4kOpen Board
HW Recommendation note

Noise suppression on analog audio ouput

Introduction

The HW of 4K UltraHD H.265 / HEVC community board based on STiH418 for the 4kOpen platforms contain an analog audio output.

Based on B2264B design, a noise is present on the audio output depending on the activity of the board and more particularly on the load present on the power supply, such as for example HDD and mouse connected on USB.

The audo noise is coming from an insuffisiant decoupling on the audio amplifier .

The purpose of this document is to describe the HW improvement to remove this noise.

Scope

This document is targeted at the following audiences in the context of 4kOpen project:

- Developers of HW platform similar to 4kOpen with STiH418

Reference documentation

Below is a list of documents that should be consulted alongside the present document.

Table 1 Reference

#	Document name	Document description
[1]	STiH418 data sheet	Data Sheet of the SOC
	b2264_b00_fp_20180222.pdf	4Kopen B2264B schematics

Note: The reference number of the 4Kopen board is B2264. The letter after B2264 indicates the version of the board PCB. For example, B2264B is the second board revision of the B2264.

Acronyms and Abbreviations

B2264	4kOpen reference board
HDD	Hard Disk Drive
HDK	Hardware Development Kit
HW	Hardware
N/A	Not Applicable
NC	Not Connected
SOC	System On Chip (STiH418)
SW	Software

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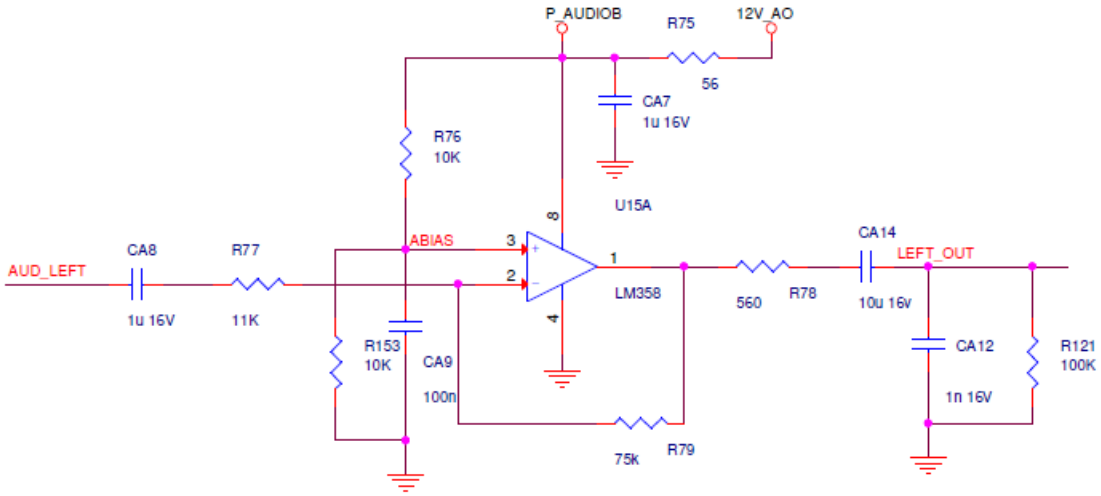
1 Analog audio amplifier on B2264B

The Figure 1 represents the audio amplifer between the SOC (U1) and the jack connector (J5) on the the 4Kopen board B2264B.

Figure 1: Audio output amplifier on B2264B



The audio amplifier is supplied by the 12V_A0 signal.

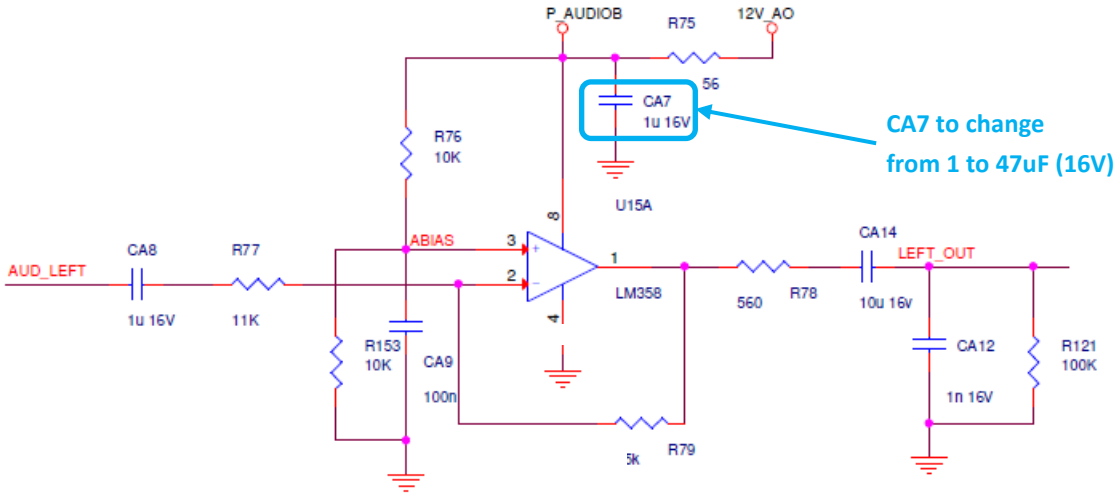
The power filtering of the audio amplifier R75 (56 Ohm) and CA7 (1uF) correspond to a cut off frequency of 2.8KHz. This value is too high.

Thus, any voltage ripple in the audio frequency range on the 12V_A0 supply is also present on the amplifier output.

2 Correction to remove noise on audio output

To remove the noise on the audio output, the cut off frequency of the filter on the audio amplifier must be reduced down to 60 Hz. Thise means to change the value of CA7 from 1 to 47uF (16V) as depicted on Figure 2

Figure 2: Correction on B2264B to remove noise on audio output



3 Revision history

Table 2: Document revision history

Date	Revision	Changes
9th march 2018	Draft 1.0	Initial version
12 Feb 2019	Release 1.2	Removed accidental cross over CA14's value