Analog MEMS microphone expansion board based on MP23ABS1 for STM32 Nucleo
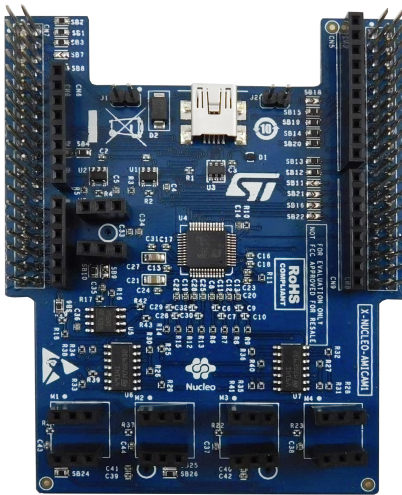

Features

- 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	X-NUCLEO-AMICAM1
Microphone coupon board based on MP23ABS1 analog MEMS microphone	STEVAL-MIC004V1
High performance MEMS audio sensor single ended analog bottom-port microphone	MP23ABS1
Application	Sensing

DB4065 - Rev 1 - December 2019
For further information contact your local STMicroelectronics sales office.

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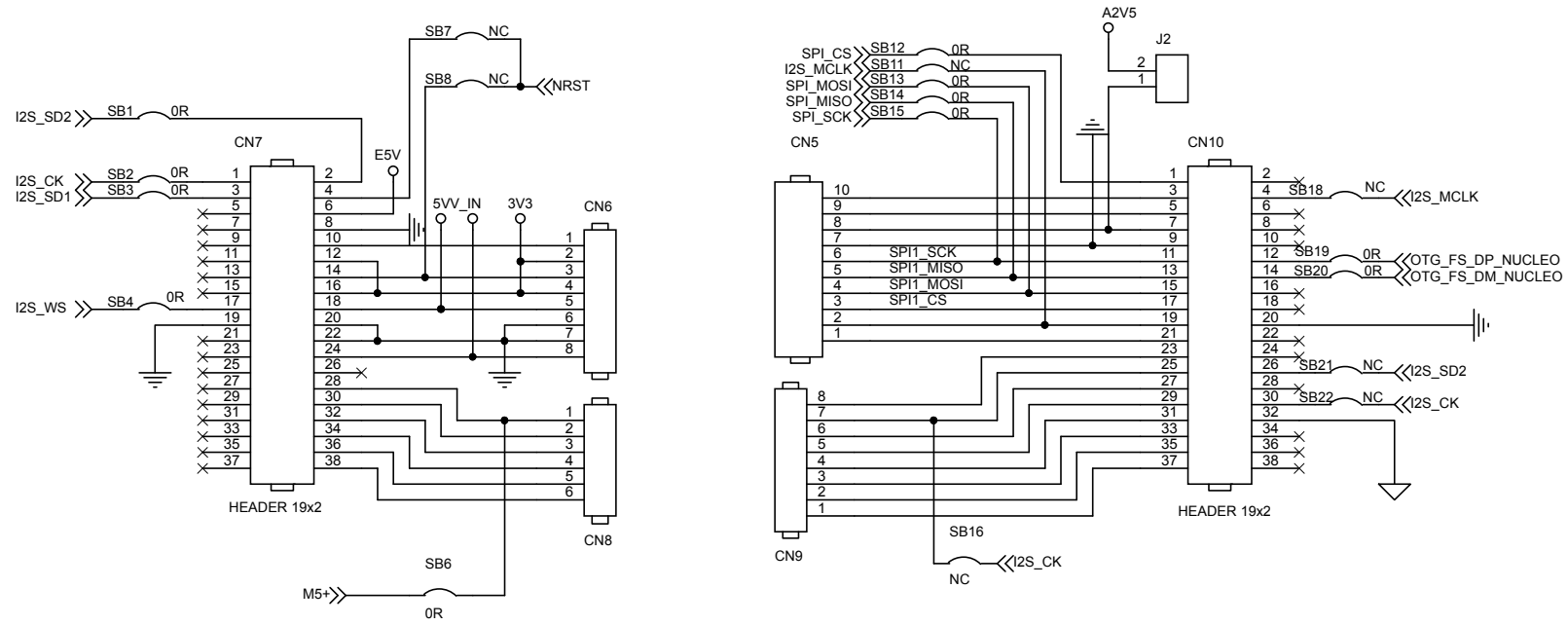## Figure 1. X-NUCLEO-AMICAM1 circuit schematic - connectors

