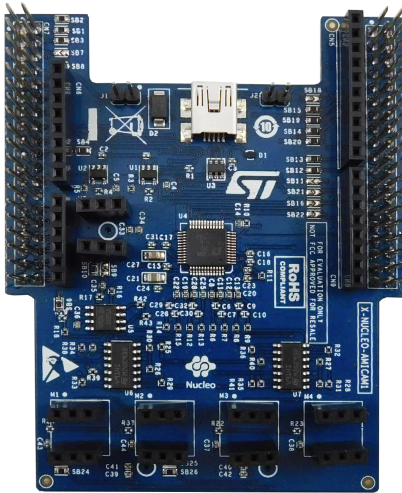


## Analog MEMS microphone expansion board based on MP23ABS1 for STM32 Nucleo



### Features

- 3 on-board **MP23ABS1** analog MEMS microphones
- 5 slots to plug analog microphone coupon boards (e.g., **STEVAl-MIC004V1**)
- Synchronized acquisition and streaming of up to 4 microphones
- Amplification stage based on TSV91x wide bandwidth operational amplifiers
- On-board external ADC
- Direct acquisition of a single microphone exploiting STM32 embedded ADC
- Up to 192 KHz sampling frequency
- Free comprehensive development firmware library and audio capture plus USB streaming sample application compatible with **STM32Cube**
- Compatible with **STM32 Nucleo** boards
- Equipped with ST morpho connectors (top and bottom) and Arduino UNO R3 connectors (top) to allow stacking of multiple boards
- RoHS and WEEE compliant



### Description

The **X-NUCLEO-AMICAM1** expansion board allows synchronized acquisition and streaming of up to 4 microphones at a maximum sampling rate of 192 KHz.

It represents a quick and easy solution to develop microphone-based applications and start implementing audio algorithms.

The expansion board is designed around the **MP23ABS1** analog MEMS microphone and is compatible with the ST morpho connector layout and with analog microphone coupon boards (e.g., **STEVAl-MIC004V1**).

The **X-NUCLEO-AMICAM1** embeds three **MP23ABS1** microphones: two connected to an external ADC and one directly routed to the STM32 embedded ADC.

The analog amplification stage is achieved thanks to ST TSV91x wide bandwidth operational amplifiers.

Product summary	
Analog MEMS microphone expansion board based on MP23ABS1 for STM32 Nucleo	<b>X-NUCLEO-AMICAM1</b>
Microphone coupon board based on MP23ABS1 analog MEMS microphone	<b>STEVAl-MIC004V1</b>
High performance MEMS audio sensor single ended analog bottom-port microphone	<b>MP23ABS1</b>
Application	Sensing

