User's Guide

Dual-Mode Bluetooth® CC2564C Evaluation Board

ABSTRACT

This quick start guide offers an overview of the Dual-Mode *Bluetooth*® CC256XCQFN-EM evaluation board, including the required hardware and software tools, and describes the basic settings. For more information on using the CC256XCQFN-EM board, see the *Dual-Mode Bluetooth® CC2564C Evaluation Board User Guide*.

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Trademarks

1 Introduction

The TI CC256XCQFN-EM board is used to evaluate the dual-mode Bluetooth CC2564C controller, which supports classic Bluetooth and Bluetooth low energy (LE) wireless technology. The CC256XCQFN-EM board works with the following hardware development kits:

- MSP-EXP432P401R with BOOST-CCEMADAPTER (through EM connectors)
- TMDXEVM3358 AM335x Evaluation Module (through COM connector)
- CC256XEM-STADAPT with STM32 MCU Evaluation Board (through EM connectors)

Note

Refer to the CC256XEM-STADAPT Quick Start Guide for a list of compatible STM32 MCU Evaluation Boards.

The CC256xC Bluetooth device is a complete basic rate (BR), enhanced data rate (EDR), and LE host controller interface (HCI) solution that reduces design effort and enables fast time to market. Based on TI's seventh-generation core, the module is a product-proven solution supporting Bluetooth 4.2 dual-mode protocols (5.1 compliant).

Figure 1-1 shows the CC256XCQFN-EM board.

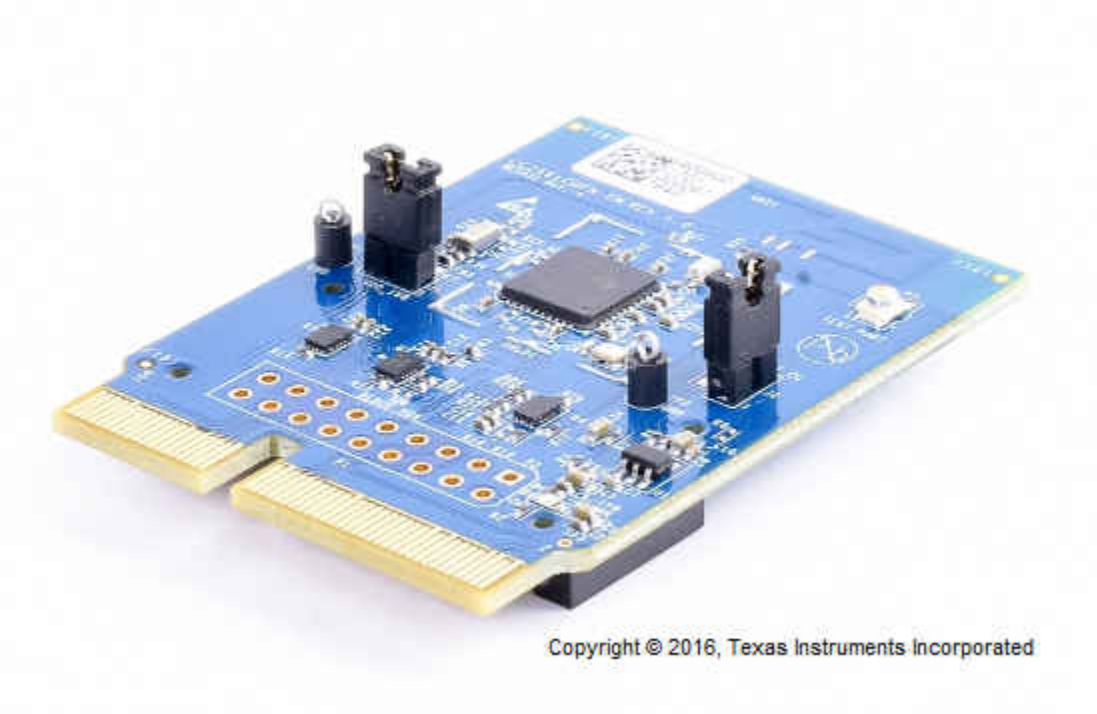

Figure 1-1. CC256XCQFN-EM Board

2 CC256XCQFN-EM Kit Contents

The CC256XCQFN-EM kit contains the following contents:

- One CC256XCQFN-EM board with a TI dual-mode *Bluetooth* CC2564C controller

3 CC256XCQFN-EM Requirements

For a complete evaluation, the CC256XCQFN-EM board requires hardware and software tools selected from the following lists.

