

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

## **User's Guide**



Literature Number: SWRU383

September 2014

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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

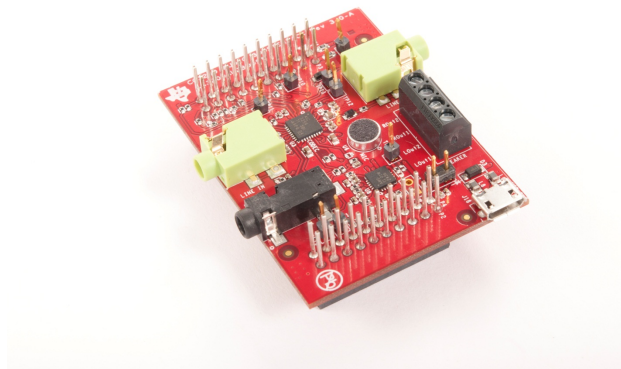
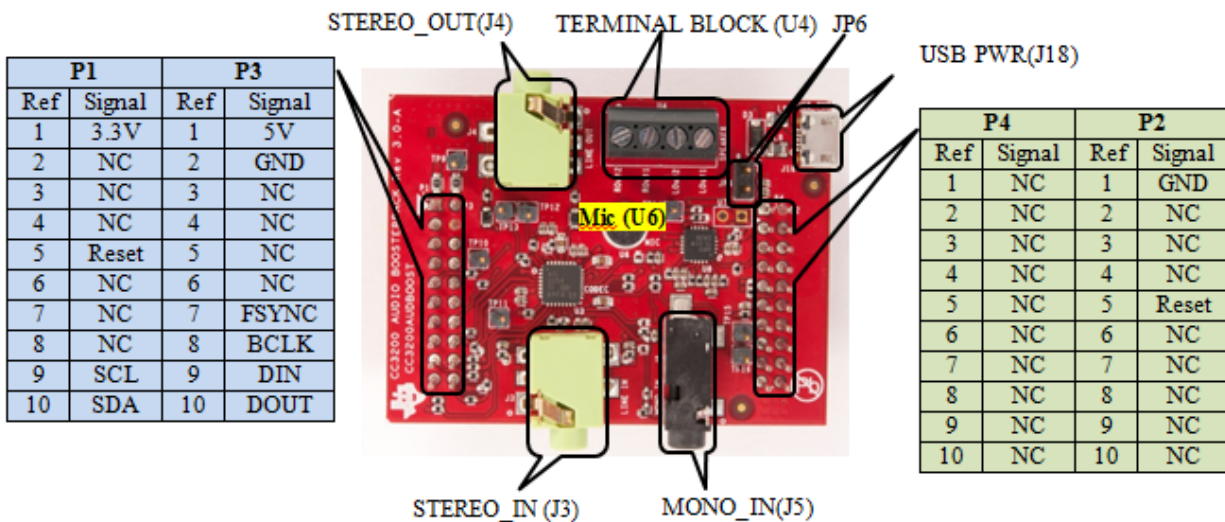


