



## CS4398 DAC r4

High performance DAC with 2 optical and 2 coaxial inputs

### SMD components:

Qty	Value	Device	Parts
16	100n	C0805	C1, C2, C11, C12, C13, C17 C18, C30, C34, C36, C37 C38, C40, C41, C42, C49
1	1n	C0805	C15
1	22n	C0805	C14
2	100n	C1206	C6, C8
4	100p	C1206	C20, C22, C23, C25
5	10n	C1206	C5, C7, C9, C28, C29
4	1n	C1206	C43, C44, C45, C46
2	220n	C1206	C21, C24
3	47uH	L3225M	L1, L2, L5
1	HW/SW	R0805-0R	JP1
1	M0	R0805-0R	JP5
1	M1	R0805-0R	JP4
1	M2	R0805-0R	JP2
1	M3	R0805-0R	JP3
1	3k	R0805	R7
6	75	R1206	R1, R2, R3, R4, R22, R23
1	10k	R1206	R8
4	18k	R1206	R6, R13, R15, R20
2	1k	R1206	R31, R32
2	2k2	R1206	R35, R36
4	2k7	R1206	R10, R12, R17, R19
4	36k	R1206	R9, R14, R16, R21
4	47	R1206	R11, R18, R33, R34
8	47k	R1206	R5, R24, R25, R26 R27, R28, R29, R30
1	12V	SOD80C	D1
2	1117-3.3	SOT223	IC3, IC6
1	1117-5.0	SOT223	IC4
1	BC850	SOT23	Q1
1	CS4398	TSSOP28	IC5
1	CS8416	TSSOP28	IC1

### Through-hole components:

Qty	Value	Device	Parts
3	100u	C-EL-2.5/6	C31, C33, C47
1	10u	C-EL-2.5/6	C19, C32
7	47u	C-EL-2.5/6	C3, C16, C26, C27, C39, C48, C50
3	220u/25	C-EL-3.5/8	C4, C10, C35
1	DSUPPLY	Con-AK500/2	X1
1	ASUPPLY	Con-AK500/3	X2
1	4-pin	Con-KK	OUT
1	5-pin	Con-KK	SW-CTRL (not included)
1	6-pin	Con-KK	HW-CTRL
2	GP1FAV	Con-Opt	OPT1, OPT2
1	2-pin	Con-pinhead	IN67 (not included)
1	5-pin	Con-pinhead	DSD (not included)
2	CINCH_1X	Con-RCA	COAX1, COAX2
1	OPA2134P	DIL-08	IC2
1	1N400x	DO41-7.5	D2
2	PE-65612NL	Pulse-trafo	TR1, TR2
1	G6H2-12V	Relay	K2

## Introduction

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.djoke.nl/en/projects/3-digital-audio/32-cs4398-dac>

## Mounting

Note that this kit contains (small) SMD components, which have been pre-mounted for your convenience.

Mounting the remaining through-hole components should be relatively straightforward. Start 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. Mount the components in this order: Diode, DIP8-feet, 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, diodes, electrolytic capacitors, etc), as it is difficult to remove them after soldering, much more time consuming and may break components or PCB.

Hints:

- 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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