- Hardware requirements:
  - MSP432™LaunchPad™ (sold separately), AM335x Evaluation Module (sold separately), or other MCU platforms (sold separately)
    - MSP432 LaunchPad board options:
      - MSP-EXP432P401R
      - BOOST-CCEMADAPTER
      - CC3200AUDBOOST (optional: only necessary for audio and voice applications like A3DP, HFP, and HSP)

Note

The BOOST-CCEMADAPTER and CC3200AUDBOOST pinout are not compatible with each other. Because of this limitation, the CC3200AUDBOOST cannot be stacked on top of the MSP-EXP432P401R and BOOST-CCEMADAPTER. Refer to the CC2564C TI Dual-Mode Bluetooth Stack on MSP432 MCUsUser's Guide for the CC3200AUDBOOST pin connections for audio and voice applications.

    - AM335x Evaluation Module options:
      - TMDXEVM3358
    - Other MCU options:
      - CC256XEM-STADAPT
      - STM3240G-EVAL or one of the STM32 MCU platforms mentioned in the CC256XEM-STADAPT User's Guide.
- Software requirements:
  - TI dual-mode *Bluetooth* stack
    - On MSP432 MCUs: CC2564CMSP432BTBLESW
    - Other MCUs: CC2564CSTBTBLESW
    - On Sitara Processors (Linux): TI-BT-4-2-STACK-LINUX-ADDON

Figure 3-1 shows example hardware setups for the CC256XCQFN-EM board using the MSP-EXP432P401R LaunchPad and the BOOST-CCEMADAPTER boards.

