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SS1103L

Single-Chip Spread Spectrum Processor for Digital Cordless Phone

Introduction

Siliconians' SS1103L is a low-cost single-chip solution for Spread Spectrum Digital Cordless Phones (DCP) or wireless PBXs (W-PBX) operating as FCC Part 15-compliant devices in the ISM bands.

The SS1103L provides a very high level of integration, low power consumption and low cost suitable for consumer applications such as DCP. The SS1103L chip finally brings all of the advantages of spread spectrum technology to the same price point as classical narrow band technology.

General Information

The SS1103L includes an internal 64 Kbps PCM CODEC for A/D and D/A conversions of the audio signal and a digital signal processor for high quality ADPCM compressed voice transmission at 32 Kbps which also performs additional voice and signal processing functions such as voice activity detection. The chip also includes an internal 8-bit microcontroller with ROM, RAM and all necessary peripheral functions together with a baseband spread spectrum modem.

The spread spectrum baseband modem provides a full-duplex voice link using a Time-Division-Duplex (TDD) protocol. It provides constant monitoring of the link quality with an indication of the relative Signal/Noise at the baseband level together with a low-speed signaling channel, independent of the main voice channel, for communication and control between the base station and the handset.

This low-cost spread spectrum technology makes monitoring of phone calls practically impossible and greatly extends the range compared with other analog or digital phones operating in the ISM bands.

The SS1103L is a 3V CMOS device and contains power-saving features, including very low battery drain in standby, for extended battery operation. It is packaged within an economic (80-pin) surface-mounted package.

Future Product - Specifications Subject to Change

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Main features

System Controller Functions:

- 8051-compatible 8-bit CPU
- Maximum operating speed: 24 Mhz
- Master clock programmable divider
- 32 Khz oscillator for sleep mode
- On-chip 16 Kbytes ROM and 512 bytes RAM
- Serial Peripheral Interface (SPI)
- Asynchronous serial interface (UART)
- Serial I/O (SIO)
- Multiple Timers: Watch dog/sleep timer, general purpose timer/counter, time base timer
- Two external interrupts
- Power-on reset

Peripheral Controller Functions:

- LED outputs (x4)
- Keypad Interface (6x6)
- Battery-Low Detect
- User Functions: Pulse/DTMF dialing, Flash, memory redial, mute, voice module control

Voice and Signal Processing Functions:

- PCM Codec-Filter (ITU G.711)
- ADPCM Transcoder (ITU G.726)
- DTMF Detection/Generation
- Microphone amplifier
- Sounder driver
- Voice activity detection & control

Spread Spectrum Baseband Modem Functions:

- High frequency oscillator
- Direct sequence spread spectrum transceiver
- 3 bit/symbol baseband modulation
- Processing Gain: 10.2 dB
- Data scrambler for spectral whitening and added security
- Dual-FIFO (30-byte deep each)
- Voice interface module (for PCM or ADPCM)
- Embedded Time-Division-Duplex (TDD) controller
- MSK on-the-air modulation

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- Four Programmable 32-bit PN Sequences
- Programmable security code
- Independent low-speed signaling channel
- Digital signal quality indicator output (S/N)
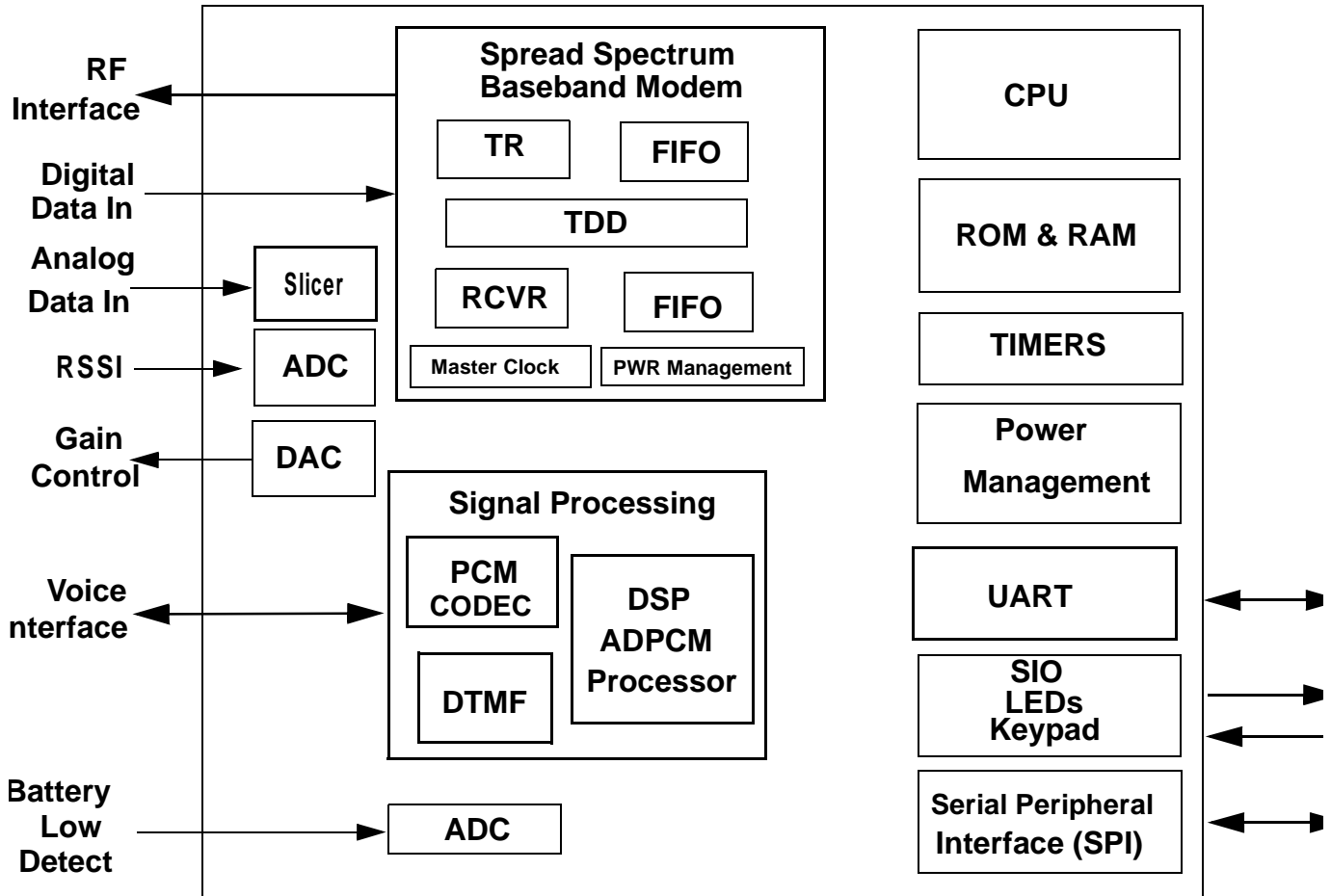
RF Module Interface:

- Control signals for: TX/RX, transmitter power, synthesizer
- Internal RSSI A/D converter
- Internal DAC for gain control (transmit or receive)
- Analog receiver data input with internal signal comparator/slicer
- Buffered master clock output

Chip Implementation:

- Very low power standby mode
- Power saving features in active mode
- CMOS: 3V, 3.3V, 5V, 80-pin PQFP
- Availability: 2Q98

Tools:

- Available 2Q98: Reference Design
- Available 2Q98: DCP Firmware

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SS1103L BLOCK DIAGRAM