @ up to 845 MHz
Compute DSP		Hexagon DSP with dual HVX, 1.1 GHz
Sensor DSP		Hexagon DSP-based
PMIC		Qualcomm® PM6150 + Qualcomm® PM6150L
Display	**Resolution**	2520 x 1080 @ 60 fps + 1920 x 1200 @ 60 fps (external)
	Interface	1x4 lane DSI D-PHY 1.2 support + DP over USB-C (external)
Camera	**Performance**	24 MP (2x ISP/16 + 16 MP), 4K30 IQ improvement: MCTF, TNR, sHDR, EIS, Dewarp, Zoom
	Interface	CSI 4+4+4 lane (or 4+4+2+1), D-PHY 1.2, C-PHY 1.0
Video	**Decode**	4K30 8-bit: HEVC/VP9
	Encode	4K30 8-bit: HEVC
Audio	**Analog**	Integrated Qualcomm® WCD9370 / Qualcomm® WCD9341 codec + Qualcomm® WSA8810 / Qualcomm® WSA8815 speaker amplifier
	Playback	Hi-Res/192 kHz, Native 44.1 kHz, audio on dedicated DSP
Storage		eMMC 5.1, UFS 2.1 Gear 3 1-lane, SD 3.0
Peripherals		1x USB 3.1 Type-C with DisplayPort and USB 2.0

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

Aikri QCS610: Aikri-X10-6S-4
by eInfochips

SoM 610
by Insignal

Open-Q™ 610 µSOM
by Lantronix

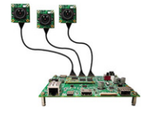
TurboX™ 610/410 SoM
by Thundercomm Technology

VVDN-QCS610 SoM
by VVDN Technologies

Development Kits

IPC610 Open Dev Kit
by Altek Corp.

qSmartAI80_CUQ610 AI Vision Kit
by e-con Systems



Aikri QCS610: Aikri-X10-6D-4
by eInfochips

DVK 610
by Insignal

ROS 610 Dev Kit
by Insignal

Open-Q™ 610 µSOM Dev Kit
by Lantronix

TurboX™ C610/C410 Open Kit
by Thundercomm Technology

VVDN-QCS610/QCS410 Dev Kit
by VVDN Technologies

Reference Designs

QCS610 Camera Reference Design
by eInfochips

TurboX™ EB2 Edge AI Station
by Thundercomm Technology

Blink T300 Video Conferencing Reference Design
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS6125 Application Processor

The Qualcomm® QCS6125 processor is optimized for retail IoT solutions to support payment applications ranging from secure-rich POS devices to touchless and biometric payment platforms.

QCS6125 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Electronic Cash Registers
- Video Conferencing
- Dash Cams
- Robotics
- Handheld Devices

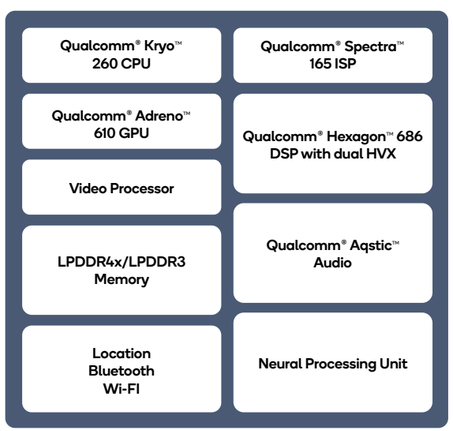
Features

- Qualcomm® Hexagon™ 686 DSP and Hexagon Vector eXtensions (HVX) for advanced imaging and computing
- Qualcomm® Adreno™ 610 GPU enables gameplay in optimal game-world conditions with ultra-fast frame rates, super smooth interactions, surround-sound audio, and extremely realistic graphics
- Support for state-of-the-art Vulkan® 1.1 graphics library that uses 20% less power than Open GL ES and integrates enhanced developer tools to improve gaming graphics and battery life
- aptX Audio and Qualcomm Aqstic™ Technology deliver a smooth, crystal-clear audio experience
- Advanced features including Hybrid Autofocus, Optical Zoom, Zero Shutter Lag, and Multi-Frame Noise Reduction, for almost endless still and video capture possibilities
- With the 48 MP Snapshot feature, capture every detail and even a hi-res photo that could be blown up to the size of a billboard
- Triple Camera with support for Telephoto, Wide and Ultra-Wide images
- Snapdragon® X12 LTE modem designed to support superior connectivity with LTE download speeds up to 600 Mbps
- Integrated 1x1 802.11ac Wi-Fi with MU-MIMO
- Octa-core Kryo 260 CPU, built in 11 nm, balances between 4 performance and 4 efficiency cores
- Qualcomm® Quick Charge™ 3.0 technology

Specifications

	QCS6125
Technology/Package	14 nm, 11 nm
CPU	Kryo 260 CPU: 64-bit Octa-cores, 2 GHz
Memory/Storage	Dual-channel non-PoP high-speed memory, LPDDR4X SDRAM designed for 1804 MHz clock (2 x 16-bit), LPDDR3 SDRAM designed for 933 MHz clock (1 x 32-bit), UFS 2.1 gear 3 (one-lane), eMMC 5.1, and SD 3.0
Location	GLONASS, Beidou, SBAS, GPS, QZSS, Galileo
Connectivity	Integrated 1x1 802.11ac, Bluetooth 5.0
GPU	Adreno 610 GPU @ 950 MHz
Compute DSP	Hexagon DSP with dual HVX
Display	FHD+ (2520 x 1080) @ 60 Hz
Camera Support	Qualcomm Spectra™ 165 Dual Camera (ZSL, 30 fps): Up to 25 MP Single Camera (MFNR, ZSL, 30 fps): Up to 25 MP Single Camera: Up to 48 MP
Video	Video decode: 4K30 Video encode: 4K30
Audio	Qualcomm Aqstic™ audio technology, Qualcomm® aptX™ HD, Qualcomm® aptX™ Audio
Interfaces	SD 3.0, USB 3.1 Type-C with DisplayPort 1.4
Security Features	Qualcomm® Mobile Security, Qualcomm® Processor Security, Qualcomm® Content Protection

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

5G SLM925 SoM
by MeiG Smart Technology Co.

