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SS1106

Single-Chip Spread Spectrum Processor for Wireless Packet Data

PPP and TCP/IP Compatible

Introduction

Siliconians' SS1106 is a low-cost single-chip solution for spread spectrum wireless data communication applications. Typical applications include: acquisition, control, local area networks, wireless computer peripherals, wireless home devices and all proprietary applications for short range and medium-speed data rates. These systems can operate as unlicensed, FCC Part 15-compliant devices in the ISM bands.

The SS1106 provides a very high level of integration, low power consumption and low cost suitable for consumer applications. The SS1106 chip finally brings all of the advantages of spread spectrum technology to applications currently limited to narrow band technology. With its integrated communication controller and optional multi-channel HDLC data framing and forward error correction (FEC), together with the processing gain achieved by the spread spectrum technology, the SS1106 will provide a very reliable and fast data link for all of your wireless applications. It is fully compatible with packet oriented protocols such as PPP and TCP/IP.

General Information

For SCADA applications, the SS1106 provides the capability to install a remote and extremely reliable wireless network inside of any building, therefore saving in installation costs and time.

With a maximum transmission rate of 400 Kbps, the SS1106 is an ideal solution for low-cost, high speed wireless computer peripherals and other internet home appliances.

The chip includes an internal 8-bit microcontroller with ROM, RAM and all necessary peripheral functions including UART and USB controller, together with a baseband spread spectrum modem.

The spread spectrum baseband modem allows for point-to-point or point-to-multipoint links and operates either in semi-duplex or full duplex 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. In full duplex mode, a low-speed signaling channel, independent of the main data channel, allows for communication and control between the two sides of the link.

The SS1106 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 (64-pin) surface-mounted package.

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Main features

System Controller Functions:

- 8051 Compatible 8-bit CPU
- Maximum Operating Speed: 24 Mhz
- On-Chip 16 Kbytes ROM and 512 bytes RAM
- External Memory Bus (2 MB address space)
- Access to external data and/or program
- Multiple Timers: Capture, Watch Dog, Time Base
- External Interrupt Line & Internal Interrupt Sources
- Operating Modes: Active / StopAll / SlowPeri
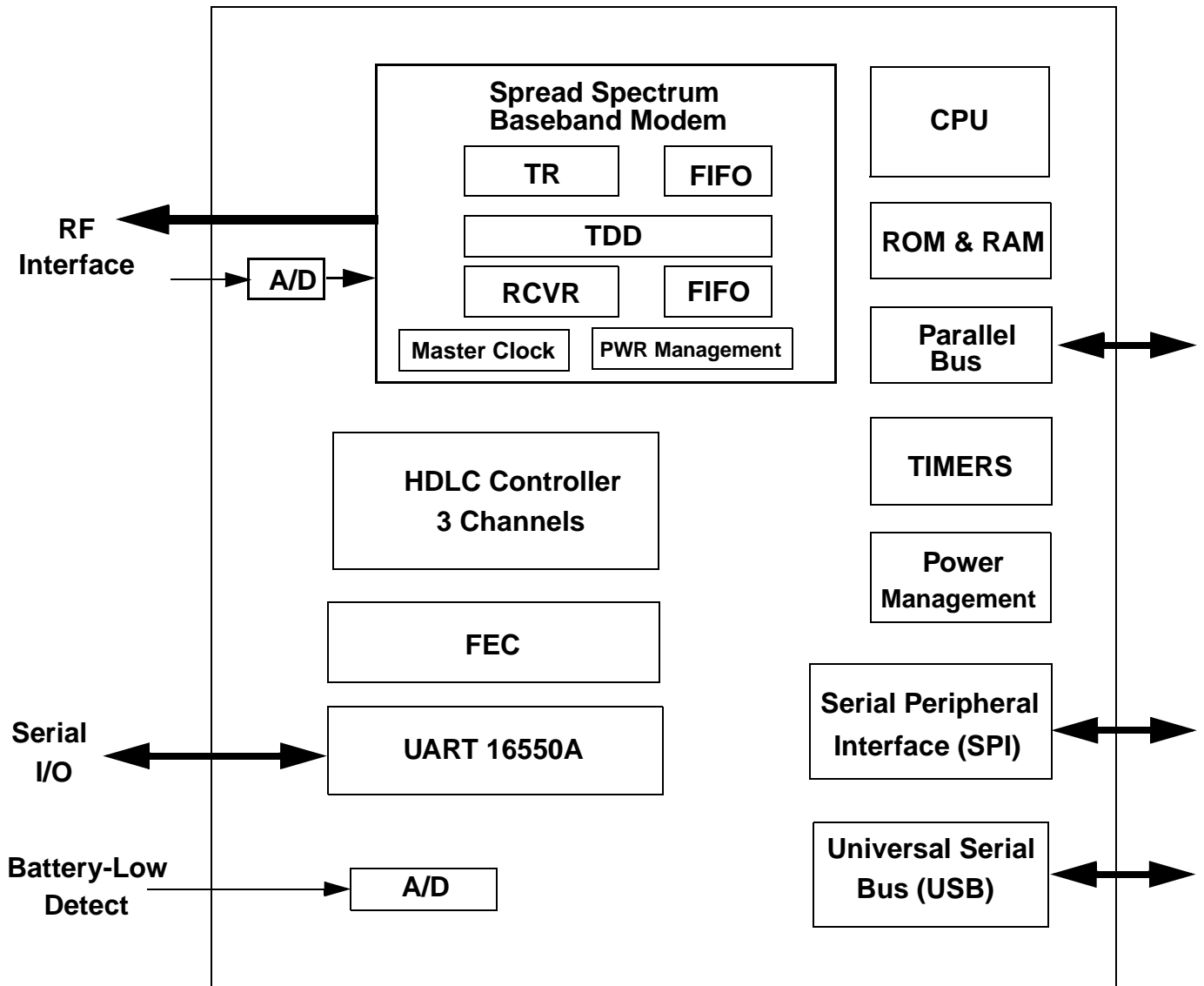
Peripheral Controller Functions:

- Serial Peripheral Interface (SPI)
- UART (16550A-compatible, programmable baud rate, loop-back mode, two 16-byte FIFOs)
- 3-Channel programmable HDLC controller
- Optional Forward Error Correction (FEC) module
- Bidirectional I/O pins
- Battery-Low Detect
- Analog Data Input (A/D) and digital data input

Spread Spectrum Baseband Modem Functions:

- Direct Sequence Spread Spectrum
- Quaternary Baseband Modulation
- Processing Gain: 10.2 dB
- Data scrambler for spectral whitening and added security
- Dual-FIFO (30-byte deep)
- Embedded Time-Division-Duplex (TDD) controller
- Optional HDLC framing (Flag generation, Frame Check Sequence, Zero Insertion/Deletion)
- MSK on-the-air Modulation
- Eight Programmable 32-bit PN Sequences
- Programmable Station ID code
- Independent low-speed signaling channel in full-duplex
- Signal Quality Indicator Output (S/N)

Chip Implementation:

- Very low power in SlowPeri Mode
- Power saving features in Active Mode
- CMOS, 3V, 3.3V, 5V, 64-pin PQFP
- Availability: 3Q98

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SS1106 BLOCK DIAGRAM