Qualcomm®
Bluetooth Audio Platform

QCC5100 Series

Ultra low power *Bluetooth*® audio SoCs optimized for compact, feature-rich wireless earbuds, hearables and speakers

QCC5100 is a family of breakthrough Bluetooth audio SoCs based on an ultra-low power architecture

Designed to meet consumer demand for robust, high quality, truly wireless listening experiences in smaller devices with low power consumption for longer audio playback.

QCC5100 series architecture is purposefully designed for ultra-low power performance and includes a Bluetooth 5 dual-mode radio, low-power audio and application subsystems. Power consumption is reduced by up to 65% for both voice calls and music streaming and devices are optimized to support longer audio playback in virtually all operating modes.

The flexibility provided by the fully programmable applications processor and fully programmable audio DSPs, helps manufacturers to easily differentiate products with new features without extended development cycles.

The QCC5100 series features hybrid active noise cancelling (ANC) technology integrated in the SoC, eliminating the need for an external ANC solution. This feature can help reduce the complexity, cost and PCB space needed for adding ANC to earbuds, hearables, and other portable audio devices.

With Qualcomm Truewireless™ technology, the QCC5100 family is engineered to deliver improved robustness and more evenly balanced power distribution between both earbuds, supporting longer playback time.

Solution Highlights

Quad-core processing

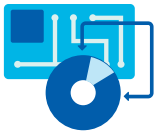
Quad-core processing architecture provides two application processors and two DSP units, designed to allow for an extensive degree of parallel processing, supporting the delivery of user experiences not previously possible.

Support for Voice UI and Voice Assistant services

The QCC5100 series is digital assistant ready with support for Always On Voice applications, designed to reduce development time of voice-activated products. Noise reduction technologies are integrated for voice UI and voice communication.

High quality wireless audio

Qualcomm® aptX™ and aptX HD audio technologies are designed to deliver consistent, high quality audio streaming over Bluetooth. The internal 24-bit end-to-end audio pipeline and high-performance DACs help provide high resolution audio to be delivered through the audio processing chain.



Customizable platform that supports innovation

The QCC5100 audio platform includes a fully customizable Audio Development Kit (ADK) and several example designs that help to address the key challenges faced when bringing products to market.

Qualcomm® aptX™ HD

87-CF482-1 Rev. A

Bluetooth Hearables and Speaker Applications


Bluetooth Hearables


Bluetooth Headsets


Bluetooth Headphones


Bluetooth Earbuds

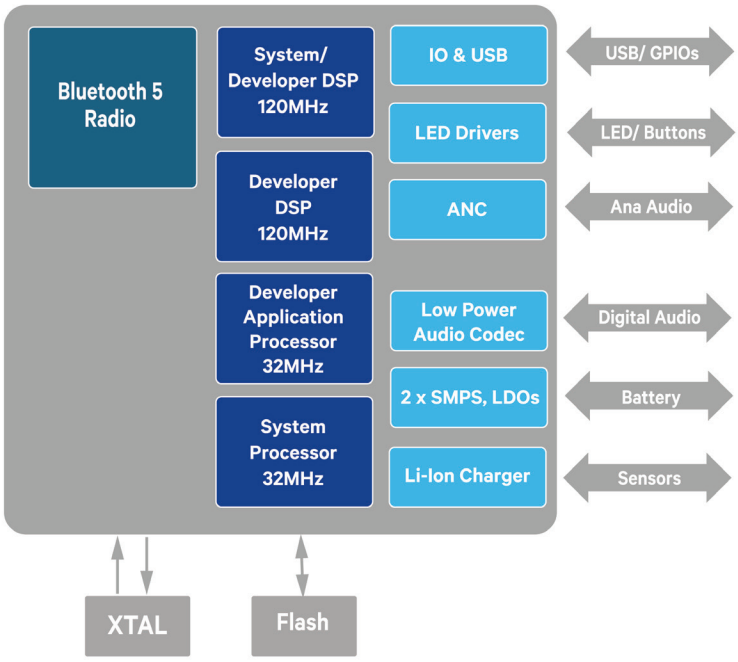

Bluetooth Portable Speakers

Features

- Bluetooth 5 radio
- 2Mbps Bluetooth Low Energy (LE) support
- Extremely low power design
- Ultra-small form factor
- Powerful quad-core processor architecture
- Dual core 32-bit processor application subsystem
- Dual core Qualcomm® Kalimba™ DSP Audio subsystem
- Embedded ROM + RAM and external Q-SPI Flash
- High performance low power audio
- 2-ch 98dBA headset class D
- 2-ch 99dBA line inputs (single ended)
- 192kHz 24-bit I2S & SPDIF interfaces
- Fully programmable digital hybrid ANC
- Always on Voice, Low power Wake
- Flexible software platform with powerful new IDE support
- aptX and aptX HD support
- Qualcomm TrueWireless Stereo support
- Integrated battery charger supporting internal mode (up to 200 mA) and external mode (up to 1.8 A)
- Integrated power management unit (PMU) to help minimize the need for external components
- Optimized eBOM with headphone drivers, LED and codecs

To learn more visit:
qualcomm.com

QCC5100 Block Diagram



QCC5100 Specifications

Bluetooth	Bluetooth 5 including 2 Mbps Bluetooth LE Single ended antenna connection with on-chip balun and Tx/Rx switch
Audio DSP	Dual 120MHz Kalimba audio DSP cores Flexible clock speed from 2MHz up to 120MHz
Application Subsystem	32-bit firmware processor 32-bit 32/80MHz developer processor
Memory	80KB program RAM 256KB data RAM, 5Mb ROM
Interfaces	UART, 2x Bit Serializers (I^2C/SPI), USB 2.0, SDIO, QSPI, NOR flash, up to 55x PIO
Power Management	Integrated power management unit (PMU) Dual switch-mode power supply (SMPS)
Battery Support	Integrated battery charger supporting internal mode (up to 200 mA) & external mode (up to 1.8 A)
Packaging	124-ball 6.5 x 6.5 x 1.0mm VFBGA, 0.5mm pitch

Qualcomm Kalimba is a product of Qualcomm Technologies, Inc. and/or its subsidiaries.