CC3200 SimpleLink™ Wi-Fi® and IoT Solution, A SingleChip Wireless MCU - Audio BoosterPack

User's Guide

Literature Number: SWRU383A
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Getting Started

1.1 Introduction

The SimpleLink™ Wi-Fi® CC3200 Audio BoosterPack (CC3200AUDBOOST) enables the evaluation and development with the digital audio peripheral [I2S] present on the SimpleLink Wi-Fi CC3200 device. This BoosterPack can be used with the SimpleLink Wi-Fi CC3200 Launchpad (CC3200-LAUNCHXL) Version 3.2 & higher. The BoosterPack contains a Class-D power amplifier to drive the speakers and an ultra-low power audio codec, TLV320AIC3254, which supports programmable audio processing. Speakers, headsets, and microphones are sold separately. Sample application in SDK requires two CC3200 LaunchPads and CC3200AUDBOOST kits. Applications include: Wi-Fi speakers, doorbell, baby monitor, Wi-Fi headsets, Wi-Fi audio streaming, and walkie-talkies.

1.2 Key Features

- TLV320AIC3254, Ultra Low Power Stereo Audio Codec
- TPA2012D2, 2.1 W/CH Stereo Filter-Free Class-D Audio Power Amplifier
- 3.5 mm Mono Jack
- 3.5 mm Stereo Jack IN
- 3.5 mm Stereo Jack Out
- On-board MIC
- Terminal blocks to connect external amplifiers
- No on-board LDO. Once the CC3200AUDBOOST and the CC3200-LAUNCHXL are connected, the CC3200-LAUNCHXL sources power to the CC3200AUDBOOST. Specifically, the CC3200-LAUNCHXL provides power to the audio codec and the power amplifier on the CC3200AUDBOOST

1.3 What's Included

- CC3200AUDBOOST
- Quick Start guide

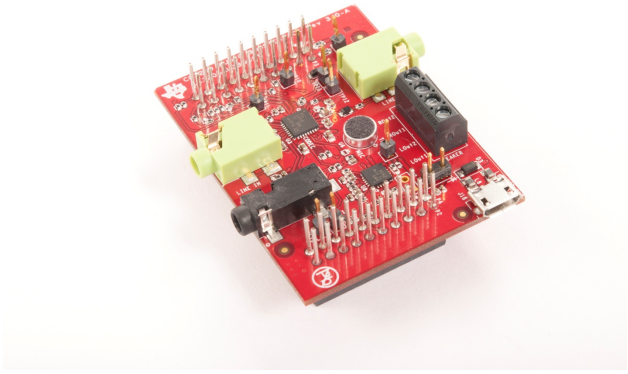
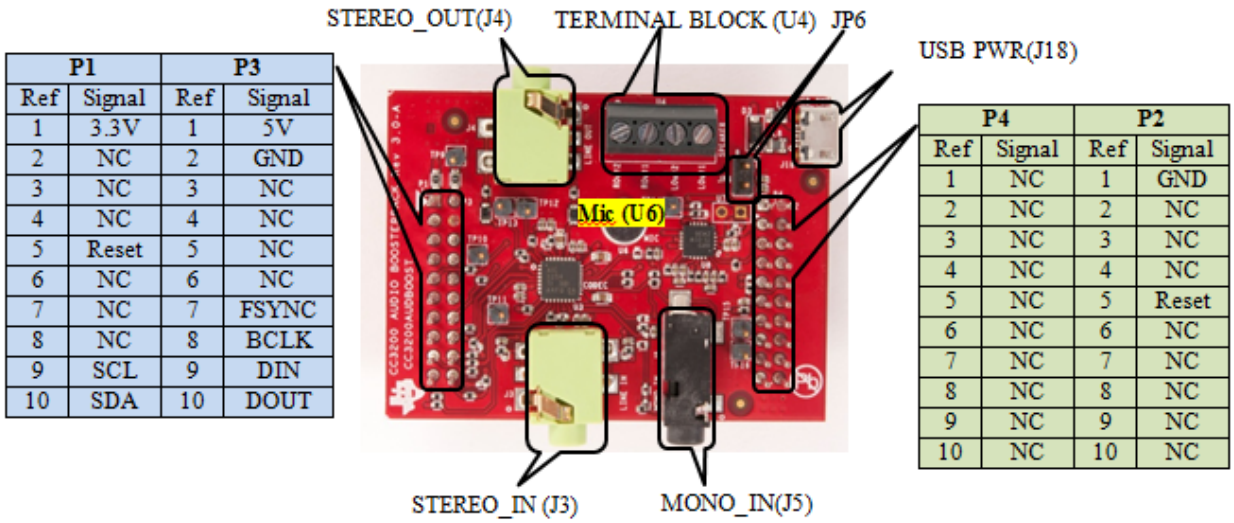


