NAU85L40 Demo Board
User Manual

The PCB name: NAU85L40 DEMO board V1.0

Ordering P/N:

NL-NAU85L40 (Differential microphone pattern)

NL-NAU85L40S (Single-end microphone pattern)

For additional information or questions, please contact: Nuvoton Technology Corporation.

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1 OVERVIEW

The NAU85L40 is a low power, high quality, 4-channel ADC for microphone array application. The NAU85L40 integrates programmable gain preamplifiers for quad differential microphones, significantly reducing external component requirements. A fractional FLL is available to accurately generate any audio sample rate using any commonly available system clock source from 8KHz through 33MHz. Audio data can be directed to two I2S data out lines or onto a single time division multiplexed (TDM) PCM data output.

2 INTRODUCTION

The NAU85L40 Demo Board is designed to allow a thorough evaluation of the multi analog input device.

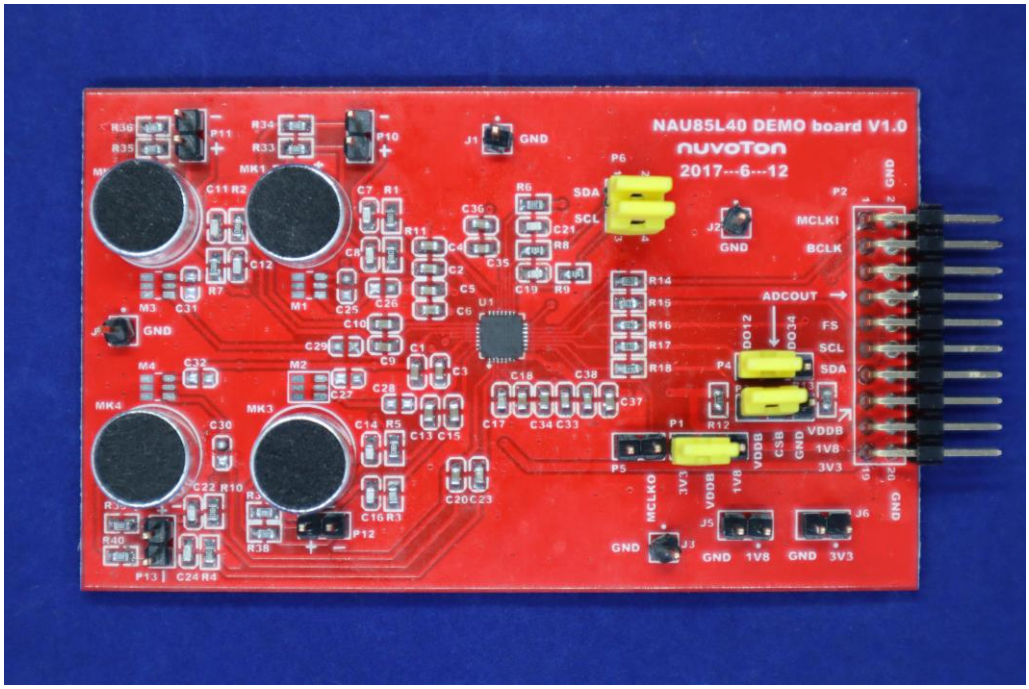


Figure 2-1 NAU85L40 Demo Board (Differential microphone pattern)

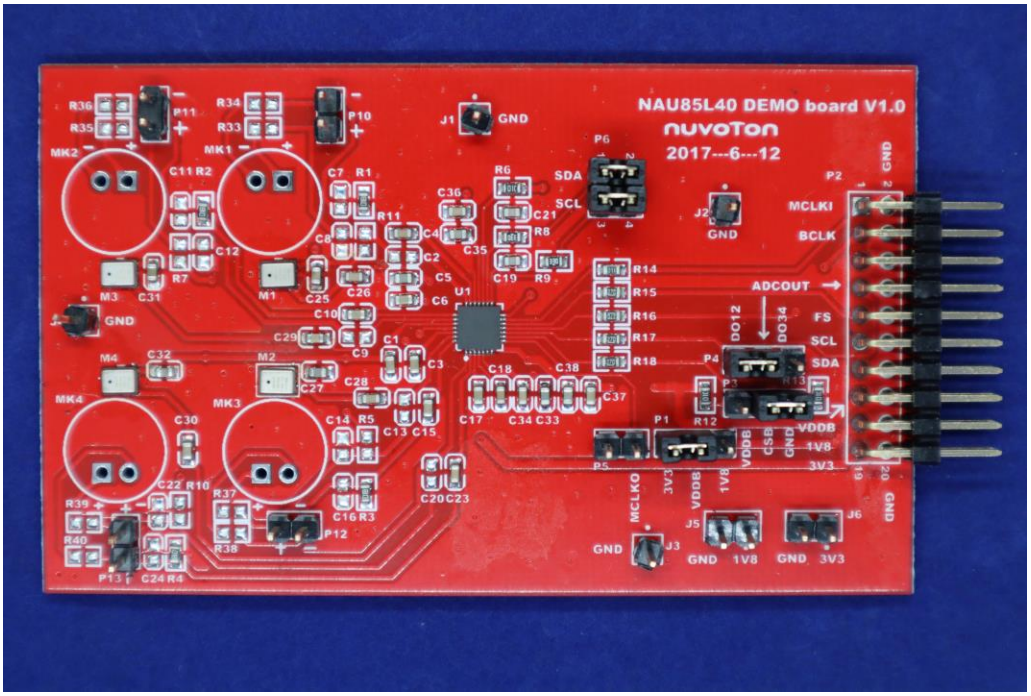


Figure 2-2 NAU85L40 Demo Board (Single-end microphone pattern)

