CC2560 *Bluetooth*® single-chip solution

Texas Instruments

Product Bulletin

Overview

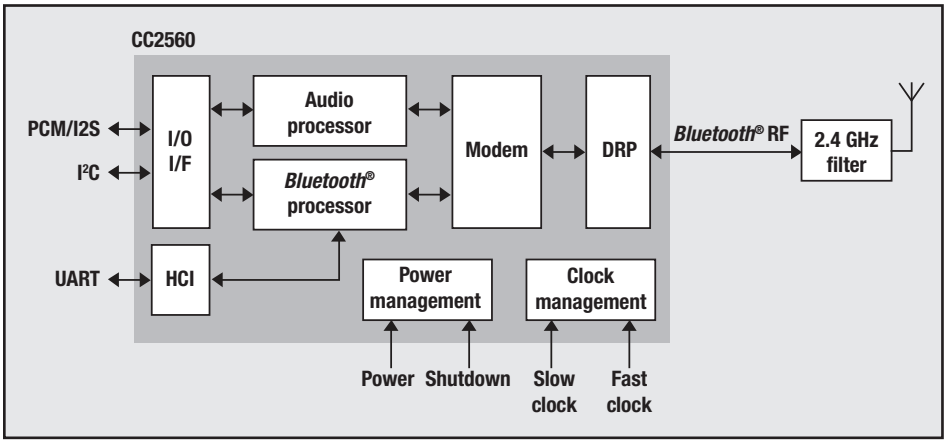
The CC2560 from Texas Instruments is a complete *Bluetooth* Host Controller Interface (HCI) solution enabling ease of design as well as decreased time to market for *Bluetooth*-enabled devices in medical, industrial and consumer electronics applications. Based on TI's seventh-generation *Bluetooth* core, the CC2560 brings a product-proven solution that supports the *Bluetooth* 2.1 + EDR release, while the CC2564 is upgradable to *Bluetooth* Version 3.0 and *Bluetooth* low energy Version 4.0.

The CC2560 is the industry's first *Bluetooth* solution manufactured with TI's cutting-edge 65-nm CMOS process and DRP technology, delivering the industry's smallest single-chip solution along with low power and cost.

Advanced power management hardware and software algorithms provide significant power savings in the most commonly used *Bluetooth* modes of operation: active, page and inquiry scans.

RF performance

The CC2560 offers best-in-class *Bluetooth* RF performance for Tx power, Rx sensitivity and blocking. In addition, internal temperature detection and compensation ensures minimal variation in RF performance over temperature. The CC2560 RF transmitter is capable of receiving -95 dBm or transmitting up to +12 dBm (with level control) without the need for external power amplifiers or a Tx/Rx switch.



▲ *CC2560 Bluetooth single-chip solution*

Key benefits

- Based on TI's cutting-edge 65-nm CMOS process and DRP technology, delivering the industry's smallest *Bluetooth* single-chip solution along with low power and cost
- Supports *Bluetooth* 2.1 + EDR release (CC2564 upgradable to *Bluetooth* Version 3.0 and *Bluetooth* Low Energy (BLE) Version 4.0)
- Flexibility for easy *Bluetooth* stack integration and validation into various microcontrollers, such as Stellaris® and low-end MSP430™ microcontrollers
- Best-in-class *Bluetooth* RF performance (Tx power, Rx sensitivity, blocking)
- Enhanced performance:
  - Improved *Bluetooth* link robustness supports power levels of *Bluetooth* Class 2 devices with increased output power capabilities
  - Improved adaptive frequency hopping algorithm with minimum adoption time

Physical interfaces

TI's CC2560 offers flexible interfaces for easy integration into various host systems. These interfaces include:

- Standard HCI over H4 UART with a maximum rate of 4 Mbps
- Flexible pulse code modulation and I²S digital audio/voice interfaces:
  - Full flexibility of data format (linear, A-law, µ-law), data width, data order, sampling and slot positioning, master/slave modes, and high clock rates up to 15 MHz for slave mode or 4.096 MHz for master mode
  - Lost packet concealment for improved audio
- I²C to external EEPROM, which can be used for storing application-specific scripts.

Evaluation and development tools

To start developing today with the CC2560 *Bluetooth* solution, TI offers two evaluation and development options:

- eZ430-RF2560: a complete, low-cost TI *Bluetooth* evaluation and software development tool in a convenient USB stick See www.ti.com/ez430-rf2560-pb
- PAN1315 evaluation module kit (EMK): an advanced connectivity board based on Panasonic's PAN1315 *Bluetooth* module with direct connection to the MSP-EXP430F5438 experimenter board to take advantage of MSP430F5438 peripherals. See www.ti.com/pan1315-pb

Key benefits

- Advanced power management for extended battery life and ease of design:
  - On-chip power management, including direct connection to battery or DC to DC
  - Low power consumption for active, standby and scan *Bluetooth* modes
  - Proprietary low-power scan algorithm achieves page and inquiry scans at one-third the normal power
  - Shut-down and sleep modes to minimize power consumption when *Bluetooth* is not used
- Flexible clock management interface with support for:
  - Automatic fast-clock detection mechanism
  - Frequency adjustment to offset and drift

Technical Specifications

Parameter	Value	Condition/notes
Power supply voltage	1.7 to 4.8 V	Battery or DC to DC
Operating ambient temperature range	-40 to 85C	Industrial temperature range
Output power	+12 dBm	GFSK, typical
Receiver sensitivity	-95 dBm	GFSK, typical, dirty Tx on
Shut-down current	1 µA	Typical
Deep sleep current	40 µA	Typical
Ultra-low-power scan	135 µA	1.28-second interval
EDR full throughput	39.2 mA	Tx = 3-DH1, Rx = 3-DH5
eSCO	8.3 mA	2-EV3 64 Kbps, no retransmission

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