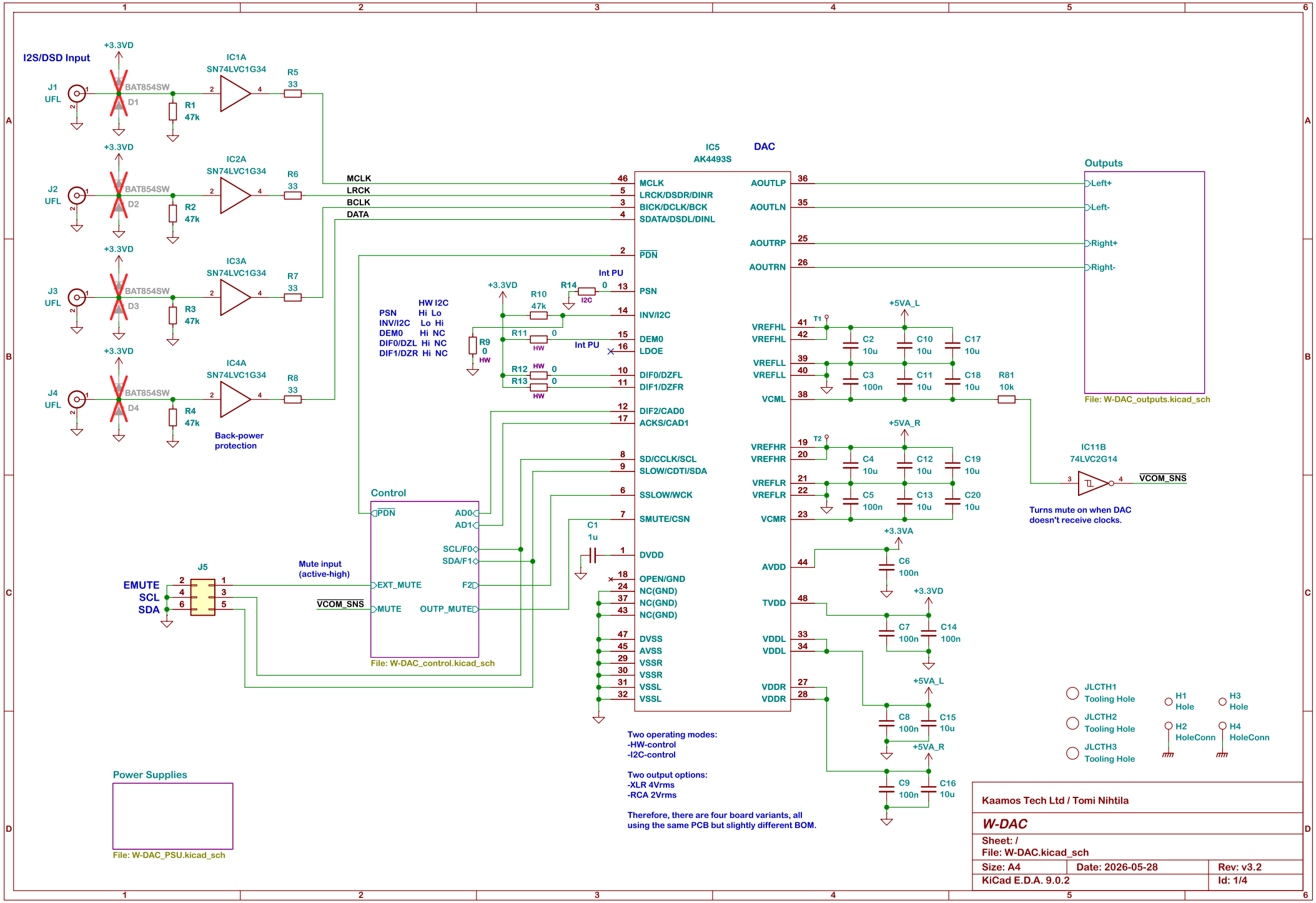
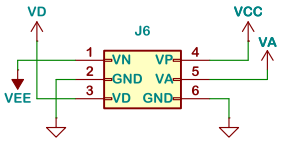