5G SLM920 SoM
by MeiG Smart Technology Co.

5G SC668S Smart Module
by Quectel

5G SC696S Smart Module
by Quectel

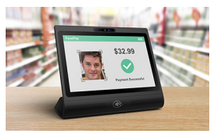
TurboX™ CM6125/C6125 SoM
by Thundercomm Technology

Development Kits

TurboX™ CM6125/C6125 Dev Kit
by Thundercomm Technology

Reference Designs

6125 10" Enterprise Display Platform
by Arima Communications



QCS5430 Application Processor

The Qualcomm QCS5430 processor is a high-tier IoT solution that combines premium connectivity, high-level performance, and edge AI-powered camera capabilities with the option to upgrade features over the air via software now or later according to your product needs.

QCS5430 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Robotics
- Industrial Handhelds
- Retail
- Cameras
- Drones and Controllers
- Edge AI Box
- Autonomous Mobile Robots

Features

- Kryo 670 CPU built on Arm v8-M architecture
- All feature packs include premium connectivity and enterprise-grade security features with upgradeable options for:
  - Increased CPU, GPU, and AI performance
  - Expanded peripherals support
- Significant reductions in latency, smooth handoffs and increased responsiveness for latency-sensitive applications
- Superior location accuracy
- Qualcomm® AI Engine includes a hardware and software AI solution with on-device machine learning to enable edge computing
- Qualcomm® Edge AI Box Solutions intelligently chooses between device edge or cloud processing of multiple camera connections, optimizing processing time and power efficiency
- Support for up to five concurrent vision sensor inputs
- 6th Gen Qualcomm AI Engine: A fused AI accelerator packing Hexagon Tensor Accelerator (HTA), Large shared AI memory, Hexagon Scalar Accelerator, Hexagon Vector eXtensions (HVX)
- Long-term OS support for Android, Ubuntu, Windows 11 Enterprise IoT, and Yocto Embedded Linux.
- Long-term support expected through July 2032 with the Product Longevity Program

Ordering Information

Product	Part Number*
QCS5430	QCS-5430-1-PSP1287-TR-00-0-AA

* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

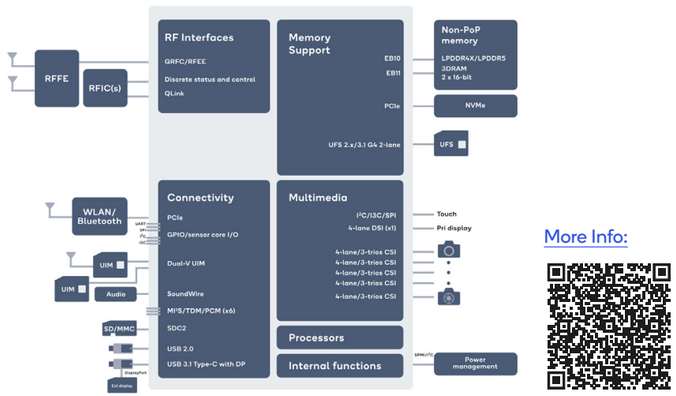
Materials are subject to change without notice.

Specifications

QCS5430 is available via two pre-defined feature packs, or through custom build. The scalable specs are CPU, GPU, DSP, Display, Camera, and USB. Please see Feature Pack 1 and Feature Pack 2 below, as well as the customizable range available through a custom feature pack.

	Feature Pack 1	Feature Pack 2	Custom Feature Pack
Technology/Package	6 nm, 12 x 14 mm; non-PoP		
CPU	Hex-core Kryo 670 CPU from 1.8 GHz to 2.1 GHz	Octa-core Kryo 670 CPU from 1.8 GHz to 2.1 GHz	Octa-core Kryo 670 CPU Scalable via licensing from 1.9 GHz to 2.7 GHz
Memory/Storage	Dual-channel, non-PoP LPDDR5/LPDDR4X SDRAM, UFS 2.x/3.1, two-lane HS gear 4, SD v3.0, eMMC 5.1		
Connectivity	WLAN: Wi-Fi 6 (802.11ax) & Wi-Fi 6E (6 GHz), Bluetooth® 5.2 & FM supported Uplink/Downlink MU-MIMO, 4K QAM, 160 MHz channels (5 & 6 GHz)		
GPU	Qualcomm® Adreno™ 642L GPU @ 315 MHz		Scalable via licensing Adreno 642L GPU @ 812 MHz
	Support for Open GL ES 3.2, Open CL 2.0, Vulkan 1.x, DX FL 12		
Compute DSP	Hexagon DSP with dual HVX and 2K HMX (~3.5 INT8 TOPS) Clock Speed 1.4 GHz		Scalable via licensing (12.15 INT8 TOPS)
Display Technology	Adreno 1075 DPU, On-device display resolution: FHD+ (1080 x 2520 pixels) 8L @ 120 fps, 1x DSI D-PHY (4-lane), DP 1.4 SST		On-device display resolution scalable via licensing to FHD+ @ 144 Hz, FHD+ @ 120 fps
Camera ISP	Qualcomm Spectra™ 570L ISP, Dual Camera: 2 x 22 MP		Scalable via licensing to 3 x 22 MP
Video	Up to 4K60 decode for H.264/H.265/VP; up to 4K30 encode for H.264/H.265; Support for HDR10 and HDR10+ playback		
Audio	Qualcomm® Noise and Echo Cancellation V10, Integrated low power VA (more keywords, Command First), Audio ML DSP: LPI, Shared 2 MB, 1.4 GHz		
Interfaces	USB Type-C 3.1, USB 2.0, UFS 2.x/3.1, eMMC 5.1, SD 3.0, 1x PCIe	with 2x PCIe	Scalable via licensing with 2x PCIe
Security Features	Hardware Key Manager & ECC, Secure Boot, Crypto Engine, Key Provisioning Security, Qualcomm TEE, Qualcomm® Content Protection (Widevine, Camera Security Framework, Secure User Interface)		

