QUALCOMM®

Qualcomm® Snapdragon™ Processors

820

The Snapdragon 820 premium tier embedded processor is ideal for developing more powerful, innovative applications

Model APQ8096 for Embedded Computing

The Snapdragon 820 high performance embedded processor features the latest in premium mobile technology for powering next-generation devices and offers many advantages including superior performance, low power consumption, and integrated connectivity for applications that are more innovative and intelligent.

Snapdragon processors were originally designed for mobile, but now can be embedded into virtually anything. The Snapdragon 820 embedded processor meets the demands of higher performance embedded computing applications with increasingly complex functionality that are small, fast and powerful.

The Snapdragon 820 processor system integrates a Qualcomm® Kryo™ customized 64-bit ARMv8-compliant quad-core applications processor, combined with the Qualcomm® Adreno™ 530 GPU, creating enough compute performance to enable high quality graphics and exciting, next-generation virtual reality applications.

Snapdragon 820 processors for embedded are designed for next-generation commercial products and support a fast-track deployment path for embedded device OEMs and developers—from development kits to customized solutions—including integration services, production-ready, customizable SoMs (System-on-Modules), and SBCs (Single Board Computers).

Solution Highlights

Highly integrated platform for compact designs

The high level of integration reduces the bill-of-material (BOM) delivering board-area savings. The package-on-package implementation adds LPDDR4 SDRAM memory without increasing a device's footprint or PCB area.

Powerful multi-core processing

The combination of the Snapdragon 820's powerful Adreno 530 GPU and quad-core Kryo CPU expands the possibilities of connected computing while providing the ultimate in performance, power efficiency and high quality visual experiences.

Next-generation computer vision

Enhanced object detection and navigation functionality allows recognition and tracking of multiple objects to navigate and perform dynamic collision avoidance in commercial drones and robots.

Immersive, life-like virtual reality

Realistic visual and audio immersion and smooth VR/AR action are enabled by the Snapdragon 820 heterogeneous compute platform designed for high performance and long battery life.

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Materials are subject to change without notice.
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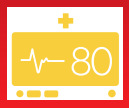
Embedded Computing Applications


Industrial IoT



Medical Devices


UAVs & Robotics


Smart Glasses

4K Video


VR/AR

Features

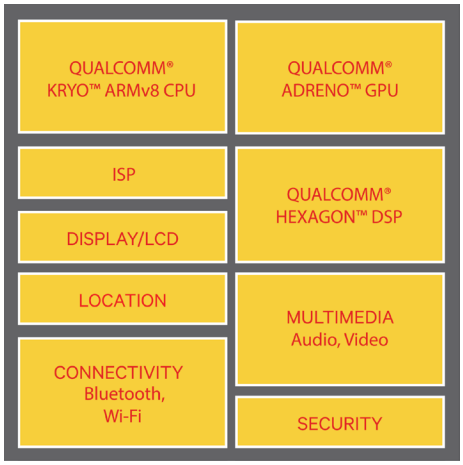
- Customized quad-core Kryo 64-bit CPU delivers maximum performance and low power consumption
- Fabricated using the advanced 14 nm FinFET process for low active power dissipation & fast peak CPU performance
- 28MP camera support (zero shutter lag) via dual 14-bit ISP
- Dual-channel PoP high-speed memory – LPDDR4 SDRAM @1866MHz clock rate
- Hardware assisted (HEVC/H.265) 4K Ultra HD video capture, streaming & playback
- Adreno 530 GPU with 64-bit addressing @624MHz with latest API support
- Hexagon DSP with dedicated Sensor Core to support always-on low power use cases with direct access to internal cores
- Fast-track deployment path for embedded device OEMs and developers— utilizing SoMs and SBCs available now from our Snapdragon Technology Providers

Prototype & Commercialize with Snapdragon 820

Company	Snapdragon 820 Products
eInfochips	Eragon 820 SOM & Dev Kit
Inforce Computing	Inforce 6601 SOM & Dev Kit Inforce 6640 SBC
Intrinsyc	Open-Q 820 SOM & Dev Kit Open-Q 820 µSOM & Dev Kit
iWave Systems	iW RainboW G25M SBC & SOM
Mistral	820 Nano SOM & Dev Kit
VIA	VIA-SOM 9X20 820 SOM

To learn more visit:
snapdragon.com/embedded or developer.qualcomm.com

Block Diagram



Snapdragon 820 Specifications

Package	15.6 x 15 x 0.64mm* 994-pin NSP, 0.4mm pitch
CPU	Kryo customized 64-bit ARMv8-compliant quad-core processor: Two high-performance Kryo cores – gold cluster up to 2.15GHz Two low-power Kryo cores – silver cluster up to 1.593GHz
Memory and Storage	LPDDR4 SDRAM dual-channel PoP @1866MHz UFS 2.0 gear 3 (1-lane), eMMC 5.1, SD3.0
Connectivity	802.11ac 2x2 MU-MIMO 2.4/5GHz, Bluetooth 4.2
Location	Qualcomm® Location Gen 8C GPS
GPU	Adreno 530 3D graphics accelerator with 64-bit addressing APIs: OpenGL ES 3.0/3.1/GEP; GL4.4; DX11.3/4; Path Rendering; OpenCL 2.0 Full; RenderScript-Next
DSP	Hexagon DSP with dual-Hexagon vector processor (HVX-512) @825MHz
Display Support	3840x2400 @60fps Up to 3 concurrent displays; 2 panels + external
Camera Support	Dual 14-bit ISP: 28MP and 13MP @600 MHz
Multimedia	H.264 (AVC) playback and capture @4K60 H.265 (HEVC) playback @4K60 and capture @4K30
Interfaces	3x PCIe 2.0, 1x USB 2.0, USB3.0, 12x BLSP, 2x TSIF, 3x MIPI-CSI, 2x MIPI-DSI, SLIMbus, I2S, PCM
Security	Secure Boot, Secure code signing service

* Height dimension does not include the memory device

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