Qualcomm

Qualcomm® RB3 Gen 2 Development Kit

IoT development kit designed for high-performance compute, accessibility, and advanced features

The Qualcomm RB3 Gen 2 development kit gives developers a valuable combination of strong performance and advanced features, including powerful AI processing and computer vision, to easily create a broad range of IoT solutions across use cases such as Robotics, industrial, and automation.

Utilizing the Qualcomm® QCS6490, the Qualcomm RB3 Gen 2 development kits offer developers considerably increased performance compared to the previous generation, including increased AI processing, higher inferences per second, improved power efficiency, and the ability to run more networks simultaneously. On-device machine learning combined with edge computing allows for near real-time processing for massive amounts of data.

The platform includes a development kit and software. Developers can select the development kit version that best addresses their needs, and design IoT products that demand advanced performance. The platform includes SDKs that make it easy for developers to use and integrate applications and services. The hardware development kit is also compliant with the 96Boards open hardware specification to support a range of mezzanine-board expansions, beginning with the Vision Mezzanine.

The platform includes the Qualcomm® Spectra™ ISP 570L image processing engine for the ultimate photography and videography experience, and comes with a main camera and tracking camera on the Vision Kit. It can connect to and process the output of other cameras such as stereo, depth, and Time-of-Flight (ToF). The Qualcomm® Adreno™ 633 VPU provides high-quality, UltraHD video encode and decode, while the Adreno 1075 DPU enables on-device and external UltraHD display support.

Multi-gigabit Wi-Fi 6E achieves blazing-fast wireless connectivity and low latency. Our Wi-Fi 6E offerings utilize advanced features like Qualcomm® 4K Quadrature Amplitude Modulation (QAM) and support for high-speed 160MHz channels for multi-gigabit-per-second speeds with superb stability and consistent experiences.

With the Qualcomm® Kryo™ 670 CPU and a Qualcomm® Hexagon™ processor featuring a fused AI-accelerator architecture, this solution delivers powerful connections and computing performance, and is purpose-built for industrial and commercial IoT applications such as ruggedized handhelds and tablets, human-machine interface systems, point-of-sale systems, drones, kiosks, edge AI boxes, and connected cameras.

Development Kit Contents

Core Kit:

- Development board based on the Qualcomm QCS6490 processor
- 12V wall power supply
- USB Type-C cable
- Mini speakers
- Setup guide
- Pick tool for setting switches

Vision Kit only:

- Mounting bracket for CSI cameras
- High-resolution CSI camera
- Low-resolution CSI camera

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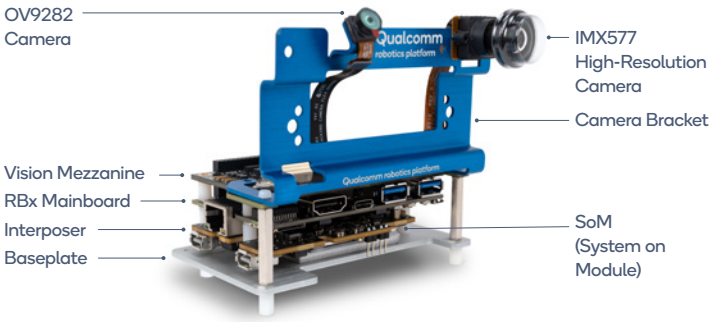


Vision Kit shown. Core Kit does not include Vision Mezzanine or camera accessories.

Related Products

This development kit is based on the QCS6490 processor, which helps enable powerful connections and reduced latency, along with dynamic triple ISPs and advanced edge AI and compute, delivering astonishing performance at lower power.