# 1 Schematic diagrams

Figure 1. X-NUCLEO-AMICAM1 circuit schematic - connectors

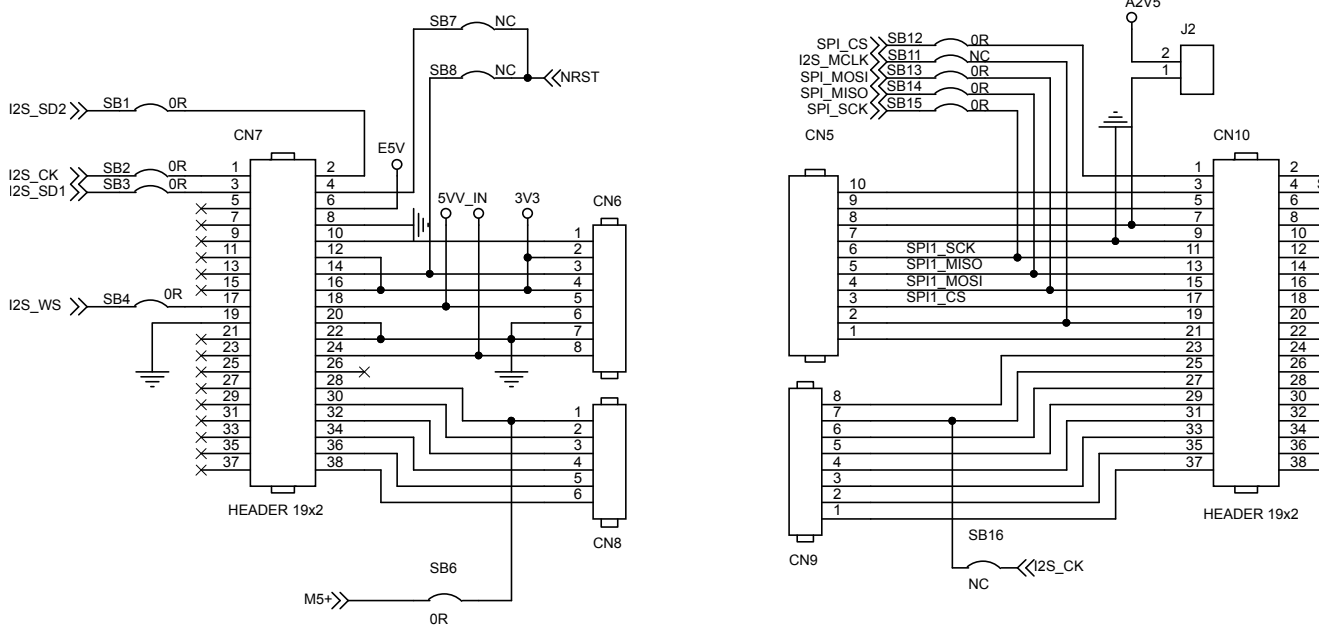


