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 possible using previous generation devices.

Ultra-low power

The QCC5100 series is designed for unprecedented 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.

High quality wireless audio

Qualcomm® aptX™ Audio, aptX HD and aptX Adaptive 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 support high resolution audio through the audio processing chain.

Qualcomm TrueWireless Mirroring

The Qualcomm® QCC514x devices feature Qualcomm TrueWireless Mirroring, a new topology that combines the best of our eavesdropping and relay solutions to deliver robustness while also supporting role-swapping and bud-to-bud Bluetooth address handover, dynamically with virtually no audio interruption.

Innovative, customizable platform

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

1 Quad-core processing is available on Qualcomm® QCC5121, Qualcomm® QCC5126 and Qualcomm® QCC5127 variants

2 Example use case stereo headset decoding A2DP stream, SBC at 350kbps/48 kHz audio processing in by-pass
Features

- Extremely low-power design
- Qualcomm® QCC512x qualified to Bluetooth 5.1; QCC514x qualified to Bluetooth 5.2 (LE Audio ready)
- 2Mbps Bluetooth low energy (LE) support
- 4mm x 4mm Ultra-small form factor enabling highly miniaturized earbuds
- Dual-core 32-bit processor application subsystem
- Dual-core Qualcomm® Kalimba™ DSP Audio subsystem (Total quad-core processor architecture, supporting complex use cases)
- Embedded ROM + RAM and external Q-SPI Flash
- Integrated PSRAM for audio buffering
- High performance, low-power audio codec suited to high resolution audio use cases
- 2-ch 98dBA headset class D
- 2-ch 99dBA line inputs (single-ended) 192kHz 24-bit I2S & SPDIF interfaces
- Fully programmable digital ANC – no PCB size penalty and ultra-low power
- Designed to support digital assistants with minimal integration effort
- Designed for reduced eBoM through highly integrated SoC design
- Button press of wake-word activated including on-board voice activity detection
- Flexible software platform with powerful new IDE support
- Designed to support aptX Adaptive, backward compatible with aptX and aptX HD
- Designed to support Qualcomm TrueWireless Stereo and Qualcomm TrueWireless Mirroring
- Integrated battery charger supporting internal mode (up to 200 mA) and external mode (up to 1.8 A)

1 Quad-core processing is available on QCC521, QCC526 and QCC527 variants

2 Integrated PSRAM on QCC526 only; QCC527 supports external PSRAM

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 (QCC512x)
- 112KB program RAM, 448KB data RAM (QCC514x)

Interfaces
- UART, 2x Bit Serializers (I2C/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)

QCC5100 Target Applications

- Bluetooth Earbuds
- Bluetooth Headphones
- Bluetooth Headsets
- Bluetooth Hearables
- Bluetooth Portable Speakers