SC14CVMDECT / SC14SPNODE Module

General description

Both SC14CVMDECT and SC14SPNODE are members of the Dialog Semiconductor SC14S cordless module family. These modules are identical in design, shape, form factor and bill of material. The modules are fully shielded applications with a 16 Mbit quad SPI flash, a 20 Mhz Chrystal, power regulation and "F" shaped embedded antenna on board.

Features

- Standard DECT/UPCS cordless handset and base station functionality.
- The base station mode (FP) of the module support up to 6 portable parts (PP)[1]
- Support voice and low speed data up to 1.6 Kbit/s with in the same time-slot configuration.
- One internal Antenna and diversity functionality included.
- Small form factor.
- Program memory available for custom application software.
- Non accessible basis software ensures the module to operate according the FCC rules[2].
- RF range: 1921.536 – 1928.448 MHz
- Receiver sensitivity < -93 dBm
- Transmit power (max): 20.2 dBm (105 mW)[3]
- Power supply voltage 2.20 - 3.45 V

Applications

The modules are designed for hosted and embedded cordless voice and data applications in the DECT/UPCS frequency band. It's simple to use AT Commands set allows setting up of a wireless link between 2 or more nodes without detailed knowledge of the DECT/UPCS protocol. These modules are designed to be used in battery powered portable applications. They can also be used in fixed applications with an extra 2nd antenna for fast antenna diversity (see also note 4).
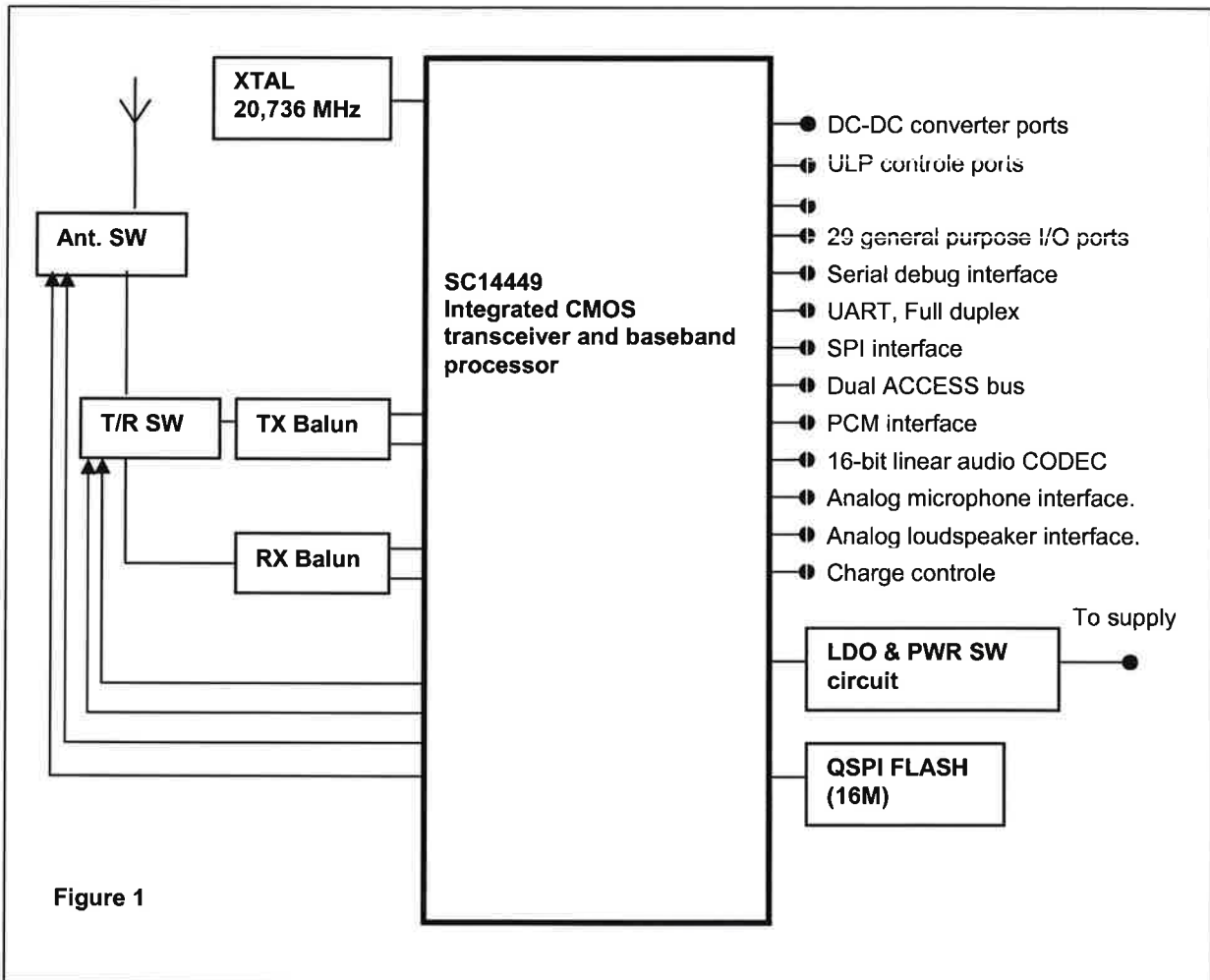
Circuit description