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

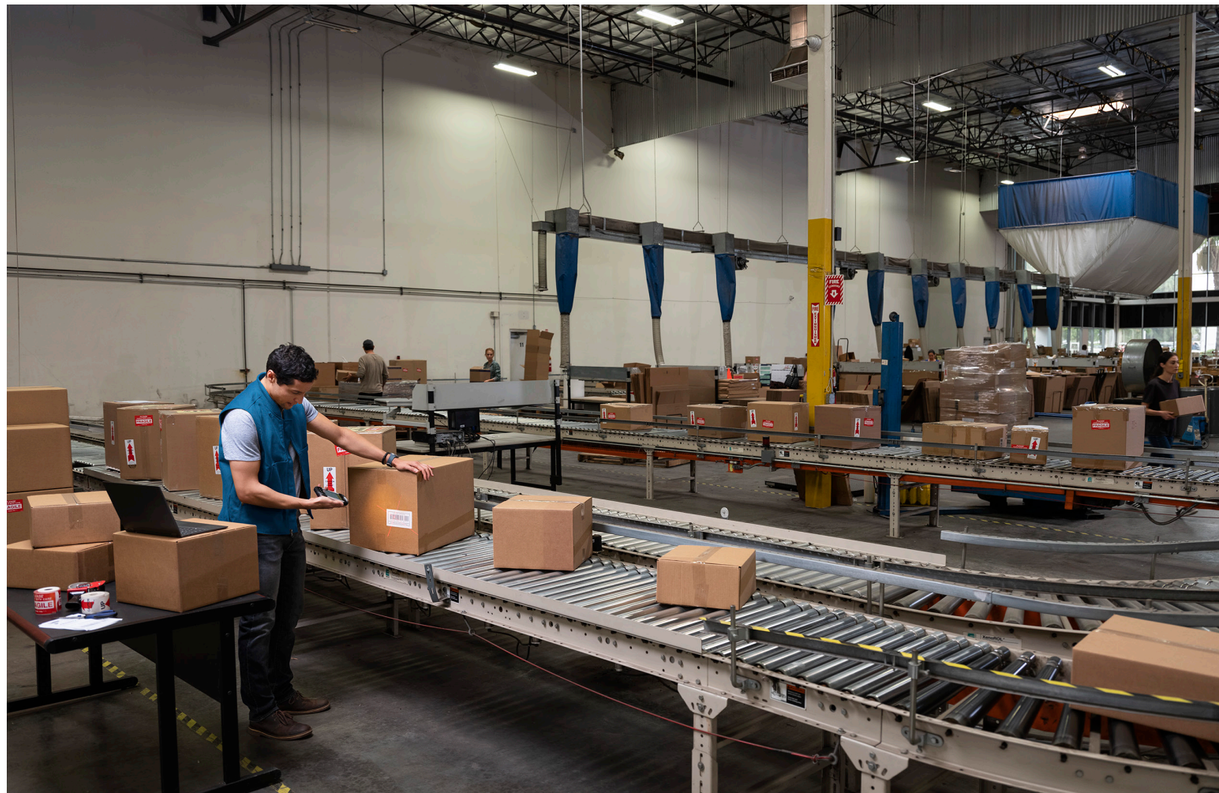
5G Smart Module SRM930L
MeiG Smart Technology Co.

TurboX™ C5430 SoM
by Thundercomm Technology

Development Kits

TurboX™ C5430 Dev Kit
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.



QCS4490 Application Processor

Premium connectivity meets next-gen processing with the QCS4490 processor. The QCS4490 delivers key, advanced features now required by industrial handheld, industrial computing, and other IoT devices.

