Factsheet

Bluetooth® - SI23BTB11

Silicon Cores™

Core to the Intelligent System™

BaseBand Controller

Silicon Interfaces' **Bluetooth is a highly integrated Bluetooth BaseBand controller designed to form the heart of Bluetooth wireless communication systems.**

Bluetooth is an innovative new technology in today's wireless communications market, which will enable the wholesale replacement of many of the short-range cables we use today. The Bluetooth wireless protocol allows for easy communication between all mobile devices, including cell phones, laptops, PDAs, wireless headsets, digital cameras and more. Bluetooth provides fast and secure transmission of data and/or voice within a given range.

The SI23BTB11 Bluetooth Baseband Controller implements the baseband and host controller interface (HCI) of the Bluetooth protocol and is specifically designed to meet the immediate market needs for low-power Bluetooth applications. The on-chip peripherals provide for easy interfacing to a Bluetooth radio and to a host system.

The core enables system-on-a-chip (SoC) developers to incorporate Bluetooth wireless technology in an ASIC or ASSP with low risk and fast time to market. SoC designers can have access to a verified building block to quickly design unique solutions that provide a competitive edge for today's marketplace.

Figure below shows the functional block diagram of the Bluetooth BaseBand controller core, along with key interfaces of the core design. The core is attached to an on-chip processor through an AMBA-based bus interface. A fully digital radio interface provides connectivity to Bluetooth radio products.

Product Specifications

- ♦ Fully synthesizable Register Transfer Level (RTL) Verilog HDL core.
- ♦ Test Bench Environment: Verilog
- ♦ Targeted to Xilinx Spartan II.
- ♦ Clock Frequency: 24 MHz for FPGA (Standard: 8 MHz)

Options:

(May be separately priced)

Adaptations:

√ Bluetooth RF Radio Interface Possible.

√ Bluetooth Version 2.0.

Add-ons:

√ NIL.

Product Highlights

- ☑ Fully compliant with Bluetooth Specifications Ver 1.1 as specified by Special Interest Group (SIG).
- ☑ Compliance to Test Suites as provided Standard Sample Test from Bluetooth Qualification Body (BQB).
- ☑ Reduced Area by logical sharing thereby Low Power Consumption.
- ☑ Time Division Duplex (TDD).
- ☑ 32-bit AMBA Advanced Peripheral Bus (APB).
- ☑ Perfectly suitable for SOC verification.
- ☑ 4 Kbits Buffer on Host Side.
- ☑ Piconet/Scatternet functions with multi-slot packets.
- ☑ Supports Asynchronous Connectionless Link (ACL) i.e. Data Channels.
- ☑ Supports Low Power Modes
- ☑ Time critical packet processing.
- ☑ Authentication and Hardware Encryption along with CRC and FEC for error detection and correction.
- ☑ RF Interface compatible to Ericsson Bluetooth Radio.
- ☑ Data Rate 1 MBPS
- ☑ 4 Kbits Buffer on RF Side.
- ☑ Single clock domain throughout the system.

Bluetooth Block Representative Schematic:
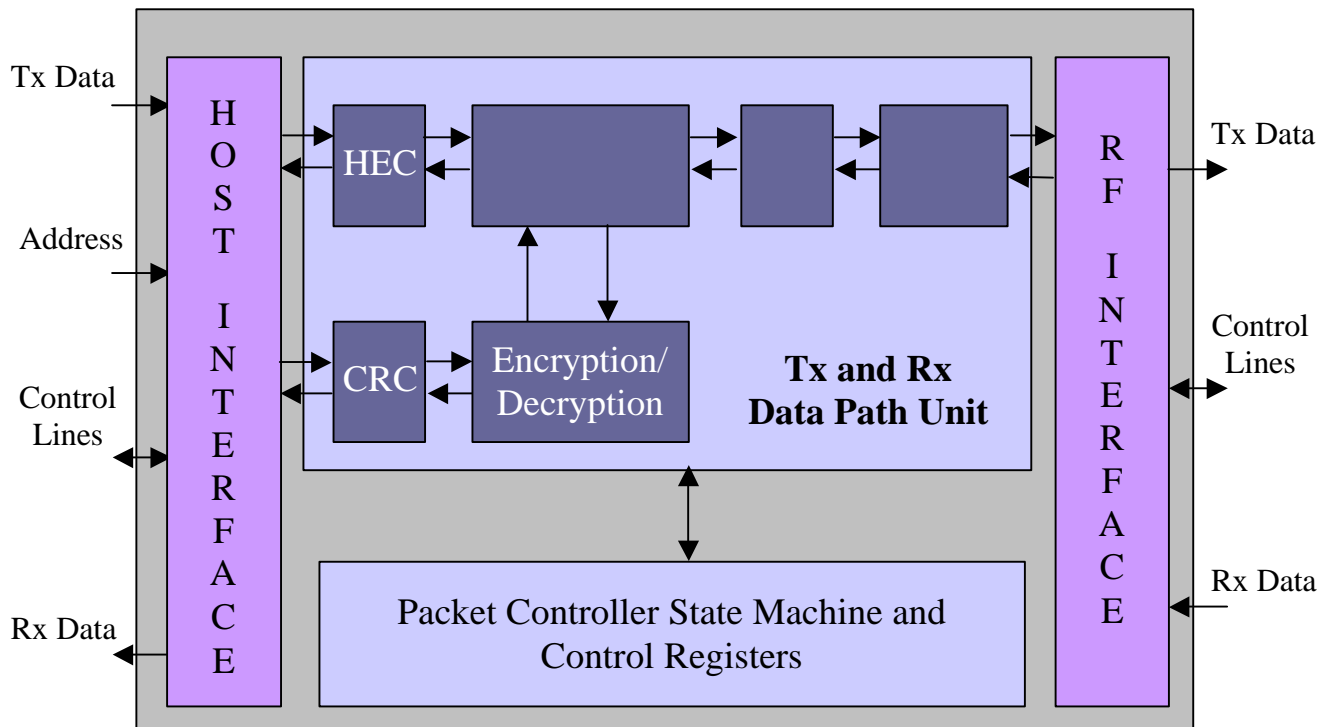
Host Interface: The functionality this block is to interface the BaseBand block with Host side i.e. with LM. The interface is compatible with AMBA. The information data is exchange between Host and BaseBand

Tx and Rx Data Path Unit: The information data is collected from Host Interface for the Packetisation of data.

The process of Packetisation includes the Access Code and Packet Header generation as well as applying error correction, detection and validation schemes on information data.

While reception data packet is received from Radio module, which includes the decoding of Access Code, Packet Header and also performs error correction, detection and validation schemes.

HEC and CRC are used for data validation and FEC is used for error correction and detection.

Encryption: The Encryption block includes the encryption engine, which generates the cipher bit stream. This bit stream is XORed with input stream to produce the encrypted output. Encryption is done for the security purpose.

Packet Controller: The main function of this block is to activate and deactivate the operation of modules inside Data Path block depending upon the Packet Type.

RF Interface: Bluetooth Radio module is interfaces with BaseBand through this block. The RF Interface is fully digital and is used to program the Control Status Register of Radio module.

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