I2S/DSD Input
J1 UFL
J2 UFL
J3 UFL
J4 UFL
+3.3VD
BAT854SW
D1
D2
D3
D4
R1 47k
R2 47k
R3 47k
R4 47k
IC1A SN74LVC1G34
IC2A SN74LVC1G34
IC3A SN74LVC1G34
IC4A SN74LVC1G34
R5 33
R6 33
R7 33
R8 33
Back-power protection
MCLK
LRCK
BCLK
DATA
IC5 AK4493S
DAC
MCLK
LRCK/DSDR/DINR
BICK/DCLK/BCK
SDATA/DSDL/DINL
PDN
PSN
INV/I2C
DEM0
LDOE
DIF0/DZFL
DIF1/DZFR
DIF2/CAD0
ACKS/CAD1
SD/CCLK/SCL
SLOW/CDTI/SDA
SSLOW/WCK
SMUTE/CSN
DVDD
OPEN/GND
NC(GND)
NC(GND)
NC(GND)
DVSS
AVSS
VSSR
VSSR
VSSL
VSSL
AOUTLP
AOUTLN
AOUTRP
AOUTRN
VREFHL
VREFHL
VREFLL
VREFLL
VCML
VREFHR
VREFHR
VREFLR
VREFLR
VCMR
AVDD
TVDD
VDDL
VDDL
VDDR
VDDR
Int PU
R10 47k
R14 0 I2C
R11 0 HW
R12 0 HW
R13 0 HW
R9 0 HW
HW I2C
PSN Hi Lo
INV/I2C Lo Hi
DEM0 Hi NC
DIF0/DZL Hi NC
DIF1/DZR Hi NC
+5VA_L
+5VA_R
+3.3VA
C1 1u
C2 10u
C3 100n
C4 10u
C5 100n
C6 100n
C7 100n
C8 100n
C9 100n
C10 10u
C11 10u
C12 10u
C13 10u
C14 100n
C15 10u
C16 10u
C17 10u
C18 10u
C19 10u
C20 10u
R81 10k
T1
T2
Outputs
Left+
Left-
Right+
Right-
File: W-DAC_outputs.kicad_sch
IC11B 74LVC2G14
VCOM_SNS
Turns mute on when DAC doesn't receive clocks.
Control
PDN
AD0
AD1
SCL/F0
SDA/F1
EXT_MUTE
F2
MUTE
OUTP_MUTE
File: W-DAC_control.kicad_sch
J5
EMUTE
SCL
SDA
Mute input (active-high)
VCOM_SNS
Two operating modes:
-HW-control
-I2C-control
Two output options:
-XLR 4Vrms
-RCA 2Vrms
Therefore, there are four board variants, all using the same PCB but slightly different BOM.
JLCTH1 Tooling Hole
JLCTH2 Tooling Hole
JLCTH3 Tooling Hole
H1 Hole
H2 HoleConn
H3 Hole
H4 HoleConn
Power Supplies
File: W-DAC_PSU.kicad_sch
Kaamos Tech Ltd / Tomi Nihtila
W-DAC
Sheet: /
File: W-DAC.kicad_sch
Size: A4
Date: 2026-05-28
Rev: v3.2
KiCad E.D.A. 9.0.2
Id: 1/4

Analog supplies

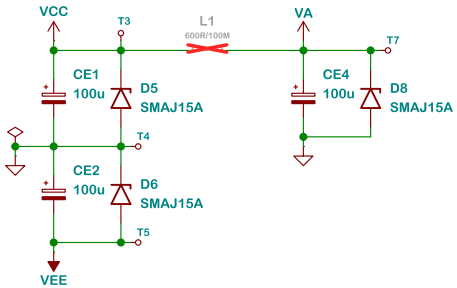
One per channel

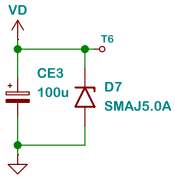
Supply voltages:
-VD = 5V
-VA = 6-15V
-VP/VN = +/-12-15V