Figure 1-1. CC3200AUDBOOST

## Hardware Overview

### 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.



**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.

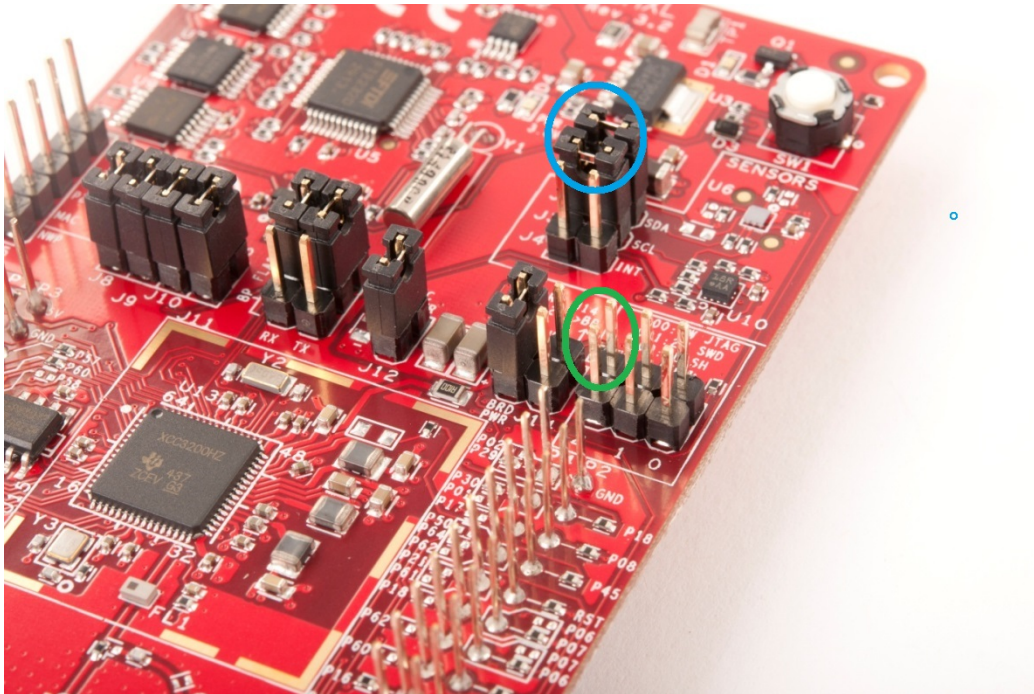
G1 (MSB)	G0 (LSB)	Gain
0	0	6dB
1	0	18dB

## 2.3 Connecting to CC3200-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.

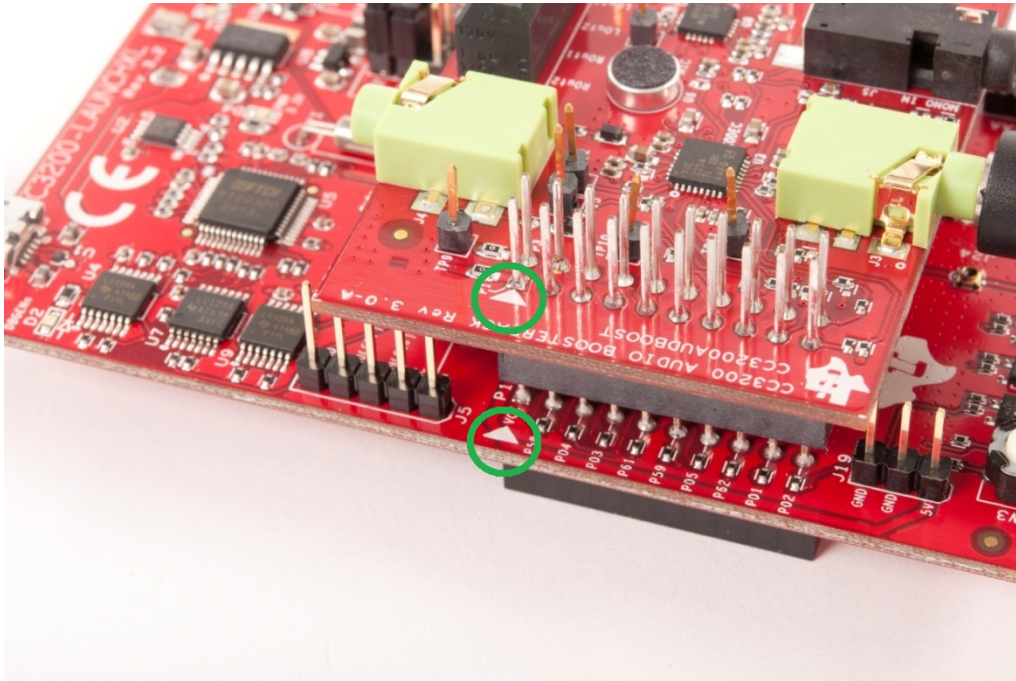


Figure 2-3. Connecting to CC3200-LAUNCHXL

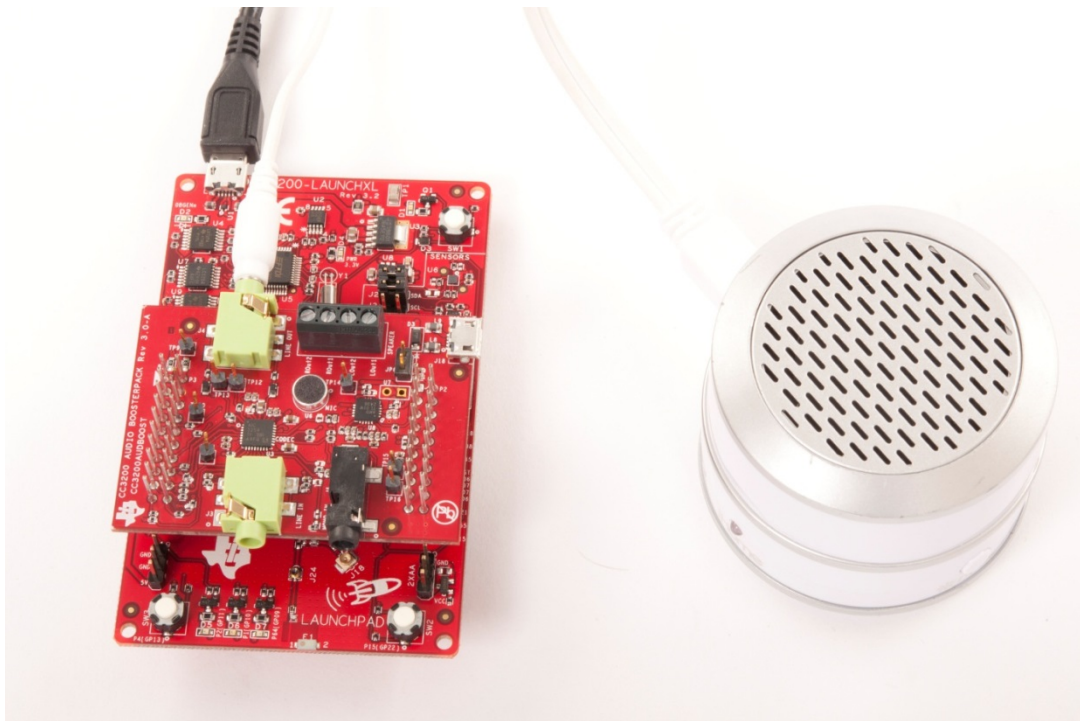


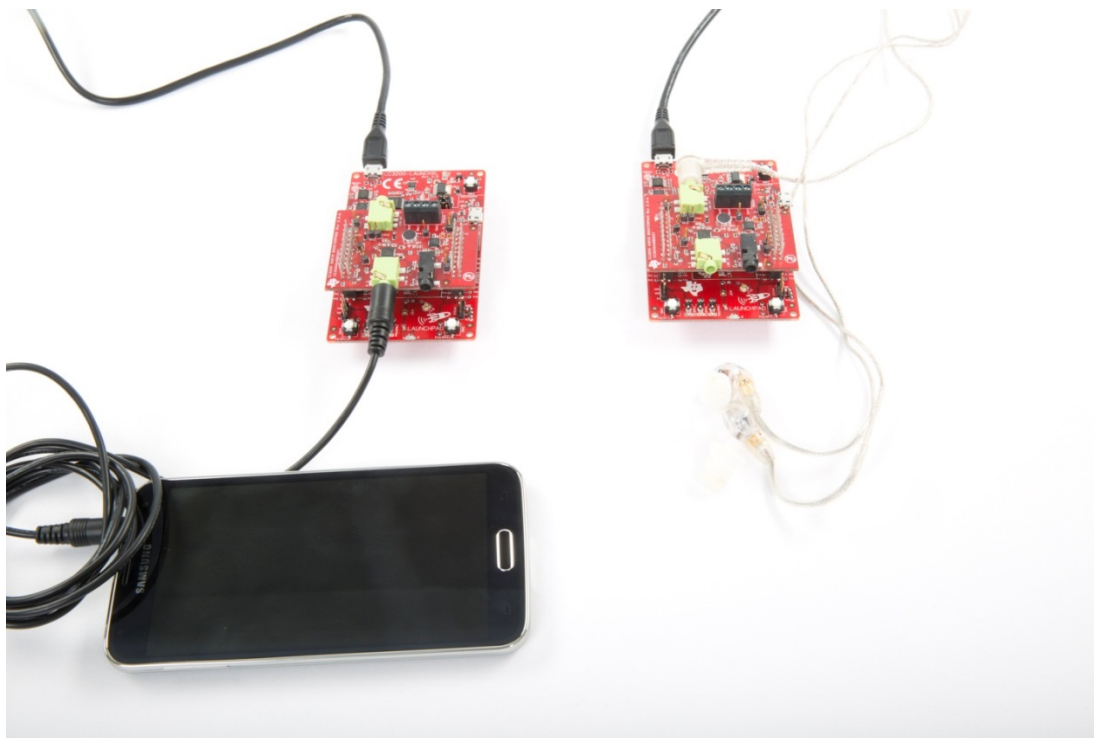
Figure 2-4. Connected Boards



### 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 Android application](#)



**Figure 2-5. Connect to Android Device**

## ***Additional Resources***

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### **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](http://processors.wiki.ti.com/index.php/CC32xx_Wifi_Audio_Application)

### **3.3 The Community**

Search the forums at [e2e.ti.com](http://e2e.ti.com). If you cannot find your answer, post your question to the community.

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- 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.
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