Figure 2. X-NUCLEO-AMICAM1 circuit schematic - USB, power, external ADC

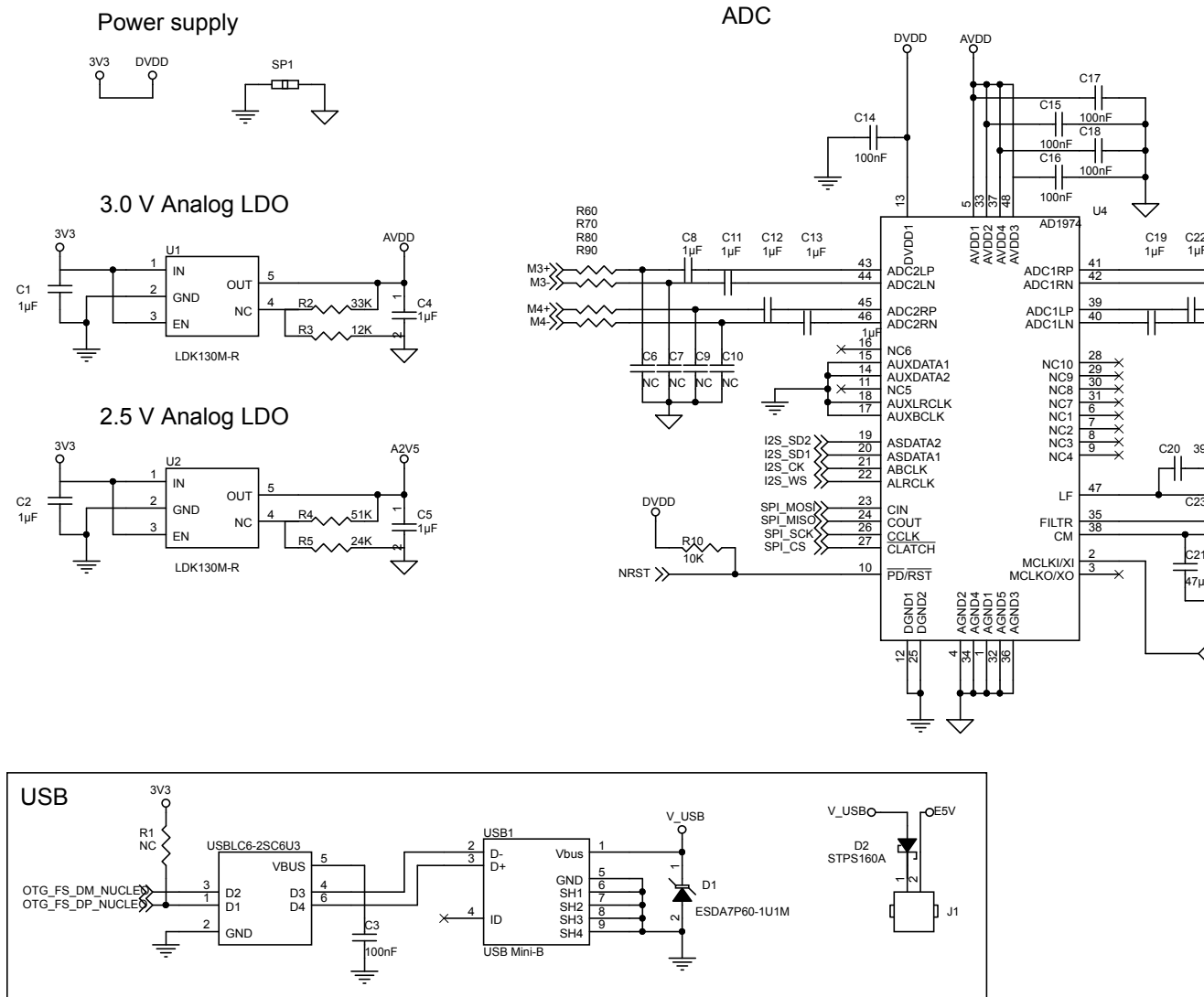
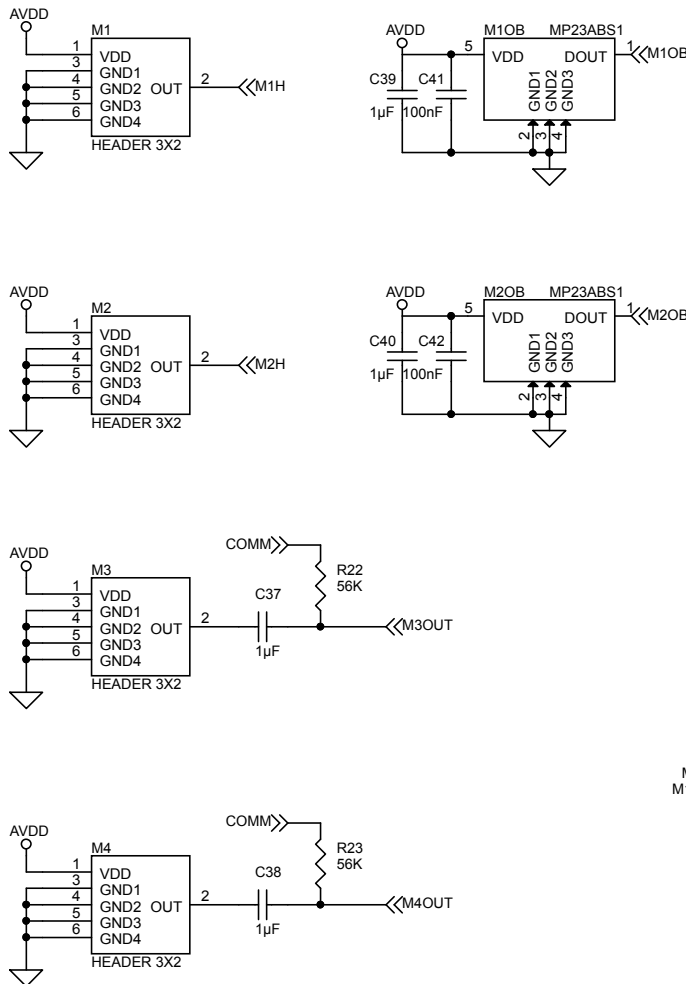