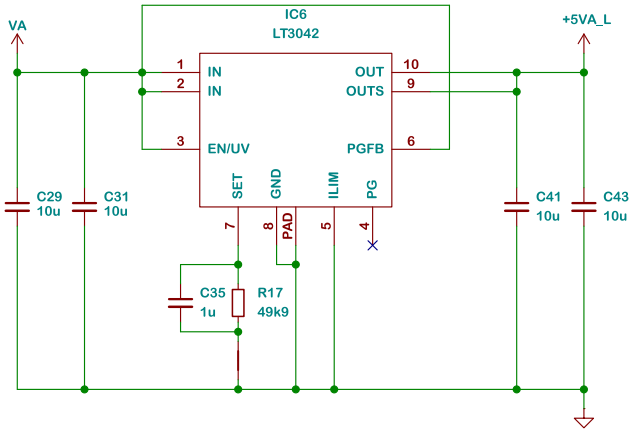


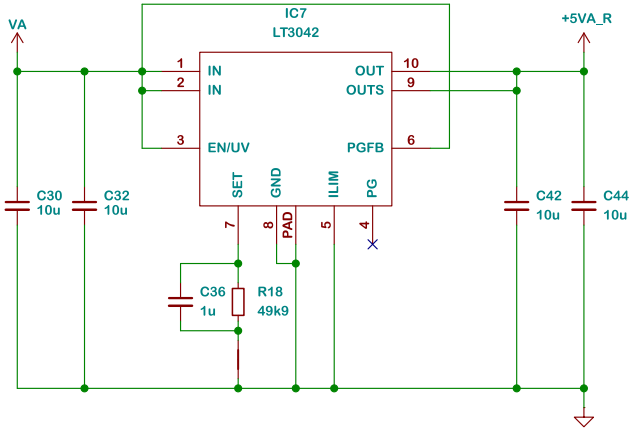
If separate VA is not used, VCC can be used for VA by populating L1.
Make sure VA is not connected to any other board or PSU via J6 that may get damaged by higher VA.

This connection can be done outside this board as well.

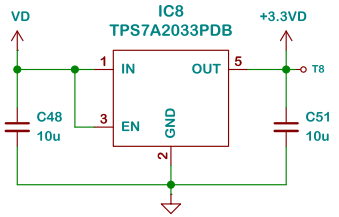




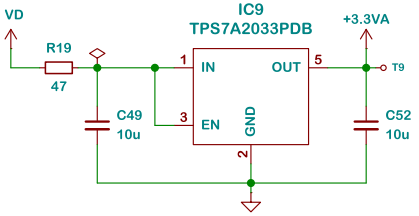




DVDD Supply



AVDD Supply



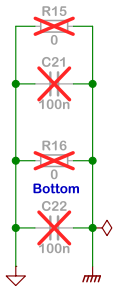
Optional

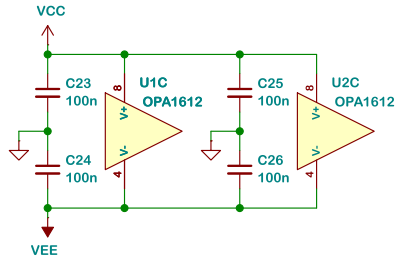
Board chassis ground is formed by XLR Pin 1 and two plated mounting holes near connectors.

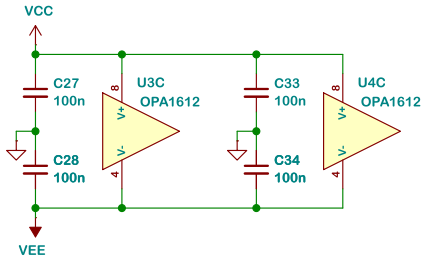
Per AES convention, XLR Pin 1 is only connected to chassis, not to signal ground. This keeps the cable shield only in the chassis and not conduct interference to audio ground.

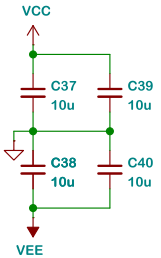
R/C here is for optional connection between chassis ground and signal ground. Some systems may benefit from it, or using R/C or 0R may be beneficial when testing and measuring without chassis.

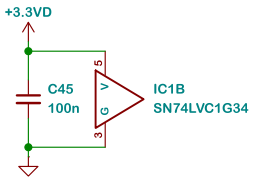
When RCAs are used, R/C connection is done from RCA negative terminal.