2.1 Top View

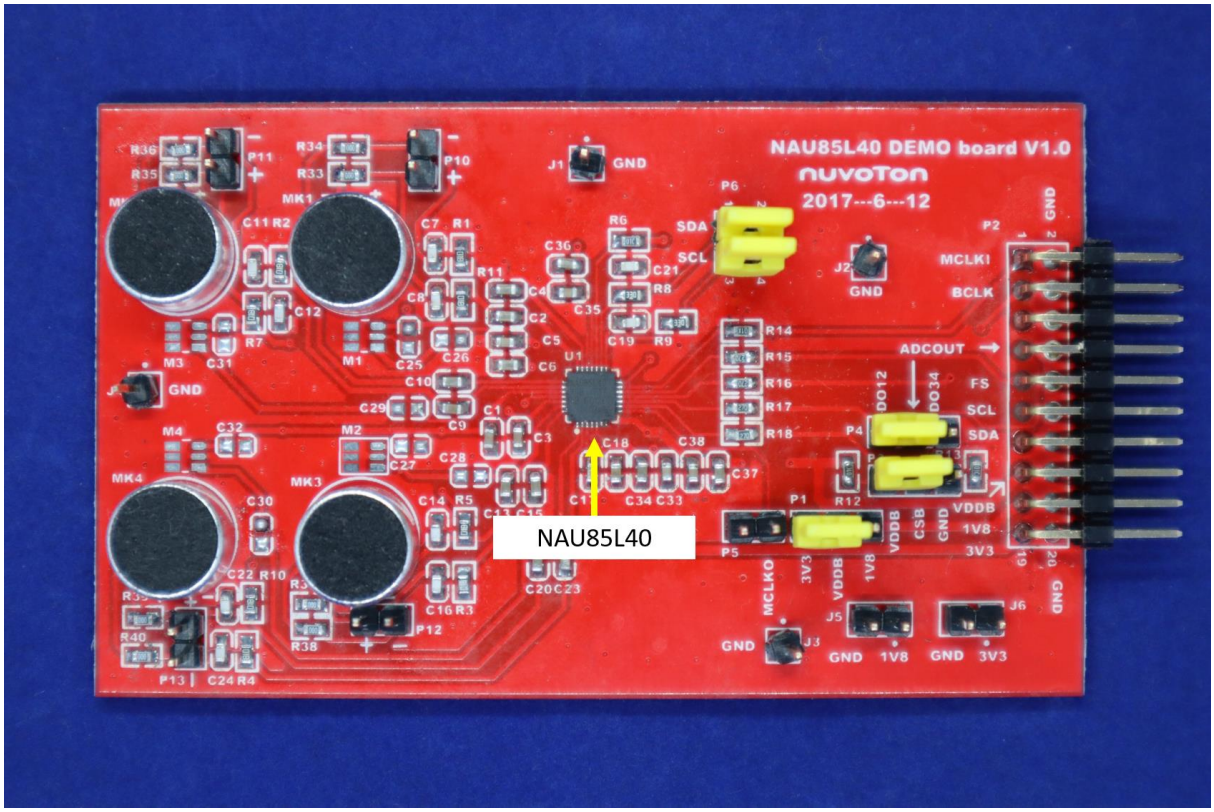


Figure 2.1-1 Top View

Name	Description
NAU85L40	Audio ADC

Table 2.1-1 Main Components

2.2 Input / Output (Differential microphone pattern)

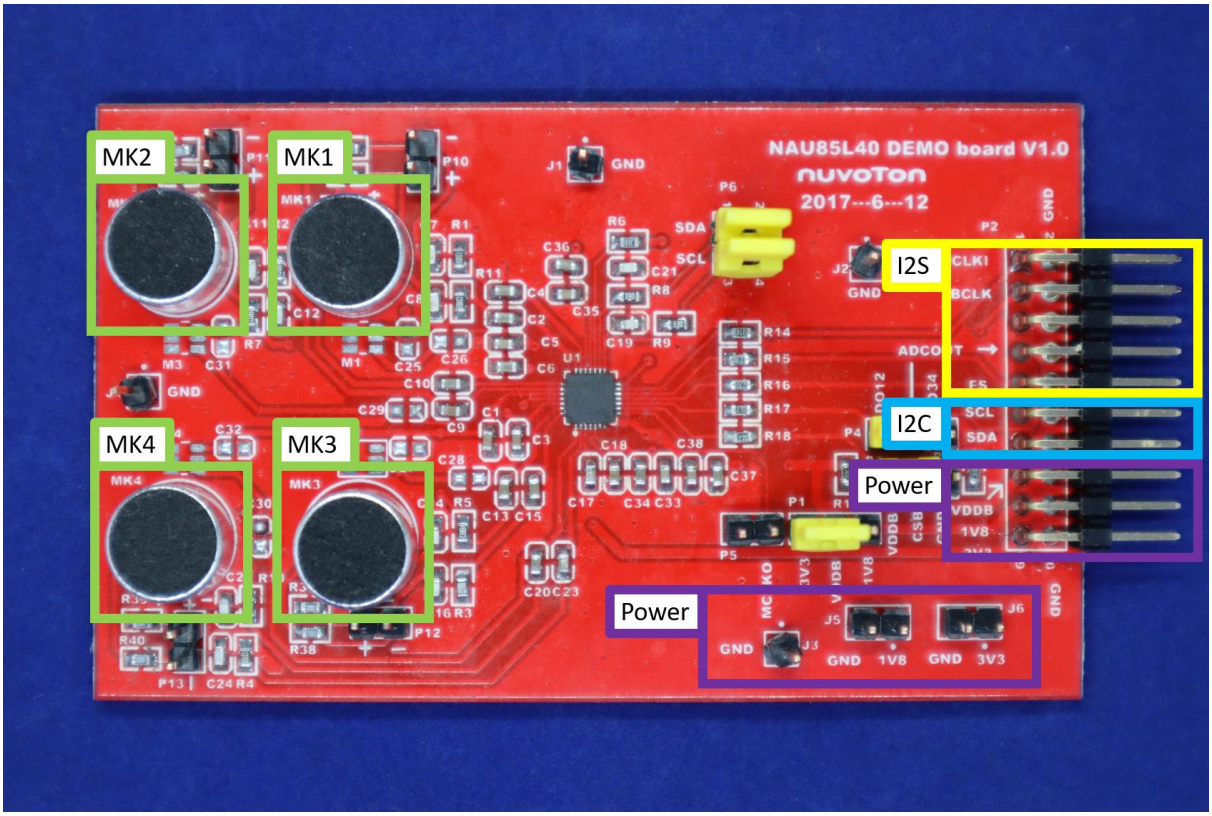


Figure 2.2-1 Input / Output(Differential microphone pattern)

Name	Description
P2	Pin 1 – I2S Interface – MCLK, Master Clock Pin 3 – I2S Interface – BCLK, Bit Clock Pin 7 – I2S Interface – ADCOUT Pin 9 – I2S Interface – FS ,Frame Sync Pin 11 – I2C Interface – SDA Pin 13 – I2C Interface – SCL Pin15 – Power. Provide power to Demo board. – VDDIO Pin 17 – Power. Provide power to Demo board. – VDD1.8 Pin 19 – Power. Provide power to Demo board. – VDD3.3
J3, J5, J6	Power. These pins can also provide the power to demo board. J3, J5, J6 or P2 select one of them.
MK1, MK2, MK3, MK4	Differential microphone input

Table 2.2-1 Input / Output (Differential microphone pattern)

