



# Qualcomm® QCC30xx Series Bluetooth Audio SoCs for Truly Wireless Earbuds

**Extremely low-power Bluetooth audio SoCs optimized for compact, feature-rich truly wireless earbuds.**

The Qualcomm® QCC302x/Qualcomm® QCC303x/Qualcomm® QCC304x/Qualcomm® QCC305x SoC series is a family of flash programmable Bluetooth® audio System-on-Chips (SoCs) based on an ultra-low power architecture. This series includes options designed specifically to meet consumer demand for robust and increasingly rich featured truly wireless earbuds that can support all-day use. These SoCs are engineered for low power performance even in demanding use cases, supporting longer battery life in virtually all operating modes.

With our Qualcomm TrueWireless™ technologies, these SoCs are engineered to deliver superior quality robustness and low latency for a sophisticated user experience. Qualcomm TrueWireless Mirroring, featured on the QCC304x and QCC305x, is designed to improve robustness even further, offers dynamic bud-to-bud role-swapping with Bluetooth address handover, and enables Qualcomm® aptX™ Adaptive audio for the first time in earbuds.

QCC30xx SoCs offer powerful multi-core processing, designed to support flexible innovation, without extended development cycles. The SoC architecture includes two dedicated, configurable 32-bit application processor subsystems and up to two Qualcomm® Kalimba™ DSPs. A feature-rich audio development kit (ADK) and enhanced development tools are available to help reduce time needed for commercialization.

The QCC305x makes premium tier Qualcomm technologies, such as Qualcomm® Adaptive Active Noise Cancellation (ANC) and wake word activated voice assistants, more accessible to a wider range of products. The QCC305x is also designed to support Qualcomm® Snapdragon Sound™ technology.

## Highlights

### Ultra-low power

The QCC302x/QCC303x/QCC304x/QCC305x series is designed for greater efficiency in power consumption compared to our previous technology. These SoCs support the development of very small form factor, richly-featured earbuds that can be used for up to 10 hours with a 65mHA battery.<sup>1</sup>



### Qualcomm TrueWireless Mirroring

The QCC304x and QCC305x devices feature Qualcomm TrueWireless Mirroring, a new topology that combines the best of our eavesdropping and relay solutions designed to deliver robustness while also supporting role-swapping and bud-to-bud Bluetooth address handover, dynamically and with virtually no interruption to the audio.



### High quality wireless audio

aptX Audio and aptX Adaptive audio technologies are designed to deliver consistent, high quality audio and low-latency streaming over Bluetooth. The internal 24-bit end-to-end audio pipeline and high-performance DACs are designed to deliver high resolution audio through the audio processing chain.



### Integrated noise cancellation

The QCC304x and QCC305x support integrated ultra-low-power digital ANC technology. Additionally, QCC305x is designed to support our Qualcomm Adaptive ANC, helping to eliminate the need for an external ANC solution. This feature can help reduce the complexity, cost and PCB space needed for adding ANC to truly wireless earbuds.



### Digital Assistant-ready

Support for voice services is available via button-press or wake word activation (QCC305x). This feature is designed to relay the audio stream and voice control capabilities to a handset to process and execute commands.



<sup>1</sup> Battery life varies significantly with settings, usage, and other factors.

