Qualcomm

Qualcomm® CSR8640 Bluetooth Audio SoC

Bluetooth® audio ROM platform with Qualcomm® cVc™ Noise Cancellation Technology for entry level to mid-range audio devices.

The CSR8640 dual-mode ROM audio SoC offers various capabilities found in the CSR8670 SoC, including cVc noise cancellation technology in a ROM-based package, ideal for entry-level to mid-range wireless audio products with support for voice and music.

The CSR8640 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 CSR8640 supports Bluetooth Advanced Audio Distribution Profile (A2DP) decoding and cVc audio processing technology to deliver high quality voice and music capabilities in a cost-efficient ROM-based single-chip package. The battery charger architecture enables the CSR8640 BGA to operate independently from the charger supply, ensuring dependable operation for all battery conditions.

The CSR8640 is an easy and cost-effective platform for developing wireless audio products and supports reduced development time. It is ideal for stereo headphones, speakers, speakerphones and headsets.

Solution Highlights

Ideal for entry-level to mid-range wireless audio products

The CSR8640 SoC has a reduced feature set supporting the essential features expected from Bluetooth audio products while providing cost efficiency for entry-level products.

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.

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Bluetooth Audio ROM Applications

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

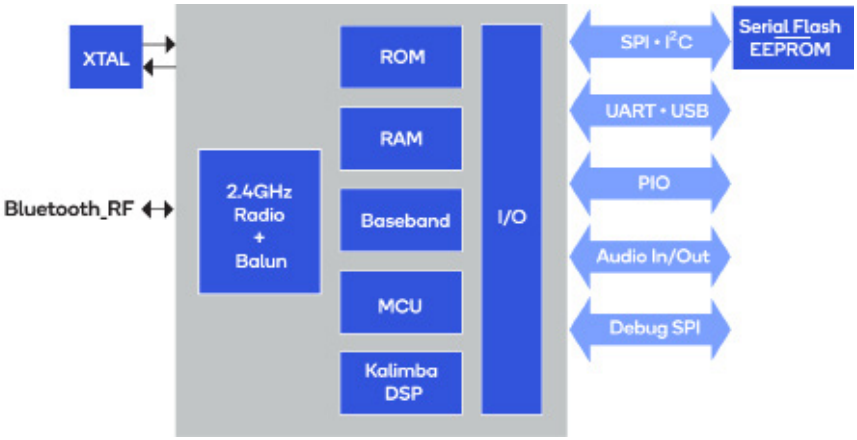
Bluetooth

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 EEPOM interfaces
- 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 CSR8645

Product	Part Number
CSR8640 BGA	CSR8640A04-IBBC-R
CSR8640 BGA Dev Kit	DK-8640-10061-2A
CSR8640 BGA Dev Board	DB-8640-10085-1A

CSR8640 Block Diagram



CSR8640 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

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