2.3 Input / Output (Single-end microphone pattern)

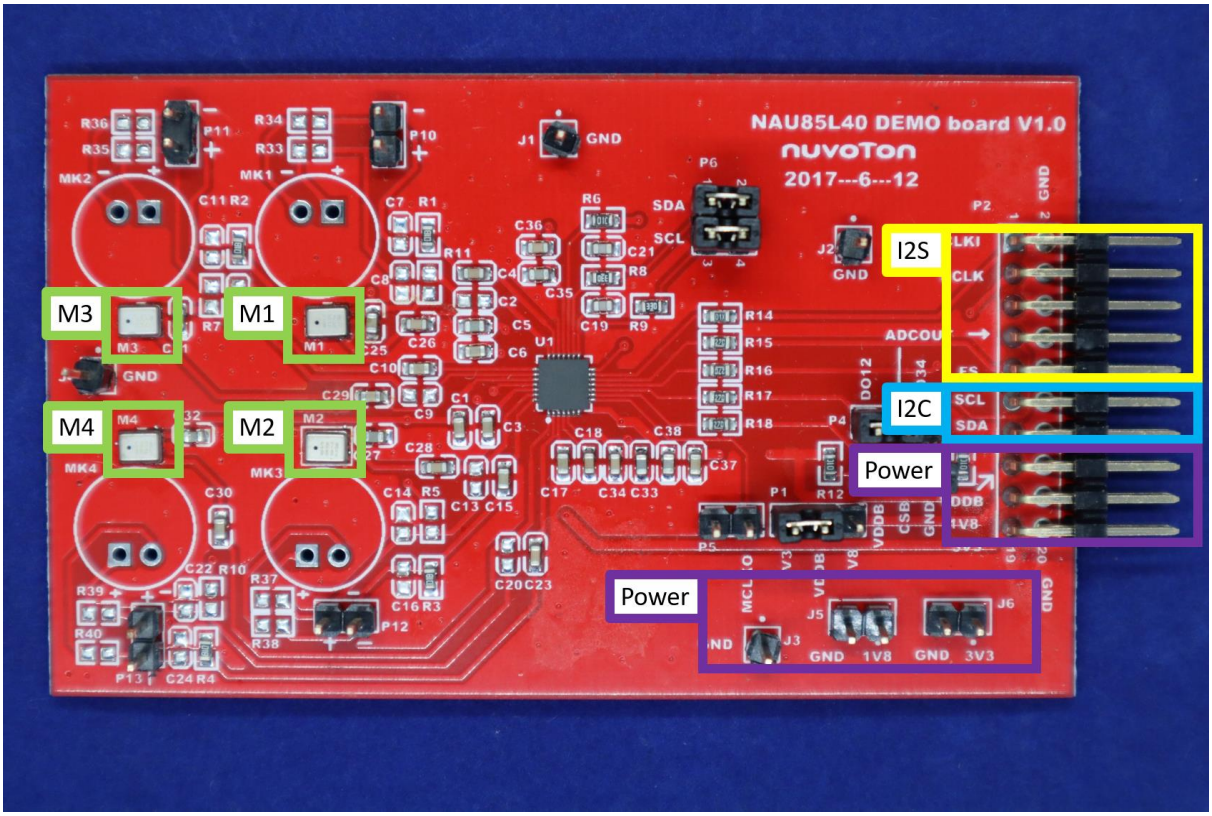


Figure 2.3-1 Input / Output(Single-end microphone pattern)

Name	Description
P2	Pin 1 – I2S Interface – MCLK, Master Clock Pin 3 – I2S Interface – BCLK, Bit Clock Pin 7 – I2S Interface – ADCOUT Pin 9 – I2S Interface – FS ,Frame Sync Pin 11 – I2C Interface – SDA Pin 13 – I2C Interface – SCL Pin15 – Power. Provide power to Demo board. – VDDIO Pin 17 – Power. Provide power to Demo board. – VDD1.8 Pin 19 – Power. Provide power to Demo board. – VDD3.3
