## *Product Brief*

### General Description:

The TLSR8269F512 is Telink-developed BLE + IEEE802.15.4 multi-standard wireless SoC solution, which combines the features and functions needed for all 2.4GHz IoT standards into a single SoC.

The TLSR8269F512 supports standards and industrial alliance specifications including Bluetooth Smart (Bluetooth 5), BLE Mesh, 6LoWPAN, Thread, Zigbee, RF4CE, HomeKit and 2.4GHz proprietary protocols. The TLSR8269F512 also has hardware OTA upgrades support and multiple boot switching, allowing convenient product feature roll outs and upgrades. For some use cases, the TLSR8269F512 supports concurrent multi-standards in which stacks like ZigBee/RF4CE and BLE can run simultaneously.

The TLSR8269F512 integrates strong 32-bit MCU, BLE/802.15.4/2.4G Radio, 32KB SRAM, 512KB internal Flash, 14bit ADC with PGA, Analog and Digital Microphone input, 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 IoT (Internet of Things) and human interface devices application development (e.g. Bluetooth Low Energy and Zigbee/IEEE 802.15.4/RF4CE).
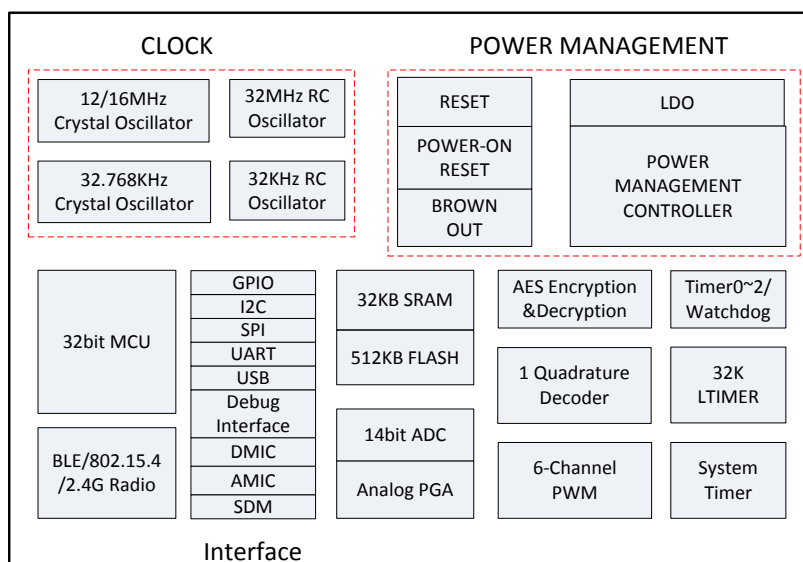


### Target Applications:

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

| - Wireless toys | - Smart Lighting, Smart Home devices |
| --- | --- |
| - 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
  - Internal 512KB Flash (Program memory) & 32KB on-chip SRAM (Data memory)
  - 12M/16MHz&32.768KHz Crystal and 32KHz/32MHz embedded RC oscillator
  - A rich set of I/Os:
    - ◇ Up to 36/21 GPIOs depending on package option
    - ◇ 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 range:
    - ◇ ET versions: -40℃~+85℃;
    - ◇ AT versions: -40℃~+125℃.
  - Supports all 2.4GHz IoT standards into a single SoC, including BLE, BLE Mesh, Zigbee, RF4CE, Homekit, 6LowPAN, Thread and 2.4GHz proprietary technologies without the requirement for an external DSP.
  - Completely RoHS-compliant package:
    - ◇ TLSR8269F512ET48/TLSR8269F512AT48, 48-pin QFN 7×7mm
    - ◇ TLSR8269F512ET32/TLSR8269F512AT32, 32-pin QFN 5×5mm

- RF features
  - BLE/802.15.4/2.4G RF transceiver embedded, working in worldwide 2.4G ISM band
  - Bluetooth 5 Compliant, mandatory 1Mbps and 2Mbps LE Enhancement FIPD version
  - IEEE802.15.4 compliant, 250Kbps
  - 2.4GHz proprietary 2Mbps mode with Adaptive Frequency Hopping feature support
  - Rx Sensitivity: -92dBm@BLE 1Mbps, -97dBm@ IEEE802.15.4 250Kbps, -88dBm @ 2.4G proprietary 2Mbps mode
  - Tx output power: +7dBm
  - 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

- ◇ Receiver mode current (Transceiver only): 12mA
- ◇ Transmitter mode current (Transceiver only): 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
  - ■ 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
  - ■ 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
  - ■ Telink extended profile with audio support for voice command based searches

- 6LoWPAN and Thread features
  - ■ Supports 6LowPAN, IPv6 and DHCPv6
  - ■ Supports UDP and DTLS
  - ■ Supports thread security and commission
  - ■ Supports networks of 250 nodes or greater

- Telink Proprietary BLE Mesh features
  - ■ Support flexible mesh control, e.g., N-to-1 and N-to-M
  - ■ Supports switch control for over 200 nodes without delay
  - ■ Supports real time status update for over 200 nodes
  - ■ Secure and safe control and scalable identification within network
  - ■ 8/16 groups can be controlled at the same time
  - ■ 128/256 nodes within mesh network
  - ■ Configurable to more or fewer hops (e.g. 4 hops) within mesh network, single hop delay less than 15ms
  - ■ Flexible RF channel usage with both BLE advertising channels and data channels for good anti-interference performance

**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.

Website: www.telink-semi.com
Tel:        021 2028 1118
Email:     telinkcnsales@telink-semi.com, telinkcnsupport@telink-semi.com