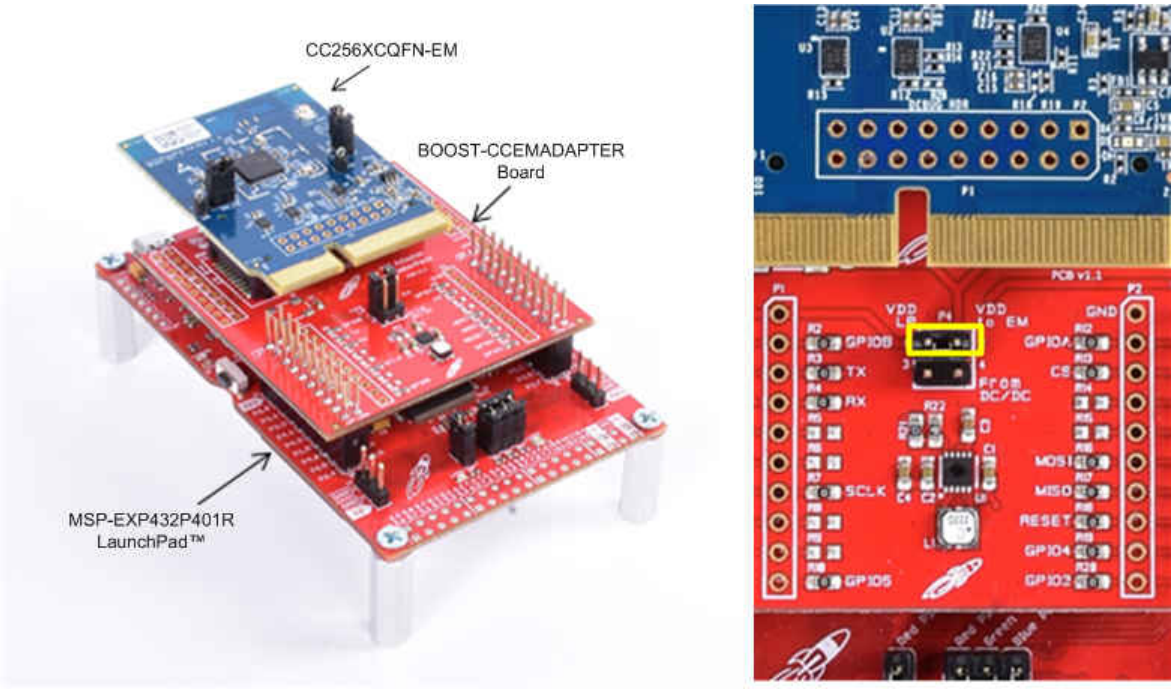

Figure 3-1. MSP432™ LaunchPad™ Hardware Setup Example

Figure 3-2 shows the example hardware setup for the CC256XCQFN-EM board using the CC256XEM-STADAPT and the STM3240G-EVAL board.

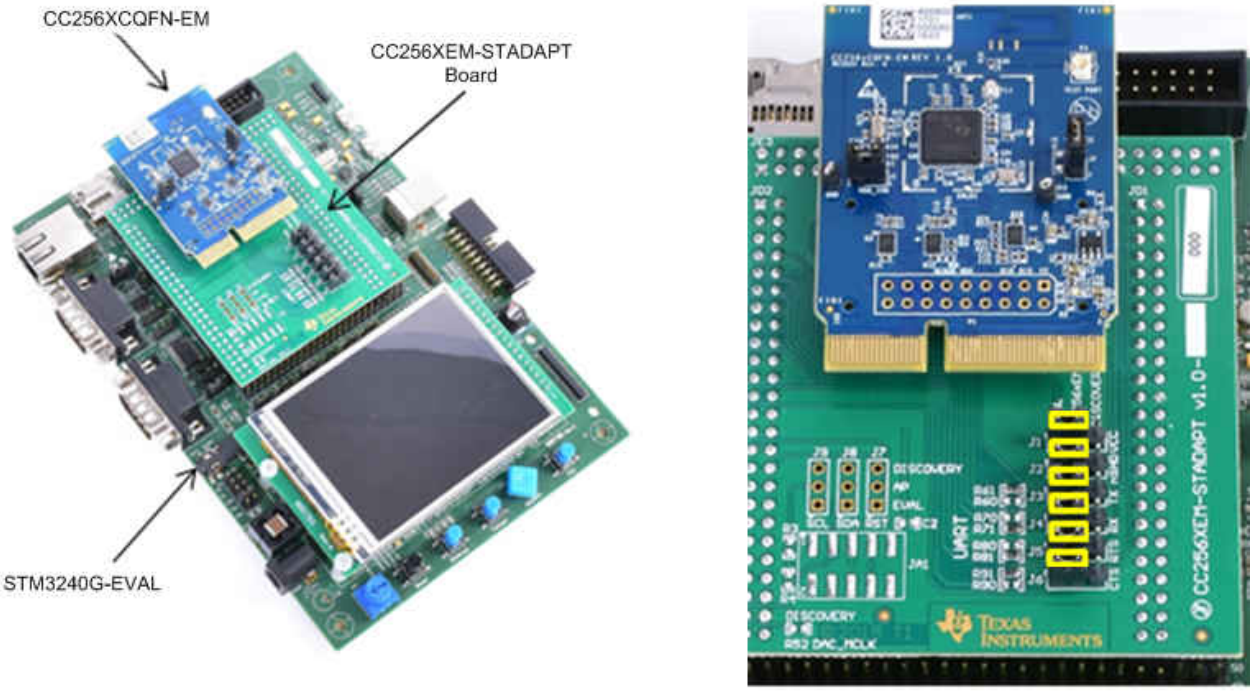

Figure 3-2. STM3240G-EVAL Hardware Setup Example

4 CC256XCQFN-EM Board Overview

The CC256XCQFN-EM board supports the following connectors:

- EM (default): I/Os are at 3.3 V.
- COM: I/Os are at 1.8 V.

