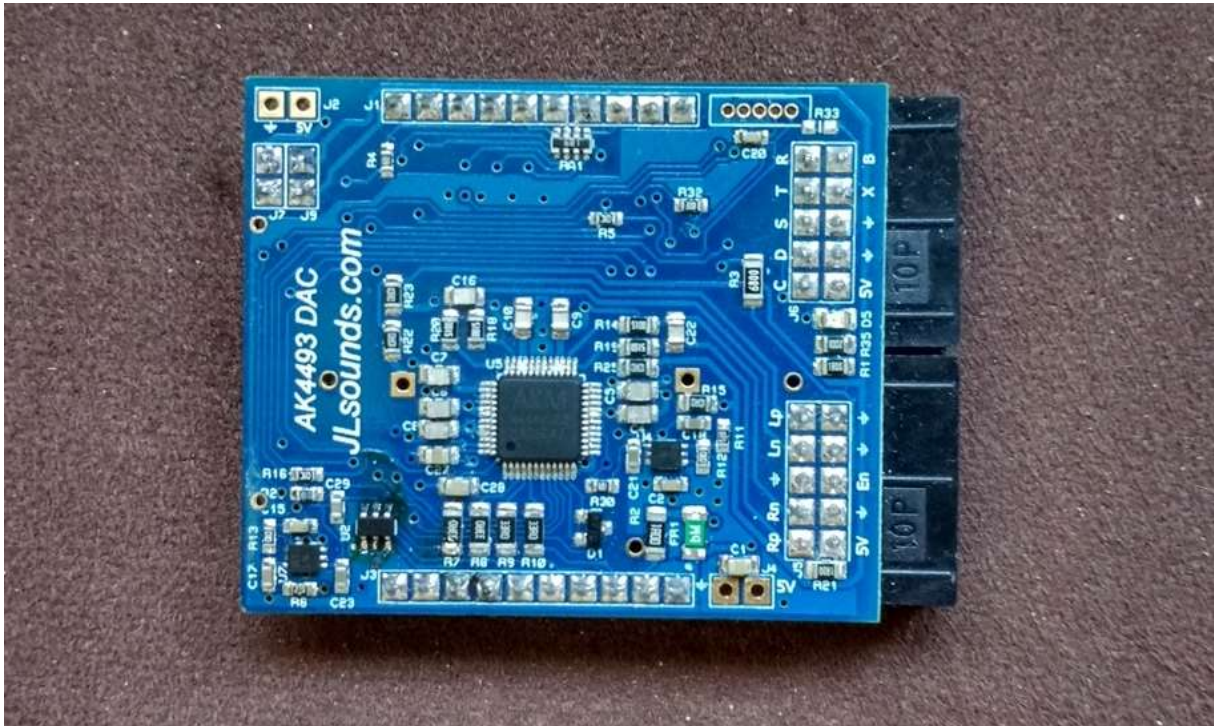


## AK4493 board



**J1, I/O interface** – non isolated signals from *I2SoverUSB* board.

**J2, I/O interface** – external power supply input for the USB part of *I2SoverUSB* board 3.8V to 5.0V/0.4A.

**J3, I interface** – isolated signals from *I2SoverUSB* board.

**J4, I/O interface** – external power supply input for the AK4493 DAC, oscillators and reclock on the *I2SoverUSB* board 5.2V 0.2A. **Note:** J7 and J9 jumpers must be removed if external power supply is provided on J4.

**J5, O interface** – analog DAC differential outputs.

**J6, O interface** – connection to control board.

J1 header 10x1 row 2.54 pitch

Pin #	Name	Type	Description
1	VDD	Power	If external power jumper is not cut +5.00VDC output. If external power jumper is cut power supply input 3.9V to +5.2VDC for USB input part.
2	GND	Ground	Electrical ground
3	NC	NC	
4	A0	Input	Sampling rate information.
5	A1	Input	Sampling rate information.
6	A2	Input	Sampling rate information.
7	MUTE	Input	Mute signal Low: the audio data stream is not valid and the DAC must be muted. High: the audio data stream is valid
8	DSD_PCM	Input	Audio Stream Format Low: the digital audio output stream format is PCM High: the digital audio output stream format is DSD
9	A3	Input	Sampling rate information.
10	GND	Ground	Electrical ground

1 VDD	2 GND	3 GP-IN	4 A0	5 A1	6 A2	7 MUTE	8 DSD_P	9 A3	10 GND
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J3 header 10x2 row 2.54 pitch

Pin #	Name	Type	Description
1	NC	NC	
2	NC	NC	
3	NC	NC	
4	MCLK_in	Input	General purpose for MCLK_1
5	NC	NC	
6	BCLK_I2S	Input	BCLK_I2S / CLK DSD
7	DATA_I2S	Input	DATA_I2S / DATA_L DSD
8	LR_CLK_I2S	Input	LRCLK_I2S / DATA_R DSD
9	VDD	Power	Isolated power supply input +5.00V to 5.2VDC for AK4493 DAC, oscillators and reclock.
10	GND	Ground	Isolated ground connection

1 NC	2 NC	3 NC	4 MCLK_in	5 NC	6 BCLK	7 DATA	8 LR_CLK	9 VDD	10 GND
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## J5, O interface

Pin #	Name	Signal
1	Rp	Right Channel Positive Analog DAC Output Pin
2	5V	5V output
3	Rn	Right Channel Negative Analog DAC Output Pin
4	GND	GND
5	GND	GND
6	EN	Mute output. <i>work</i> – 3.3V; <i>mute</i> – 0V
7	Ln	Left Channel Negative Analog DAC Output Pin
8	GND	GND
9	Lp	Left Channel Positive Analog DAC Output Pin
10	GND	GND

1 Rp	3 Rn	5 GND	7 Ln	9 Lp
2 5V	4 GND	6 EN_2	8 GND	10 GND

Configuration jumpers – If jumpers are installed, the board is USB powered. If jumpers are open then you must provide external stabilized power supply on **J4**.

