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.
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 Specifications

**Bluetooth**

Integrated dual-mode radio and balun (50 Ω)
-92dBm (typical) receiver sensitivity; +9dBm transmitter power
Bluetooth v4.0 firmware

**MCU**

80MHz non-programmable RISC processor for application code and user interface

**Audio**

Integrated non-programmable 24-bit fixed-point
80MHz Qualcomm® Kalimba DSP

**Battery Support & Power Management**

Li-Ion battery charger with support up to 200mA
2x high-efficiency switch-mode regulators with
1.8V & 1.35V outputs from battery supply

**Audio Interfaces**

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)

**Physical Interfaces**

I²S and PCM interfaces
Up to 22x GPIOs, USB2.0, FC, SPI, UART
3x hardware LED controllers

**Memory**

Integrated ROM memory
56kB system MCU RAM
64k x 24-bit data & 12k x 32-bit program memory dedicated to DSP

**Packaging**

5.5 x 5.5 x 1mm, 0.5mm pitch 68-ball VFBGA

## CSR8645 Block Diagram

![CSR8645 Block Diagram](image)

## Bluetooth Audio ROM Applications

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

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