Figure 1-1. CC3200AUDBOOST

2.1 CC3200AUDBOOST

The CC3200AUDBOOST is a BoosterPack board with several connectors which allow the user to demonstrate the audio capability of the CC3200 device, present on the CC3200-LAUNCHXL board. Those connectors are described below.



P1		P3	
Ref	Signal	Ref	Signal
1	3.3V	1	5V
2	NC	2	GND
3	NC	3	NC
4	NC	4	NC
5	Reset	5	NC
6	NC	6	NC
7	NC	7	FSYNC
8	NC	8	BCLK
9	SCL	9	DIN
10	SDA	10	DOUT

P4		P2	
Ref	Signal	Ref	Signal
1	NC	1	GND
2	NC	2	NC
3	NC	3	NC
4	NC	4	NC
5	NC	5	Reset
6	NC	6	NC
7	NC	7	NC
8	NC	8	NC
9	NC	9	NC
10	NC	10	NC

Figure 2-1. CC3200AUDBOOST Board's Interfaces

2.1.1 20 Pins headers (P1, P2, P3, P4)

The 2x10 pin Launchpad headers (P1, P2, P3, P4) connect the CC3200AUDBOOST board to the CC3200-LAUNCHXL. The headers provide the necessary interface to power up the audio boosterpack (CC3200AUDBOOST) and access the I2C lines on the CC3200-LAUNCHXL board. While connecting to the CC3200-LAUNCHXL, ensure that the white triangle at P1 matches with the CC3200-LAUNCHXL.

2.1.1.1 Power Connector

The CC3200AUDBOOST board is powered from 3.3 V sourced from the Launchpad. No special care is needed when the Launchpad board is powered from the USB supply, but when powered from a 2xAA battery, ensure that the battery does not drop below 2.6 V.

2.1.1.2 I2C Connections

The I2C lines are connected, by default, to the launchpad through the 20 pin connector. The default I2C address on the on-board audio codec is given in Table 2-1.

Table 2-1. Default I2C Address

Part	Ref	Part Number	Slave Address
Audio Codec	U3	TLV320AIC3254	0x30

2.1.2 Mono and Stereo Jacks

- The stereo jack IN (J3) is a 3.5 mm audio jack connecting to an audio source.
- The stereo jack OUT (J4) is a 3.5 mm jack connecting to a headphone or speaker.
- The mono audio jack IN (J5) is a 3.5 mm audio jack connecting to an audio source.

2.1.3 On-Board MIC

The on-board MIC (U6) allows the audio boosterpack to be used as a microphone emulator. The used on-board MIC is CMC-2242PBL-A.

2.1.4 Terminal Blocks (U4)

The CC3200AUDBOOST can be connected to external amplifiers via the terminal block (U4).

2.2 Power Amplifier

The on-board amplifier has gain select pins G1 (MSB) and G0 (LSB). The max gain supported with the on-board amplifier is 18dB.

G1 (MSB)	G0 (LSB)	Gain
0	0	6dB
1	0	18dB

2.3 Connecting to CC32000-LAUNCHXL

2.3.1 Configuration required on CC3200-LAUNCHXL

No changes are required. CC3200AUDBOOST should be connected to CC3200-LAUNCHXL with the default configurations. Ensure the following:

1. Once the binaries are flashed, remove jumper J15 on SOP2 of the CC3200-LAUNCHXL, and reset the board (refer to the green circle in Figure 2-2).
2. Jumpers J2 and J3 should be closed (refer to the blue circle in Figure 2-2).