QCS4490 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Industrial Handheld
- Retail POS Devices
- Control & Automation
- Industrial Computing Devices
- Industrial & Personal Security Panels

Features

- Wi-Fi 6E that uses the 6 GHz spectrum to extend advanced Wi-Fi 6 MU-MIMO and OFDMA into the new band and deliver superior performance, even in congested areas
- Delivers speeds of up to 3.6 Gbps, supported by Qualcomm® 4K Quadrature Amplitude Modulation (QAM), 160 MHz channel support and unique 4-stream (2x2 + 2x2) Dual Band Simultaneous (DBS)
- 4th generation 5G NR Sub-6 modem with 3GPP Rel. 16 capable and true global carrier support
- Voice-over-NR (VoNR), 5G location (E-CID)
- Multi-gen leap to Kryo Octa-core CPU (up to 2x over previous generation in performance benchmarks)
- On-device processing allows for efficient data analysis between device and cloud (intelligent edge computing)
- Planned software support for Android releases 13 through 18 allows you to design products up to 2030*
- Save costs by investing in just one IoT chipset for multi-year industrial design, development, and maintenance support from Qualcomm Technologies and ODMs
- Significant reductions in latency and increased responsiveness for latency-sensitive applications (voice, video)
- Smooth handoffs and superior connectivity, even in large, complex environments with multiple high-demand devices such as hospitals and warehouses
- Audio AI accelerator enhances voice quality and voice UI accuracy
- Enhanced camera ISP hardware to support superior image quality
- Long-term support expected through April 2030 with the Product Longevity Program

* Subject to change without notice

Ordering Information

Product	Part Number*
QCS4490	QCS-4490-0-AB

* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS4490
Technology/Package	4 nm, 12 x 11 mm
CPU	Kryo Octa-core CPU: 2x Gold A78 @ 2.4 GHz + 6x Silver A55 @ 2.0 GHz, 1 MB L3 cache
Memory/Storage	LPDDR4X/LPDDR5 SDRAM (2 x 16-bit) @ up to 3.2 GHz
Location	Gen 9 VT v5, GPS, BeiDou, GLONASS, Galileo, dual-frequency L1/L5, Navic
Connectivity	WLAN: Wi-Fi 6E (802.11b/g/n/ac/ax) 2x2 160 MHz, 4K QAM, 2x2 DBS (Qualcomm® WCN6856) Bluetooth® 5.2
Modem	5G R16 Sub-6 100 MHz (QCM4490 only)
GPU	Qualcomm® Adreno™ GPU 613
Display	FHD+ (1080 x 2520) @ 90/120 Hz
Camera Support	Qualcomm® Spectra™ ISP
Video	Video decode: Up to 1080p60D for H.264/H.265/VP9 Video encode: Up to 1080p60E for H.264/H.265
Audio	eNPU processor, Integrated SVA, 1 MB shared LPI with sensor
Interfaces	USB 3.1 type-C, eMMC v5.1, SD 3.0, UFS 3.1, PCIe
Security Features	Secure Boot, Secure Debug, HW encryption, Qualcomm TEE, pIMEM, TME1.0

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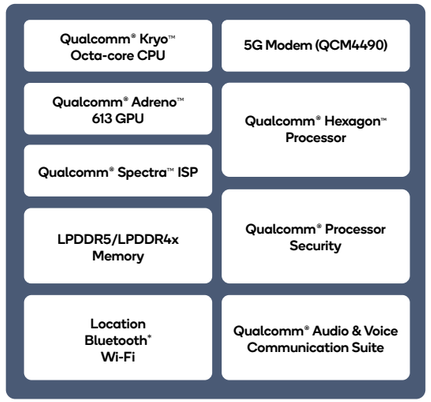


* Supported with a companion module

More Info:

SoMs, SiPs, and Smart Modules

TurboX™ CT4490 SoM
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS4290 Application Processor

The QCS4290 application processor delivers greater performance, a better AI Engine, and broader connectivity options compared to previous generations. It delivers powerful performance, dynamic camera capabilities, and Wi-Fi 6-ready connectivity, ideal for industrial and commercial IoT applications.

QCS4290 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Industrial Handheld
- Security Panels
- Cameras

Features

- Kryo 260 CPU, octa-core CPU architecture for increased[1] and sustained speeds
- 11 nm Process Technology for improved performance and lower[1] power consumption
- Dual Frequency GNSS (L1 and L5) and support for India's NavIC satellite system
- Qualcomm® FastConnect™ 6100 system provides the Wi-Fi 6-ready subsystem, integrated with Bluetooth 5.1 and FM
- Dedicated Hexagon 683 compute DSP with dual HVX @ 1.0 GHz
- Qualcomm® Universal Bandwidth Compression with display and GPU
- Display support: FHD+, four hardware layers, 10-bit end-to-end, and Qualcomm® True Palette Display feature
- One 4-lane DSI D-PHY 1.2 @ 1.5 Gbps per lane, split link supported
- 3x ISP (13 MP + 13 MP)/(25 MP + 5 MP) @ 30 fps
- Three 4-lane CSIs (4/4/4 or 4/4/2/1) D-PHY 1.2 @ 2.5 Gbps per lane or C-PHY 1.0 @ 10 Gbps (3.42 Gbps/trio)
- Support for USB 3.1 Type-C
- Long-term support expected through September 2027 with the Product Longevity Program