J3, J5, J6	Power. These pins can also provide the power to demo board. J3, J5, J6 or P2 select one of them.
M1, M2, M3, M4	Single-end microphone input

Table 2.3-1 Input / Output (Single-end microphone pattern)

2.4 Jumpers

Single-end microphone's jumper with the same position as the Differential microphone pattern

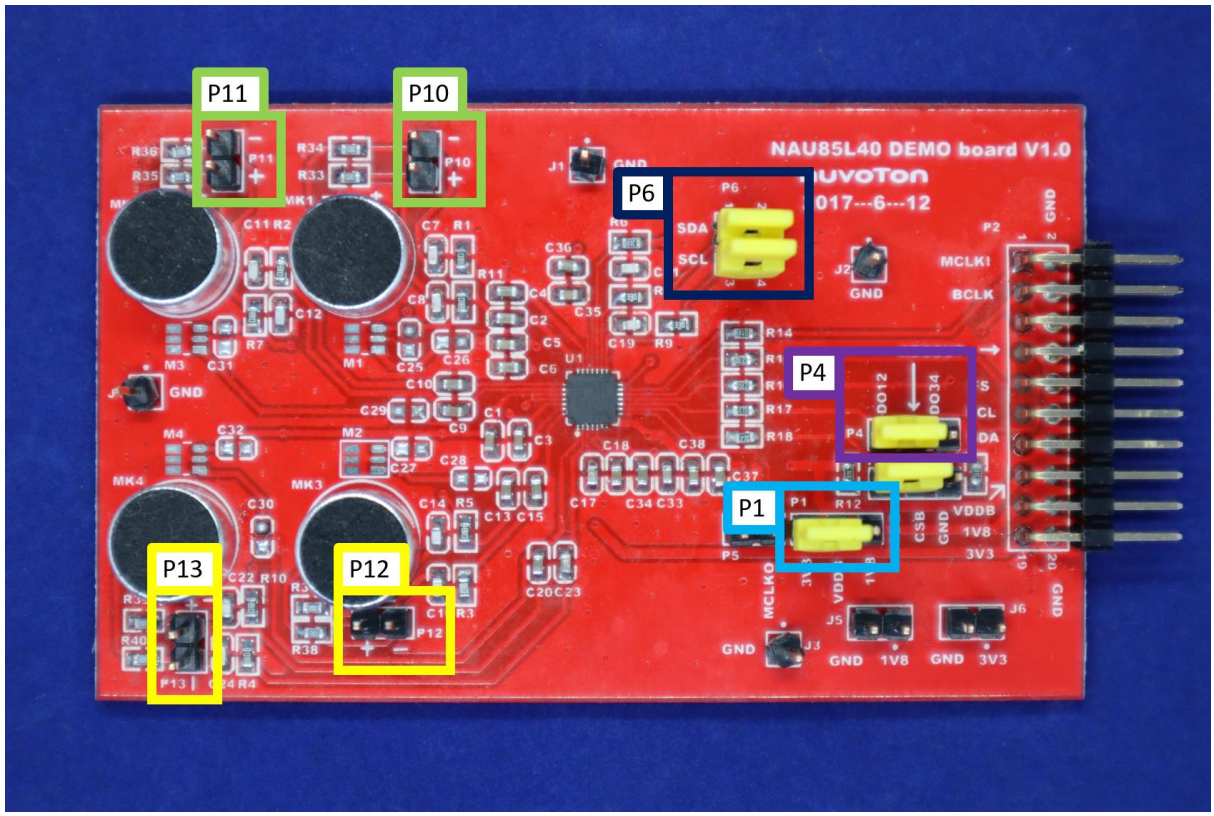
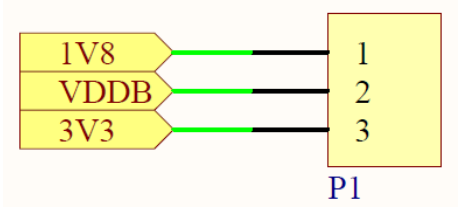
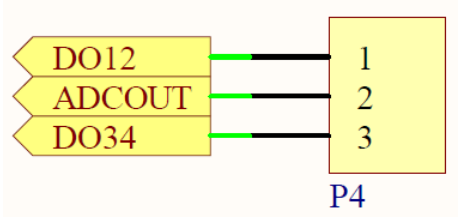
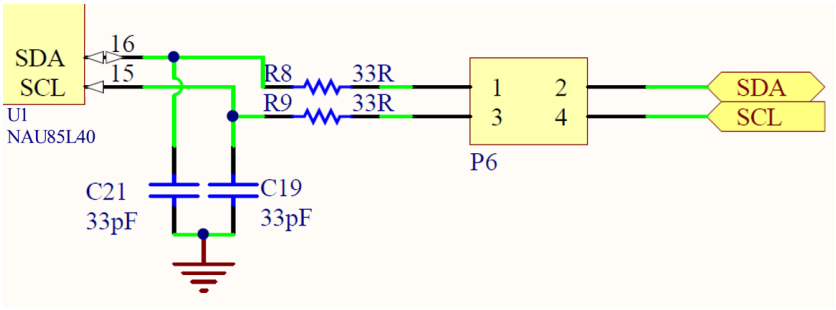


