Ensigma Whisper

Bluetooth / Bluetooth Low Energy Baseband IP

Bluetooth and Bluetooth Low Energy up to 5.0

Ensigma™ Explorer is a family of high performance broadcast wireless and connectivity IPs for standards television and audio broadcast, Bluetooth and Wi-Fi. Specifically designed to meet the requirements for markets such as Home Entertainment, personal Computing and Wireless Infrastructure, Ensigma Explorer provides a highly flexible and platform for high performance systems.

Ensigma™ Series4 Radio Processing Units implements all of the connectivity and broadcast reception requirements of tomorrow's complex SoCs. With more than thirty different deployable standards available today, they are the world's most comprehensive baseband solution for integration into SoCs and advanced chipsets. Series4 RPUs are offered in a wide spectrum of performance capabilities, ranging from MIMO-capable multi-stream cores featuring dynamic support for mixed simultaneous standards to single-steam configurations that can replace multiple hardwired cores.

Built using the fourth generation of Imagination's highly successful programmable radio technology, Ensigma Series4 RPUs bring truly multi-standard basebands to consumer- class products. RPU technology uniquely combines fully programmable modulation and coding processors with multi-standard hardware accelerators and a multi-stream DMA fabric to yield a power and area optimized multi-standard baseband solution. The hardware accelerators implement structures less suited to software such as signal down-conversion and advanced error correction, and are themselves reused between standards.

The RPU has an embedded low power 32 bit MIPS® processor and it implements high level control APIs, removes system dependencies and performs tasks, such as the Wi-Fi MAC, that might otherwise have been implemented on less power-efficient application processors. Several different MIPS processor configurations may be embedded within the RPU, giving additional scalability.

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Features

- Support for BT and BLE modes (up to BLE 5.0)
- Flexible Baseband and RF interfaces
- Industry-leading performance
- Ultra-low power
- Small die area
- Patchable ROM based firmware

Benefits

- Complete Baseband IP solution
- End to End Solution when paired with Imagination's BT/BLE RF IP
- Silicon proven solution that minimises risk and reduces time-to-market
- Easy integration into an SoC

Applications

- Digital TV and set-top boxes
- Tablets/smartphones
- Connected consumer products
- IoT

Bluetooth Standards Support

BT Classic	Basic Data Rate (BR)/Enhanced Data Rate(EDR)
BT Dual Mode	BR + EDR + BLE
BLE Mode	Supports up to BLE 5.0

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General Features

- **Extreme low power:** the system enters low power mode at every opportunity, thus maximising battery life

- **Seamless dual-mode operation:** through optimised baseband resource management

- **Robust WLAN co-existence** with maximal throughput using
  - Imagination Technologies WLAN IP
  - External WLAN IP via the Packet Traffic Arbitration interface

- **Customisable**: both HW and Firmware can be tailored to exactly suit a range of use-cases, thus requiring a minimum of resources whilst maximising performance

- **Choice of suppliers:** the Baseband hardware presents a firmware-configurable interface to the modem and RF/AFE, allowing these items to be sourced separately.

- **Range of SoC layout options:** the Baseband, Modem and RF/AFE components can be integrated into one SoC, or distributed across chip boundaries.

- **Choice of Host interface transport layers:** Shared memory, USB or UART

Classic Features

- GFSK, pi/4-DQPSK, 8DPSK modulation
- BB:
  - AFH Adaptive frequency hopping
  - BR/EDR 1,2 or 3 Mbps
  - ACL, SCO, eSCO
  - EDR ACL, EDR eSCO
  - 1/3/5 slot packets
  - Interlaced scan
  - Sniff sub rating mode
- LMP:
  - Authentication/Encryption (with pause/resume)

- Hold, Sniff and Park modes
- Master/Slave roles in multiple piconets
- RSSI
- Simple pairing
- BR/EDR Secure Connection
- Enhanced power control

LE Features

- GFSK modulation
- LL 4.2
  - Advertising/Scanning/Initiation roles
  - Master/Slave roles
  - Authentication/Encryption (with pause/resume)
  - Frequency hopping
  - LE Data Length Extension
  - Secure Connections
  - LL Privacy
  - LL Extended Scanner Filter Polices
- LL 5.0
  - LE Advertising Packet Length Extension
  - 2Mbps LE PHY
  - LE Long Range

Software

- Works with open source Bluetooth host stack implementations such as BlueZ , Blue Droid
- Partnership with Leading Stack Providers to provide a well proven and optimized solution

BT SIG Certification

- BLE 4.2 Certified

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