SX1282

Transceiver/MCU/ADC System-on-Chip with RISC CPU for Battery-Powered Ultra-Low Power Applications

WIRELESS & SENSING PRODUCTS

Description

The SX1282 transceiver with embedded CoolRISC® MCU, dual 10 and 16-bit ADC and peripherals provides a highly-integrated single-chip acquisition processing and RF solution.

With a design which sets state-of-the-art standards in low receiver consumption, dual ISM-band transceiver blocks are combined with a sophisticated ultra low-power 8-bit RISC core plus extensive signal acquisition peripherals to provide a complete system on chip for ISM-band applications.

The SX1282 is manufactured in an ultra modern 0.18µm process, with the entire radio, CoolRISC MCU, ADCs, peripherals, inductors and filters all integrated on a single die. The circuit is capable of operating down to 1.0V, which makes operation from a single alkaline battery possible. The circuit is enclosed in a 60-pin QFN package of dimensions 7x7mm.

Features

- Operating voltage down to 1.0V
- Supply voltage range from 1.0V to 1.6V
  - Entire circuit can operate on a single AA battery
- Transceiver Chain
  - Dual-Band operation, 434 MHz and 868 MHz
  - Multi-channel, on-chip PLL,12.5 kHz steps
  - FSK and OOK modulation
  - Data rate up to 80 kbit/s FSK
  - Sensitivity of -102 dBm @ 25 kbit/s, FSK, 10-3 BER
  - Receive current 2.5 mA
  - Autonomy up to four years from a single AA battery in wireless sensing
  - Transmit power +10 dBm differential (35 mA supply current)
  - Integrated RX-TX switch
  - Super heterodyne architecture
    - First conversion: IF @ 96 MHz for 868 MHz band
    - Second conversion: zero IF
    - HW support for symbol synchronization and clock recovery
- Power Management
  - High-current step-up for external EEPROM supply @ 2.7V
  - Low-current step-up for the supply of the data acquisition chains
  - POR and brown-out detector
  - Sophisticated Power Management
    - Unused blocks are powered down
    - Standby current down to 4.0uA typical (23µA maximum)
  - Oscillators
    - Integrated programmable RC oscillator
      - Start-up and µC operation
    - 12.8 MHz crystal oscillator:
      - Transceiver operation
    - Low-power 32 kHz crystal oscillator
      - µA level Time-keeping operation
      - Analog watchdogs detect crystal oscillator failures
- Data Acquisition
  - Pyroelectric acquisition chain
    - 80 dB PSRR on the full chain
    - 10 µV/LSB
    - 16 bits ADC, 8 Hz bandwidth
  - Auxiliary 10 bits ADC
    - 10k samples/s
    - Multiple signal sources
    - Programmable input attenuation
    - Integrated thermometer function, 2°C accuracy
- Embedded Core
  - Ultra Low-power
  - 1.3 mA power consumption at 6.4 MIPS
  - CoolRISC technology
  - Energy-efficient RISC architecture
  - Integrated 8x8 multiplier
  - Program loads into and executes from RAM
  - Memory resources
    - 1 kbytes boot ROM
    - 22 kbytes Instruction RAM
    - 1 kbytes data RAM

Applications

- Alarm and security systems
- Wireless Sensor Networks
- Home Automation
- Wireless computer peripherals
- Telemetry
- Sports and Leisure Equipment
- Industrial Sensing

Ordering Information

Part Number	Package
SX12821075	VQFN60