Figure 2.4-1 Jumpers

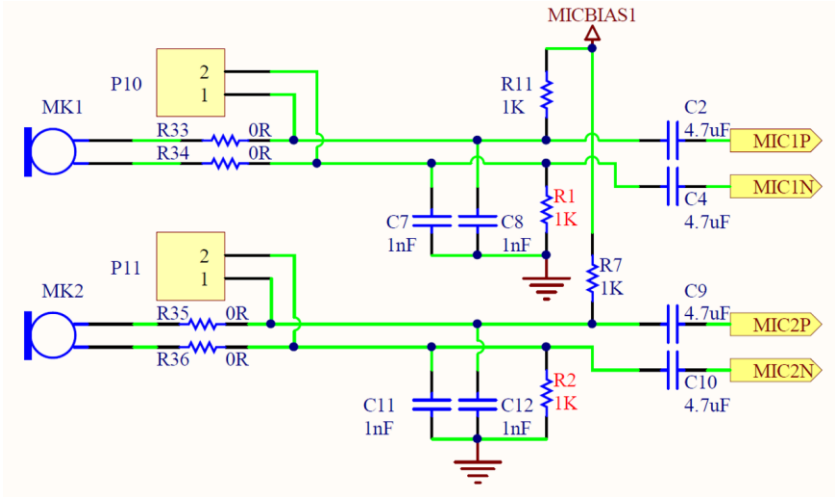
Name	Pin definition	Description
P1	VDDB voltage selection	 1-2: VDDB uses voltage of 1.8V 2-3(default): VDDB uses voltage of 3.3V Must be consistent with the I2C voltage of the master

<table>
<tr>
<td>P4</td>
<td>Select which group of signals to use for ADCOUT of P2</td>
<td>


<table>
<tr><td></td><td>1-2 (default)</td><td>2-3</td></tr>
<tr><td>P4</td><td>Use Digital Audio ADC Data Output for ADC 1 and 2 to output at ADCOUT of P2.</td><td>Use Digital Audio ADC Data Output for ADC 3 and 4 or TDM to output at ADCOUT of P2.</td></tr>
</table>
</td>
</tr>
<tr>
<td>P6</td>
<td>I2C signal input selection</td>
<td>


<table>
<tr><td></td><td>short (default)</td><td>Open</td></tr>
<tr><td>P6</td><td>I2C signal is input by P2-Pin11, Pin13</td><td>I2C signal is input by P6-Pin1, Pin3</td></tr>
</table>
</td>
</tr>
<tr>
<td>P10

P11</td>
<td>An external signal can be provided to MIC 1 (P10) and MIC 2(P11)

