Qualcomm

# Qualcomm® SDM845/ Qualcomm® SDA845 SoCs

**A System-on-Chip (SoC) designed using next generation mobile technology with tech savvy consumers in mind.**

The SDM845/SDA845 SoC combines high-performance heterogeneous computing, Qualcomm® Artificial Intelligence (AI) Engine for on-device machine learning, computer vision, hardware-based security, multimedia, Wi-Fi and integrated LTE modem (SDM845).

SDM845/SDA845 utilizes heterogenous compute capabilities to enable immersive multimedia experiences including eXtended reality (XR), on-device artificial intelligence (AI) and lightning-fast connectivity. The SDM845/SDA845 also introduces a hardware isolated subsystem called the secure processing unit (SPU), which is designed to add vault-like characteristics to existing layers of Qualcomm Technologies' security features.

The 3rd generation Qualcomm AI Engine enables on-device intelligence and simplifies how pictures and videos are taken. It also enables enhanced features like camera bokeh, more true to life XR, gaming, and long lasting battery life. The core hardware architectures are engineered to run AI applications quickly and efficiently.

The Qualcomm® Adreno™ 630 GPU features room-scale 6 degrees of freedom (6DoF) with simultaneous localization and mapping (SLAM). SDM845/SDA845 also introduces Adreno Foveation which substantially reduces power consumption, improves visual quality and boosts XR application performance, as compared to the previous generation. All these features make it ideal for manufacturers to develop SWaP constrained devices in the immersive multimedia space, wearables, portable healthcare and connected cameras' domain.

## Highlights

### On-device intelligence powered by the Qualcomm AI Engine

The Qualcomm AI Engine is on-device intelligence that delivers mobile-optimized computer vision (CV) experiences for wide-array of use cases.

### Power efficient and cost-effective

The Qualcomm® Kryo™ 385 CPU is manufactured in 2nd gen 10nm LPP, optimized across four performance and four efficiency cores for higher performance. The custom built 64-bit Arm v8-compliant Kryo CPU has independent efficiency and power clusters, each designed to optimize for a unique user experience.

### Captures cinema grade videos

The SDM845/SDA845 is built with new camera and graphics architectures that are designed to allow capture of videos in cinema-grade quality and have access to a billion shades of colors and features with 64x more color information via Ultra HD premium video capture.

### Lighting fast Qualcomm® Snapdragon™ X20 LTE Modem and Wi-Fi

**With more spectrum flexibility than ever before, the integrated Snapdragon X20 modem (SDM845 only) is designed to bring improved app performance and lightning fast access to cloud storage. Experience similar blazing speeds with 802.11ad multi-gigabit Wi-Fi and integrated 2x2 802.11ac.**

### Vault-like security

**SDM845/SDA845 is designed with the Qualcomm® Secure Processing Unit (SPU) that is engineered to help protect personal data with vault-like security. Biometrics used for authentication can be stored in isolation, helping to keep precious data out of prying eyes.**

Materials are subject to change without notice.

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## SDM845/SDA845 Target Applications

- XR, VR, Gaming
- Artificial Intelligence (AI)
- Robotics, Drones
- Wearables
- Portable Healthcare
- Connected Cameras

