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Features

BlueCore® CSR8811™ A06 0.4mm WLCSP

- Dual-mode Bluetooth®/Bluetooth low energy radio
- Fully qualified Bluetooth v4.0 IC
- Can form part of Bluetooth v4.0 + HS system
- Class 1 or Class 2 Bluetooth power levels
- High-sensitivity Bluetooth and Bluetooth low energy receiver
- Full-speed Bluetooth operation with full piconet and scatternet support
- On-chip balun and minimal BOM
- Low-power selectable 1.2 to 3.6V I/O
- Integrated I/O and core regulators
- High-speed UART port (up to 4Mbps)
- Two PCM/I^{2}S digital audio interfaces
- Support for IEEE 802.11 coexistence
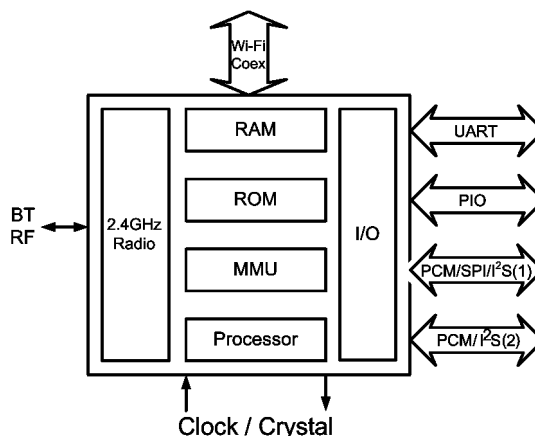- Green (RoHS and no antimony or halogenated flame retardants)

Bluetooth v4.0
Bluetooth low energy
Advance Information
CSR8811A06-ICYR-R
Issue 1

General Description

The CSR8811™ is a product from CSR's Connectivity Centre. It is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems including EDR to 3Mbits/s and Bluetooth low energy.

CSR8811's dual-mode radio enables it to connect to the billions of Bluetooth products already on the market, as well as a new generation of Bluetooth low energy devices.

Bluetooth low energy allows mobile devices to exchange simple data sets with very low consumption. Example use cases include watches, medical sensors and fitness trainers that can operate for many years from a small coin cell battery. CSR8811 brings Bluetooth low energy to the mobile phone, allowing it to connect to this new class of devices.

CSR8811 is pin-compatible with future CSR chips that will add support for:

- Wideband speech
- On-chip SBC or aptX encoding for streaming stereo audio with A2DP

It is also pin-compatible with the CSR8810 Bluetooth v3.0 IC. This makes it easy to upgrade products to the latest Bluetooth features without changing PCB design.

When used with CSR Synergy Software™ and a CSR UniFi ® wireless chip, CSR8811 provides a system fully qualifiable to the Bluetooth v4.0 + HS system for faster file transfer.

Applications

- Low-cost phones
- Feature phones
- Smartphones

This family of Bluetooth products that include:

- CSR8311™ A06 for automotive applications
- CSR8510™ A06 for PCs and USB dongles

Products requiring a standalone Bluetooth low energy radio should use CSR1000 or CSR1001 ICs.

CSR designed CSR8811 to reduce PCB area and the number of external components:

- The high-power Class 1 Bluetooth transmitter removes the requirement for external amplification.
- The balun is integrated, which results in a single-ended 50Ω port that does not require additional matching components.
- Integrated LDOs, with minimum decoupling components, allow the chip to be operated directly from the battery or a regulated supply.
- No requirement for external inductors.

This ensures that production costs are minimised.

The device incorporates auto-calibration and BIST routines to simplify development, type approval and production test.

To improve the performance of both Bluetooth and IEEE 802.11b/g/n co-located systems a wide range of coexistence features are supported.

CSR8811 A06 0.4mm pitch WLCSP Technical Overview

1   Device Details

Bluetooth low energy

- Dual mode Bluetooth low energy radio
- Supports simultaneous Bluetooth BR/EDR and multiple low energy connections
- Support for on-chip AES encryption
- Adaptive Bluetooth/Bluetooth low energy scheduler
- On-chip whitelist support

Bluetooth Radio

- On-chip balun (50Ω impedance in TX and RX modes)
- No external trimming is required in production
- Bluetooth v4.0 specification compliant

Bluetooth Transmitter

- Class 1, Class 2 and Class 3 support without need for external power amplifier or TX/RX switch
- DQPSK and 8DPSK

Bluetooth Receiver

- Integrated channel filters
- Digital demodulator for improved sensitivity and co-channel rejection
- Real time digitised RSSI available on HCI interface
- Fast AGC for enhanced dynamic range
- Channel classification for AFH
- DQPSK and 8DPSK

Baseband and Software

- Internal RAM allows full-speed data transfer, mixed voice and data, and full piconet operation, including all medium rate packet types
- Logic for forward error correction, header error control, access code correlation, CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping. Includes support for eSCO and AFH
- Transcoders for A-law, μ-law and linear voice from host and A-law, μ-law and CVSD voice over air

Bluetooth Stack

- CSR's Bluetooth Protocol Stack runs on the on-chip MCU in the configuration Standard HCI over UART

Synthesiser

- Fully integrated synthesiser requires no external VCO varactor diode, resonator or loop filter
- Compatible with external clock 19.2MHz to 40MHz
- Can be operated from external crystal

Physical Interfaces

- UART interface with programmable baud rate up to 4Mbits/s
- BCSP, H4, H4DS and H5 support
- 2 PCM/I^{2}S interfaces
- Synchronous serial interface up to 4Mbits/s for system debugging

Auxiliary Features

- Power management includes digital shutdown, and wake up commands with an integrated low power oscillator for ultra low power Park/Sniff/Hold mode
- Auto Baud Rate setting, depending on host interface
- On-chip linear regulators:
  - 1.8V output from typical 2.5 to 4.8V (5.5V for short periods) input (load current 100mA)
  - Low dropout linear regulators producing internal supply voltages from 1.8V, and allowing operation directly from a battery
- Power-on-reset cell detects low supply voltage
- Arbitrary sequencing of power supplies is permitted

Package

- 41-ball 2.57 x 3.21 x 0.6mm, 0.4mm pitch WLCSP

2   Ordering Information

Interface Version	Package			Order Number
	Type	**Size**	**Shipment Method**	
UART	WLCSP 41-ball Green	2.57 x 3.21 x 0.6mm, 0.4mm pitch	Tape and reel	CSR8811A06-ICYR-R

Note:

At **Production** status 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, send e-mail to sales@csr.com or go to www.csr.com/contacts.htm.

Document History

Revision	Date	Change Reason
b	16 MAY 11	Original publication of this document. If you have any comments about this document, email comments@csr.com giving number, title and section with your feedback.

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