

DCX81 Product Brief

Product Overview

Synaptics DCX81 chipset family is a flexible, high-performance and highly integrated solution for digital 1.9Ghz communication products. Combining state-of-the-art RF and ARM9™ baseband functions with Synaptics rich set of features and advanced audio processing, the DCX81 chipset is the best cost-optimized solution for voice and smart home applications over DECT/CAT-iq/ ULE standard.

The DCX81 chipset's integrated digital cordless telephone solution includes all required functionalities of a digital baseband controller, analog interface, RF transceiver, and power amplifier. The system-on-a-chip (SoC) also features an innovative, highly flexible quad-SPI (QSPI) memory interface for running code and storing data on a single device, thereby reducing time to market and overall system costs compared to parallel and embedded Flash solutions. Supporting all DECT bands and protocols including the latest generation of CAT-iq (2.0, 2.1, 3.0-SUOTA) & ULE, the DCX81 enables worldwide coverage.

Comprised of a 208MHz ARM926™ processor, hardware accelerators and a direct memory access (DMA) controller, the DCX81 chipset meets all telephony application needs, and is suitable for new markets and advanced applications. Synaptics provides hardware and software reference designs for the DCX81 in order to minimize development time and reduce cost and risk for cordless device manufacturers.

Product Applications

- Advanced cordless handset supporting DECT/CAT-iq, graphical user interface (GUI) and/or Flash upgradability
- Embedded DECT/CAT-iq /ULE module for VoIP & Home Gateways, eMTA and IoT Hubs
- Wireless audio and monitoring devices (e.g. security, door phone, baby monitoring)
- DECT devices requiring Flash memory flexibility
- Headphones and headsets.

Product Benefits

- Strong processing power providing performance overhead required for future cordless telephony applications and features
- Present and future application support with abundance of embedded memory
- Fast code execution and data storage with single QSPI Flash memory
- Scalable application code and data size with enhanced external memory buses (serial and parallel)
- Lowest power consumption per highest cordless telephony performance
- Fast time to market with SW compatibility with existing DCX-based products
- Long-range, advanced communications with state-of-the-art RF and BMC
- Exceptional voice quality with advanced Synaptics algorithms, codecs and integrated analog front end
- Highly competitive IC cost targeting mass products
- High integration level for low system cost and minimal form factor
- Easy SW development and IP re-use with standard ARM processor

Product Highlights

- Hardware and software reference designs with demo MMI for key features
- Advanced GUI capabilities for QVGA resolution
- Advanced music and voice codecs support and easy porting
- Digital MJPEG over DECT for light video monitoring
- Full CAT-iq 1.0, 2.0, 2.1 and 3.0 (SUOTA) support
- Supporting full ULE functionality on hubs and gateways simultaneously with voice and DECT/CAT-iq
- Multi-base, multi-handset (up to 10 active HS with non-blind slot), multiline support
- Rich set of telephony features and advanced voice and audio processing including caller ID, PBX functions, DTMF, tone generation and detection, polyphonic ringing, wallpapers, and text-to-speech
- Wideband audio (WBA), wideband synthesis (WBS), protected audio mode, noise reduction, echo canceller
- Digital telephone answering machine (DTAM)
- Low power consumption
- Multi-language, multi-country support

Product Features

Digital Processing Unit (DPU)

- Processor: 32-bit ARM926 @208MHz with MMU and Embedded
- Memories
- External Memory and LCD Interfaces
 - Memory mapped QSPI Flash interface up to 104MHz, supporting up to two devices and read-while-write to/from single device
 - 16-bit parallel bus for SRAM extension, NOR/NAND Flash options, and high-resolution LCD
 - Two fast SPI interfaces with DMA support for serial display
 - I2C
- Enhancements
 - DMA (internal memory to/from external memory and LCD)
 - JPEG decoder for motion picture streaming
 - G.726/727 NB audio channels and G.722 WB audio channels with HW ADPCM engine

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- Burst mode controller (BMC) supporting all DECT protocols and frame structures
- USB OTG
- Advanced master/slave PCM/TDM/IOM-2, I2S interface
- UART
- Keyboard
- GPIO
- Power
 - 1.2V core
 - 1.8V or 3.3V I/O with separate domain for QSPI, capable of direct driving up to four LEDs

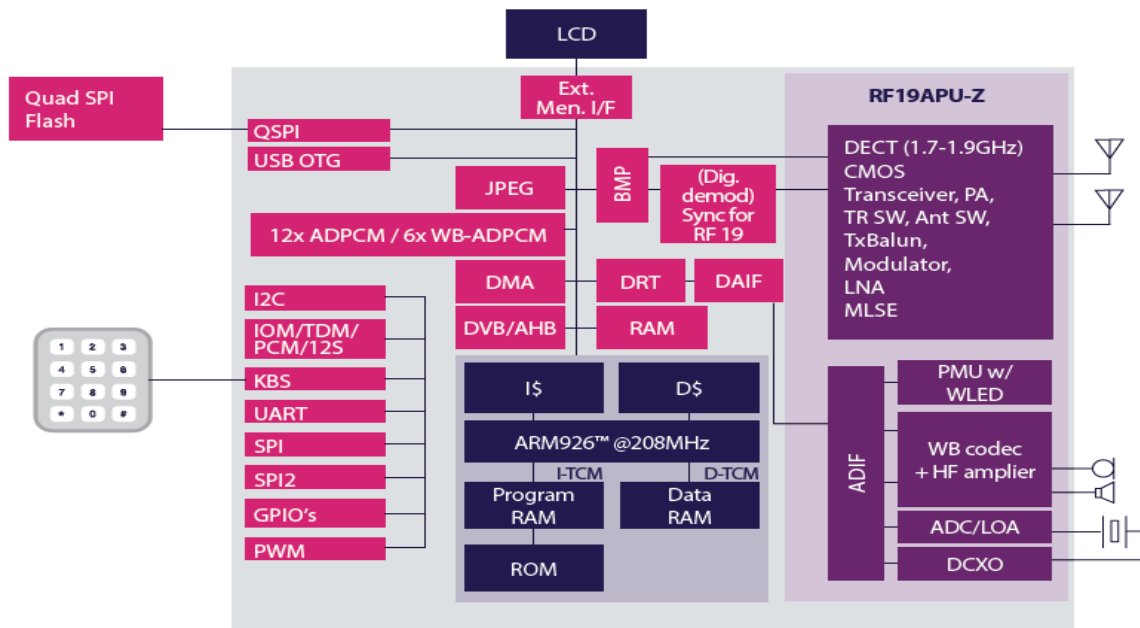
RF Analog Processing Unit (RFAPU)

- Worldwide DECT 1.7GHz-1.9GHz
- Embedded PA and LNA
- Embedded RF switches for T/R and antenna diversity
- Integrated MLSE to further enhance Rx sensitivity
- DC2DC step-up conversion, voltage doubler and tripler
- Direct 2-cell battery feeding, 3-cell and Li-ion battery support
- Embedded regulation and generation of 4.5V, 3V, 2.5V, 1.8V and 1.2V system power supplies
- Embedded white LED driver with voltage and current control
- Two audio codecs
- Differential input and output amplifier for 2x microphone/line and 2 x speaker/line connectivity
- Loudspeaker amplifier of up to 1W @4
- 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

Device Packaging

- Multi-chip with RFAPU (QFN) or stand-alone digital (QFN/BGA)

DCX81 Block Diagram



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