(Differential microphone pattern)</td>
<td>


</td>
</tr>
</table>

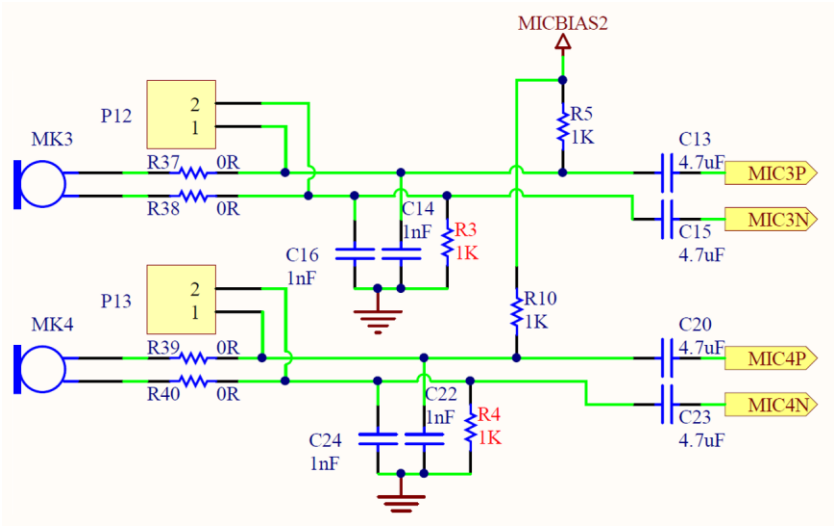
P12 P13	An external signal can be provided to MIC 3 (P12) and MIC 4(P13) **(Differential microphone pattern)**	

