



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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Features

- Bluetooth® v3.0 specification fully qualified software
- Bluetooth v4.0 specification compliant hardware
- Radio includes integrated balun and RF performance of 10dBm transmit power and -90dBm receive sensitivity
- 80MHz RISC MCU and 80MIPS Kalimba DSP
- 16Mb internal flash memory (64-bit wide, 45ns); optional support for 64Mb of external SPI flash
- Stereo codec with 2 channels of ADC and up to 6 microphone inputs (includes bias generators and digital microphone support)
- Support for CSR's latest CVC technology for narrow-band and wideband voice connections including wind noise reduction
- Audio interfaces: I²S, PCM and SPDIF
- Serial interfaces: UART, USB 2.0 full-speed, master and slave bit-serialiser (I²C and SPI)
- Integrated dual switch-mode regulators, linear regulators and battery charger
- 3 hardware LED controllers (for RGB) and ability to drive LCD segment display directly
- Support for up to 6 capacitive touch sensor inputs
- 6.5 x 6.5 x 1mm, 0.5mm pitch 112-ball VFBGA
- Green (RoHS compliant and no antimony or halogenated flame retardants)

General Description

The BlueCore® CSR8670™ BGA consumer audio platform for wired and wireless applications integrates an ultra-low-power DSP and application processor with embedded flash memory, a high-performance stereo codec, a power management subsystem, LED and LCD drivers and capacitive touch sensor inputs in a SOC IC. The dual-core architecture with flash memory enables manufacturers to easily differentiate their products with new features without extending development cycles.

CSR's popular BlueCore5-Multimedia® platform is software-portable to the BlueCore® CSR8670™ BGA, with easy migration of a broad range of solutions from CSR's eXtension partners. This migration enables rapid time-to-market deployment of a broad range of consumer electronics products.

The enhanced Kalimba DSP coprocessor with 80MIPS supports enhanced audio and DSP applications.

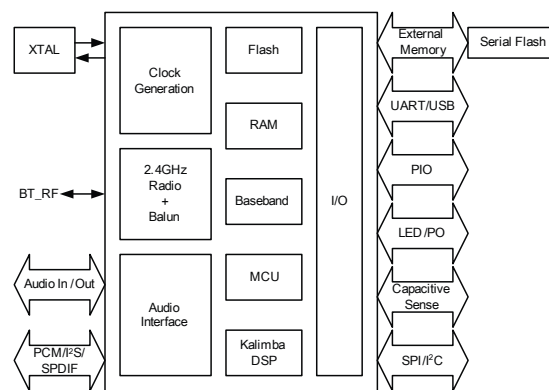
BlueCore® CSR8670™ BGA

Low-power Solution for DSP Intensive Audio Applications

Advance Information

CSR8670C

Issue 3



Applications

Home Entertainment Ecosystem

- TVs
- Smart remote controllers
- Wired or wireless soundbars
- Wired or wireless speakers and headphones

Tablets / PCs / Mobile Connectivity

- Wearable audio (on-the-go)
- Wearable audio with sensors (health and well-being applications)
- Wired or wireless stereo headphones for music/gaming/multimedia content
- Wired or wireless speakers
- Wired or wireless speakerphones
- Mono headsets for voice

The audio codec supports 2 ADC channels, up to 6 microphone inputs, stereo output and a variety of audio standards.

See *CSR Glossary* at www.csrsupport.com.



1 Device Details

Bluetooth Radio

- On-chip balun (50Ω impedance in TX and RX modes)
- No external trimming is required in production
- Bluetooth v3.0 specification compliant

Bluetooth Transmitter

- 10dBm RF transmit power with level control from on-chip 6-bit DAC over a dynamic range >30dB
- Class 1, Class 2 and Class 3 support without the need for an external power amplifier or TX/RX switch

Bluetooth Receiver

- Receiver sensitivity of -90dBm
- Integrated channel filters
- Digital demodulator for improved sensitivity and co-channel rejection
- Real-time digitised RSSI available to application
- Fast AGC for enhanced dynamic range
- Channel classification for AFH

