Qualcomm

# Qualcomm® APQ8009 SoC for IoT

**The APQ8009 System-on-Chip (SoC) is designed to help support various platforms for Internet of Things (IoT) applications.**

The APQ8009 processor is engineered to support industry-standard Bluetooth and Wi-Fi connectivity alongside quad-core processing power, supplemented by low-power Qualcomm® Hexagon™ DSP processing and an Qualcomm® Adreno™ GPU, for IoT applications.

Its quad-core Arm Cortex-A7 application processor helps expand mass-market chipset capabilities to make rich multimedia features accessible to more consumers worldwide.

The APQ8009 has a high level of integration that reduces the bill-of-material (BOM) and board area. The cost and time-to-commercialization advantages of this SoC is designed to help drive wireless broadband adoption in mass markets around the world.

It features integrated wireless connectivity, making it ideal for innovative IoT applications such as data capable connectivity devices, music player enabled devices and applications, multimedia phones with gaming, streaming video and video conference features and support for the latest, most popular operating systems.

## Highlights

### Single platform design

Higher integration helps to reduce PCB surface area, time-to-commercialization, and BOM costs while adding more capabilities and processing power.



### Superior image quality and resolution

Integrated application processors and hardware cores eliminate multimedia co-processors,providing superior image quality and resolution for mobile devices while extending application times



### Integrated connectivity support

Integrated support for 802.11a/b/g/n, WI-FI, Bluetooth and Bluetooth Low Energy connectivity.




### Maximized performance and power efficiency

The heterogeneous architecture of the APQ8009 SoC is designed to allow applications to utilize the full spectrum of specialized processors within in order to maximize performance and power efficiency.



Materials are subject to change without notice.
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## APQ8009 Target Applications

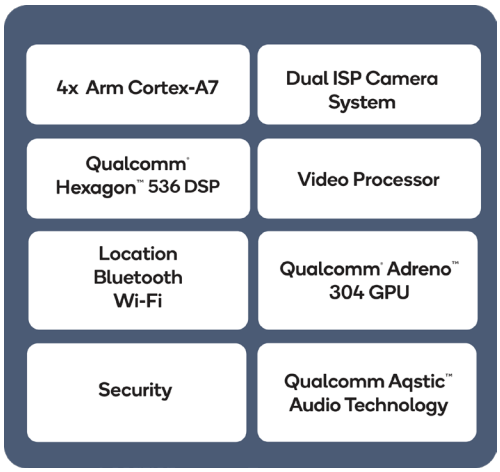
- Smart Speakers
- Camera Phones
- Multimedia Devices
- Smart Home Devices
- Smart Appliances
- Smart Assistants

## Features

- Adreno 304 GPU 3D graphics accelerator (up to 456 MHz) with latest API support
- Hexagon 536 DSP designed to provide battery-efficient audio/video use cases
- Heterogeneous architecture includes 32-bit, quad-core Arm Cortex-A7 CPU @ up to 1.3GHz per core
- Fabricated using the advanced 28 nm LP CMOS process
- Qualcomm® Location Suite Gen 8C; support for three bands concurrently:
  - GPS, BeiDou and GLONASS or
  - GPS, BeiDou and Galileo
- Integrated 802.11a/b/g/n, Bluetooth 4.1 low energy and GPS support
- Provides dedicated support for industry-leading codecs and other multimedia formats to support carrier deployments around the world.
- Worldwide ecosystem of QTI vendors, customers, developers and embedded device OEMs

| Product | Qualcomm Part Numbers |
|---|---|
| APQ8009 processor | APQ8009 |
| Wireless | Qualcomm® WCN3610/ WCN3660B |
| Power Management | Qualcomm® PM8909/ PM8916 |
| GPS & Glonass RF Receiver | Qualcomm® WGR7640 |

## APQ8009 Block Diagram




## APQ8009 Specifications

| | |
|---|---|
| **Package** | 504 NSP; 11.1 × 12.0 × 0.96 mm; 0.4mm pitch |
| **CPU** | 4x Arm Cortex-A7 quad-core CPU 32-bit @ up to 1.3 GHz |
| **Memory and Storage** | Non-PoP LPDDR2, LPDDR3 up to 533 MHz; eMMC v4.5/SD 3.0 |
| **Connectivity** | 802.11a/b/g/n with 2x2 MU-MIMO, Bluetooth Low Energy 4.1, FM Rx |
| **Location** | Qualcomm Location Gen 8C GNSS |
| **GPU** | Adreno 304; 3D graphics accelerator (up to 456MHz) OpenGL ES 3.0 |
| **DSP** | Hexagon 536 |
| **Display Support** | Up to 720p |
| **Camera Support** | Single ISP/12bit – 8M; 8M@30fps by single ISP; CSI: 4 or 2/1; DPHY – 1.5Gbps |
| **Multimedia** | 1080p decode, 720p encode (30fps) |
| **Audio** | Qualcomm Aqstic™ audio technologies |
| **Security Features** | Qualcomm® Processor Security, Qualcomm® Content Protection |

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