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 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.
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 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, I²C, 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

To learn more visit: qualcomm.com or developer.qualcomm.com

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