Qualcomm

QCC30xx

# Bluetooth Audio Applications

- Truly Wireless Earbuds



## QCC302x/QCC304x/QCC305x Features Comparison

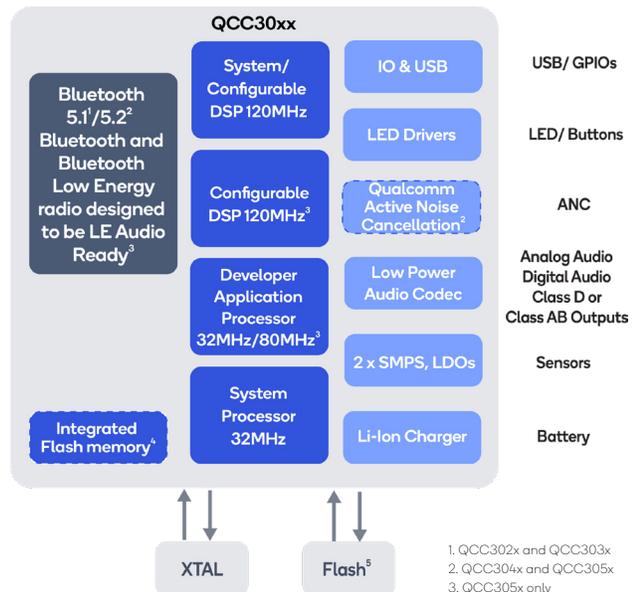
	Qualcomm TrueWireless Stereo	Qualcomm TrueWireless Mirroring	aptX Audio	Qualcomm ANC	cVc	Voice Assistant activation	LE Audio	Integrated Flash	DSPs (120 MHz)	Package
Qualcomm® QCC3026	✓		classic		2-mic	Button			1	WLCSP 3.98x4.02x0.54mm
Qualcomm® QCC3020	✓		classic		2-mic	Button			1	BGA 5.5x5.5x1.0mm
Qualcomm® QCC3040		✓	Adaptive	FF/Hybrid	2-mic	Button		32 Mbit	1	BGA 5.6x5.9x1.0mm
Qualcomm® QCC3046		✓	Adaptive	FF/Hybrid	2-mic	Button			1	WLCSP 4.38x4.26x0.57mm
Qualcomm® QCC3056		✓	Adaptive	FF/ Adaptive Hybrid	2-mic	Button/wake-word	✓		2	WLCSP 4.38x4.26x0.57mm
Qualcomm® QCC3050		✓	Adaptive	FF/ Adaptive Hybrid	2-mic	Button/wake-word	✓	64 Mbit	2	BGA 5.6x5.9x1.0mm

## Features

- Highly integrated SoC with extremely low-power design\*
- Support for digital assistants with minimal integration effort
- Programmable Qualcomm® Active Noise Cancellation (ANC)
- Qualcomm TrueWireless Stereo / Qualcomm TrueWireless Mirroring support
- Support for aptX and aptX Adaptive audio
- Support for Qualcomm® cVc™ Echo Cancelling and Noise Suppression (ECNS)
- QCC302x/QCC303x qualified to Bluetooth 5.1 and QCC304x/QCC305x qualified to Bluetooth 5.2 (QCC3050 LE Audio ready)
- 2Mbps Bluetooth low energy (LE) support
- Variety of form factors, down to ultra-small 4mm x 4mm
- Dual core 32-bit processor application and configurable Kalimba DSP Audio subsystem
- Embedded ROM + RAM and integrated Flash (with QCC3040 and QCC3050)
- High-performance low power audio codec
- 1-ch 98dBA class D analog output
- 2-ch 99dBA line inputs (single-ended) and 192kHz 24-bit I2S input
- Flexible software platform with powerful new IDE support

\* up to 73% improved compared with our Qualcomm® CSR867x series

## QCC30xx Block Diagram



1. QCC302x and QCC303x  
 2. QCC304x and QCC305x  
 3. QCC305x only  
 4. QCC3040, QCC3044 and QCC3050  
 5. QCC302x, QCC303x, QCC3046 and QCC3056

## Ordering Information

Product	Part Number	Product	Part Number
QCC3020	QCC3020-0-CSP90	QCC3026	QCC3026-0-81WLN5P
QCC3040	QCC-3040-0-CSP90B	QCC3046	QCC-3046-0-WLN5P94B
QCC3050	QCC-3050-0-CSP90B	QCC3056	QCC-3056-0-WLN5P94B

Qualcomm QCC3020, Qualcomm QCC3026, Qualcomm QCC3040, Qualcomm QCC3046, Qualcomm QCC3056, Qualcomm QCC3050, Qualcomm CSR867x and Qualcomm cVc are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

