Device Features

- Fully qualified Bluetooth v2.1 + EDR specification
- Piconet and Scatternet Support
- Best in Class Bluetooth Radio with +10dBm Transmit Power and -90dBm Receive Sensitivity in the QFN Package
- Best in Class Bluetooth Radio with +7dBm Transmit Power and -89dBm Receive Sensitivity in the WLCSP Package
- 16-bit AuriStream (ADPCM) CODEC -90dB SNR for DAC
- Minimum External Components
- Low-Power 1.5V Operation, 1.8V to 3.6V I/O
- Integrated 1.8V and 1.5V Linear Regulators
- UART Port to 4Mbaud
- 6 x 6 x 0.6mm QFN or 3.49 x 3.21 x 0.6mm (max.) WLCSP
- Support for 802.11 Coexistence
- RoHS Compliant

General Description

BlueCore6-ROM is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems including *enhanced data rates* (EDR) to 3Mbits/s.

With the on-chip CSR Bluetooth software stack, it provides a fully compliant Bluetooth system to v2.1 + EDR of the specification for data and voice communications.
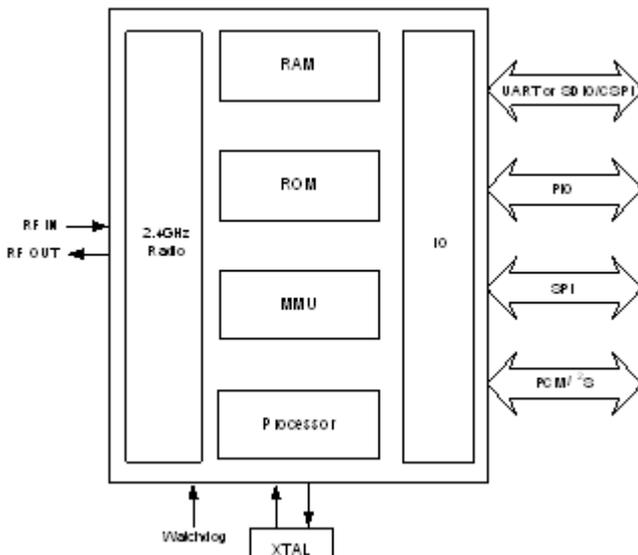
Applications

- Cellular handsets
- Personal Digital Assistants (PDAs)
- Automotive
- Personal Navigation Devices

BlueCore6-ROM has been designed to reduce the number of external components required which ensures production costs are minimised. BlueCore6-ROM includes AuriStream, which offers significant power reduction over the CVSD based system when used at both ends of the link.

The device incorporates auto-calibration and *built-in self-test* (BIST) routines to simplify development, type approval and production test. All hardware and device firmware is fully compliant with the Bluetooth v2.1 + EDR specification (all mandatory features).

Figure: System Architecture

BlueCore™ 6-ROM Product Technical Overview

1 Device Details

Radio

- Common TX/RX terminal simplifies external matching; eliminates external antenna switch
- No external trimming is required in production
- Bluetooth v2.1 + EDR specification compliant

Transmitter

- + 10dBm (QFN package) or +7dBm (WLCSP package) RF transmit power with level control from on-chip 6-bit DAC over a dynamic range >30dB
- Class 1 (QFN only), Class 2 and Class 3 support without the need for an external power amplifier or TX/RX switch

Receiver

- Receiver sensitivity of -90dBm
- 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

Synthesiser

- Fully integrated synthesiser requires no external VCO varactor diode, resonator or loop filter
- Compatible with crystals between 16 and 26MHz or an external clock between 12 and 52MHz

Baseband and Software

- AuriStream (16, 24, 32, 40 kbps) CODEC, which offers significant power reduction over the CVSD based system when used at both ends of the link
-
- Internal 6Mbit ROM
- Internal 48kbyte RAM, allows full speed data transfer, mixed voice and data, and full piconet operation, including all EDR packet types
- Logic for forward error correction, header error control, access code correlation, CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping. Supports all Bluetooth v2.1 + EDR features including eSCO and AFH
- Transcoders for A-law, μ-law and linear voice from host and A-law, μ-law and CVSD voice over air

Auxilliary Features

- Crystal oscillator with built-in digital trimming
- Clock request output to control an external clock
- Device can run in low power modes from an external 32768Hz clock signal
- Power management includes digital shutdown, and wake up commands with an integrated low power oscillator for ultra low power Park/Sniff/Hold mode
- Auto Data Rate setting, subject to host interface in use
- On-chip linear regulators: 1.8V output from 2.7V to 5.5V input to power I/O ring (load current 100mA) and second low dropout linear regulator producing 1.5V core voltage from 1.8V
- Power-on-reset cell detects low supply voltage
- Arbitrary sequencing of power supplies permitted

Physical Interfaces

- SDIO and CSPI
- Synchronous serial interface up to 4Mbaud for system debugging
- UART interface with programmable baud rate up to 4Mbaud with optional bypass mode
- Bi-directional serial programmable audio interface, supporting PCM and I^2S formats

Bluetooth Stack

CSR's Bluetooth Protocol Stack runs on the on-chip MCU in the following configuration:

- Standard HCI over UART

Package Options

- 40 Lead 6 x 6 x 0.6mm, QFN
- 51 Ball 3.49 x 3.21 x 0.6mm (max.), WLCSP

2 Ordering Information

Interface Version	Package			Order Number
	Type	Size	Shipment Method	
UART	40 Lead QFN	6 x 6 x 0.6mm, 0.5mm pitch	Tape and reel	BC63B239A04-IQD-E[a]
	51 Ball WLCSP	3.49 x 3.21 x 0.6mm (max.), 0.4mm		BC63B239A04-IYB-E[b]

[a] Until BC63B239A reaches production, the order number for the QFN package is BC63B239A04-ES-IQD-E

[b] Until BC63B239A reaches production, the order number for the WLCSP package is BC63B239A04-ES-IYB-E

Minimum Order Quantity

2kpcs taped and reeled

2.1 Tape and Reel Information

For tape and reel packing and labelling see *IC Packing and Labelling Specification*.

Document History

Revision	Date	Change Reason
1	04 SEPT 07	Original publication of this document. Based on CS-112431-DSP2 To contact a CSR representative, email sales@csr.com or go to www.csr.com To feedback on this document, email comments@csr.com

BlueCore™ 6-ROM Product Technical Overview