TLSR8646F512

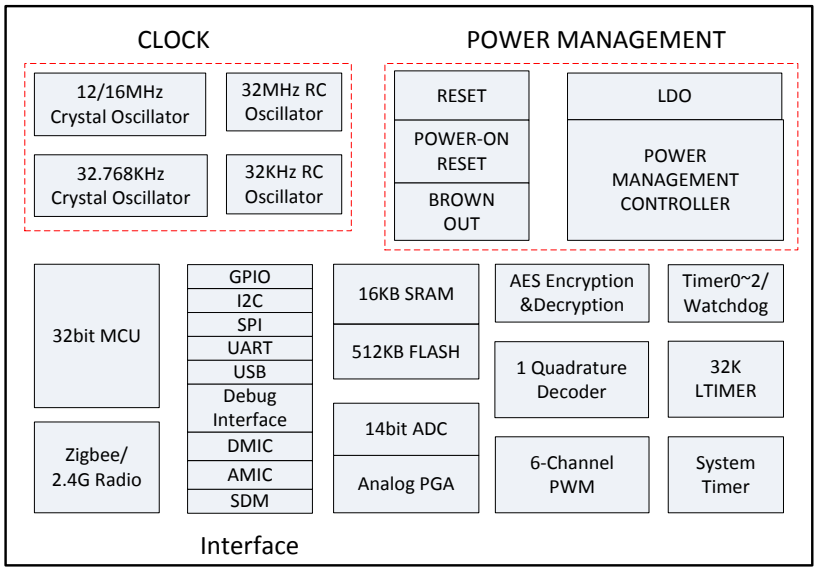
Telink Zigbee/RF4CE SoC With Internal Flash

Product Brief

General Description:

The TLSR8646F512 is Telink-developed Zigbee/RF4CE SoC solution with internal Flash support. It's completely RoHS-compliant and 100% lead (Pb)-free. It supports IEEE 802.15.4 standard and Zigbee-compliant platform. The TLSR8646F512 solution can be used for a wide range of applications and is perfect for creating interoperable solution for use within the home combined with leading Zigbee/RF4CE software stack. The TLSR8646F512 also has embedded audio supporting for analog MIC, digital MIC, and mono-channel audio output.

The TLSR8646F512 is designed to offer high integration, ultra-low power application capabilities. It integrates strong 32-bit MCU, Zigbee/2.4G Radio, 16KB SRAM, 512KB internal Flash, 14bit ADC with PGA, 6-channel PWM (2-channel IR), one quadrature decoder (QDEC), abundant GPIO interfaces, multi-stage power management module and nearly all the peripherals needed for Zigbee/IEEE 802.15.4/RF4CE applications development.



Target Applications:

- Smart Home
- Building Automation
- Smart Grid
- Intelligent Logistics/Transportation/City
- Consumer Electronics
- Industrial Control

- Health Care

Key Features:

- General features
  - 32bit high performance MCU, up to 48MHz
  - Program memory: internal 512KB Flash
  - Data memory: 16KB on-chip SRAM
  - 12M/16MHz&32.768KHz Crystal and 32KHz/32MHz embedded RC oscillator
  - A rich set of I/Os:
    - ✧ Up to 36 GPIOs
    - ✧ DMIC (Digital Mic), AMIC (Analog Mic), Mono-channel Audio output
    - ✧ SPI, I2C, USB, Debug Interface, UART with hardware flow control
  - Up to 6 channels of PWM, 2-channel IR
  - Sensor:
    - ✧ 14bit ADC with PGA
    - ✧ Temperature sensor
  - One quadrature decoder
  - Embedded hardware AES
  - Compatible with USB2.0 Full speed mode
  - Operating temperature: -40℃~+85℃ temperature range.
  - Package:
    - ✧ TLSR8646F512ET48, 48-pin QFN 7×7mm

- RF features
  - Zigbee/2.4GHz RF transceiver embedded, working in worldwide 2.4GHz ISM band
  - Zigbee compliant, 250Kbps
  - Rx Sensitivity: -95dBm@Zigbee 250Kbps
  - Tx output power: +6dBm
  - Single-pin antenna interface
  - RSSI monitoring

- Features of power management module
  - Embedded LDO
  - Battery monitor: Supports low battery detection
  - Power supply: 1.9V~3.6V
  - Multiple stage power management to minimize power consumption
  - Low power consumption:
    - ✧ Receiver mode current: 12mA
    - ✧ Transmitter mode current: 15mA @0dBm power, 22mA @max power
    - ✧ Suspend mode current: 10uA (IO wakeup), 12uA (Timer wakeup)
    - ✧ Deep sleep mode current: 1.7uA

- Flash features
  - Total 512KB (4Mbits)
  - Flexible architecture: 4KB per Sector, 64KB/32KB per block

- Up to 256 Bytes per programmable page
- Write protect all or portions of memory
- Sector erase (4KB)
- Block erase (32KB/64KB)
- Cycle Endurance: 100,000 program/erases
- Data Retention: typical 20-year retention

- Zigbee RF4CE features
  - Based on IEEE 802.15.4 Standard, certified RF4CE platform, with ZRC1.1/ZRC2.0 and MSO profile support
  - Various transmission options including broadcast
  - Provides a secured key generation mechanism
  - Supports a simple pairing mechanism for devices with full application confirmation
  - Only authorized devices are able to communicate
  - Various power saving modes are supported for all device classes
  - Supports AES-128bit encryption
  - Extensible to vendor specific profiles
  - Telink extended profile with audio support for voice command based searches
  - Over the air (OTA) firmware upgrade with hardware support

Development tools:

A full set of development tools for the Zigbee 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 Co., Limited is a fabless semiconductor company that provides highly integrated radio-frequency and mixed-signal System-On-Chip (SoC) solutions for a variety of communication and control applications. We serve numerous markets including consumer electronics, medical instruments, industrial control, home automation and smart energy etc.

Our product portfolio currently includes 2.4GHz standard and proprietary wireless SoC, touch screen and touch button controller, and generic wireless MCU, all offering high performance, small silicon area, and low power consumption. We integrate high performance radio frequency, analog and mixed signal front end with efficient digital signal processing, digital communication and control functions into our SoC solutions in standard CMOS process technology.

We provide our customers with world leading level of wireless performance at a price level that is appealing to even the most cost-sensitive products. Our proprietarily optimized hardware and software platform makes it extremely easy to design into existing or emerging products, offering our customers rapid time-to-market and exceptional system design value.