

Bluetooth  
BQB  
Qualified

# BOOST Core™

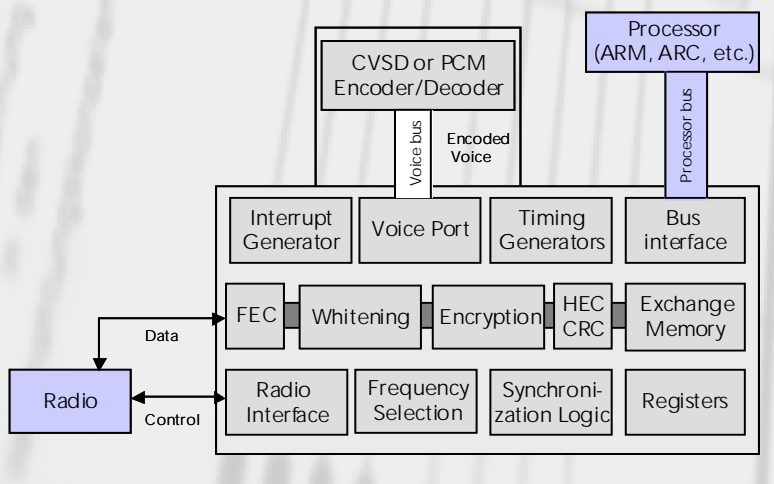
Bluetooth™ baseband processor core for integration into Bluetooth standard ICs and ASICs. Complemented with BOOST Software™ to implement a Bluetooth protocol stack.

## Product Features

- BQB qualified to Bluetooth specification v1.1
- Designed in synthesizable VHDL for easy technology migration
- Low power consumption
- Low operating frequency selectable between 12 and 16 MHz
- Low gate-count
- Optimized interface to BOOST Software™
- Designed for easy integration into an ASIC
- Reusable block to be plugged on fast processor bus
- Supports various radio chips via a selectable interface
- Supports 0 dBm and 20 dBm radio modules
- Direct voice bus from CVSD transcoder (optional for voice applications, 20k gates)
- DFT ready, accepted by major ATPG tools
- Hardware encryption
- Hopping frequency calculation (1600 and 3200 hops/s) for 79- and 23-frequencies schemes
- Bluetooth clock and multiple offsets management for scatternet operation in master and slave devices
- TDMA/TDD frames formatting and synchronization
- Supports Bluetooth low power modes (sniff, hold and park)
- Supports Bluetooth optional and mandatory paging modes
- Supports all packet types:
  - Control packets
  - Voice packets
  - Mixed voice-data packets
  - Single-slot data packets
  - Multi-slot data packets
- Supplied selection of scripts:
  - VHDL Compilation
  - Synthesis
  - Test insertion
- Supplied with test bench suite permitting reverification of core after user edits
- Comprehensive documentation and training
- Turnkey IC design service available on request
- Flexible processor interface (ARM, ARC, etc.)

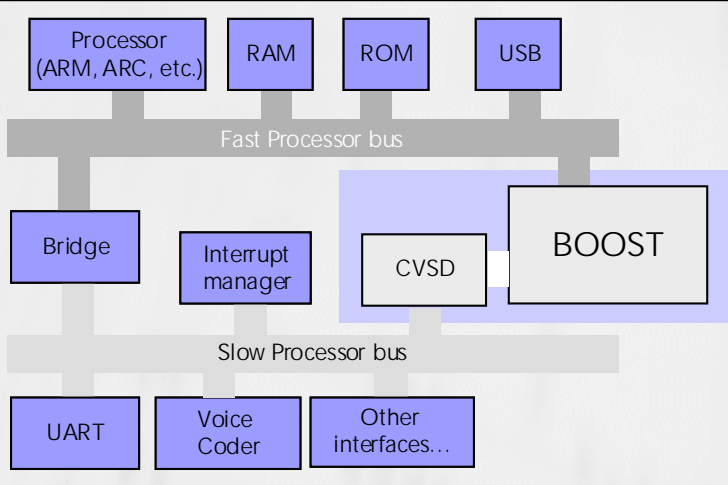
## Integration into a Bluetooth ASIC

The BOOST Core has been designed for integration into an ASIC, as shown in the typical system overleaf. A RAM and a ROM (could also be EPROM, EE-PROM, OTP or Flash memory) are necessary to host the BOOST Software. The CVSD transcoder (available as an option) and a voice coder are necessary to support voice operation. For data applications, it is possible to input a data stream from a UART, proprietary interfaces or a USB interface. However, the complete application can be integrated on-chip and generate a data stream to be transferred via Bluetooth wireless technology.



NewLogic

Intellectual Property for Bluetooth Wireless Technology



## Embedded Exchange Memory

The Exchange Memory is a static RAM embedded inside the BOOST Core containing control structures and data buffers. Its size can be tailored to the application and is typically somewhere between 2 and 12 KByte.

The processor and the core both access the Exchange Memory: a synchronization and prioritization mechanism is implemented to ensure a clean handshaking between the hardware and the software, avoiding any real-time issues.

The Exchange Memory and registers are memory mapped on the core's address range (17-bit addressing range).

## Link with BOOST Software

The BOOST Software has been developed with the BOOST Core in order to optimize the hardware-software interface and fully exploit the performance of the block.

Interrupts are generated at selectable times to synchronize the software processing with the operation of the core. A single line of interrupt is sent to the processor.

## Validation

The BOOST Core and BOOST Software have been validated on development board. This board is available for ASIC prototyping and software development.

## Interfacing to the BOOST Core

The BOOST Core interfaces to a fast processor bus. This bus ensures that data can be moved quickly between the processor and the Exchange Memory embedded into the core. The bus interface has been optimized for the ARM™ processor, but other processors (eg. ARC) are also supported.

A proprietary interface is provided to link the BOOST Core to the CVSD transcoder for voice applications, in order to be able to process a continuous voice stream without the need of processor intervention. In addition PCM format is supported.

Several radio components, from various manufacturers, can be attached to the BOOST Core. A dedicated radio interface is available for each supported radio. The selection is performed at synthesis time and only the necessary logic is therefore implemented. The core interface is fully digital. Some additional A-to-D or D-to-A converters may be required to interface to specific RF modules. These can also be integrated directly on the baseband chip.

The BOOST Core can be used together with the BOOST Radio™, NewLogic's Bluetooth CMOS radio core in order to implement a single chip Bluetooth solution.

## About NewLogic

NewLogic is an independently owned and operated company based in Lustenau, Austria. Founded in 1997, NewLogic provides System-On-Chip (SoC) design services and silicon IP development for leading semiconductor and systems companies. NewLogic's

comprehensive IP portfolio includes embedded non-volatile memory, DSP, mixed signal and RF cores for the communications, automotive and consumer electronics markets.