[1] All comparisons to previous generations

Ordering Information

Product	Part Number*
QCS4290	QCS-4290-0-NSP752

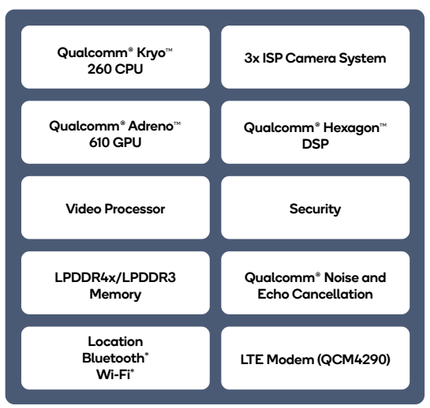
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS4290
Technology/Package	752 NSP, 12.0 x 12.4 x 0.91 mm; 0.4 mm pitch
CPU	8x Kryo 260 CPU from 1.8 up to 2.0 GHz
Memory/Storage	Dual-channel, non-PoP high-speed memory: LPDDR4x SDRAM @ 1866 MHz clock (2 x 16-bit), LPDDR3 SDRAM @ 933 MHz clock (1 x 32-bit), eMMC 5.1, SD 3.0
Location	GPS, GLONASS, NavIC, BeiDou, Galileo, QZSS, and SBAS
Connectivity	WLAN 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, and FM with Qualcomm® WCN3950 or Qualcomm® WCN3988 (1x1 ax-ready)
GPU	Adreno 610 GPU @ 950 MHz with support for Open GL ES 3.2, Open CL 2.0, Vulkan 1.1
DSP	Hexagon 683 compute DSP with dual HVX @ 1.0 GHz
Display Support	Adreno 921 DPU
Camera Support	13 MP + 13 MP/25 MP + 5 MP @ 30 fps or 16 MP + 16 MP @ 24 fps
Multimedia	1080p60 8-bit decode for H.264/H.265/VP9, 1080p60 8-bit encode for H.264/H.265
Audio	Integrated low power island (LPI) for voice UI, Qualcomm® Noise and Echo Cancellation, Qualcomm® Voice Suite
Security Features	Secure Boot, Secure Debug, Crypto Engines, Key Provisioning Security, Qualcomm TEE

Block Diagram

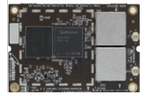


* Supported with a companion module

More Info:

SoMs, SiPs, and Smart Modules

Aikri QCS4290: Aikri-42X-90AS-4
by eInfochips



Open-Q™ 4200 Series SiP (Android)
by Lantronix

5G Smart Module SLM926
MeiG Smart Technology Co.

5G LTE SC680A Smart Module
by Quectel

5G LTE SC686A Smart Module
by Quectel

TurboX™ C4290/CM4290
by Thundercomm Technology

Development Kits

Aikri QCS4290: Aikri-42X-90AD-4
by eInfochips

Open-Q™ AL Dev Kit
by Lantronix

TurboX™ CM4290/C4290 Dev Kit
by Thundercomm Technology

Reference Designs

iDhi 4290
by Innominds Software

For additional information for a chosen product please check directly with the manufacturer.

QRB4210 Application Processor

The Qualcomm® Robotics RB2 platform (QRB4210) integrates high-level features, AI solutions, and powerful performance in a unified, cost-effective solution giving OEMs, ODMs, and developers flexibility to design and create a generation of high-performance everyday robotics and IoT products.

QRB4210 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Robot Vacuum Cleaners
- Home Service Robots
- Entry-Tier Commercial Service Robots
- E-Scooters
- Smart Cameras – Body, Dash, etc.
- Rugged Handhelds, Smart Panels

Features

- 11 nm process technology for improved performance and lower power consumption
- Designed with CPU architectures for increased speeds and sustained performance
- Kryo 260 CPU with quad high-performance cores @ 2.0 GHz and quad power-saving cores @ 1.8 GHz
- Adreno GPU 610 @ 950 MHz with 64-bit addressing
- Dual-channel non-PoP high-speed memory
- FastConnect 6100 Mobile Connectivity System provides the Wi-Fi 6-ready, integrated with Wi-Fi subsystem with Bluetooth 5, WPA3 Security, and digital FM. Bluetooth 5.1 provides improvement in power performance from previous generation
- Qualcomm Universal Bandwidth Compression with display and GPU
- Support FHD+ display, four hardware layers, 10-bit end-to-end, and Qualcomm True Palette Display feature
- 1080p60 video encode/decode
- Long-term support expected through May 2032 with the Product Longevity Program

Ordering Information

Product	Part Number*
QRB4210	QRB-4210-0-NSP752

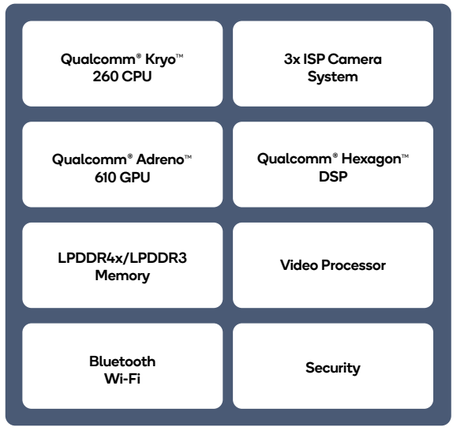
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QRB4210
Technology/Package	11 nm, 12 x 12.4 mm
CPU	Octo-core Kryo 260 CPU @ up to 2.0 GHz
Memory/Storage	Dual-channel non-PoP high-speed memory: LPDDR4X SDRAM designed for 1866 MHz clock (2 x 16-bit), LPDDR3 SDRAM designed for 933 MHz clock (1 x 32-bit), Support for USB 3.1 Type-C, UFS 2.1 gear 3 (one-lane), eMMC 5.1, and SD 3.0
Connectivity	1x1 Wi-Fi 802.11a/b/g/n/ac Bluetooth 5.0 specification
GPU	Adreno 610 GPU @ 950 MHz with 64-bit addressing
DSP	Dedicated compute DSP - Hexagon DSP with dual HVX @ 1.0 GHz
Camera/Video	3x ISP (13 MP + 13 MP)/(25 MP + 5 MP) @ 30 fps or (16 MP + 16 MP) @ 24 fps; 3x 4-lane CSIs (4/4/4 or 4/4/2/1), D-PHY 1.2 @ 2.5 Gbps per lane or C-PHY 1.0 @ 10 Gbps (3.42 Gbps/trio)
Video	1080p60 8-bit HEVC (H.265)/H.264 encode and decode Concurrency: 1080p30 decode + 1080p30 encode
Security Features	Hardware Key Manager, Key Provisioning Security, Qualcomm TEE, Trust Zone, Secure Boot, DSP Secure Domain, Secure Debug
Operation System	Linux, ROS 2