Bluetooth Synthesiser

- Fully integrated synthesiser requires no external VCO, varactor diode, resonator or loop filter
- Compatible with crystals 19.2MHz to 42MHz or an external clock 19.2MHz to 42MHz
- Accepts 19.2, 19.44, 19.68, 19.8 and 38.4MHz TCXO frequencies for GSM and CDMA devices with sinusoidal or logic level signals

Kalimba DSP

- Enhanced Kalimba DSP coprocessor, 80MIPS, 24-bit fixed point core
- 2 single-cycle MACs; 24 x 24-bit multiply and 56-bit accumulator
- 32-bit instruction word, dual 24-bit data memory
- 12K x 32-bit program RAM including 1K instruction cache for executing out of internal flash
- 32K x 24-bit + 32K x 24-bit 2-bank data RAM

Audio Interfaces

- Audio codec with 2 high-quality dedicated ADCs
- 2 microphone bias generators and up to 2 analogue microphone inputs
- Up to 6 digital microphone (MEMS) inputs
- G.722 compatible, includes improved digital FIR filter path for stop-band attenuation required for G.722 compliance
- Enhanced side-tone gain control
- Supported sample rates of 8, 11.025, 16, 22.05, 32, 44.1, 48 and 96kHz (DAC only)

Baseband and Software

- 16Mb internal flash
- Memory protection unit supporting accelerated VM
- 56KB internal RAM, enables full-speed data transfer, mixed voice/data and full piconet support
- Logic for forward error correction, header error control, access code correlation, CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping
- Transcoders for A-law, μ -law and linear voice via PCM and A-law, μ -law and CVSD voice over air

Physical Interfaces

- UART interface
- USB 2.0 interface (full-speed)
- Master and slave bit-serialiser (I²C and SPI)
- Up to 29 PIOs, i.e. 14 general purpose PIOs and unused digital interfaces are available as PIOs
- SPI debug and programming interface with read access disable locking
- PCM, I²S and SPDIF interfaces
- Dual/quad external serial flash memory interface
- 3 LED drivers (includes RGB) with PWM flasher on sleep clock
- Support for up to 6 capacitive touch sensor inputs

Integrated Power Control and Regulation

- 2 high-efficiency switch-mode regulators with 1.8V and 1.35V outputs from battery supply
- 3.3V USB pad supply linear regulator
- Low-voltage linear regulator for internal digital supply with 0.80V to 1.25V output
- Low-voltage linear regulator for internal analogue supply with 1.35V output
- Power-on-reset detects low supply voltage
- Power management includes digital shutdown and wake-up commands with an integrated low-power oscillator for ultra-low power Park/Sniff/Hold mode

Battery Charger

- Lithium ion / Lithium polymer battery charger with instant-on
- Fast charging support up to 200mA with no external components
- Higher charge currents using external pass device
- Supports USB charge enumeration
- Charger pre-calibrated by CSR
- PSE compliance:
 - Design to JIS-C 8712/8714 (batteries)
 - Testing based on IEEE 1725

Auxiliary Features

- Customer application space available
- Crystal oscillator with built-in digital trimming
- Clock request output to control external clock
- Auxiliary ADC and DAC available to applications

Package Option

- 6.5 x 6.5 x 1mm, 0.5mm pitch 112-ball VFBGA



2 Ordering Information

Device	Package			Order Number
	Type	Size	Shipment Method	
CSR8670C	VFBGA 112-ball (Pb free)	6.5 x 6.5 x 1mm 0.5mm pitch	Tape and reel	CSR8670C-IBBH-R

Note:

Minimum order quantity is 2kpcs taped and reeled.

Supply chain: CSR's manufacturing policy is to multisource volume products. For further details, contact your local sales account manager or representative.

To contact a CSR representative, email sales@csr.com or go to www.csr.com/contacts.

2.1 CSR8670C Development Kit Ordering Information

Description	Order Number
CSR8670C Audio Development Kit	DK-8670-10060-1A

Document History

Revision	Date	Change Reason
1	19 MAY 10	Original publication of this document.
2	25 MAY 10	Editorial changes.
3	01 JUL 11	Production Information. If you have any comments about this document, email comments@csr.com giving number, title and section with your feedback.

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