Figure 4-1 shows the connectors on the front side of the CC256XCQFN-EM board.

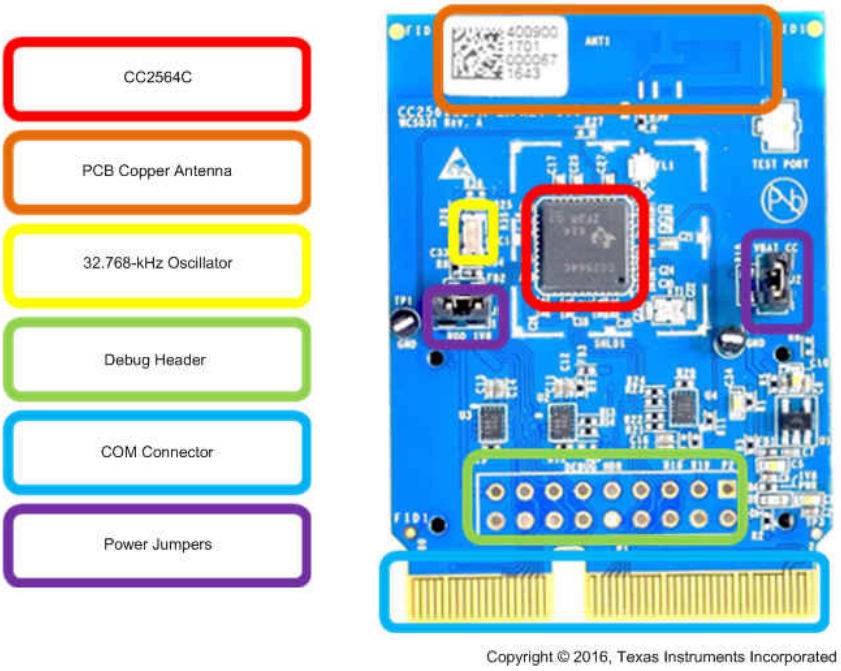

Figure 4-1. CC256XCQFN-EM Front View

Figure 4-2 shows the connectors on the back side of the CC256XCQFN-EM board.

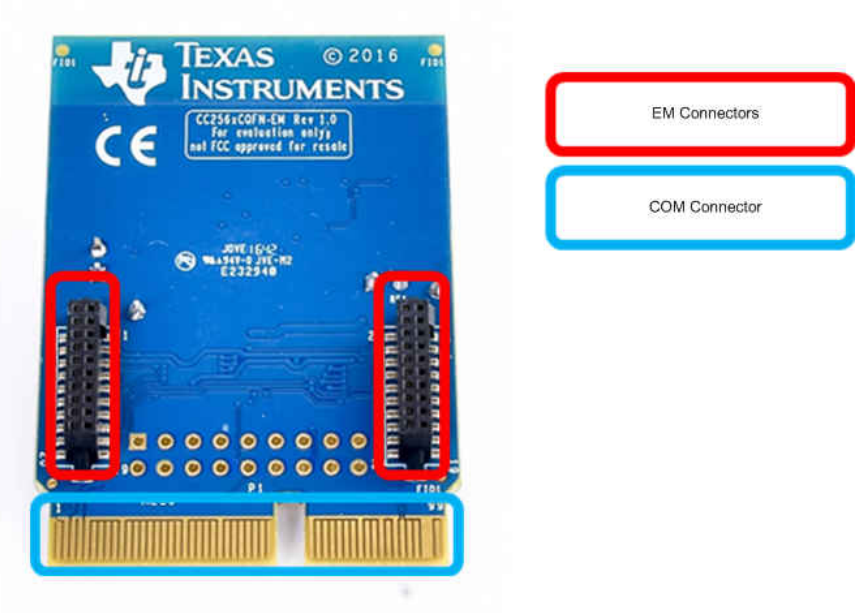

Figure 4-2. CC256XCQFN-EM Back View

5 CC256XCQFN-EM Board Settings

This section describes the settings for the EM connector and the COM connector.