Materials are subject to change without notice.
87-74789-1 Rev. A

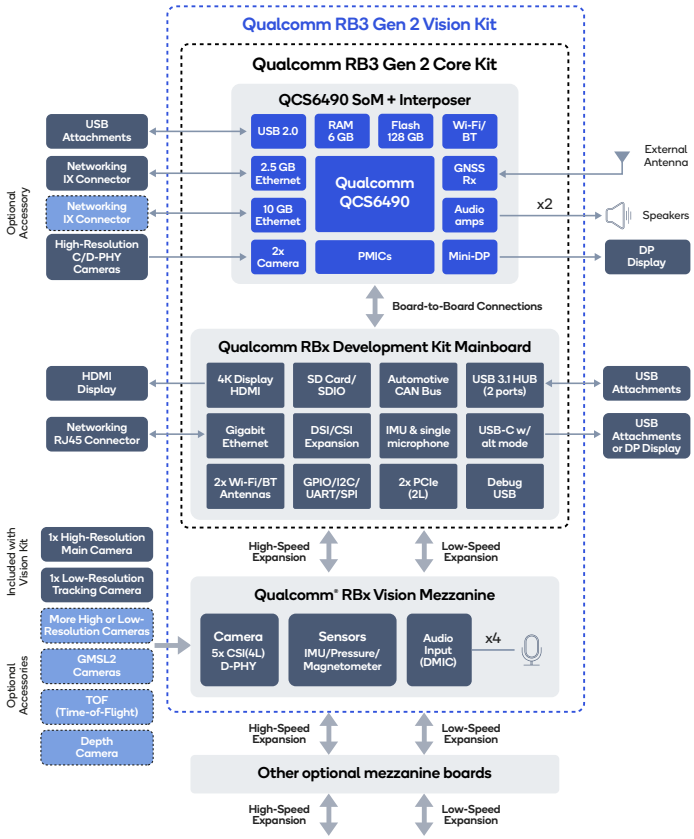
Target Applications

- Face Detection and Recognition
- Deep Learning
- Inventory Management
- Surveillance and Security
- Object Detection and Avoidance
- Path Planning and 3D Map Formation
- vSLAM (Visual Localization and Mapping)
- Driver Management Systems

Features

- Advanced ISPs for single or multiple concurrent camera experience with superior image and video capture
- AI-accelerated workplace security and visibility
- Blazing-fast wireless connectivity and low latency thanks to multi-gigabit Wi-Fi 6E: Up to 3.6 Gbps, 160MHz, 4K QAM, DBS with MU-MIMO and OFDMA, and WPA3-P & E
- Superior Bluetooth® 5.2 and LE audio with crystal-clear sound, low latency, and reliability with an extended range
- Low-speed expansion for GPIOs, I2C, SPI, UART, and/or audio
- High-speed expansion for PCIe, USB, MIPI CSI/DSI, and/or SDIO, designed for 96Boards mezzanines

Block Diagram



Software

- **Support for Linux, Android**
- **Qualcomm® Intelligent Multimedia Product SDK (for Linux)**
- **Qualcomm® Intelligent Robotics Product SDK**
- **Qualcomm® Neural Processing SDK**
- **Hexagon SDK**

Specifications

	Core Kit	Vision Kit
Chipset	QCS6490	
CPU	Octa-core CPU	
Memory (RAM)	uMCP package (6 GB LPDDR4x)	
Camera	2x C-PHY/D-PHY 30-pin expansion ports on interposer board	1x IMX577 D-PHY 12 MP, 1x OV9282 D-PHY 1 MP with bracket, plus additional D-PHY and GMSL-capable expansion ports
GPU	Adreno 643 GPU	
Video	Adreno 633 VPU: 4K60 fps decode / 4K30 fps encode	
Display	Up to two displays supported concurrently: Full-size HDMI connector, USB Type-C supporting DP alt mode, mini-DP connector, DSI expansion	
AI	12 TOPS	
WLAN/Bluetooth	802.11ax with DBS, Bluetooth 5.2, two onboard printed antennas, RF expansion connectors for optional external antennas	
Storage (onboard)	uMCP package (128 GB UFS Flash)	
Storage (external)	1x MicroSD Card Slot, PCIe expansion for NVMe	
PCIe	1x PCIe Gen 3 2-lane to expansion connector, optional 1x PCIe Gen 3 1-lane to expansion connector	
USB	1x USB 3.0 Type-C, 1x USB 2.0 w/OTG, 2x USB 3.0 Type-A, 1x USB 3.0 on high-speed expansion	
Audio	1x DMIC, 2x digital audio amplifiers, I2S/Soundwire/ DMIC expansion on low-speed connectors	4x DMIC, 2x digital audio amplifiers, I2S/Soundwire/DMIC expansion on low-speed connectors
Sensor	IMU onboard (ICM-42688), additional expansion	IMU (ICM-42688), Pressure sensor (ICP-10111), Mag sensor/compass (AK09915), additional expansion

To learn more visit: qualcomm.com

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