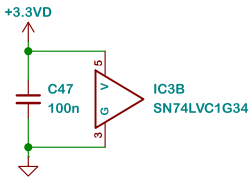


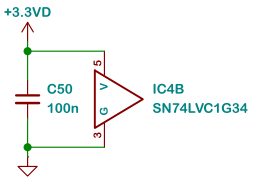


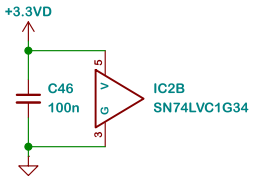










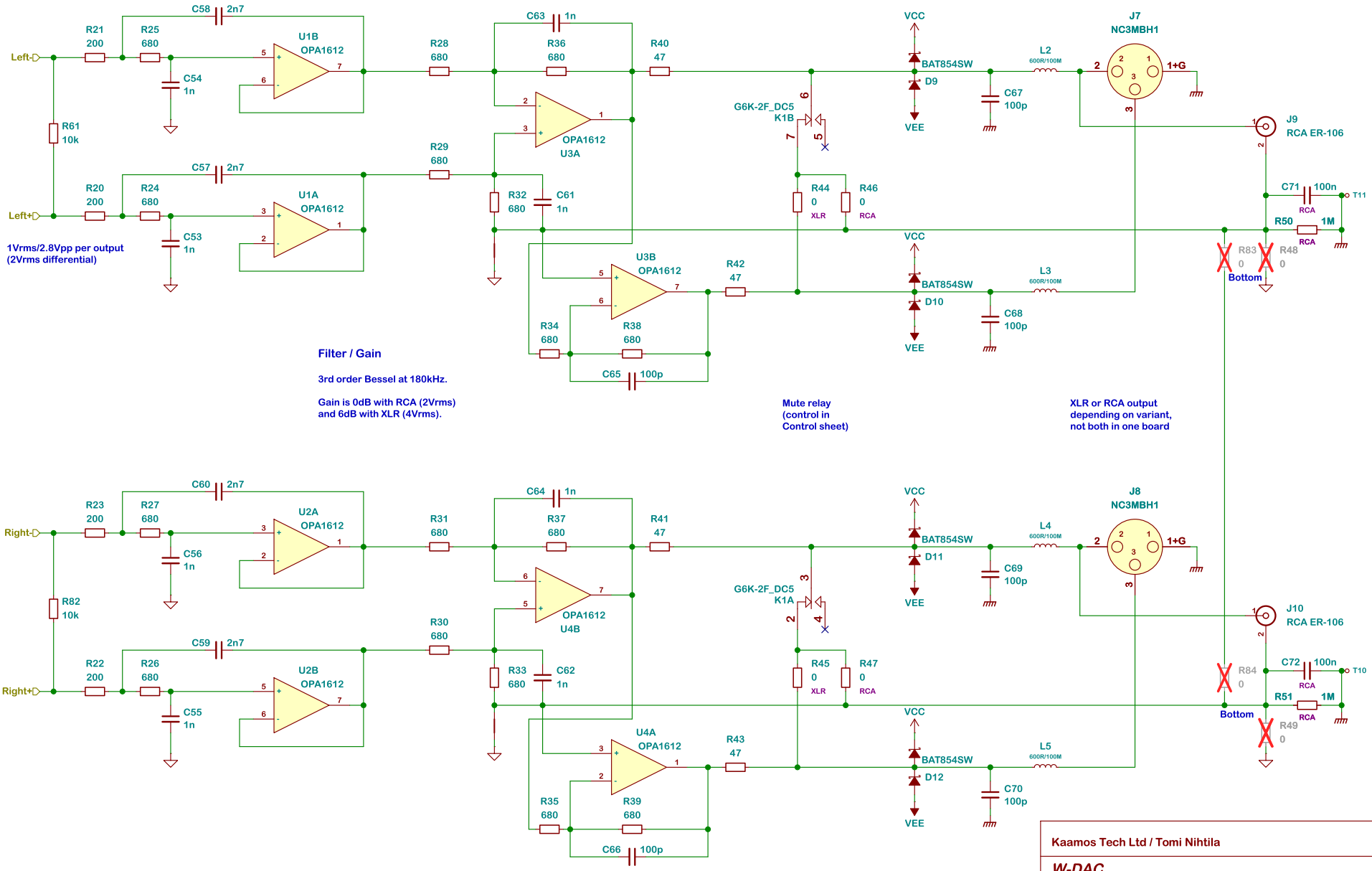


Kaamos Tech Ltd / Tomi Nihtila

W-DAC

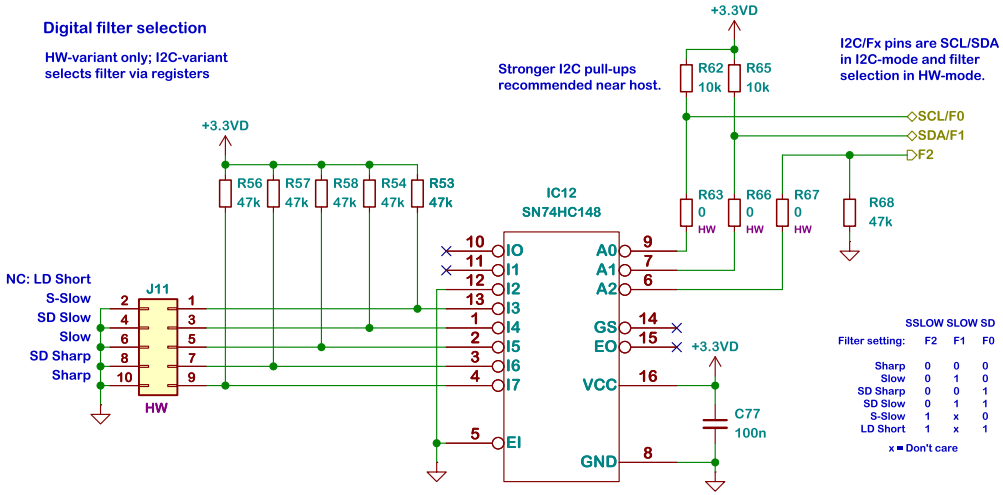
Sheet: /Power Supplies/
File: W-DAC_PSU.kicad_sch

Size: A4	Date: 2026-05-28	Rev: v3.2
KiCad E.D.A. 9.0.2		Id: 2/4


Left-
Left+
R21 200
R25 680
C58 2n7
C54 1n
U1B OPA1612
R61 10k
R20 200
R24 680
C57 2n7
C53 1n
U1A OPA1612
1Vrms/2.8Vpp per output
(2Vrms differential)
R28 680
R29 680
C63 1n
R36 680
U3A OPA1612
R32 680
C61 1n
R40 47
R42 47
U3B OPA1612
R34 680
R38 680
C65 100p
G6K-2F_DC5
K1B
R44 0 XLR
R46 0 RCA
VCC
BAT854SW
D9
VEE
D10
C67 100p
C68 100p
L2 600R/100M
L3 600R/100M
J7 NC3MBH1
1+G
J9 RCA ER-106
C71 100n RCA
T11
R50 1M RCA
R83 0
R48 0
Bottom
Filter / Gain