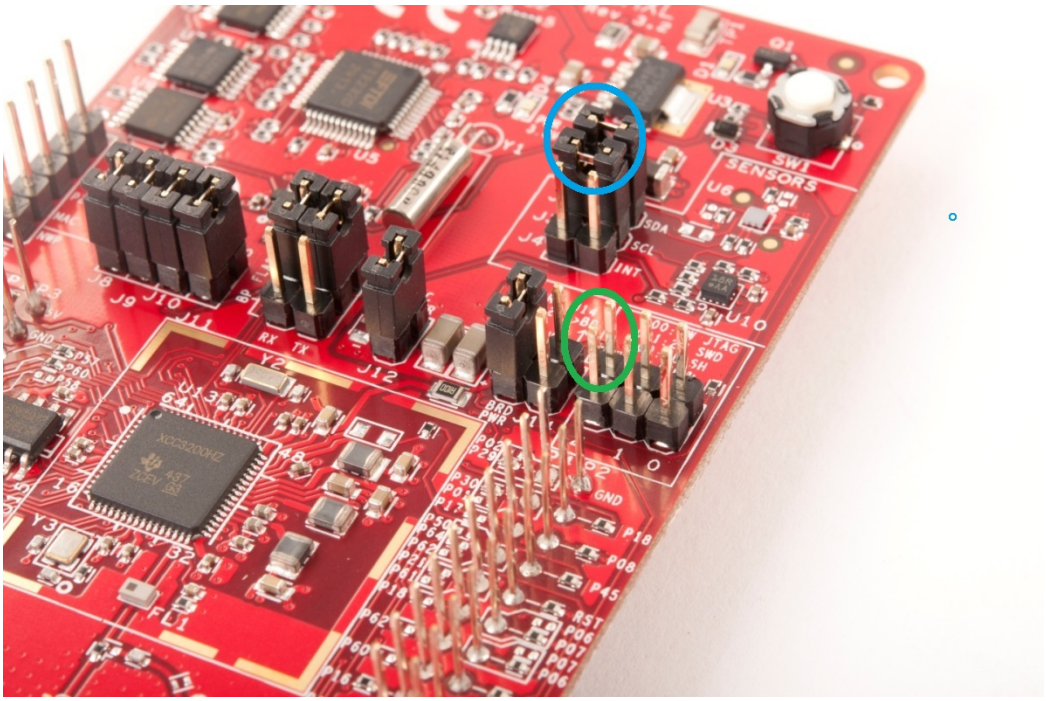


Figure 2-2. CC3200-LAUNCHXL Configuration

2.3.2 Connecting to CC3200-LAUNCHXL

The CC3200AUDBOOST board can be directly mated with a CC3200-LAUNCHXL by using two 2x10 pin header connectors. A white triangle marked on the board (shown in the green circle) indicates the pin-1 (of P1) that must be aligned with the triangle on the CC3200-LAUNCHXL (pin 1 of P1). Failure to align the boards correctly before power-up can damage the boards. The correctly connected boards are shown in Figure 2-3.