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

Aikri QRB4210: Aikri-42X-10LS-3
by eInfochips

Open-Q™ 4200 Series SiP (LE)
by Lantronix

TurboX™ C4210 SoM
by Thundercomm Technology

Development Kits

Aikri QRB4210: Aikri-42X-10LD-3
by eInfochips

Open-Q™ RB Dev Kit
by Lantronix

Qualcomm® Robotics RB2 Platform
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QCS410 Application Processor

The QCS410 processor is engineered to deliver powerful computing for on-device camera processing and machine learning, with exceptional power and thermal efficiency, across a wide range of IoT applications.

QCS410 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Industrial IoT
- Smart AI Home Security
- Home IP Cameras
- Enterprise Security Cameras
- Dash Cams and Body Cams
- Smart Display, Videoconferencing

Features

- Dual 14-bit Spectra 250L ISP capable of supporting up to dual sensors. 24 MP @ 30 fps with dual ISPs; each ISP capable of 16 MP
- Fabricated using the advanced 11 nm FinFET process for exceptional thermal and power efficiency
- Adreno 612 GPU with 64-bit addressing @ up to 845 MHz with latest API support
- Hexagon DSP with dual HVX, 1.1 GHz for running DNN models and advanced Qualcomm Neural Processing SDK support
- Four Kryo 460 CPU cores optimized for power and DMIPS
- Qualcomm AI Engine designed to support on-device machine learning
- Low-power sensor core helps support always-on use cases at reduced power levels
- HW-based security designed with features such as secure boot from hardware root of trust, TEE, hardware crypto engines, storage security, secure debug, and key provisioning
- Long-term support expected through June 2030 with the Product Longevity Program

Ordering Information

Product	Part Number*
QCS 410	QCS-410-0-PSP806-MT-01-0-AC
PMIC	PM6150, PM6150L
Connectivity	WCN-3980

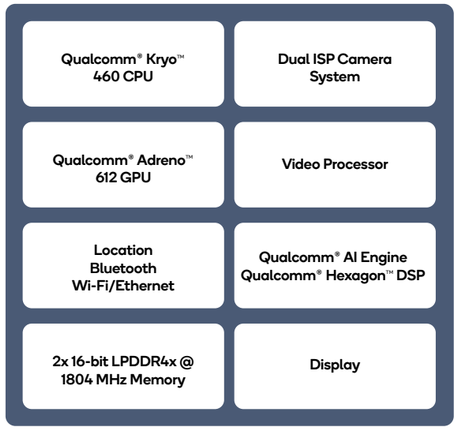
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

		QCS410
Technology/Package		11 nm, 12 x 11.1 x 0.92 mm non-PoP
CPU		Quad-core Kryo 460
Memory		2 x 16-bit LPDDR4x @ 1804 MHz
Location		GPS/GLONASS, BeiDou, Galileo
Connectivity		Ethernet RGMII, Integrated 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, FM
PMIC		Qualcomm® PM6150 + Qualcomm® PM6150L
Sensor DSP		Hexagon DSP-based
Display	Resolution	2520 x 1080 @ 60 fps + 1920 x 1200 @ 60 fps (external)
	Interface	1x4 lane DSI D-PHY 1.2 support + DP over USB-C (external)
Camera	Performance	21 MP (2x ISP/16+16 MP), 1080p30 IQ improvement: MCTF, TNR, sHDR, EIS, Dewarp, Zoom
	Interface	CSI 4+4+4 lane (or 4+4+2+1), D-PHY 1.2, C-PHY 1.0
Video	Decode	1080p 8-bit: HEVC/VP9
	Encode	1080p 8-bit: HEVC
Audio	Analog	Integrated Qualcomm® WCD9370 / Qualcomm® WCD9341 codec + Qualcomm® WSA8810 / Qualcomm® WSA8815 speaker amplifier
	Playback	Hi-Res/192 kHz, Native 44.1 kHz, audio on dedicated DSP
Storage		eMMC 5.1, UFS 2.1 gear 3 1-lane, SD 3.0
Peripherals		1x USB 3.1 Type-C with DisplayPort and USB 2.0

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

Aikri QCS410: Aikri-X10-4S-4
by eInfochips

Open-Q™ 410 SoM
by Lantronix

TurboX™ 610/410 SoM
by Thundercomm Technology

VVDN-QCS410 SoM
by VVDN Technologies

Development Kits

IPC410 Open Dev Kit
by Altek Corp.

Aikri QCS410: Aikri-X10-4D
by eInfochips

Open-Q™ 410 Dev Kit
by Lantronix

TurboX™ C610/C410 Open Kit
by Thundercomm Technology

VVDN-QCS610/QCS410 Dev Kit
by VVDN Technologies

For additional information for a chosen product please check directly with the manufacturer.