**Our recommendation is to use external power supply on J4 for better sound quality.**

**Analog outputs are 2.8Vpp (5V power supply).**

Configuration from PCM to DSD data format and back, is done by microcontroller, which 0.5sec after his work is done, is putted on sleep mode not to insert disturbances.

If you use **both** boards together there are three ways for power supply.

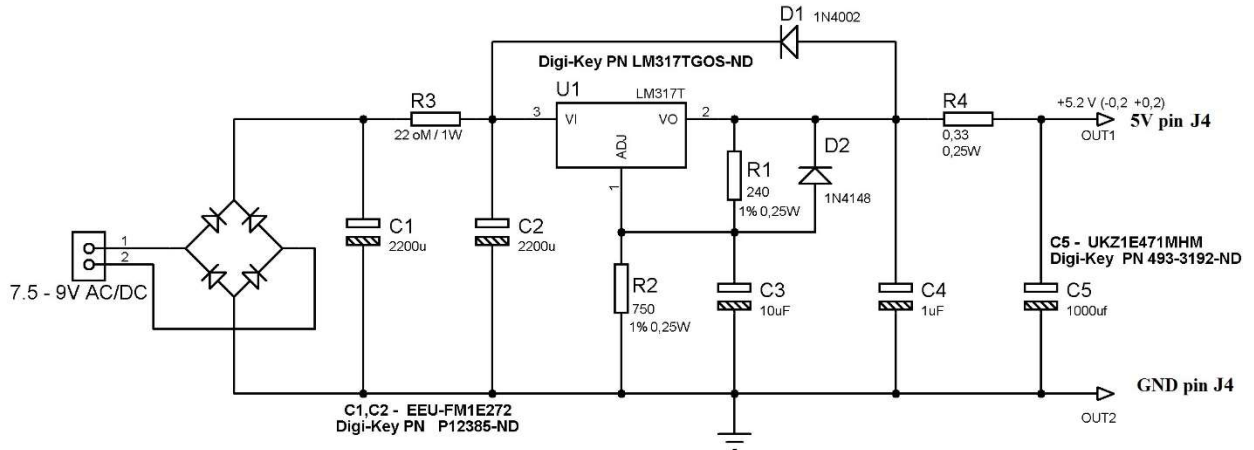
1. Two boards are powered from USB bus. Default state. Galvanic isolation is avoided (on AK4493 board, configuration jumpers – J7 and J9 are installed). *Note: higher input sample rates may not work!*
2. External power supply for the AK4493 board: **5.2V/0.25A** on J4. This power supply is feeding AK4493 and generators and reclock on

*I2SoverUSB* board. On AK4493 board, configuration jumpers are opened (J7 and J9).

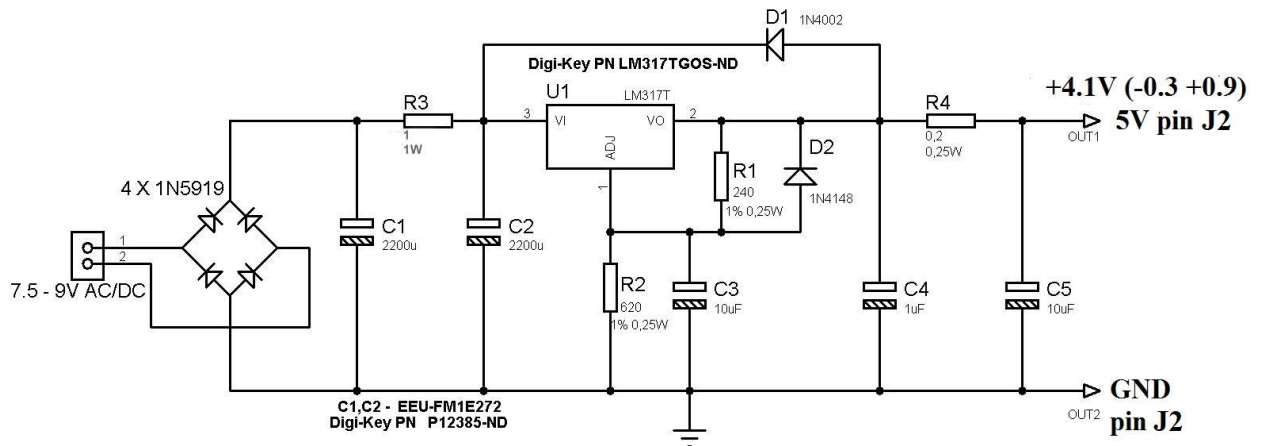
3. External power supply for the AK4493 board: **5.2V/0.25A** on J4. This power supply is feeding AK4493 and generators and reclock on *I2SoverUSB* board. External power supply for USB side **3.8V** to **5.0V/0.45A** on J2. On *I2SoverUSB* board, external power supply jumper must be cut and on AK4493 board, configuration jumpers (J7 and J9) are opened. In this way *I2SoverUSB* board consumes less than 10mA from USB host.

## Recommended minimum requirement schemes of external power supplies

External power supply for AK4493 and generators and reclock on *I2SoverUSB* board.



External power supply for USB part.



If the two boards are powered from USB bus and the voltage from the USB host drops below 4.8V, 352.8kHz, 768kHz and DSD512 might not work (allowable minimum power supply for AK4493 is 4.75V). The solution is to use external power supply for the AK4493 board, oscillators and reclock (J4).

**For the AK4493 board, we highly recommend external power supply for high quality sound.**