5.1 EM Connector Settings

The CC256XCQFN-EM can be mounted on TI MCU platforms such as the MSP-EXP432P401R using the BOOST-CCEMADAPTER. The CC256XCQFN-EM EM1/EM2 connectors can also be used with the CC256XEM-STADAPT to mount the CC256XCQFN-EM on other MCU platforms.

All EM I/Os are at 3.3-V levels. Pin assignments are described with respect to the front (CC2564C) side. For example, MODULE_UART_RX refers to the receiving UART RX pin on the CC256xC device that connects to the UART_TX pin on the MCU.

Table 5-1 describes the standard pinout for EM1.

Table 5-1. EM1 Standard Pinout

Pin	EM Adapter Assignment(1)	Pin	EM Adapter Assignment(1)
1	GND	2	NC
3	MODULE_UART_CTS	4	NC
5	SLOW_CLK	6	NC
7	MODULE_UART_RX	8	NC
9	MODULE_UART_TX	10	NC
11	NC	12	NC
13	NC	14	NC
15	NC	16	NC
17	NC	18	NC
19	GND	20	NC

(1) NC = not connected

Table 5-2 describes the standard pinout for EM2.

Table 5-2. EM2 Standard Pinout

Pin	EM Adapter Assignment(1)	Pin	EM Adapter Assignment(1)
1	NC	2	GND
3	NC	4	NC
5	NC	6	NC
7	3.3 V	8	MODULE_AUDIO_DATA_OUT
9	3.3 V	10	MODULE_AUDIO_DATA_IN
11	MODULE_AUDIO_FSINK	12	NC
13	NC	14	NC
15	NC	16	NC
17	MODULE_AUDIO_CLK	18	MODULE_UART_RTS
19	nSHUTD	20	NC

(1) NC = not connected

For complete evaluation of the audio applications with the MSP432 LaunchPad and STM32 Evaluation boards, the level shifter U4 must be properly configured to ensure proper direction of PCM signals.

- When using CC256XC as PCM master:
  - R19 must be populated with a 10K Ω resistor.
  - R18 and R11 must be unpopulated (removed).
- When using CC256XC as PCM slave:
  - R18 must be populated with a 0Ω resistor.
  - R19 and R11 must be unpopulated (removed).

More information on the hardware changes required for PCM signals on EM connectors is in the Dual-Mode Bluetooth CC2564C Evaluation Board User's Guide and the CC256XCQFN-EM board design files (schematics and bill of materials).

5.2 COM Connector Settings

The COM connector interfaces with TI's MPU platforms, such as the AM335x evaluation module (TMDXEVM3358).

Note

- All I/Os for the COM connector are at 1.8 V.
- Some components must be removed (DNI) and R2 must be populated on the CC256XCQFN-EM to use to use the COM connector with the AM335x evaluation module.
- EM1, EM2, U2, U3, U4 must be unpopulated (removed).
- R2 (0 Ω) must be populated.
- More information on the hardware changes required for COM connector is in the Dual-Mode Bluetooth CC2564C Evaluation Board User's Guide and the CC256XCQFN-EM board design files (schematics and bill of materials).

Table 5-3 describes the COM connector pinout.

Table 5-3. COM Connector Pinout

Pin(1)	Relevant COM Connector Pin Assignment
1	SLOW_CLK_EDGE
8	1V8_IN
52	AUD_CLK_1V8
54	AUD_FSYNC_1V8
56	AUD_IN_1V8
58	AUD_OUT_1V8
66	HCI_TX_1V8
68	HCI_RX_1V8
70	HCI_CTS_1V8
72	HCI_RTS_1V8
76	TX_DEBUG_1V8
89	nSHUTDOWN_1V8
3, 9, 19, 37, 47, 63, 77, 83, 87, 95, 97	GND
2, 6, 18, 22, 42, 60, 64, 92	GND

(1) Pins not listed are NC.

6 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision B (March 2020) to Revision C (December 2021)	Page
• Updated language to reflect Bluetooth 5.1 certification	2
• Updated the numbering format for tables, figures and cross-references throughout the document	2

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