

Qualcomm® IQ8 Series Platform

The Qualcomm IQ8 Series powers compute-heavy and AI-based devices, and is designed to operate in an expanded temperature range with available built-in safety features and rich peripheral support, delivering powerful and efficient workload processing in demanding industrial environments.

Enhanced by on-device AI, Qualcomm IQ8 Series delivers industrial-grade AI performance of up to 40 TOPS, an octa-core Qualcomm® Kryo™ Gen 6 CPU, a powerful Qualcomm® Adreno™ 623 GPU, support for up to 12 concurrent cameras, and 4K video encode and decode alongside multiple displays. It also features a dedicated safety island or real-time subsystem, as well as the capacity to run in far-ranging industrial environments from -40°C to +125°C, making it ideally suited for use across a wide range of intelligent, reliable, compute-heavy industrial applications.

Features

- A Qualcomm® Hexagon™ Tensor Processor integrated with a Hexagon DSP, a quad Hexagon Vector eXtensions (HVX) processor, and dual Hexagon Matrix eXtensions (HMX) coprocessors to deliver up to 40 TOPS to power high-performance, AI-centric, and generative AI industrial use cases
- Multi-OS support for Qualcomm® Linux® software stack and Ubuntu
- Features to help meet safety goals with support for error correction code (ECC) memory, and a dedicated safety island with real-time cores
- Designed for use in extremely harsh industrial environments with a wide junction temperature range of -40°C to +125°C
- Adreno Video Processing Unit (VPU) 623: Fifth-generation Ultra HD video processing unit for high-quality, 4K video encode (up to 4K85) and decode (up to 4K135). Includes native decode support for HEVC, H.265, H.264, AV1, and VP9, and native encode support for HEVC, H.265, and H.264
- Octa-core processor includes four high-performance CPU cores, four efficiency CPU cores, a GPU, and a Hexagon Tensor Processor with vector and matrix extensions for managing various concurrent compute and AI workloads simultaneously
- Rich in peripherals, including integrated Ethernet with TSN, PCIe, Wi-Fi, Bluetooth, and USB
- Built-in MCU subsystem that can replace external MCUs or enhance them for design flexibility and reduced BOM costs

Highlights

On-Device AI

Qualcomm IQ8 Series delivers AI performance of up to 40 dense TOPS, running Llama2 13-billion-parameter models, and generating 9 tokens per second, for industrial applications and power efficiency through on-device AI.



Safety and Reliability

The Qualcomm IQ8 Series offers available industrial-grade safety features as well as error correction code (ECC) memory that add reliability to devices operating in harsh industrial environments ranging from -40°C to +125°C.

A high-performance MCU-like subsystem, which contains a physically and electrically separated subsystem with a dedicated 4x high-performance, real-time core CPU, standard and high-speed IOs like Ethernet, and CAN-FD, helps address safety and real-time use cases with the ability to offload to an external MCU.

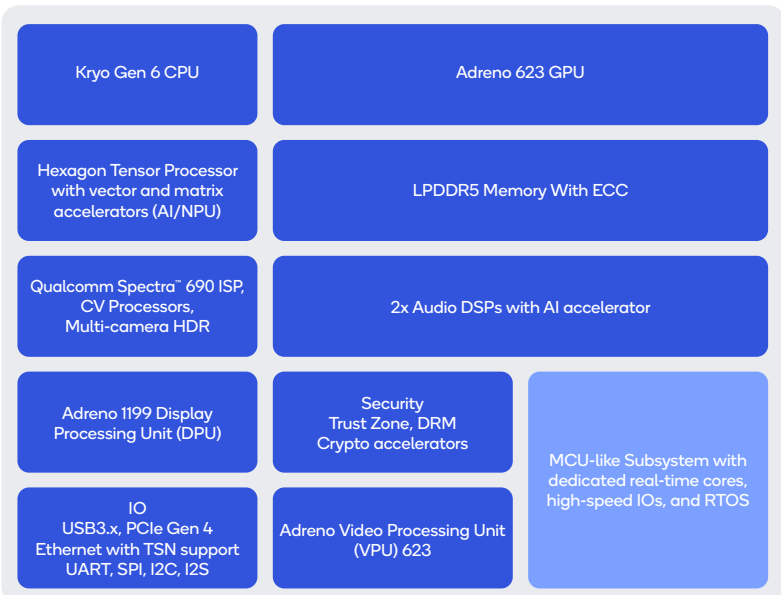


Developer-Friendly Design

The Qualcomm IQ8 Series is designed to be developer-friendly, with multi-OS support for Qualcomm Linux software stack and Ubuntu. Combined with product longevity support for 10+ years, developers can easily build, test, and deploy solutions based on this platform with confidence that their designs will be supported for years to come.



Block Diagram



Target Applications

- Factory Automation
- Industrial Robots
- Industrial Personal Computers
- Drones
- Edge AI Boxes
- Machine Vision
- Autonomous Mobile Robots (AMRs)
- Industrial Gateways



Specifications

Chipsets	IQ-8275	IQ-8300
CPU	2x Kryo Gold Prime @ 2.35 GHz + 2x Kryo Gold @ 2.1 GHz + 4x Kryo Silver @ 1.95 GHz	
GPU	Adreno 623 GPU	
Memory	4x16 LPDDR5/5x @ 3200 MHz	
Addressable Memory	Up to 32 GB with inline ECC	
Audio	DSP: V66 @ 1.3 GHz + 1x V73 @ 1.7 GHz Up to 8x I2C/PCM/TDM	
AI Performance	Scales 20–40 INT8 TOPS (Dense)	~40 INT8 TOPS (Dense)
Display Support	Up to 5 Typical 12 MP – 1x 4K + 2x 1920x1080	
Display Interfaces	Adreno DPU 1199 1x DSI (4-lane), 1x DP1.4 (MST4)	
Video Decode/Encode	4K @ 135 Decode / 4K @ 85 Encode	
Camera	24b HDR safe ISP with RGB-IR CFA Max 8 MP sensor resolution Up to 12 cameras over 3x 4-lane CSI2 2.4 Gpix/s throughput	
Peripherals	2x PCIe Ports – 1x 2-lane + 1x 4-lane (Gen 4) 1x 2.5 GbE with TSN (SGMII) 1x QSPI I2C/SPI/UART	
USB Support	1x USB 3.1 Gen 1, 1x USB 2.0	
Storage	1x UFS 3.1 Gen 4 2-lane, 1x 8-bit SDCC5, 1x eMMC 5.1	
MCU-Like Subsystem	4x real-time cores @ 1.85 GHz w/ 4x CAN FD + 1x 1 GbE (1x RGMII)	Up to SIL3-compliant, dedicated safety island with 4x real-time cores @ 1.85 GHz w/ 4x CAN FD + 1x 1 GbE (1x RGMII)
Operating System	Linux Yocto, Ubuntu	Linux
Temperature Range	-40°C to +125°C (Tj)	
Build Design	FCBGA1326+HS, 25.0 mm x 25.0 mm, 0.65 mm ball pitch	

Ordering Information

Product	Part Number
IQ-8275	QCS8275-0-AA
IQ-8300	QCS8300-0-AA



The Qualcomm IQ8 Series 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.

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



©2024 Qualcomm Technologies, Inc. and/or its affiliated companies. All Rights Reserved. Snapdragon and Qualcomm branded products are products of Qualcomm Technologies, Inc. and/or its subsidiaries. The registered trademark Linux® is used pursuant to a sublicense from the Linux Foundation, the exclusive licensee of Linus Torvalds, owner of the mark on a worldwide basis.