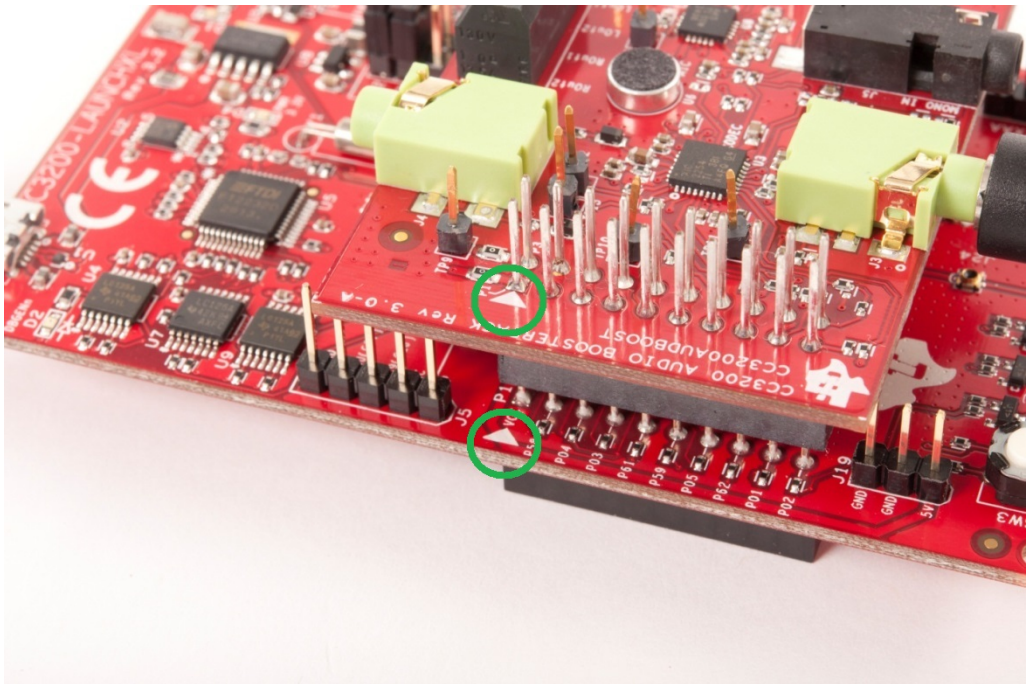


Figure 2-3. Connecting to CC3200-LAUNCHXL

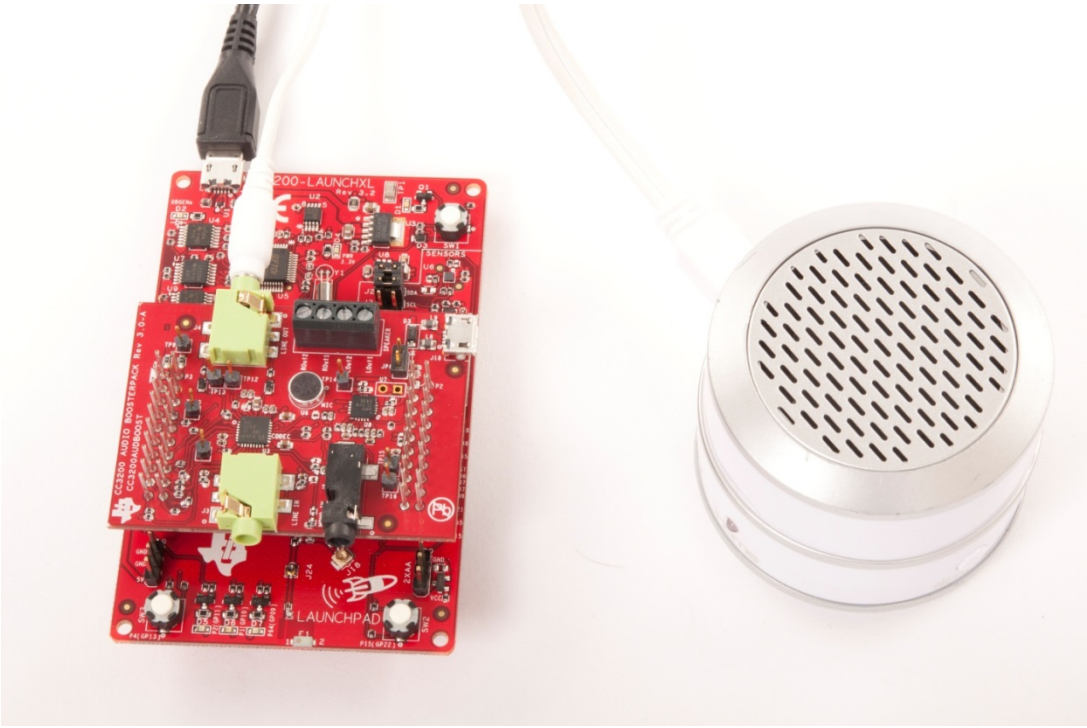


Figure 2-4. Connected Boards

2.3.3 Software Examples

This link provides an example that demonstrates a bi-directional audio application on a CC3200-LAUNCHXL+CC3200AUDBOOST setup. The setup comprises of two CC3200-LAUNCHXL in station (STA) mode. The audio is streamed over Wi-Fi from one CC3200-LAUNCHXL and rendered on another.

