Qualcomm

Qualcomm® QCC30xx Series Bluetooth Audio SoCs for True 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/Qualcomm® QCC307x SoC series is a family of flash programmable Bluetooth® audio System-on-Chips (SoCs) based on an ultra-low power architecture. They are designed specifically for the future of Bluetooth audio, and to meet listener demand for robust and rich-featured truly wireless earbuds that can support all-day use. This series includes options that support the LE Audio Bluetooth standard and benefit from Snapdragon Sound™ technology – our optimized chain of superior audio, connectivity, and mobile innovations.

With our highly-integrated Bluetooth technologies, these SoCs are engineered to deliver a superior, sophisticated user experience. Qualcomm TrueWireless™ Mirroring, featured on the QCC304x, QCC305x and QCC307x, is designed to maximize robustness, and offers dynamic bud-to-bud role-swapping with Bluetooth address handover. The QCC307x brings LE Audio use cases supported alongside traditional Bluetooth tech, for the best listening experiences in a range of environments.

QCC30xx SoCs offer powerful multi-core processing, designed to support flexible innovation, without extended development cycles. The SoC architecture includes two dedicated, programable 32-bit application processor subsystems and up to two configurable 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 and QCC307x make premium tier Qualcomm technologies, such as Qualcomm® Adaptive Active Noise Cancellation (ANC) and digital assistants, accessible to a wide range of products, and are designed to support Snapdragon Sound technology.

Highlights

Ultra-low power

The QCC30xx series is designed for ultra-high efficiency in power consumption. These SoCs support the development of very small form factor, richly-featured earbuds that can be used for up to 16 hours with a 65mAh battery.[1] The QCC307x platforms achieve advanced computation at no compromise to our ultra-low power performance.

LE Audio

QCC307x is designed to support a range of LE Audio-enabled use cases for earbuds, including audio sharing and broadcast, gaming mode and stereo recording. These dual-mode platforms integrate the best of LE Audio and the best of traditional Bluetooth to enable smooth feature adoption for real-world listening scenarios.

CD Lossless and high resolution audio

With Qualcomm® aptX™ Adaptive Audio and high-performance DACs, these platforms are designed to deliver high resolution (24-bit 96kHz) and low latency audio through the Bluetooth audio processing chain. The QCC307x features CD-Lossless audio with Snapdragon Sound, designed to dynamically scale the Bluetooth connection to deliver 16-bit 44.1kHz lossless audio.

Integrated noise cancellation

The QCC304x, QCC305x and QCC307x support integrated ultra-low power digital ANC technology. QCC307x is designed to support our third-generation Qualcomm Adaptive ANC, with full-band ambient mode for strong, effective noise cancellation and a natural feeling of spatial awareness in relation to the listener's surrounding environment.

Digital Assistant-ready

Support for voice services is available via button-press or wake word activation (QCC305x and QCC307x) and is designed to relay the audio stream and voice control capabilities to a handset to process and execute commands.

[1] Battery life varies significantly with settings, usage, and other factors.

Bluetooth Audio Applications

- Truly Wireless Earbuds

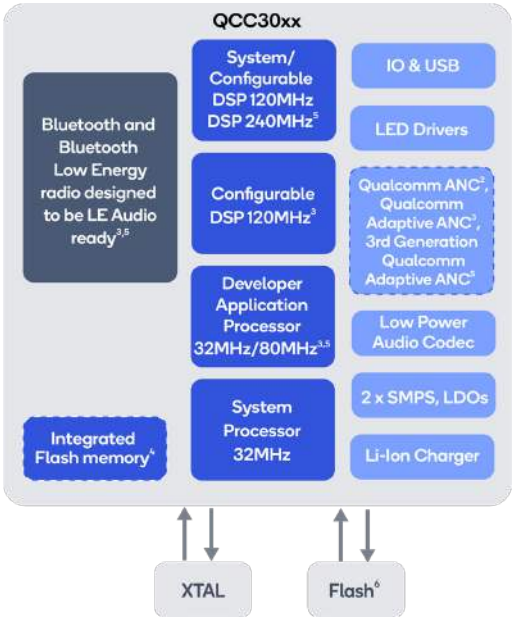
QCC302x/QCC304x/QCC305x/QCC307x Features Comparison

	Snapdragon Sound	Qualcomm TrueWireless	aptX Audio	Qualcomm ANC	cVc	Voice Assistant activation	LE Audio	Integrated Flash	DSPs (120 MHz) (240MHz[5])	Package
Qualcomm® QCC3026		Stereo	Classic		2-mic	Button			1	WLCSP 3.98x4.02x0.54mm
Qualcomm® QCC3020		Stereo	Classic		2-mic	Button			1	BGA 5.5x5.5x1.0mm
Qualcomm® QCC3040		Mirroring	Adaptive	FF/Hybrid	2-mic	Button		32 Mbit	1	BGA 5.6x5.9x1.0mm
Qualcomm® QCC3046		Mirroring	Adaptive	FF/Hybrid	2-mic	Button			1	WLCSP 4.38x4.26x0.57mm
Qualcomm® QCC3056	✓	Mirroring	Adaptive	FF/ Adaptive Hybrid	2-mic	Button/ wake-word			2	WLCSP 4.38x4.26x0.57mm
Qualcomm® QCC3050	✓	Mirroring	Adaptive	FF/ Adaptive Hybrid	2-mic	Button/ wake-word		64 Mbit	2	BGA 5.6x5.9x1.0mm
Qualcomm® QCC3071	✓	Mirroring	Adaptive Lossless[8]	FF/ Adaptive Hybrid[7]	3-mic	Button/ wake-word	✓		1	WLCSP 4.93x3.936x0.57mm

Features

- Highly integrated SoC with extremely low-power design
- Qualcomm TrueWireless Stereo / Qualcomm TrueWireless Mirroring support
- Support for aptX, aptX Adaptive audio and aptX Lossless with Snapdragon Sound
- Programmable Qualcomm® Active Noise Cancellation (ANC)
- Support for Qualcomm® cVc™ Echo Cancelling and Noise Suppression (ECNS)
- QCC302x/QCC303x qualified to Bluetooth 5.1 and QCC304x qualified to Bluetooth 5.2 and QCC305x/QCC307x qualified to Bluetooth 5.3
- QCC307x designed to integrate LE Audio use cases
- 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 quality, low power audio codec including 1-ch Class D and Class AB analog outputs
- Up to 4-ch[5] high quality singled ended line inputs and 192kHz 24bit I^2S input.
- Flexible software platform with powerful new IDE support
- Support for digital assistants with minimal integration effort

QCC30xx Block Diagram



[1] QCC302x and QCC303x
[2] QCC304x and QCC305x
[3] QCC305x only
[4] QCC3040 and QCC3050
[5] QCC3071 only
[6] QCC302x, QCC3046, QCC3056 and QCC3071
[7] 3rd generation Qualcomm Adaptive ANC
[8] CD Lossless audio available with Snapdragon Sound

Ordering Information

Product	Part Number	Product	Part Number
QCC3020	QCC-3020-0-CSP90	QCC3026	QCC-3026-0-81WLNSP
QCC3040	QCC-3040-0-CSP90B	QCC3046	QCC-3046-0-WLNSP94B
QCC3050	QCC-3050-0-CSP90B	QCC3056	QCC-3056-0-WLNSP94B
QCC3071	QCC-3071-0-WLNSP99		

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