QCS2290 Application Processor

The robust, entry-level QCS2290 processor delivers enhanced GPS and advanced camera features. It enables reliable performance and power-conservation with upgraded features and memory support for low power consumption.

QCS2290 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Retail POS
- Industrial Handheld
- Asset Tracking
- Camera

Features

- Customized 64-bit Cortex-A53 quad-core applications processor @ up to 2.0 GHz
- Dedicated DSP shared between sensor core and low-power audio subsystem
- Adreno 702 GPU @ 845 MHz, 3D graphics accelerator with 64-bit addressing
- Qualcomm Universal Bandwidth Compression with GPU
- Display support: HD+, 720 x 1680 @ 60 Hz,
- 10-bit end-to-end, and up to four hardware layer composition. Features Qualcomm® Low-Power Picture Enhancement and Qualcomm True Palette Display
- One 4-lane DSI D-PHY 1.2 @ 1.5 Gbps per lane, split link supported
- Two 4-lane CSIs (4/4 or 4/2/1) D-PHY 1.2 @ 2.5 Gbps per lane or C-PHY 1.0 @ 10 Gbps (3.42 Gbps/trio)
- Support for USB 3.1 Type-C/Micro USB
- Always-on subsystem with RPM for power management
- Long-term support expected through November 2030 with the Product Longevity Program

Ordering Information

Product	Part Number*
QCS2290	QCS-2290-0-NSP752

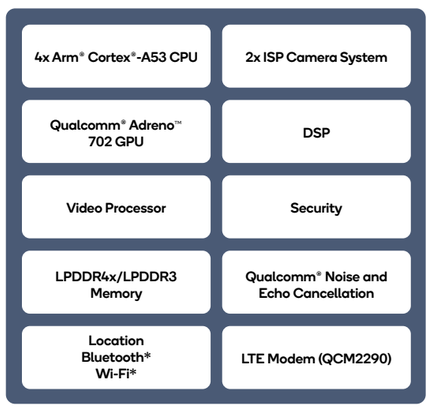
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QCS2290
Technology/Package	752 NSP, 12.0 x 12.4 x 0.91 mm; 0.4 mm pitch
CPU	Quad-core Cortex-A53 processor @ up to 2.0 GHz
Modem	6th generation LTE multimode modem 3GPP Rel. 10 with selected 3GPP Rel. 12 features. (QCM2290 only)
Memory/Storage	Dual-channel, non-PoP high-speed memory: LPDDR4x SDRAM @ 1804 MHz clock (2 x 16-bit), LPDDR3 SDRAM @ 933 MHz clock (1 x 32-bit)
Location	GPS, GLONASS, NavIC, BeiDou, Galileo, QZSS, and SBAS
Connectivity	WLAN 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, and FM with Qualcomm® WCN3950 or Qualcomm® WCN3910 (802.11b/g/n)
GPU	Adreno 702 GPU @ 845 MHz with support for Open GL ES 3.1, Open CL 2.0, Vulkan 1.1
Display Support	Adreno 920 DPU
Camera Support	12x ISP (13 MP + 13 MP or 25 MP) @ 30 fps ZSL
Multimedia	1080p30 8-bit decode for H.264/H.265/VP9, 1080p30 8-bit encode for H.264/H.265
Audio	Integrated Low Power Island (LPI) DSP for Voice UI, Qualcomm Noise and Echo Cancellation, Qualcomm Voice Suite
Security Features	Secure Boot, Secure Debug, Key Provisioning Security, TrustZone, Qualcomm TEE, hardware supported KeyStore

Block Diagram



* Supported with a companion module

More Info:

SoMs, SiPs, and Smart Modules

Aikri QCS2290: Aikri-22X-90AS-4
by eInfochips

ISQ 2290
by Innominds Software

Open-Q™ 2200 Series SiP (Android)
by Lantronix

5G Smart Module SLM550
by MeiG Smart Technology Co.

5G LTE SC200E Smart Module
by Quectel

5G LTE SC206E Smart Module
by Quectel

TurboX™ CM2290/C2290 SoM
by Thundercomm Technology

VVDN-QCM2290/QCS2290 SoM
by VVDN Technologies

Development Kits

Aikri QCS2290: Aikri-22X-90AD-4
by eInfochips

Open-Q™ AL Dev Kit
by Lantronix

TurboX™ CM2290/C2290 Dev Kit
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

QRB2210 Application Processor

The Qualcomm® Robotics RB1 Platform (QRB2210) integrates high-level features, AI solutions, and powerful performance in a unified, cost-effective solution giving OEMs, ODMs, and developers the flexibility to design and create a generation of high-performance everyday robotics and IoT products.

