

## CS4398 DAC – mounting instructions

Thanks for buying this pcb or kit! Now the fun of mounting starts. Make sure you read the complete instructions before you start mounting. Complete assembly can be done by an experienced hobbyist in about two hours. More information can be found on the project page:

<http://www.djuke.nl/en/projects/3-digital-audio/32-cs4398-dac>

### List of components

The kit consists of the following components. If you bought the pcb, these components are suggested (but you can of course adapt it to your needs).

#### SMD components

Qty	Value	Device	Parts
8	100n	C-0805	C11, C17, C18, C30, C34, C36, C38, C40
1	1n	C-0805	C15
10	100n	C-1206	C1, C2, C6, C8, C12, C13, C37, C41, C42, C49
1	22n	C-1206	C14
4	100p	C-1206	C20, C22, C23, C25
2	220n	C-1206	C21, C24
4	1n	C-1206	C43, C44, C45, C46
5	10n	C-1206	C5, C7, C9, C28, C29
1	CS4398	CS4398	IC5
1	CS8416	CS8416	IC1
3	47uH	L-3225M	L1, L2, L5
1	HW/SW	R-0805	JP1
1	M2	R-0805	JP2
1	M3	R-0805	JP3
1	M1	R-0805	JP4
1	M0	R-0805	JP5
6	75	R-1206	R1, R2, R3, R4, R22, R23
4	2k7	R-1206	R10, R12, R17, R19
2	47	R-1206	R11, R18
2	1k	R-1206	R31, R32
1	0	R-1206	R33
4	220	R-1206	R34, R35, R36, R37 (not included, only for current-out DAC)
8	47k	R-1206	R5, R24, R25, R26, R27, R28, R29, R30
4	18k	R-1206	R6, R13, R15, R20
1	3k	R-1206	R7
1	10k	R-1206	R8
4	36k	R-1206	R9, R14, R16, R21
2	1117-3.3	V-reg	IC3, IC6
1	1117-5.0	V-reg	IC4

#### Through-hole components

Qty	Value	Device	Parts
1	DSUPPLY	AK500/2	X1
1	ASUPPLY	AK500/3	X2
2	10u	C-elec-5mm	C19, C32
7	47u	C-elec-6mm	C3, C16, C26, C27, C39, C48, C50
3	100u	C-elec-6mm	C31, C33, C47
3	220u/25	C-elec-8mm	C4, C10, C35
2	CINCH_1X	CINCH_1X	COAX1, COAX2
1	OPA2134P	DIP-8+IC	IC2
1		KK/3	OUT
1		KK/5	SW-CTRL (not included)
1		KK/6	HW-CTRL
2	GP1FAV	Opt-rx	OPT1, OPT2
1		Pinheader-1x4	DSD (not included)
2	PE-65612NL	Pulse trafo	TR1, TR2

## Tools

### Required:

- ✓ Soldering iron, flux and solder (0.5mm)
- ✓ Multi-meter (voltage and resistance)
- ✓ Side-cutting pliers, tweezers

### Recommended:

- ✓ Adjustable dual power supply
- ✓ S/pdif source
- ✓ Oscilloscope

## Mounting

Note that this kit contains (small) SMD components, which might sound difficult if you haven't done this before, but they can be quite well soldered using a soldering iron with small tip, thin solder (0.5mm) and flux (important). Please check some SMD mounting tutorials on YouTube if this is the first time you solder SMD components.

The easiest way of mounting is by starting with the components with the lowest height and build up the PCB in steps, where components of the same height are fitted and soldered in each step. So, first solder the SMD components and then the through-hole components in this order: ICs, resistors, capacitors, inductors, voltage regulators, DIP8-feet, MKT capacitors, transistors, pulse transformers, connectors and the electrolytic capacitors. Do not fit the opamp yet!

Always double check all components before you solder them (especially the ones that are polarity dependent, electrolytic capacitors, etc), as it is difficult to remove them after soldering, much more time consuming and may break components or PCB.

### Hints:

- Be careful not to mix the SMD capacitors as they don't have the value printed on them
- The silkscreen of pcb r.1 does not properly show the M0-M3 and HW/SW prints. To use HW mode, mount the M0-M3 jumper resistors (right of the CS4398) in the left position. Mount the HW/SW jumper resistor (left of the CS4398) to the bottom position. Please refer to the pictures on the project page.
- The pcb can directly be mounted to a panel using the input connectors

## Operating mode

The circuit can be used in both software and hardware mode. The components in the Bill-of-Materials are primarily meant for hardware mode, but with some small modifications (JP1-5) it can be used in software mode, where the circuit can be controlled using a microcontroller. Please refer to the schematic and datasheets if you intend to use the circuit in software mode.

