TLSR8251

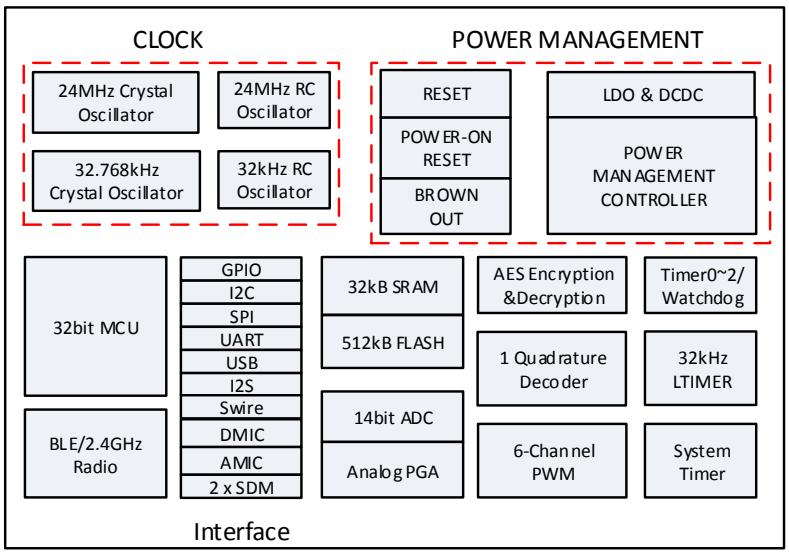
Telink BLE 4.2 SoC with audio

Product Brief

The TLSR8251 is Telink-developed Bluetooth LE SoC solution with internal Flash and audio support.

The TLSR8251 is compatible with Bluetooth standard and supports BLE specification up to version 4.2. It allows easy connectivity with Bluetooth Smart Ready mobile phones, tablets, laptops, which supports BLE slave and master mode operation, including broadcast, encryption, connection updates, and channel map updates.

The TLSR8251 integrates a power-balanced 32-bit MCU, BLE/2.4GHz Radio, 32kB SRAM, 512kB Flash, 14bit ADC with PGA, Analog and Digital Microphone input, stereo audio output, 6-channel PWM, one quadrature decoder (QDEC), flexible IO interfaces, and other peripheral blocks required for Bluetooth Low Energy applications. The TLSR8251 also includes multi-stage power management design allowing ultra-low power operation and making it the ideal candidate for wearable and power-constraint applications.



Applications

- Smartphone and tablet accessories
- RF Remote Control
- Sports and fitness tracking
- Wearable devices

Key Features

- 4-byte chip unique ID (UID)
- 32bit proprietary microcontroller
  - Better power-balanced performance than ARM M0
  - Instruction cache controller
  - Maximum running speed up to 48MHz

- Memory architecture
  - Program memory: 512kB Flash
  - 32kB on-chip SRAM with retention in deep sleep
  - Flash preloaded with UID
  - Firmware protection for anti-cloning
- RF transceiver
  - BLE/2.4GHz RF transceiver in worldwide 2.4GHz ISM band
  - Bluetooth 4.2 Compliant, 1Mbps and 2Mbps LE Enhancement FIPD version
  - 2.4GHz proprietary 1Mbps/2Mbps/250kbps/500kbps mode with Adaptive Frequency Hopping feature
  - Rx Sensitivity: -96.5dBm@BLE 1Mbps, -94dBm @ BLE 2Mbps mode
  - Tx output power: up to +10dBm
  - 50 Ω matched single-pin antenna input
  - RSSI monitoring with +/-1dB resolution
  - Auto acknowledgement, retransmission and flow control
  - Support full-function BLE location features
- Power management
  - Power supply of 1.8V~3.6V
  - Battery monitor for low battery voltage detection
  - Brownout detection/shutoff and Power-On-Reset
  - Multiple-power-state to optimize power consumption
- Low power consumption
  - Whole Chip RX mode: 5.3mA
  - Whole Chip TX mode: 5.4mA @ 0dBm
  - Deep sleep with external wakeup (without SRAM retention): 0.4uA
  - Deep sleep with SRAM retention: < 1uA
- RTC and other timers
  - Clock source of a 24MHz&32.768kHz Crystal and 32kHz/24MHz embedded RC oscillator
  - Three general 32-bit timers with four selectable modes in active mode
  - Watchdog timer
  - A low-frequency 32kHz timer available in low power mode
- Digital and analog interfaces
  - Up to 32/17/10 GPIOs depending on package option
  - DMIC (Digital Mic), Dual AMIC (Analog Mic), I2S, Stereo Audio output
  - SPI, I2C, USB, Swire, UART with hardware flow control support
  - Up to 6 channels of differential PWM
  - IR transmitter with DMA
  - One quadrature decoder, two-phase input selectable from 8 pins
  - 10-channel (only GPIO input), 14-bit ADC
  - 4-channel PGA, differential input
  - Low power comparator
- Embedded hardware AES and AES-CCM
- Embedded hardware acceleration for Elliptical curve cryptography (ECC)
- Hardware OTA upgrade and multiple boot switch, allowing convenient product feature roll outs and upgrades
- Operating temperature: -40℃~+85℃
- Completely RoHS-compliant package
  - TLSR8251F512ET48, 48-pin QFN 7×7mm
  - TLSR8251F512ET32, 32-pin QFN 5×5mm
  - TLSR8251F512ET24, 24-pin QFN 4×4mm

Development tools

A full set of development tools for the SoC are provided, which include EVB, reference design and SDK for customers to perform evaluation, quick application prototyping and firmware development.

Company Profile

Telink Semiconductor provides highly integrated radio-frequency and mixed-signal System-On-Chip (SoC) solutions for a variety of communication and control application markets including consumer electronics, medical instruments, industrial control, home automation, smart energy, and etc.

For further information on the technology, product and business term, please contact Telink Semiconductor.

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