



# Qualcomm® CSR8645 Bluetooth Audio Platform

## Integrated Bluetooth® audio ROM platform with Qualcomm® aptX™ Audio & Qualcomm® cVc™ Noise Cancellation Technology

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.

## 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 allow manufacturers to develop end-products without writing code, while customization tools support quick modification of device behaviour 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 Bluetooth headsets, handsets, hands-free devices, and automotive.





## Bluetooth Audio ROM Applications

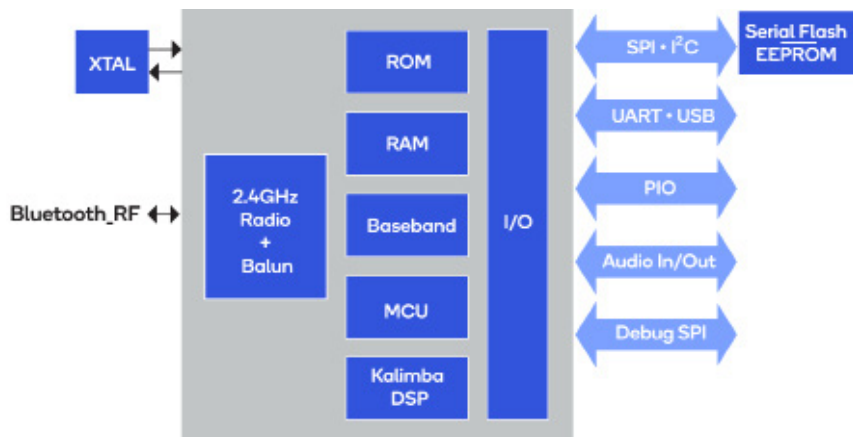
- Speakerphones
- Stereo Speakers
- Stereo Headphones
- Stereo Headsets
- Wireless Earbuds
- Soundbars



## 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

## 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

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

To learn more visit: [qualcomm.com](http://qualcomm.com)

Qualcomm Kalimba, CSR8640 and GAIA are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

©2018 Qualcomm Technologies International, Ltd. All Rights Reserved. Qualcomm is a trademark of Qualcomm Incorporated, registered in the United States and other countries. aptX, cVc and Kalimba are trademarks of Qualcomm Technologies International, Ltd., registered in the United States and other countries. The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Qualcomm Technologies International, Ltd. is under license. Other products and brand names may be trademarks or registered trademarks of their respective owners. 0518A

