

Qualcomm

Qualcomm® CSRA68105 Bluetooth Audio SoC

High-performance, single-chip Bluetooth® audio SoC, designed for premium wireless speaker and headphone applications.

The CSRA68105 audio System-on-Chip (SoC) is designed and optimized to support innovation and features differentiation in premium Bluetooth speakers – including voice-enabled Bluetooth speakers and Real Time Operating System (RTOS) smart speakers and headphones.

This highly integrated SoC is engineered to include a comprehensive selection of connectivity, system processing, audio processing and power management resources. Designed to support OEMs in their development of products with superior audio quality, voice control, far-field echo cancellation, sensor processing and audio post processing, it raises the bar in terms of digital signal processor (DSP) processing power and advanced features on a single-chip platform.

Dual 240MHz Qualcomm® Kalimba™ audio DSPs, and Qualcomm® Kymera™ audio framework offer four times more DSP processing power than its predecessor, CSR8675. This eliminates the need for external audio processing previously required to support premium features such as far-field voice processing and advanced musical effects and reduces eBOM.

The CSRA68105 SoC is designed to offer developers freedom to innovate, with a dedicated application processor sub-system, next generation audio development kit (ADK) and enhanced development tools.

Product Highlights

High-performance, single-chip solution for premium audio

A highly integrated SoC designed to support superior sound quality, with a fully qualified dual-mode Bluetooth 5 radio, integrated NFC, multi-processor subsystems, integrated power management and multiple advanced audio interfaces.



Offers 4x more DSP processing power than our CSR8675 premium SoC

Dual 240MHz Kalimba audio DSPs include a new ability for the DSP to dynamically reconfigure at runtime, and eliminate the need for external audio processing.



Flash-programmable memory for more flexibility

A dedicated 120MHz 32-bit OEM application processor is designed to provide programming resources and freedom for developing proprietary features.



Next gen ADK software designed to support ease of development

CSRA68105 comes with the next generation ADK 6 and features a comprehensive suite of software tools designed to support the development of audio applications and the configuration of sophisticated audio processing chains. ADK 6 includes a SIG-qualified Bluetooth stack, helping to reduce end-product development time, and improve ease of customisation.



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Bluetooth Audio Applications

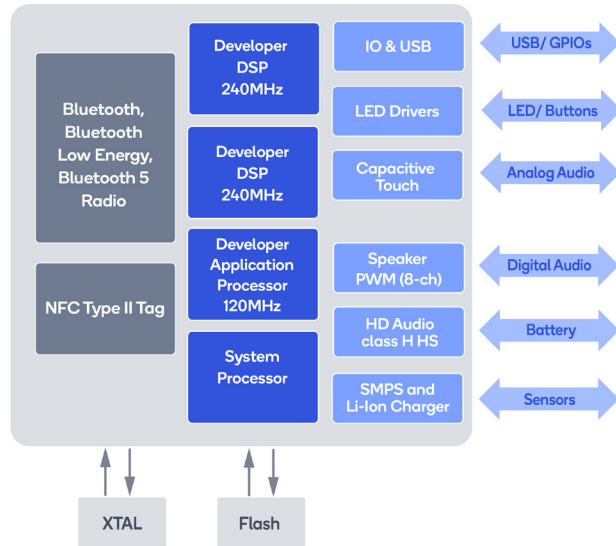
- Voice-enabled Bluetooth Speakers
- RTOS Smart Speakers
- Premium Bluetooth Wireless Speakers
- Premium Wireless Headphones
- Premium Audio Accessories and Adapters



Features

- **Powerful quad-core processor architecture**
 - Dedicated 120MHz 32-bit processor application subsystem
 - Dual-core 240MHz Kalimba DSP Audio subsystem
 - DSPs support downloadable capabilities from RAM/QSPI and pre-installed library functions from ROM
 - Further system processor with embedded Bluetooth protocol stack
 - Embedded ROM + RAM and external QSPI Flash
- **Variety of high definition audio interfaces**
 - 2-ch 24-bit 109dBA line outputs
 - 2-ch 24-bit 100dBA line inputs
 - 2-ch 24-bit 96dBA class-H ground referenced headphone driver
 - 8-ch 108dBA PWM speaker outputs
 - 4x 384kHz 24-bit I²S
 - 4x 96kHz 24-bit SPDIF interfaces
- **Integrated Bluetooth 5 and NFC tag radios**
 - Dual-mode Bluetooth BR/EDR and Bluetooth Low Energy
- **Pin-to-pin compatible with CSRA68100**
- **Advanced power management with integrated SMPS & Li-Ion battery charger with USB type-C charger support**
- **Rich array of interfaces including LED drivers and capacitive touch**

CSRA68105 Block Diagram



CSRA68105 Specifications

Bluetooth	Integrated dual-mode radio and balun (50 Ω) Up to -91 dBm receiver sensitivity, +1.5dBm transmit power Bluetooth v5.0, Bluetooth Class 1 or 2 support
NFC	Integrated NFC Radio w/ NFC Forum static handover for Bluetooth NFC Forum Tag Type 2 emulation, Peer-to-Peer Listener mode
Applications Subsystem	32-bit 120MHz programmable developer processor dedicated to customer applications 32-bit 120MHz firmware processor for system
Audio Subsystem	2x programmable 32-bit fixed-point 240MHz Kalimba DSPs, 192KB program RAM at 240MHz, 512KB data RAM
Battery Support & Power Management	Integrated Li-Ion battery charger supporting up to 200mA for internal mode and up to 1.8 A in external mode
Audio Interfaces	2x high-quality line level ADCs, 2x low-power ADCs with microphone pre-amp & bias, Up to 8x digital microphones, 2x high-quality line level DACs, 2x low-power headphone drivers, SPDIF 4x input, 4x output, 4x I ² S up to 192kHz
Physical Interfaces	UART, BitSerialiser SPI & I ² C, USB Host & USB Device. SDIO v3.0, 63x PIOs, 8x LEDs with PWM, 13 XIO, Capacitive Touch, 12-bit ADC, 10-bit DAC Supporting external QSPI Flash parts up to 256 Mb
Packaging	213-ball 10 x 8 x 1.2mm, 0.5mm pitch TFBGA

Ordering Information

Product	Part Number
CSRA68105 Dev Kit	DK-CSRA68105-TFBGA213-A-0
CSRA68105 Module	DB-CSRA68105-TFBGA213-A-0
CDA Base Board & Ancillaries Kit	DK-CDA-BASE-BOARD-A-0
TRBI200 Debugger	DK-TRBI200-CE684-1

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