

### Overview

DSP Group's DHX91 chipset is a flexible, high-performance and highly-integrated system on a chip (SoC) for Ultra Low Energy (ULE) DECT wireless communication, ideal for Smart Home and Smart Energy Applications such as home automation, security, monitoring, metering, healthcare and others. Combining unique DECT ULE features with high level of integration and optimized connectivity to various types of sensors, as well as state of the art RF, the DHX91 is the most cost-optimized solution for Home Area Network (HAN) applications.

The DHX91 chipset includes all required functionalities of a digital baseband controller, ultra low energy module, hibernation mode, various peripherals, RF transceiver and audio and video capabilities, Chipset supports worldwide DECT/DECT ULE.

DSP Group provides complete hardware and software reference designs for the DHX91, in order to minimize development time and cost.

## Features

### Digital Processing Unit (DPU)

- Processor
  - 32-bit ARM926 @208MHz with MMU
  - 32KB I-cache and 8kB D-cache
- Embedded memory
  - 256KB program ROM
  - 128KB program/data RAM
- External memory and LCD interfaces
  - Memory mapped Quad SPI (QSPI) Flash interface up to 104MHz
  - Two fast SPI interfaces with DMA support for serial display
  - I2C
- Advanced master/slave PCM/TDM/IOM-2, I2S interface
  - Interfaces: UART, Keyboard scanner, GPIO, PWM for up to 3 LEDs

### Ultra Low Energy (ULE) Unit

- Hibernation mode: low power state (1uA)
- Up to four asynchronous wakeup events, two of which may be analog
- Real Time Clock (RTC): for configurable hibernation period while maintaining synchronization to fixed part
- Event detection: using enhanced debouncers to avoid false detection
- Two 16-bit counters: can be used as single 32-bit counter
- Fast wakeup management from Hibernation mode
- I/O management during Hibernation mode (LED, PWM, clock out, GPO)

### RF Analog Processing Unit (RFAPU)

- Worldwide DECT 1.7GHz-1.9GHz
- Embedded PA with dynamic control of output power
- RX sensitivity -98dBm, TX power +25.5dBm
- Integrated MLSE to improve RX sensitivity
- DC2DC step-up and step-down conversion
- Direct two -cell battery feeding, 3V Lithium and Li-ion battery support
- Embedded regulation and generation of 4.5V, 3.3V, 1.8V and 1.2V system power supplies
- Super wide band audio codec
- Differential input and output amplifiers for microphone/line and 2x speaker/line connectivity
- Loudspeaker amplifier of up to 1W @4Ω
- Microphone power
- Auxiliary ADC for HW and SW monitoring of various DC sources
- Automatic low-cost charger control
- Two PWM outputs with closed-loop control
- Embedded temperature sensor

### Package

- QFN68 (8x8) or QFN88 (10x10)

## Applications

- Home security and monitoring
  - Safety devices like smoke, CO, and flood detectors
  - Security systems like motion, glass breakage, door/window magnet detectors
  - Alarm systems like siren, strobe light
  - Detectors with voice or video verification
  - Surveillance system with voice and video
  - Baby monitoring
  - Home and remote smart control display
- Home automation
  - Smart plugs
  - Lighting control
  - Heating, ventilation, air-conditioning (HVAC)
  - Home control keypad/display
  - Doorbell with voice and video
  - Door lock system
- Healthcare
  - Panic button pendant with voice
  - Activity monitoring
  - Patient monitoring
- Consumer electronics
  - Remote control
  - Entertainment systems
- Utility metering
  - Smart grid
  - Remote metering and control
- Wireless audio
  - Home and office communication devices