QRB2210 Application Processor

Get Started

Commercial Modules and Development Tools

Target Applications

- Social, Companion, & Educational Robots
- Dash Cams & Surveillance Cameras
- Smart Displays & Interactive Control Panels
- Home Assistants
- Smart Energy Gateways
- Industrial Handhelds

Features

- **Customized 64-bit Cortex-A53 quad-core applications processor @ up to 2.0 GHz**
- **Dedicated DSP shared between sensor core and low-power audio subsystem**
- **Adreno GPU 702 @ 845 MHz, 3D graphics accelerator with 64-bit addressing**
- **Dual-channel non-PoP high-speed memory**
- **Qualcomm Universal Bandwidth Compression (UBWC) with GPU**
- **Display support: HD+, 720 x 1680 @ 60 Hz, 10-bit end-to-end, and up to four hardware layer composition. Features Qualcomm Low-Power Picture Enhancement and Qualcomm True Palette Display**
- **Support for eMMC 5.1, SD 3.0, and USB 3.1 Type-C**
- **Always-on subsystem with RPM for power management**
- **Long-term support expected through May 2032 with the Product Longevity Program**

Ordering Information

Product	Part Number*
QRB2210	QRB-2210-0-NSP752

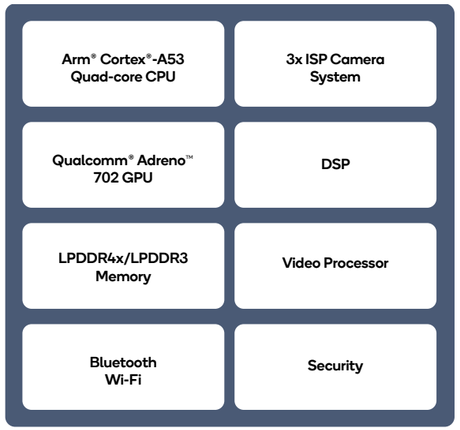
* Part numbers are subject to change. Please check with the distributor for most accurate ordering information.

Materials are subject to change without notice.

Specifications

	QRB2210
Technology/Package	11 nm LPP, NSP752, 12.0 x 12.4 x 0.91 mm, 0.4 mm pitch, non-PoP
CPU	Cortex-A53 processor @ up to 2.0 GHz
Memory/Storage	Dual-channel non-PoP high-speed memory: LPDDR4X SDRAM designed for 1804 MHz clock (2 x 16-bit), LPDDR3 SDRAM designed for 933 MHz clock (1 x 32-bit)
Connectivity	1x1 Wi-Fi 802.11a/b/g/n/ac Bluetooth 5.0 specification
GPU	Adreno 702 GPU @ 845 MHz 3D graphics accelerator with 64-bit addressing
Camera Support	2x ISP (13 MP + 13 MP or 25 MP) @ 30 fps ZSL; Two 4-lane CSIs (4/4 or 4/2/1) D-PHY 1.2 @ 2.5 Gbps per lane or C-PHY 1.0 @ 10 Gbps (3.42 Gbps/trio)
Video	1080p30 8-bit HEVC (H.265)/H.264 encode and decode; Concurrency: 1080p30 decode + 720p30 encode
Security Features	Secure Boot, Secure Debug, Key Provisioning Security, Qualcomm TEE, TrustZone, hardware supported KeyStore
Operation System	Linux, ROS 2

Block Diagram



More Info:

SoMs, SiPs, and Smart Modules

Aikri QRB2210: Aikri-22X-10LS-3
eInfochips

Open-Q™ 2200 Series SiP (LE)
by Lantronix

TurboX™ C2210 SoM
by Thundercomm Technology

Development Kits

Aikri QRB2210: Aikri-22X-10LD-3
eInfochips

Open-Q™ RB Dev Kit
by Lantronix

TurboX™ C2210 Dev Kit
by Thundercomm Technology

Qualcomm Robotics RB1 Platform
by Thundercomm Technology

For additional information for a chosen product please check directly with the manufacturer.

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Locate Module Vendors

Company	Website	Product Based on
Adlink Technology, Inc.	https://www.adlinktech.com/en/Computer_on_Modules	QRB5165
Altek	https://store.altek.com.tw/qualcomm/	QCS610, QCS410
AmTRAN	https://www.amtran.com.tw/categories/QCS8250/products/800517879	QCS8250
Arima Communications	http://www.arimacomm.com.tw/en/solutions-1.php?index_id=7	QCS6125
DFI	https://us.dfi.com/product/index/1611	QRB5165
e-con Systems	https://www.e-consystems.com/qualcomm-embedded-cameras/qcs610-ai-vision-kit-imx415.asp	QCS610
eInfochips / Edge Labs	https://eragon.einfochips.com/products.html	QRB5165, QCS8250, QCS610, QCS4290, QRB4210, QCS410, QCS2290
FAIOT Co.,LTD	https://www.faiot.com/?list_39/	QCS8250, QCS6490, QRB2210
Innominds Software	https://www.idhi.ai/kiteboard_soms_series/	QRB5165, QCS8250, QCS6490, QCS4290
Insignal	https://qcs.insignal.co.kr/	QRB5165, QCS8250, QCS610, QRB2210
Lantronix	https://www.lantronix.com/products-class/compute-som-dev-kits/	QRB5165, QCS8250, QCS610, QCS4290, QRB4210, QCS410, QCS2290
MeiG Smart Technology Company	https://en.meigsmart.com/product/nbiotmz53.html	QCS8550, QCS8250, QCS6125, QCS4290
ModalAI	https://www.modalai.com/pages/development-kits	QRB5165
Quectel	https://www.quectel.com/shop/	QCS8550, QCS8250, QCS6125, QCS4290
Sigma Group	https://www.sigmaconnectivity.com/qualcomm	QCS6490
Thundercomm	https://www.thundercomm.com/products/	QCS8550, QRB5165, QCS8250, QCS6490, QCS610, QCS6125, QCS5430, QCS4490, QCS4290, QRB4210, QCS410, QCS2290, QRB2210
VVDN	https://www.vvdntech.com/en-us/partners/qualcomm	QRB5165, QCS8250, QCS6490, QCS610, QCS410

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