Using the circuit in hardware mode only requires a few external components on the HW-CTRL port:

- By using the 4 different combinations of pulling RXSEL0/1 to either +5V or GND, one of the 4 inputs can be selected (RXSEL1 (0=Opt, 1=Coax), RXSEL0 (0=in1, 1=in2))
- The NVERR output and GND can be connected (through a 1Kohm resistor) to a LED to indicate if a signal is present on the input.

## Testing

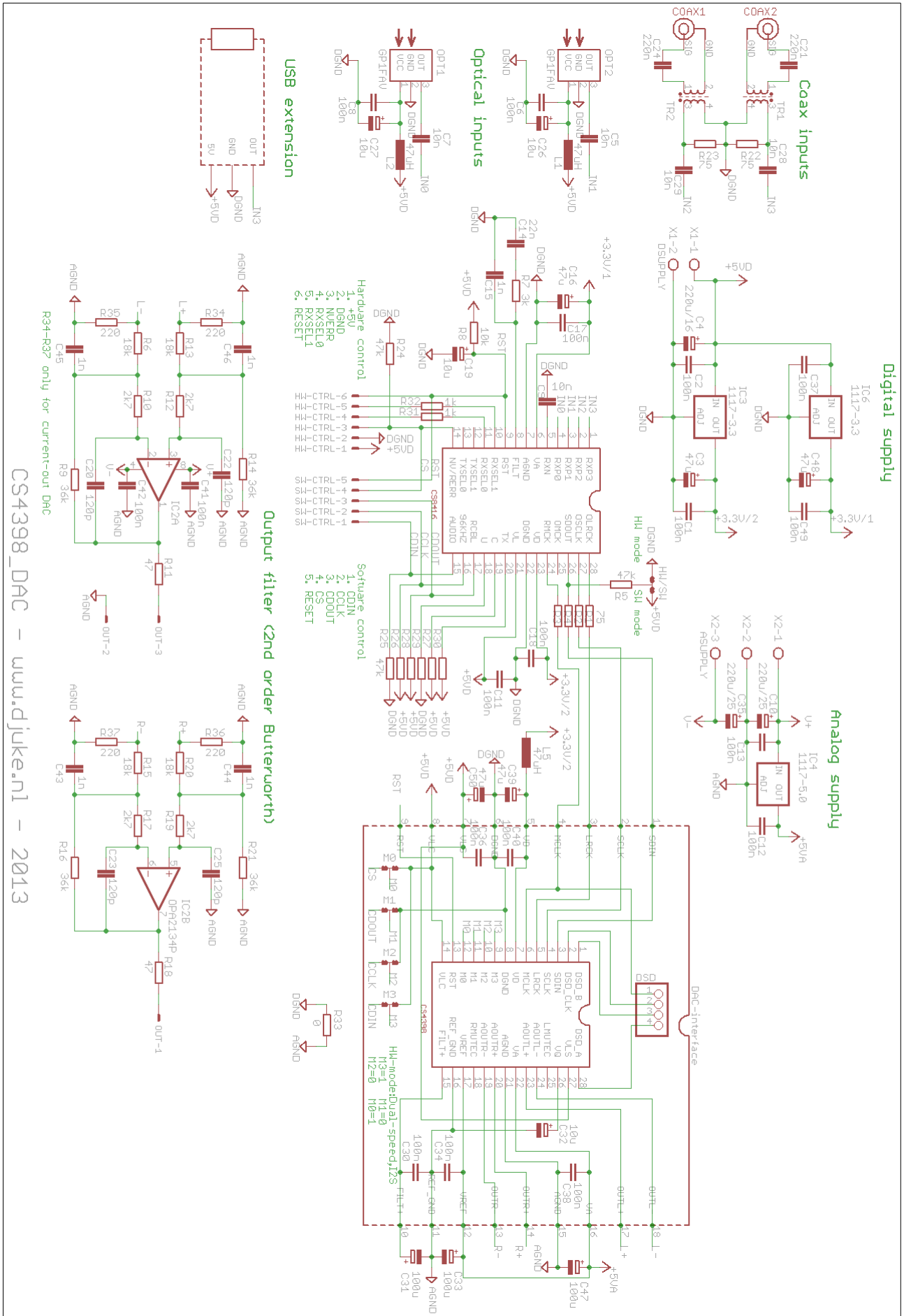
Do not fit the opamp yet! Double-check all soldering connections to make sure no shorts are present.

- Connect a 5V bench supply to DSUPPLY
- Measure the output voltage of the 3.3V regulators (IC3, IC6)
- Connect a dual 8v bench supply to ASUPPLY
- Measure the output voltage of the 5V regulator (IC4)
- Measure the opamp supply relative to AGND (pin8=+8V, pin4=-8V)
- Measure the DAC output voltage relative to AGND (L+, L-, R+, R- on the pcb, should be 0V without an input signal and 2.5V with an input signal)

If all of above is ok, remove bench supply, connect the opamp and connect the final supply.

Connect your favourite input and enjoy many listening hours!

# Schematic



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