Figure 3. X-NUCLEO-AMICAM1 circuit schematic - microphones to external ADC

Microphones



OpAmp

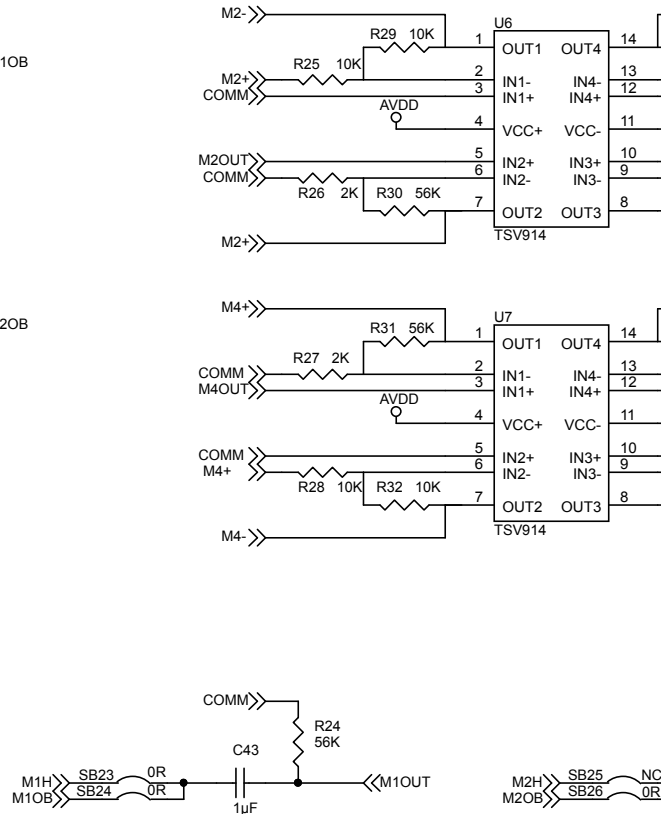
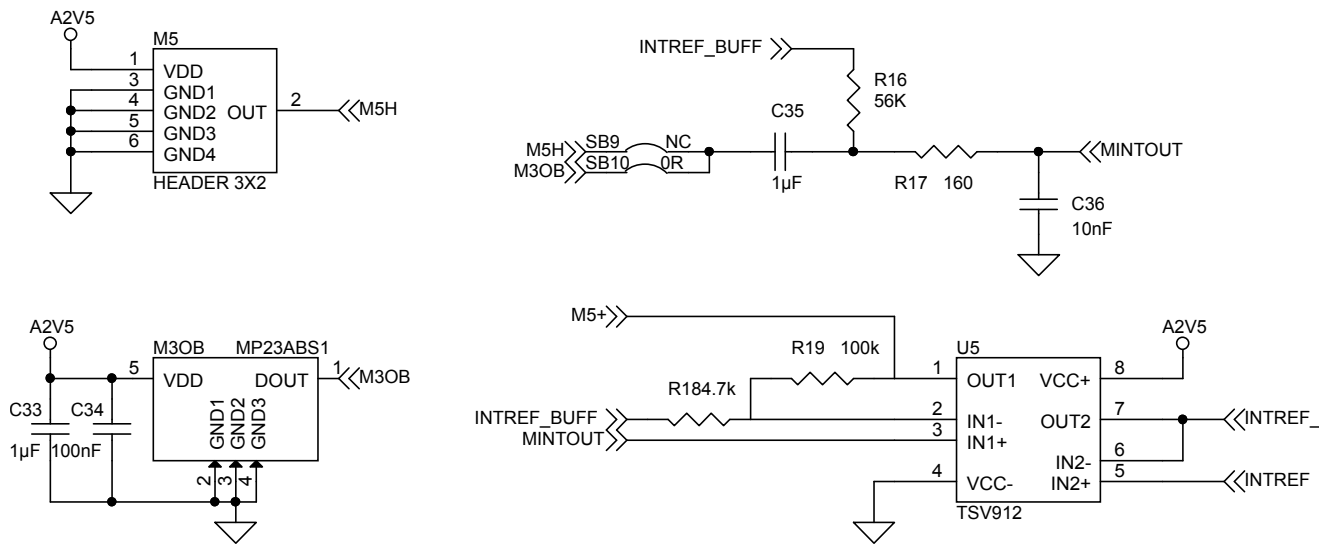


Figure 4. X-NUCLEO-AMICAM1 circuit schematic - microphones to internal ADC

HP Filter -->  $f_c = 2.8\text{Hz}$   
 LP Filter -->  $f_c = 99.4\text{KHz}$



## Revision history

**Table 1. Document revision history**

Date	Version	Changes
09-Dec-2019	1	Initial release.

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