

Qualcomm

# Qualcomm® QCS410/610 SoCs for IoT

**QCS410/610 11nm SoCs are purpose-built to deliver high-performing, power-efficient edge computing for next-gen smart cameras and smart enterprise/home applications for the mid-tier segment.**

The QCS410/610 family of high performance IoT System-on-Chips (SoCs) incorporates key features for building advanced use cases encompassing machine learning, edge computing, sensor processing, voice UI enablement and integrated wireless connectivity cost effectively.

The QCS410 and QCS610 SoCs are 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. They integrate Qualcomm Technologies' most advanced image signal processor (ISP) to date and the Qualcomm® Artificial Intelligence (AI) Engine, along with a heterogeneous compute architecture including highly optimized custom CPU, GPU and DSP.

The QCS410/610 SoCs feature Qualcomm® Noise and Echo Cancellation, as well as advanced on-device audio analytics and processing features to support natural language processing, audio speech recognition.

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

### Better performance with low power consumption

Engineered specifically for camera applications that utilize intensive processing features, QCS410/610 chipsets are designed to use less power while performing better than if running on a more general-purpose chip.



### Highly Integrated SoC designed to reduce BOM costs and faster time to commercialization

Integrated PMIC, audio codecs and connectivity solutions can reduce the commercialization efforts while keeping BOM costs low.



### Artificial Intelligence for differentiating user experiences

On-device machine learning through the Qualcomm AI Engine can support AI use cases including face detection, face recognition, object tracking and people counting.



### Dual ISPs and up to 4K Ultra HD video with enhanced image processing features

Dual ISPs support staggered HDR, low light noise reduction, enhanced auto-focus performance and several hardware accelerated ISP features. Premium 4K @30fps HEVC video capture and playback support on QCS610.



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QCS410  
QCS610

## QCS410/610 Target Applications

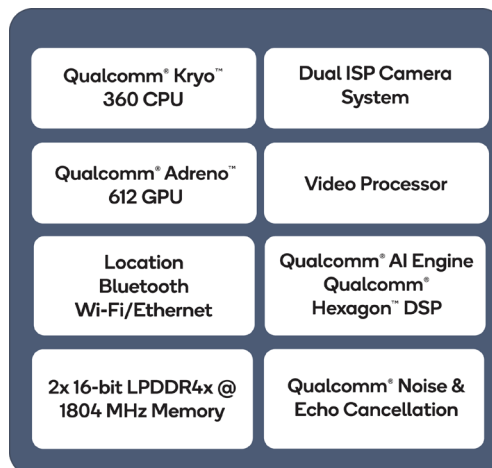
- Industrial IoT
- Smart AI Home Security
- Home IP Cameras
- Enterprise Security Cameras
- Dash Cam and Body Cam
- Smart Display, Videoconferencing

## Features

- Dual 14-bit Qualcomm Spectra™ 230 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
- Qualcomm® Adreno™ 612 GPU with 64-bit addressing @ up to 845MHz with latest API support
- Qualcomm® 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 Qualcomm® Kryo™ 360 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, debug security with lifecycle control, key provisioning and wireless protocol security
- 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

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

## QCS410/610 Block Diagram



## QCS410 and QCS610 Specifications

	QCS410	QCS610
<b>Technology / Package</b>	11nm LPE, , 12x11.1 mm2 non-PoP	
<b>CPU</b>	Kryo 360: 64-bit quad-cores, 2x Gold (2.2GHz) + 2x Silver (1.8GHz)	Kryo 360: 64-bit Octa-cores, 2x Gold (2.2GHz) + 6x Silver (1.8GHz)
<b>Memory</b>	2x 16-bit LPDDR4.x 1804MHz	
<b>Location</b>	GPS/GLONASS, BeiDou, Galileo	
<b>Wired/Wireless Connectivity</b>	Ethernet RGMII, Integrated 1x1 802.11a/b/g/n/ac, Bluetooth 5.0, FM	
<b>PMIC</b>	Qualcomm® PM6150 + Qualcomm® PM6150L	
<b>Display</b>	<b>Resolution</b>	2520x1080 60 fps + 1920x1200 60 fps (External)
	<b>Interface</b>	1x4 lane DSI DPHY 1.2 support + DP over USB-C (external)
<b>Camera</b>	<b>Performance</b>	21MP (2x ISP/16+16MP), 1080p30 IQ improvement: MCTF, TNR, sHDR, EIS, Dewarp, Zoom
	<b>Interface</b>	CSI 4+4+4 lane (or 4+4+2+1), DPHY1.2, CPHY 1.0
<b>Video</b>	<b>Decode</b>	1080p 8-bit: HEVC/VP9
	<b>Encode</b>	1080p 8-bit HEVC
<b>GPU</b>	Adreno 612 @ up to 845MHz	
<b>Audio</b>	<b>Analog</b>	Integrated Qualcomm® WCD9370/WCD9341 codec + Qualcomm® WSA8810/WSA8815 speaker amplifier
	<b>Playback</b>	Hi-Res/192kHz, Native 44.1kHz, audio on dedicated DSP
	<b>Voice</b>	Qualcomm Noise and Echo Cancellation
<b>Sensor DSP</b>	Hexagon DSP based	
<b>Storage</b>	eMMC 5.1, UFS 2.1 Gear3 1-lane, SD 3.0	
<b>Peripherals</b>	1x USB3.1 Type-C with Display Port and USB 2.0	

Qualcomm Spectra, Qualcomm Kryo, Qualcomm Adreno, Qualcomm Hexagon, Qualcomm PM6150, Qualcomm PM6150L, Qualcomm WCD9370/WCD9341 and Qualcomm WSA8810/WSA8815 are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

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