Table 2.4-1 Jumpers

2.5 Schematic

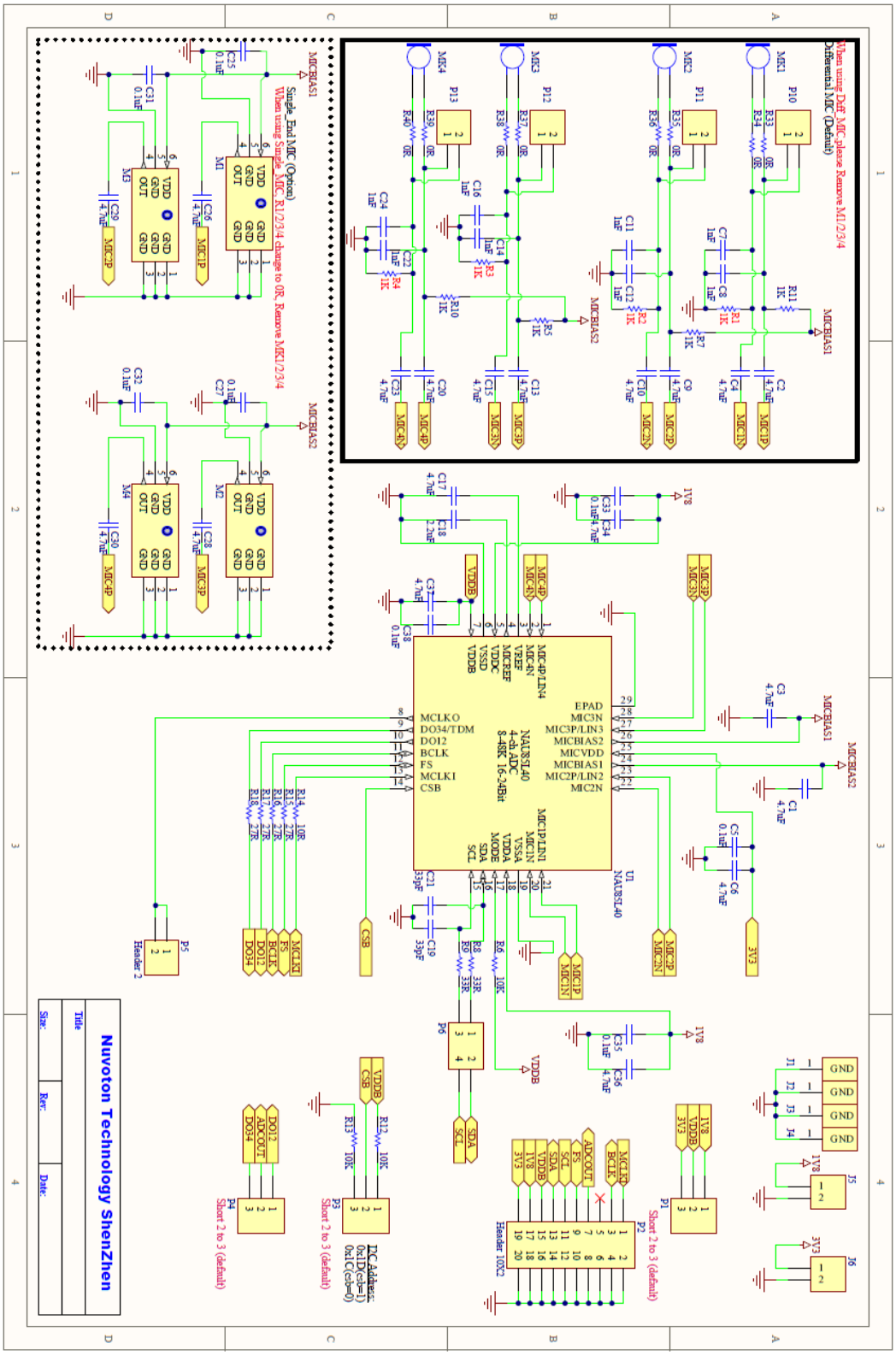


Figure 2.5-1 Schematic

2.6 Bare Board

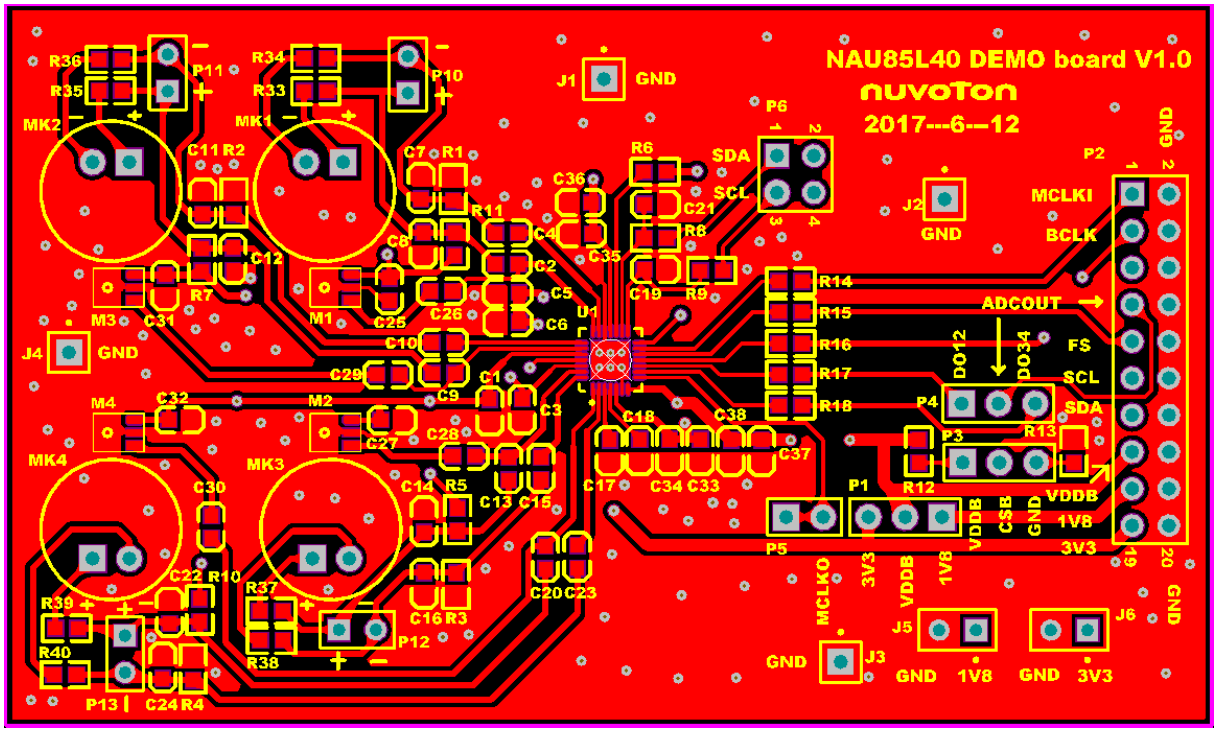


Figure 2.6-1 Top View of Bare Board

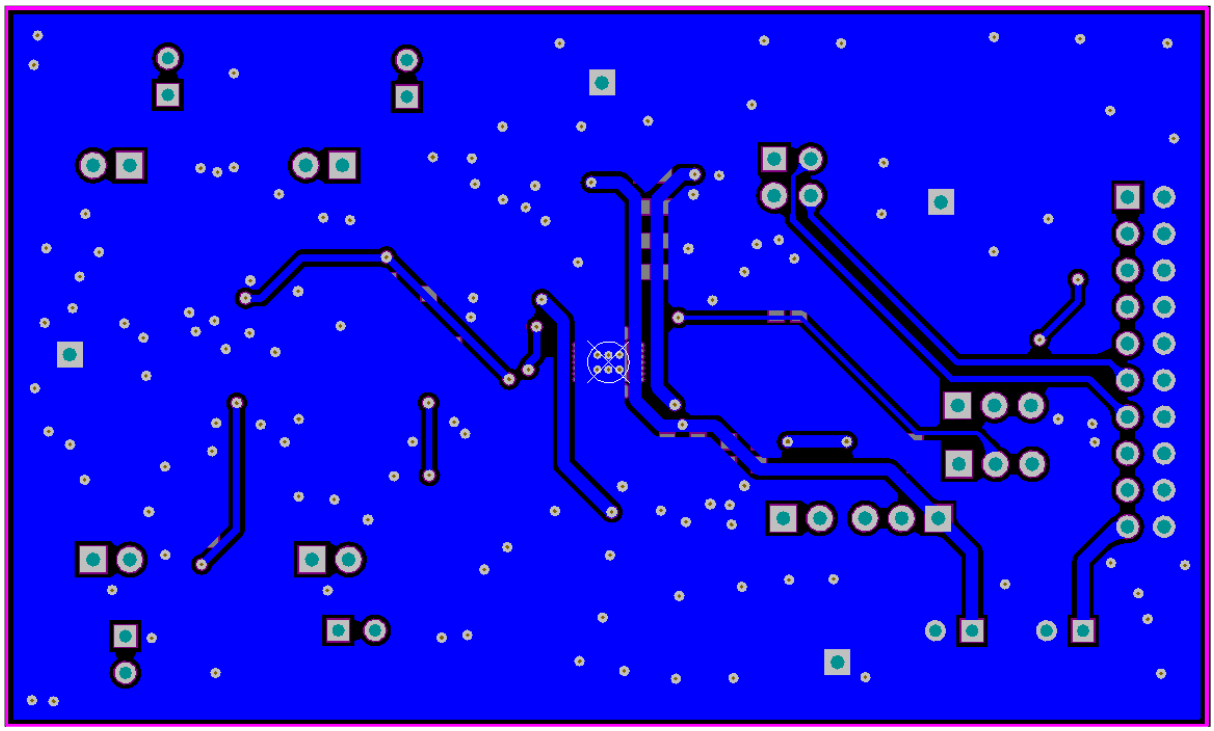


Figure 2.6-2 Top View of Bare Board

3 CONNECTED TO AUDIO CONTROL BOARD

If there is Nuvoton's Audio Control Board, NAU85L40 Demo Board can be used with Audio Control Board (USB_I2C_I2S_Control_Board_V1.1). When the Audio Control Board is connected to the NAU85L40 Demo Board, the PC or USB host can use the GUI to control the NAU85L40 Demo Board and know the status of the NAU85L40 Demo Board