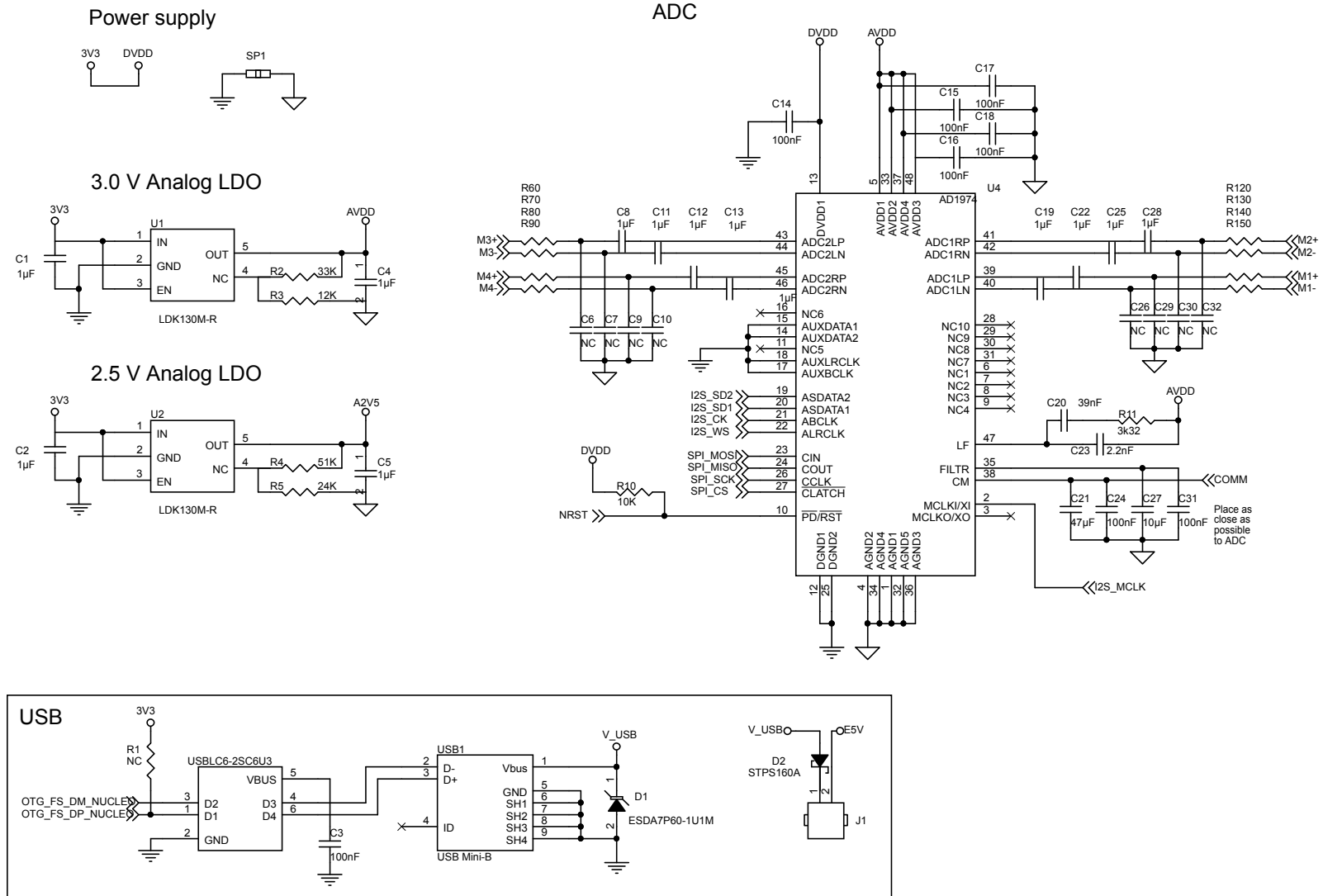**Figure 2. X-NUCLEO-AMICAM1 circuit schematic - USB, power, external ADC**