3rd order Bessel at 180kHz.
Gain is 0dB with RCA (2Vrms)
and 6dB with XLR (4Vrms).
Mute relay
(control in
Control sheet)
XLR or RCA output
depending on variant,
not both in one board
Right-
Right+
R23 200
R27 680
C60 2n7
C56 1n
U2A OPA1612
R82 10k
R22 200
R26 680
C59 2n7
C55 1n
U2B OPA1612
R31 680
R30 680
C64 1n
R37 680
U4B OPA1612
R33 680
C62 1n
R41 47
R43 47
U4A OPA1612
R35 680
R39 680
C66 100p
G6K-2F_DC5
K1A
R45 0 XLR
R47 0 RCA
D11
D12
C69 100p
C70 100p
L4 600R/100M
L5 600R/100M
J8 NC3MBH1
J10 RCA ER-106
C72 100n RCA
T10
R51 1M RCA
R84 0
R49 0
Kaamos Tech Ltd / Tomi Nihtila
W-DAC
Sheet: /Outputs/
File: W-DAC_outputs.kicad_sch
Size: A4
Date: 2026-05-28
Rev: v3.2
KiCad E.D.A. 9.0.2
Id: 3/4

Digital filter selection

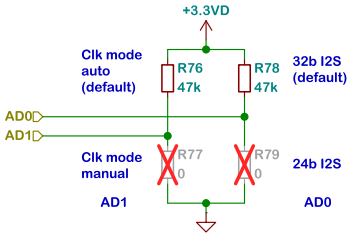
HW-variant only; I2C-variant selects filter via registers