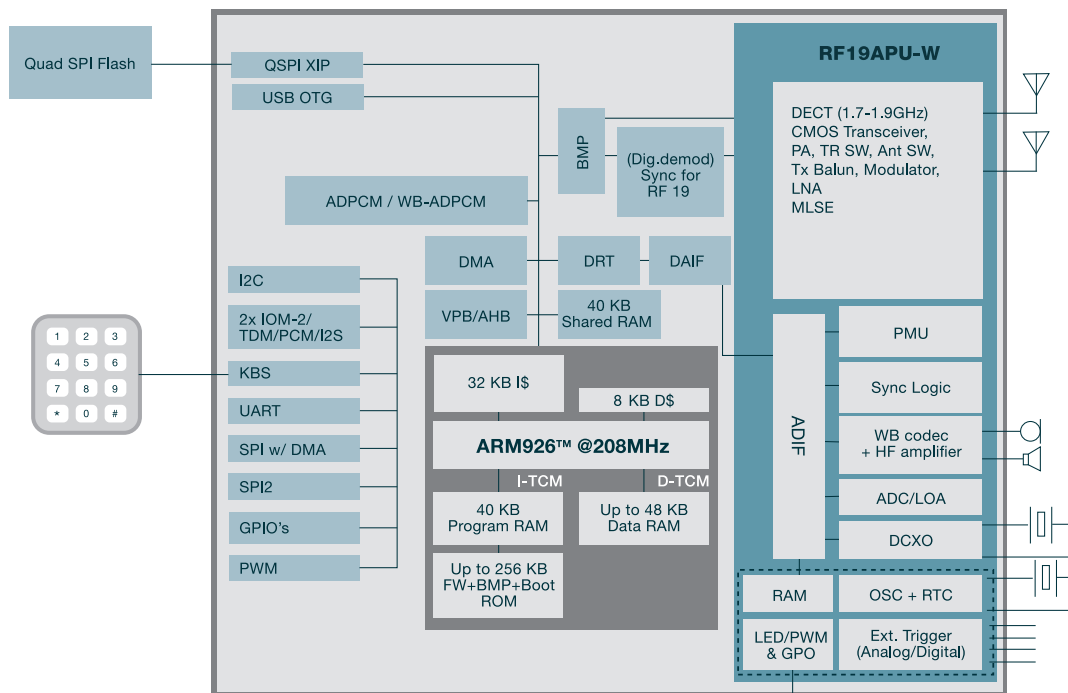
# DHX91 Chipset

Comprehensive, feature-rich DECT ULE system on a chip

## Highlights

- Years of battery life with Ultra Low Energy mode - 1uA during hibernation
- DECT ULE ETSI standard compliance
- Small form factor to fit any HAN application
- Worldwide DECT 1.7GHz-1.9GHz
- Long-range communication with RX sensitivity -99.5dBm, TX power +25.5dBm
- Highly competitive IC cost targeting mass products
- Extensive Hibernation mode with RTC, counters and debouncer, digital and analog IO management for BOM optimizations
- High integration level for low system cost and minimal form factor
- Enabling audio and video for monitoring and safety applications
- Rich peripheral set
- Easy SW development and IP re-use with standard ARM processor
- Fast time-to-market with hardware and software reference designs

## DCX Block Diagram



DSP Group®, Inc. (NASDAQ: DSPG) is a leading global provider of wireless chipset solutions for converged communications. Delivering semiconductor system solutions with software and reference designs, DSP Group enables OEMs/ODMs, consumer electronics (CE) manufacturers and service providers to cost-effectively develop new revenue-generating products with fast time to market. At the forefront of semiconductor innovation and operational excellence for over two decades, DSP Group provides a broad portfolio of wireless chipsets integrating DECT/CAT-iq, DECT ULE, Wi-Fi, PSTN, HDClear™, video and VoIP technologies. DSP Group enables converged voice, audio, video and data connectivity across diverse mobile, consumer and enterprise products – from mobile devices, connected multimedia screens, and home automation & security to cordless phones, VoIP systems, and home gateways. Leveraging industry-leading experience and expertise, DSP Group partners with CE manufacturers and service providers to shape the future of converged communications at home, office and on the go.

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