- Hardware prerequisites:
  - 2x CC3200-LAUNCHXL 3.2 or above
  - 2x CC3200AUDBOOST 3.0-A
  - 2x Headphones/speakers
  - 2x Audio sources
  - Android / iOS device (for Smart Config)
  - Access point
- Software Prerequisites:
  - CC3200 SDK
  - Uniflash Tool
  - Smart Config Application

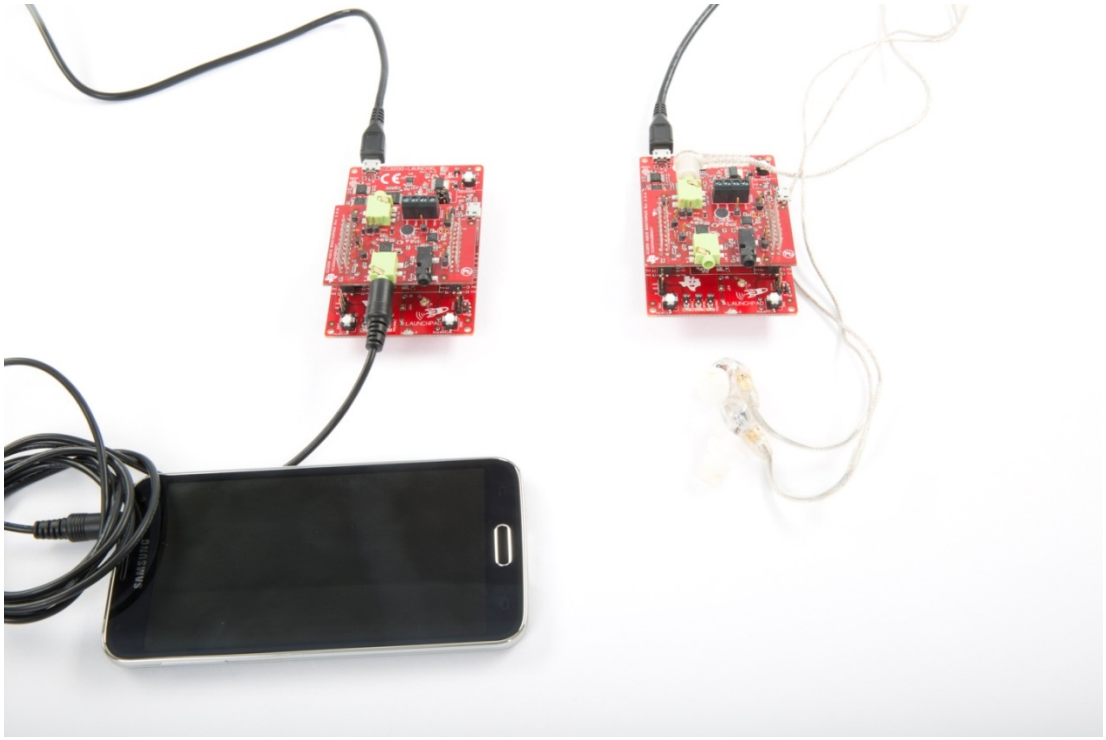


Figure 2-5. Connect to Android Device

Additional Resources

3.1 Schematic and Board files

The latest design files, which include the gerber files, schematic, bill of materials, PCB layout, and assembly drawings, can be obtained from http://www.ti.com/tool/tidc-cc3200audboost.

3.2 CC3200AUDBOOST Wiki

Visit the following wiki page for an example application:
http://processors.wiki.ti.com/index.php/CC32xx_Wifi_Audio_Application

3.3 The Community

Search the forums at e2e.ti.com. If you cannot find your answer, post your question to the community.

Revision History

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

Changes from Original (September 2014) to a Revision	Page

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      Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

      FCC Interference Statement for Class A EVM devices

STANDARD TERMS FOR EVALUATION MODULES (continued)

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265