Qualcomm

Qualcomm® APQ8053 SoCs for IoT

The APQ8053 System-on-Chips (SoCs) are designed to help support various platforms for IoT applications.

Designed with a high-value combination of advanced features and power efficiency, the APQ8053-Pro and APQ8053-Lite SoCs help support advanced use cases, including machine learning, robust edge computing, sensor processing and voice user interface (UI) enablement. They feature integrated wireless connectivity, making them ideal for innovative Internet of Things (IoT) applications such as smart cameras, smart displays, smart appliances, home control panels, point-of-sale (PoS) solutions and industrial handheld devices. Dual image signal processors (ISPs) support leading intelligent camera features for sports cameras, IP security cameras and VR cameras.

The APQ8053 SoCs feature a customized octa-core 64-bit Arm Cortex-A53 applications processor as well as a Qualcomm® Hexagon™ 546 DSP, which helps provide battery-efficiency for audio voice UI, video and computer vision use cases. The Qualcomm® Adreno™ 506 GPU is designed to support PC-class graphics and the Qualcomm® Snapdragon™ sensor core helps support always-on use cases at efficient power levels.

The heterogeneous architecture of the APQ8053 SoCs is designed to allow applications to utilize the full spectrum of specialized processors within to maximize performance and power efficiency, including support for Qualcomm® Artificial Intelligence (AI) Platform built for on-device machine learning that can be optimized with the Qualcomm® Neural Processing SDK software framework.

Highlights

Artificial Intelligence for differentiating user experiences

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

4K Ultra HD video with enhanced camera features and object classification

Dual ISPs support staggered HDR, low light noise reduction, and enhanced auto-focus performance. Premium 4K @30fps HEVC video capture and playback with support for secondary streams for preview and streaming.

Integrated audio support

Support for dual microphones with PIMIC, >3 WCD for solutions with a voice UI.

Integrated connectivity support

Integrated support for 802.11ac, WI-FI, BT/BLE 4.x connectivity, as well as Bluetooth low energy and 15.4 connectivity for home control and automation applications.

Qualcomm

APQ8053

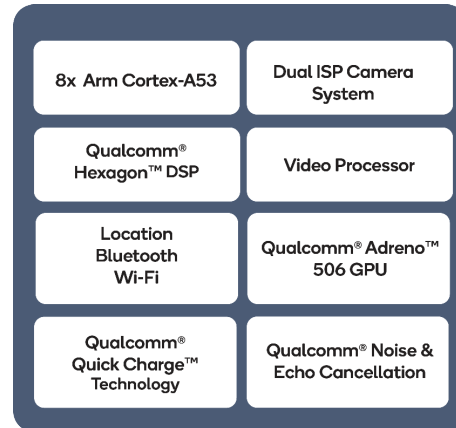## APQ8053 Target Applications

- Smart Appliances
- Smart Cameras
- Smart Displays
- POS Systems
- Industrial Handhelds
- Smart Home Devices

Features

- Dual ISP ideal for supporting intelligent camera features for sports cameras, IP security cameras and VR cameras

- Fabricated using the advanced 14 nm FinFET process for low active power dissipation & fast peak CPU performance

- Adreno 506 GPU with 64-bit addressing @ up to 650MHz with latest API support

- Hexagon 546 DSP designed to provide battery-efficient audio, video, and computer vision use cases

- Heterogeneous architecture includes 64-bit, octa-core Arm Cortex-A53 CPU @ up to 2.2GHz per core

- Qualcomm AI Platform designed to support on-device machine learning

- Low power Snapdragon sensor core helps support always-on use cases at reduced power levels

- Integrated 802.11ac, Bluetooth 4.1 low energy and GPS support

- Worldwide ecosystem of QTI vendors, customers, developers and embedded device OEMs

Product	Part Numbers
APQ8053-Pro	APQ8053-Pro
APQ8053-Lite	APQ8053-Lite
Power Management Module	PM8953, PMi8952
Audio Codec	WCD9326, WCA8815/10
GPS & Glonass RF Receiver	WGR7640

Qualcomm

APQ8053 Block Diagram

8x Arm Cortex-A53	Dual ISP Camera System
Qualcomm® Hexagon™ DSP	Video Processor
Location Bluetooth Wi-Fi	Qualcomm® Adreno™ 506 GPU
Qualcomm® Quick Charge™ Technology	Qualcomm® Noise & Echo Cancellation

APQ8053 Specifications

Product		APQ8053-Lite/APQ8053-Pro
Technology / Package		14LPP, 12x14 mm2, non-POP
CPU		**APQ8053-Lite:** 8xA53 @1.8 GHz, 1MB L2 **APQ8053-Pro:** 8xA53 @2.2 GHz, 1MB L2
Memory		1x 32-bit LPDDR3 933MHz
Location		GPS/GLONASS, BeiDou, Galileo
Wireless Connectivity		Integrated 1x1 802.11b/g/n/ac, BT 4.x, FM
PMIC		PM8953 + PMI8952
Display	Resolution	1920x1200 60fps + 1080p30 Miracast
	Interface	2x DSI 4+4 lane
Camera	Performance	**APQ8053-Lite:** Dual ISP 21MP30 ZSL, 930Mpix/sec, HW WNR, LTM, Advanced AF **APQ8053-Pro:** Dual ISP 24MP30 ZSL, 930Mpix/sec, HW WNR, LTM, Advanced AF
	Interface	CSI 4+4+4 lane (or 4+4+2+1), DPHY1.2, CPHY 1.0
Video	Decode	**APQ8053-Lite:** 1080p60 HEVC **APQ8053-Pro:** 4K30 HEVC
	Encode	**APQ8053-Lite:** 1080p90 **APQ8053-Pro:** 4K30
GPU		Adreno 506 @ 650MHz
Audio	Analog	Integrated Codec PM8953 or WCD9326/35
	Audio	HD-Audio, Dolby, SVA
	Voice	Qualcomm® Noise and Echo Cancellation v6.1, HD, Pro v2.2
Sensor DSP		Hexagon DSP based
Storage		eMMC5.1, SD3.0
Peripherals		1x USB3.0