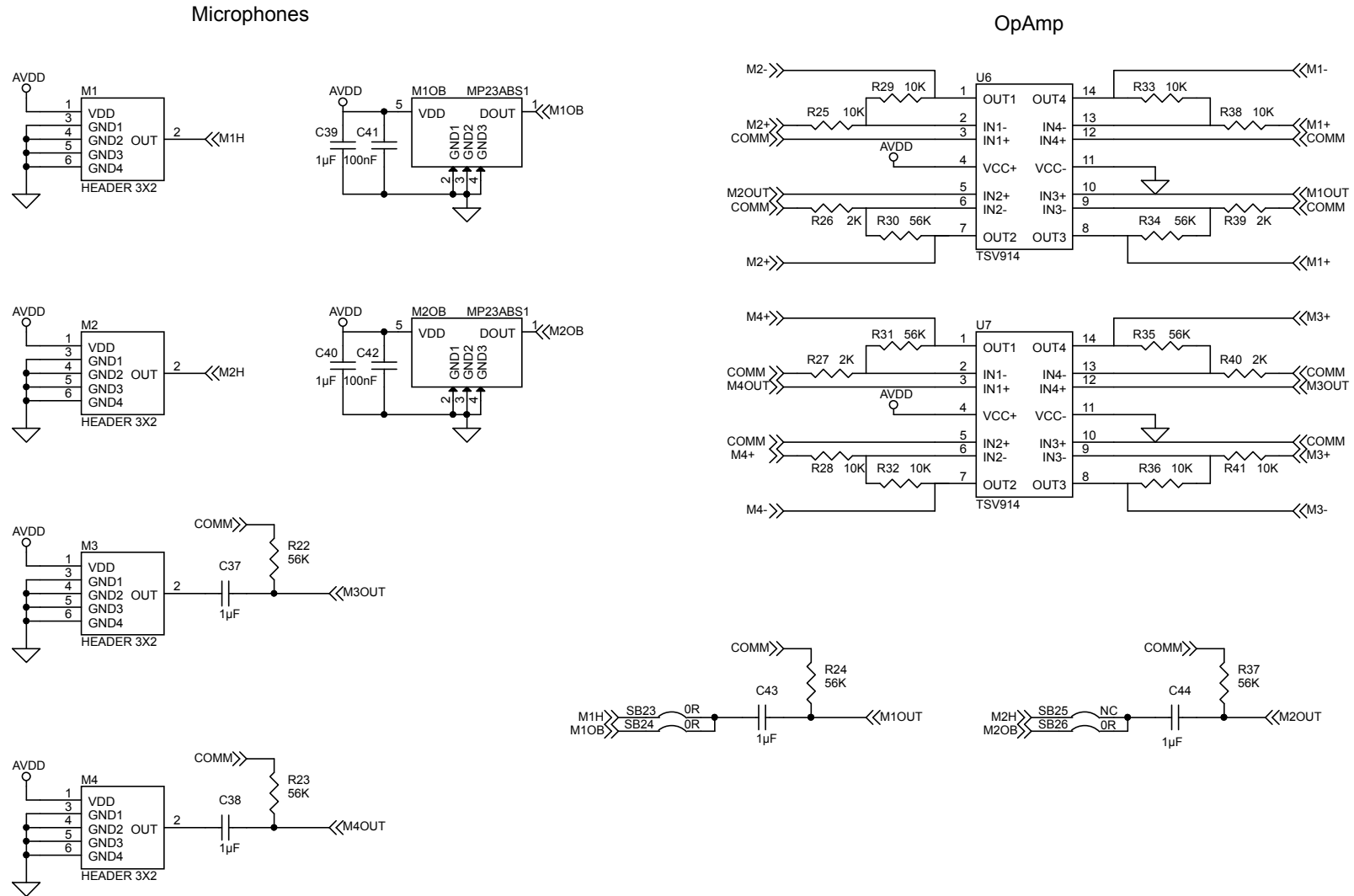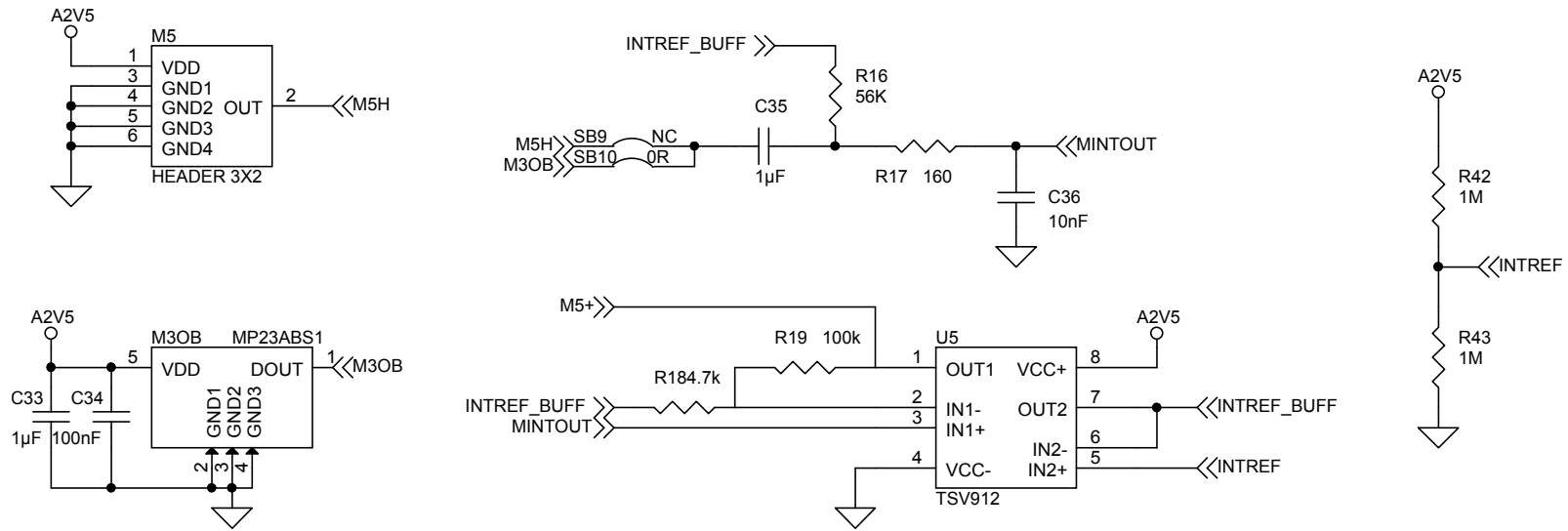**Figure 3. X-NUCLEO-AMICAM1 circuit schematic - microphones to external ADC**

Microphones

OpAmp

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

HP Filter --> fc = 2.8Hz
LP Filter --> fc = 99.4 KHz

Revision history

Table 1. Document revision history

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

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