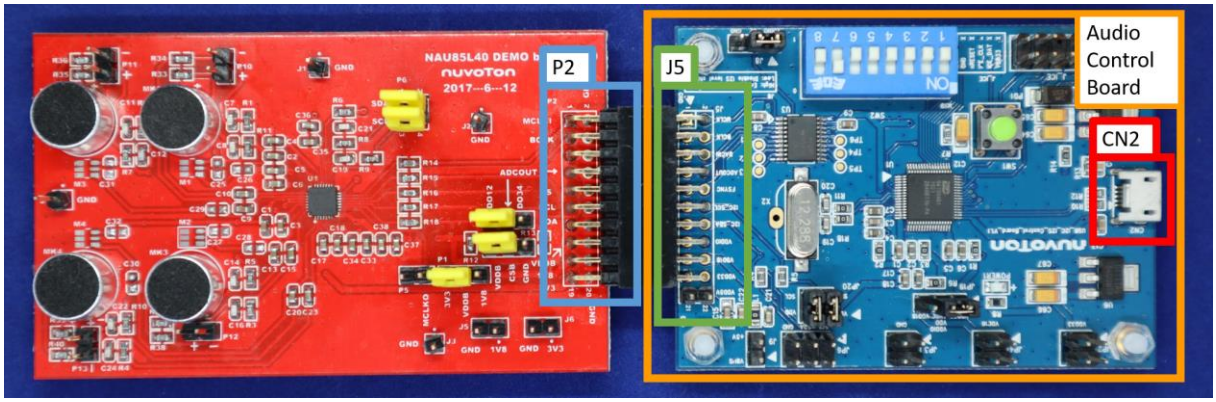


Figure 3-1 Connection Audio Control Board

Signal path:

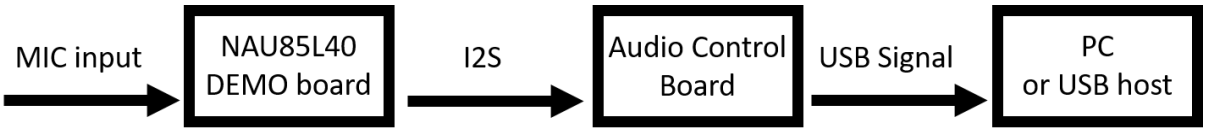


Figure 3-2 Signal Path

Board setting SOP:

Reference Figure 3-1

Step1: Connect P2 of the NAU85L40 Demo Board to J5 of the Audio Control Board.

Step2: Connect CN2 of the Audio Control Board to PC or USB host via USB cable.

4 REVISION HISTORY

Date	Revision	Description
2021.05.31	1.0	1st version release
2020.10.30	1.1	Add chapter 3 (CONNECTED TO CONTROL BOARD)
2021.06.03	1.2	Update the contents of the user manual

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