

Qualcomm

Qualcomm® QCS410/QCS610 SoCs for IoT

QCS410/QCS610 11nm SoCs are purpose-built to deliver high-performing, power-efficient edge computing for next-gen smart cameras and smart enterprise, home and automotive IoT applications.

The QCS410 and QCS610 IoT System-on-Chips (SoCs) combine key features for building advanced vision intelligence applications encompassing machine learning, edge computing, multimedia, sensor processing and voice control, all in a cost effective solution.

Qualcomm® Artificial Intelligence (AI) Engine, along with heterogeneous compute architecture, including up to octa-core Qualcomm® Kryo™ 460 CPU, Qualcomm® Adreno™ 612 GPU and Qualcomm® Hexagon™ DSP enables powerful compute capability engineered specifically for low power edge IoT applications. The QCS410 and QCS610 SoCs support advanced dual image signal processor (ISP), hardware-based security, video processing engine, audio codecs and GPS along with a wide variety of connectivity options including Wi-Fi, Bluetooth and Ethernet.

To further facilitate fast and cost-effective development, Qualcomm Technologies, Inc. has partnered with ODMs to provide full form factor reference devices, as well as ISVs to provide solutions that address various IoT market segments.

Highlights

4K Ultra HD video with enhanced image processing features

Premium 4K @30fps H.264/ H.265 video capture and playback with advanced noise reduction and low light performance and cutting-edge IQ.



Artificial Intelligence for differentiating user experiences

On-device machine learning through the Qualcomm AI Engine can support a plethora of AI networks and IOT use cases at low power consumption.



Highly integrated SoC designed to reduce BOM costs and time to commercialization

Highly Integrated PMIC, audio codecs, security and connectivity solutions along with a wide range of interfaces. Pin to pin compatibility between QCS610 and QCS410 supports maximum reuse and reduced commercialization time for multiple camera products on the same platform.



Multiple Connectivity Options

Integrated support for WI-FI 802.11ac, BT 5.0, Ethernet/ RGMII addressing a wide range of IOT camera applications.



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QCS410
QCS610

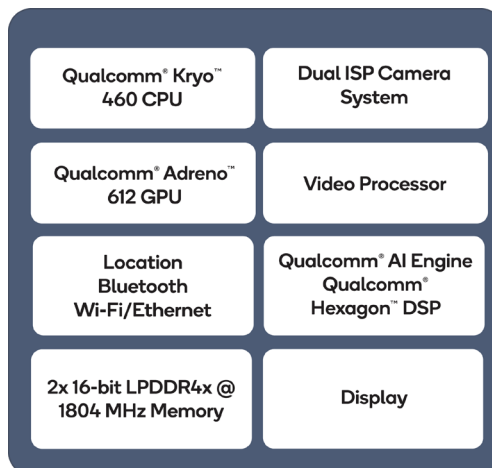
QCS410/QCS610 Target Applications

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

Features

- Dual 14-bit Qualcomm 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 11nm FinFET process for exceptional thermal and power efficiency
- Adreno 612 GPU with 64-bit addressing @ up to 845MHz with latest API support
- Hexagon DSP with dual Hexagon Vector eXtensions (HVX), 1.1Ghz for running DNN models and advanced Qualcomm® Neural Processing Engine SDK support
- Up to 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
- Supports Ethernet, 802.11a/b/g/n/ac Wi-Fi® and Bluetooth® 5
- HW based security designed with features such as secure boot from hardware root of trust, trusted execution environment, hardware crypto engines, storage security, secure debug and key provisioning
- Support for Microsoft Azure Machine Learning and Azure services
- Worldwide ecosystem of vendors, customers, developers and embedded device OEMs with experience in commercializing our solutions

QCS410/QCS610 Block Diagram



QCS410 and QCS610 Specifications

| | QCS410 | QCS610 |
|------------------------------------|--|--|
| Technology / Package | 11nm LPE, , 12x11.1 mm2 non-PoP | |
| CPU | Kryo 460: 64-bit quad-cores, 2x Gold (2.2GHz) + 2x Silver (1.8GHz) | Kryo 460: 64-bit Octa-cores, 2x Gold (2.2GHz) + 6x Silver (1.8GHz) |
| Memory | 2x 16-bit LPDDR4.x 1804MHz | |
| Location | GPS/GLONASS, BeiDou, Galileo | |
| Wired/Wireless Connectivity | Ethernet RGMII, Integrated 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, FM | |
| PMIC | Qualcomm® PM6150 + Qualcomm® PM6150L | |
| Display | Resolution | 2520x1080 60 fps + 1920x1200 60 fps (External) |
| | Interface | 1x4 lane DSI DPHY 1.2 support + DP over USB-C (external) |
| Camera | Performance | 21MP (2x ISP/16+16MP), 1080p30 IQ improvement: MCTF, TNR, sHDR, EIS, Dewarp, Zoom |
| | Interface | CSI 4+4+4 lane (or 4+4+2+1), DPHY1.2, CPHY 1.0 |
| Video | Decode | 1080p90 8-bit: HEVC/VP9 |
| | Encode | 4K30 8-bit: HEVC/VP9 |
| GPU | Adreno 612 @ up to 845MHz | |
| Audio | Analog | Integrated Qualcomm® WCD9370/ Qualcomm® WCD9341 codec + Qualcomm® WSA8810/ Qualcomm® WSA8815 speaker amplifier |
| | Playback | Hi-Res/192kHz, Native 44.1kHz, audio on dedicated DSP |
| Compute DSP | Hexagon DSP with dual Hexagon Vector eXtensions (HVX), 1.1Ghz | |
| Sensor DSP | Hexagon DSP based | |
| Storage | eMMC 5.1, UFS 2.1 Gear3 1-lane, SD 3.0 | |
| Peripherals | 1x USB3.1 Type-C with Display Port and USB 2.0 | |

Qualcomm Spectra, Qualcomm Neural Processing Engine, Qualcomm PM6150, Qualcomm PM6150L, Qualcomm WCD9370, Qualcomm WCD9341, Qualcomm WSA8810 and Qualcomm WSA8815 are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

| Product | Qualcomm Part Numbers |
|--------------|-----------------------------|
| QCS 610 SoC | QCS-610-0-PSP806-MT-01-0-AC |
| QCS 410 SoC | QCS-410-0-PSP806-MT-01-0-AC |
| PMIC | PM6150, PM6150L |
| Connectivity | WCN-3980 |

To learn more visit: qualcomm.com