Filter setting:	F2	F1	F0
Sharp	0	0	0
Slow	0	1	0
SD Sharp	0	0	1
SD Slow	0	1	1
S-Slow	1	x	0
LD Short	1	x	1

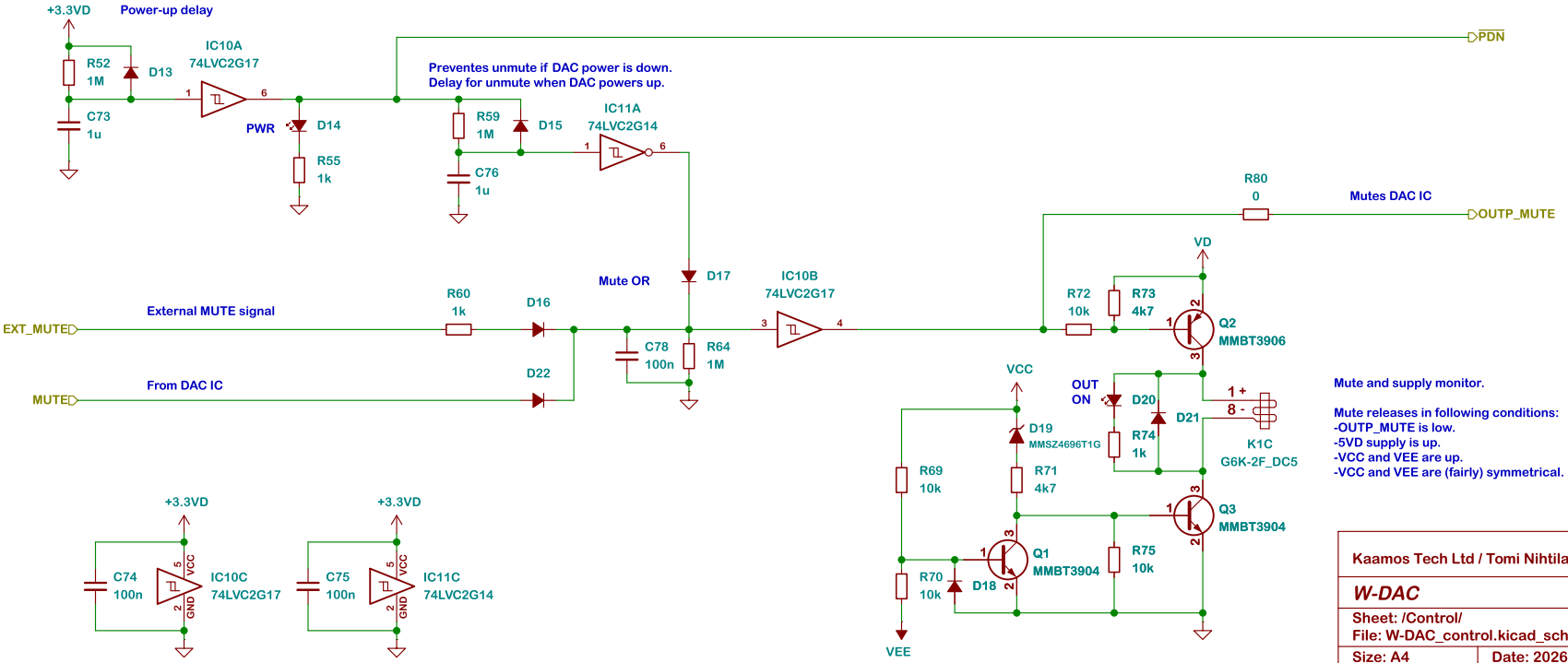
x = Don't care

Clocking and data in HW-mode, address pins in I2C-mode.



I2C addresses:
AK4493S: 0010 0 A1 A0 RW (def 7-bit 0x13)

Power-up and Mute



Mute and supply monitor.

Mute releases in following conditions:
-OUTP_MUTE is low.
-5VD supply is up.
-VCC and VEE are up.
-VCC and VEE are (fairly) symmetrical.

Kaamos Tech Ltd / Tomi Nihtila		
W-DAC		
Sheet: /Control/ File: W-DAC_control.kicad_sch		
Size: A4	Date: 2026-05-28	Rev: v3.2
KiCad E.D.A. 9.0.2		Id: 4/4