



## Qualcomm® BlueCore™ Audio Platform

# CSR8645

### Bluetooth dual-mode ROM audio System on Chip (SoC)

**The CSR8645 dual-mode ROM audio SoC is designed to offer extensive voice and music capabilities in a ROM-based package, including aptX and cVc, making it ideal for a variety of wireless audio products with support for voice and music.**

The CSR8645 is part of the CSR86xx portfolio, a range of silicon platforms for wireless audio applications which integrate a dual-mode Bluetooth radio, a low power DSP, an application processor, a battery charger, memory and various audio and hardware interfaces into a single-chip solution.

Developed for entry-level to mid-range wireless audio devices, the CSR8645 SoC supports cVc voice processing technology and aptX codec technology to deliver high quality voice and music capabilities in a cost-efficient ROM-based single-chip package.

The CSR8645 is an easy and cost-effective platform for developing wireless audio products and supports reduced development time. It is an ideal solution for a range of highly differentiated home entertainment and wearable audio products including stereo headphones, speakers, speakerphones, headsets and hands-free devices.

## Integrated Bluetooth® audio ROM platform with Qualcomm® aptX™ and Qualcomm® cVc™ audio technology

### Solution Highlights



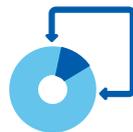
#### High performance audio with aptX technology

aptX audio technology supports high-quality wireless audio, bringing pro-audio quality to consumer electronic devices.



#### Integrated single-chip solution for smaller designs

Application processor, Bluetooth and Bluetooth low energy radios, DSP and memory integrated into a single SoC helps reduce system complexity and eBOM while supporting small form factor designs.



#### No software development required

Pre-loaded Bluetooth and audio applications support development of end-products without writing code, while customization tools support quick modification of device behavior and user interface.



#### cVc 6th generation 2-mic audio technology

cVc technology is a suite of algorithms designed to work on the transmit and receive path of voice calls to deliver optimum voice quality on various Bluetooth headsets, handsets and hands-free devices.

## Bluetooth Audio Applications



Speakerphones



Stereo Speakers



Stereo Headphones



Stereo Headsets



Earbuds



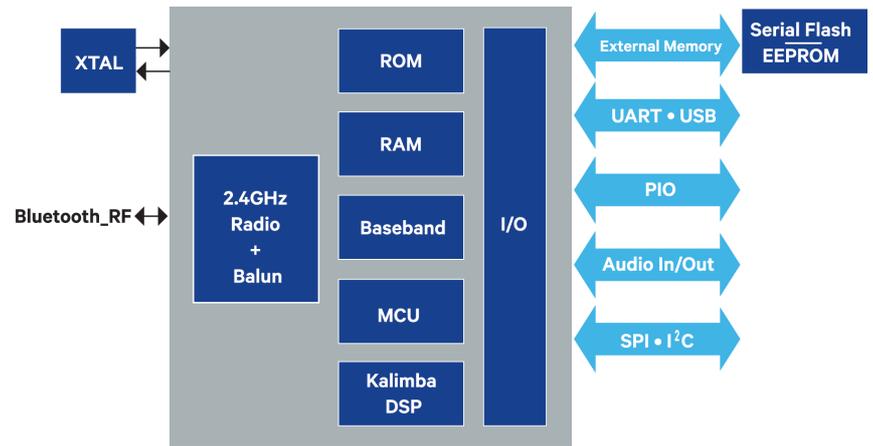
Soundbars

## Features

- Bluetooth 4.0 specification compliant
- Flexible ROM-based platform with fully configurable MMI and tool chain
- Support for various profiles including: HFP 1.6, A2DP 1.2 AVRCP 1.4
- 80MHz Qualcomm® Kalimba™ DSP with integrated multipoint A2DP and HFP audio applications
- 2-mic cVc 6th Generation voice processing technology with wideband speech
- Audio tuning suite with audio enhancements and 5-band EQs
- Internal ROM, serial flash memory and EEPROM interfaces
- aptX, MP3, AAC and SBC audio codecs
- GAIA V1 and associated Android and iOS apps for connectivity with mobile devices
- Reference speaker and headset applications pre-loaded on the ROM
- Fast charging support up to 200mA with no external components
- Pin compatible with CSR8640

Product	Part Number
CSR8645 BGA	CSR8645A03-IBBC-R
CSR8645 BGA Dev Kit	DK-8645-10064-1A
CSR8645 BGA Dev Board	DB-8645-10067-1A

## CSR8645 Block Diagram



## CSR8645 Specifications

<b>Bluetooth</b>	Integrated dual-mode radio and balun (50 Ω) -92dBm (typical) receiver sensitivity; +9dBm transmitter power Bluetooth v4.0 firmware
<b>MCU</b>	80MHz non-programmable RISC processor for application code and user interface
<b>Audio</b>	Integrated non-programmable 24-bit fixed-point 80MHz Kalimba DSP
<b>Battery Support &amp; Power Management</b>	Li-Ion battery charger with support up to 200mA 2x high-efficiency switch-mode regulators with 1.8V & 1.35V outputs from battery supply
<b>Audio Interfaces</b>	Stereo 16-bit ADC; up to 48kHz sampling frequency Stereo 16-bit DAC; up to 96kHz sampling frequency Microphone inputs: up to 2x analog or digital (MEMS)
<b>Physical Interfaces</b>	I <sup>2</sup> S and PCM interfaces Up to 22x GPIOs, USB2.0, I <sup>2</sup> C, SPI, UART 3x hardware LED controllers
<b>Memory</b>	Integrated ROM memory 56kB system MCU RAM 64k x 24-bit data & 12k x 32-bit program memory dedicated to DSP
<b>Packaging</b>	5.5 x 5.5 x 1mm, 0.5mm pitch 68-ball VFBGA

Qualcomm Kalimba is a product of Qualcomm Technologies International, Ltd.

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