Ultra-low power wireless connectivity for consumer medical, mobile accessories, sports and wellness applications

Texas Instruments provides Bluetooth low energy solutions for Bluetooth Smart sensor applications and Bluetooth Smart Ready mobile handhelds. TI’s Bluetooth low energy devices for sensor applications are true one-chip integrated solutions. Combined with TI’s protocol stack and profile software with associated sample applications, the CC254x form the market’s most flexible and cost-effective single-mode Bluetooth low energy solutions.

www.ti.com/bluetoothlowenergy
Bluetooth® low energy technology

Bluetooth low energy technology offers ultra-low power state-of-the-art communication capabilities for consumer medical, mobile accessories, sports and wellness applications. Compared to classic Bluetooth capabilities, Bluetooth low energy technology is a connectionless protocol, which significantly reduces the amount of time the radio must be on. Requiring only a fraction of the power consumption of traditional Bluetooth technology, Bluetooth low energy can enable target applications to operate on a coin cell for more than a year.

TI Bluetooth low energy – single mode and dual mode

TI provides Bluetooth low energy single-mode solutions for Bluetooth Smart sensor applications and dual-mode solutions for Bluetooth Smart Ready mobile handheld devices. With both sides of the link, TI delivers a fully tested and robust Bluetooth low energy ecosystem.

CC254x Bluetooth low energy system-on-chip

TI’s Bluetooth low energy solution for sensor applications includes the CC2541/CC2540 2.4 GHz system-on-chip (SoC) devices, TI protocol stack and profile software with associated sample applications. The CC254x devices are ultra-low power, true one-chip integrated solutions with controller, host and application on one device. The devices feature a combination of TI’s best-in-class RF transceiver technology and an industry-standard enhanced 8051 MCU, and include peripherals to interface with analog and digital sensors, in-system reprogrammable flash memory, accurate RSSI function, full-speed USB 2.0 interface (CC2540 only), integrated AES-128 encryption engine and many other powerful supporting features and peripherals.

The CC254x enable robust master or slave nodes to be built with low total bill-of-material costs. With low power sleep modes and short transition times between operating modes, the CC254x are suitable for systems where ultra-low power consumption is required. The CC254x come in two different versions: CC254xF128/F256 with 128 and 256 KB of flash memory, respectively. Combined with TI’s Bluetooth low energy protocol stack, the CC254xF128/F256 form the market’s most flexible and cost-effective single-mode Bluetooth low energy solution.

The CC254x come in 40-pin 6mm x 6mm x 0.85mm QFN package.

CC254x Key Features

- Turnkey solution – 2.4 GHz system-on-chip, TI protocol stack, profile software with associated sample applications, and application support.
- Ultra-low power consumption – enables sensor applications to operate for >1 year on a coin cell battery.
- Leading RF performance – up to +97 dB link budget for long range. Excellent coexistence with other 2.4-GHz devices.
- One-chip integrated solution – controller, host and application on one 6mm x 6mm device reducing required PCB area. Applications can be written directly onto the CC254x, which supports both analog and digital peripherals.
- Flash-based and flexible device – firmware can be updated in the field and data can be stored on-chip.
- Single mode and dual mode – as a supplier of both single mode and dual mode Bluetooth low energy solutions, TI delivers fully tested and robust ecosystem solutions – from smart sensors to smart phones.
CC2541/CC2540 SoC features

- **8051 MCU** – 128/256 kB in-system programmable Flash - 8 kB SRAM
- **Fully integrated radio** – Bluetooth low energy (1Mbps GFSK)
- **Digital peripherals** – 21 GPIOs, 2 USART (UART or SPI), I2C interface (CC2541 only), full speed USB 2.0 (CC2540 only), 2x 16 bit, 2x 8-bit timers, dedicated link layer timer for Bluetooth low energy protocol timing, AES-128 encryption/decryption in hardware
- **Advanced analog peripherals** – 8-channel, 8- to 12-bit delta-sigma ADC, ultra-low-power analog comparator, integrated high-performance op amp (CC2540 only)
- All in a 40-pin 6mm x 6mm x 0.85mm QFN package

CC254x development kits

TI’s CC254x development kits for single-mode Bluetooth low energy applications provide application designers with a comprehensive hardware performance test platform and generic software development environment. TI’s full system-solution is aimed at simplifying design and shrinking development time for Bluetooth Smart sensor applications.

For more information, please visit [www.ti.com/bluetoothlowenergy](http://www.ti.com/bluetoothlowenergy).

**Bluetooth low energy dual mode**

Dual-mode Bluetooth low energy technology is available as a part of TI’s proven WiLink™and BlueLink™ connectivity combo solutions. These solutions support dual-mode operations by providing classic Bluetooth technology capability along with Bluetooth low energy technology. The WiLink and BlueLink solutions provide size, cost, performance, power management advantages and includes on-chip coexistence which eases customer development cycles and improves the user experience. WiLink 8.0 is the latest TI addition and is the industry’s first true single-chip mobile WLAN, GNSS, NFC, Bluetooth, Bluetooth low energy, ANTTM and FM transmit/receive solution. WiLink8.0 brings connectivity features to mainstream products such as smart phones, tablets, eBooks, ultrathin computing devices and other feature-rich mobile products.

For more information visit [www.ti.com/wilink](http://www.ti.com/wilink).
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