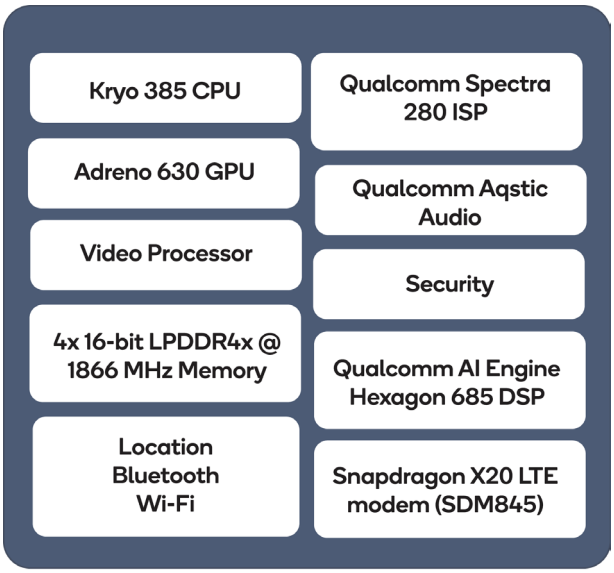
## Features

- Customized 64-bit Arm v8-compliant octacore Kryo 385 applications processor
- Always-on subsystem with RPMh for hardware-based resource and power management
- Qualcomm® Universal Bandwidth Compression (UBWC) 2.0, 2x compression with camera, display, and DSP
- Integrated Snapdragon X20 LTE modem to support latest air interfaces including 5x CA up to 1.2 Gbps
- Two 4-lane DSI D-PHY 1.2 at 2.5 Gbps per lane
- 3840 × 2400 display at 60 fps, 2560 buffer width (10 layers blending), and VESA DSC 1.1
- A complete 4K60 entertainment system 4K60 10b encode + 4K60 10b decode
- Qualcomm Spectra™ 280 camera: dual 14-bit image signal processing (ISP) + Lite ISP: 16 + 16 + 2 megapixels (MP) to support 32 MP/30 fps
- Three 4-lane CSI with C-PHY/D-PHY and one 2-lane CSI with D-PHY to support 4 + 4 + 4 + 2
- 1x UFS 2.1, 2x USB 3.1, DisplayPort
- One 1-lane PCIe Gen 2 and one 1-lane PCIe Gen 3
- WLAN 802.11ac and Bluetooth 5.0 with the Qualcomm® WCN3990 device; WiGig (802.11ad/60 GHz) with the Qualcomm® QCA6335 + Qualcomm® QCA6310 device
- Audio DSP for low-power audio subsystem (LPASS)
- Compute DSP with Qualcomm® Hexagon™ Vector eXtensions (HVX)
- Dedicated low-power Snapdragon sensor core with DSP to support always-on use cases
- Secure processor

**To learn more visit: www.qualcomm.com**

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## SDM845/SDA845 Block Diagram




## SDM845/SDA845 Specifications

| | SDM845/SDA845 SoC |
|---|---|
| Package | 12.4 × 12.4 x 0.58 mm MEP (without memory device on top) |
| CPU | 8x Kryo 385 CPU, up to 2.8 GHz |
| Modem | Snapdragon X20 LTE modem @ up to 1.2 Gbps (SDM845) |
| ISP | Qualcomm Spectra 280 Image Signal Processor |
| Camera | Single HFR 16 MPix camera @ 60fps ZSL, Dual 16 MPix cameras @ 30fps ZSL, Single 32 MPix camera at 30fps ZSL |
| Video | Ultra HD Premium video capture @ 4K (3840x2160) 60fps, 10bit HDR, Rec 2020 color gamut; H.264 (AVC), H.265 (HEVC) and VP9 support; Slow motion HEVC video encoding of either HD (720p) video up to 480fps or FHD (1080p) up to 240fps |
| GPU | Adreno 630 GPU with support for Open GL ES 3.2 and Open CL 2.0 |
| DSP | Hexagon 685 DSP with 3rd Gen Vector Extensions |
| Memory & Storage | LPDDR4x, 4x16 bit; up to 1866MHz, 8GB RAM |
| Wireless Connectivity | Wi-Fi integrated 802.11ac 2x2 with MU-MIMO; Tri-band Wi-Fi: 2.4 GHz and 5 GHz with Dual Band Simultaneous (DBS), Bluetooth 5.0 |
| Audio | Qualcomm Aqstic™ audio technology; Qualcomm® aptX™ audio technology |
| Location | GPS, Glonass, BeiDou, Galileo, QZSS, and SBAS |

Qualcomm Universal Bandwidth Compression, Qualcomm Spectra, Qualcomm Hexagon, Qualcomm WCN3990, Qualcomm QCA6335, Qualcomm QCA6310, Qualcomm Aqstic amd Qualcomm aptX are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

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