CC2560 Bluetooth® single-chip solution

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.

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

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**Technical Specifications**

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

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