The module consists mainly of the fully integrated CMOS transceiver and baseband processor SC14449 from Dialog semiconductor intended for DECT/UPCS handsets and base stations. RF switches and other components are added to the design in order to perform the desired functionality required. Figure 1 shows the block diagram of the module.
The module also has its own power regulation on board assuring a constant power regulation. The single embedded antenna in this module makes it very suitable for portable, battery powered, applications.

1) Because of the radio design used (blind slot configuration) the base station can only use a maximum of 6 time slots.
2) The physical layer configuration can't be changed by the OEM.
3) Transmit PWR is measured conducted in the manufacturing process in order to insure FCC complacence.
4) Using an extra 2nd antenna will make the modules approval void, approval done only on one antenna and PP applications.

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		SC14SPNODE / SC14CVMDECT			**Operational description**			Page 1 of 2

Block Diagrams

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                    ┌──────────────┐        ┌──────────────────┐
                    │ XTAL         │        │                  │──● DC-DC converter ports
       ╲╱           │ 20,736 MHz   │        │                  │──◑ ULP controle ports
        V           └──────────────┘        │                  │──◑
                                            │                  │──◑ 29 general purpose I/O ports
  ┌──────────┐                              │ SC14449          │──◑ Serial debug interface
  │ Ant. SW  │                              │ Integrated CMOS  │──◑ UART, Full duplex
  └──────────┘                              │ transceiver and  │──◑ SPI interface
    ▲▲   │                                  │ baseband         │──◑ Dual ACCESS bus
         │                                  │ processor        │──◑ PCM interface
  ┌────────┐   ┌───────────┐                │                  │──◑ 16-bit linear audio CODEC
  │ T/R SW │───│ TX Balun  │                │                  │──◑ Analog microphone interface.
  └────────┘   └───────────┘                │                  │──◑ Analog loudspeaker interface.
    ▲▲                                      │                  │──◑ Charge controle
               ┌───────────┐                │                  │
               │ RX Balun  │                │                  │
               └───────────┘                │                  │
                                            │                  │
                                            │                  │
                                            │                  │
                                            │                  │
   Figure 1                                 └──────────────────┘
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DC-DC converter ports
ULP controle ports

29 general purpose I/O ports
Serial debug interface
UART, Full duplex
SPI interface
Dual ACCESS bus
PCM interface
16-bit linear audio CODEC
Analog microphone interface.
Analog loudspeaker interface.
Charge controle

To supply

LDO & PWR SW circuit

QSPI FLASH (16M)

Figure 1

SC14449 – integrated CMOS transceiver and baseband processor

SC14449 is a 1.8V single chip for DECT applications containing a fully integrated radio transceiver and baseband processor. It is designed to perform the complete transmit and receiver function. The device is designed to operate the frequency synthesizer in a close loop configuration both during transmit and receive mode. Logic output ports are used to control the T/R switch and antenna switch for FAD (Fast Antenna Diversity). The two equal antennas are PCB monopole antennas tuned for the actual frequency range.

The Compact RISC CR 16Cplus microprocessor with a single wire debug port running from ROM controls the protocol stack and the I/O peripherals, keyboard, UART, ACCESS bus, SPI, LED drivers and RF switches.

The audio path comprises a 16 bit CODEC with an analog frontend including a high efficiency 4 ohm audio amplifier (class D) and a programmable Gen2DSP supporting various telecommunication algorithms. Detailed information about the chip is available from Dialog semiconductors.