CSR

BlueCore® CSR8811 WLCSP

Features

- Fully qualified Bluetooth® v4.1 system
- Full-speed Bluetooth operation with full piconet and scatternet support
- Class 1 Bluetooth power level supported
- High-sensitivity Bluetooth receiver
- On-chip SBC encoding
- On-chip balun
- Low-power selectable 1.2 to 3.6V I/O
- Integrated I/O and core regulators
- High-speed UART port (up to 4Mbps)
- PCM/I^{2}S digital audio interface
- Support for IEEE 802.11 coexistence
- HFP v1.6 wide-band speech supported on-chip
- Optimised for use on low-cost PCBs
- 28-ball 2.57 x 3.21 x 0.6mm 0.5mm pitch WLCSP
- Green (RoHS compliant and no antimony or halogenated flame retardants)

Bluetooth® v4.1 Specification
Bluetooth Smart Ready

CSR8811A12

Production Information

Issue 1

General Description

The CSR8811 WLCSP 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 WLCSP'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.

When used with CSR Synergy® Software and a CSR UniFi ® wireless chip, CSR8811 WLCSP provides a system fully qualifiable to the Bluetooth v4.1 for faster file transfer.

This family of Bluetooth products includes:

- CSR8311 A12 for automotive applications

Products requiring a standalone Bluetooth low energy radio should use products of the CSR101x™ family.
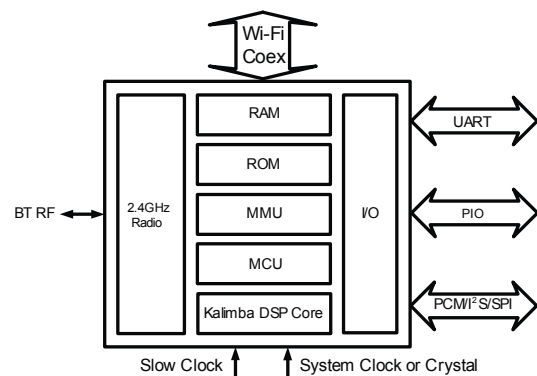
Applications

Consumer electronics devices, for example:

- Portable navigation devices
- Point of sale terminals
- Personal media players

CSR designed CSR8811 WLCSP 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 required, allow the chip to be operated directly from a battery or 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.

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Device Details

Bluetooth low energy

- Dual-mode Bluetooth low energy radio
- Support for Bluetooth basic rate/EDR and Bluetooth low energy connections.
- Support for on-chip AES encryption
- Adaptive Bluetooth/Bluetooth low energy scheduler
- On-chip whitelist support

Bluetooth Radio

- Integrated balun (50Ω impedance in TX and RX modes)
- No external trimming is required in production
- Bluetooth v4.1 specification compliant

Bluetooth Transmitter

- 9dBm (typical) RF transmit power (basic rate) with level control from on-chip DAC
- Class 1, Class 2 and Class 3 support without need for external power amplifier or TX/RX switch
- DQPSK and 8DPSK

Bluetooth Receiver

- -95dBm (typical) π/4 DQPSK sensitivity
- 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 enables 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 up to HCI on the on-chip MCU

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 4Mbps
- BCSP, H4, H4DS and H5 support
- PCM interface/I^{2}S interface
- Synchronous serial interface up to 4Mbps 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
- Integrated 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
- Arbitrary sequencing of power supplies is permitted

Package

- 28-ball 2.57 x 3.21 x 0.6mm, 0.5mm pitch WLCSP

  Note:

   This IC has the same package size as the previous CSR8811 WLCSP 0.5mm pitch versions and the CSR8810 WLCSP 0.5mm pitch ICs.
- Low-cost PCB with no laser via needed

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1   Ordering Information

Device	Package			Order Number
	Type	Size	Shipment Method	
CSR8811 WLCSP	WLCSP-28-ball (Pb free)	2.57 x 3.21 x 0.6mm 0.5mm pitch	Tape and reel	CSR8811A12-ICXR-R

Note:

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

1.1   Contacts

General information   www.csr.com
Information on this product   sales@csr.com
Customer support for this product   www.csrsupport.com
Details of compliance and standards   product.compliance@csr.com
Help with this document   comments@csr.com

Document History

Revision	Date	Change Reason
1	12 MAR 15	Original publication of this document.

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