# FreeDSP OVTAVIA Main Board

**DC12V WALL ADAPTOR**

J2 DC12V-IN
FL1 ACM9070
C1 0.1uF
C3 0.01uF
C4 1uF/16V
GNDPWR
GND
DC-INPUT

for Reverse Voltage Protection
AO3401A
Q7

**MAINS POWER SWITCH**

SW2
ON
OFF
SW_SPDT
GND

## Power ON/OFF Mute Driver

D9 SS2040FL
D10 SS2040FL
C12 220uF/16V
+3.3V
D8 1N4148W
R15 470R
R16 1MEG
Q4 MMBT5401
R20 100k
1N4148W D5
22uF/16V C8
GND
Q3 MMBT5401
R71 330R
XSMT
10k R64
C140 0.1uF
Q9 2N7002
-5VA
GND
MUTE
R34 10k
1.09V/4.8V

## SMPS 12V -> 3.3V, 1A

Holding Power (Extend Shut-off time)
+5V
D11 1N4148W
10uF/16V C5
1uF/16V C6
0.1uF C9
IC1 TPS5430DDA
VIN BOOT
EN PH
GND VSENSE
GNDPAD
3.3V R7
C10 0.1uF
L2 22uH(2A)
R13 5.6R
DC+3.3V
C17 0.1uF
C15 22uF/6.3V
+3.3V (DSP Power) 920mA max.
R14 3.2k
D16 D_Schottky_5A
GND

**GZ2012D601TF FB13**
+3.3V
10uF/16V C37
10uF/16V C38
L4 22uH(2A)
U8 LM2611AMFX
VIN SW
SHDN NFB
GND
C118 1uF
L5 22uH(2A)
C119 1uF
R130 29.4k
SW
D20 D_Schottky_1A
R131 10.5k
C120 1000pF
C121 10uF/16V
C122 10uF/16V
-5VA
GNDA

**RAS-Pi POWER SWITCH**

SW3
RUN
STOP
SW_SPDT
GND
D2 1N4148W
+3.3VP
R2 10k
POWER
RASPI_OFF

**RAS-Pi RES/SHUT SWITCH**

D1
SW1 1N4148W
SW_Push
GND
D4 1N4148W
R11 47R
R9 NOP
GPIO3(SCL1)
GPIO17(GEN0)
GPIO26

Short Push = REBOOT
Long Push = ShutDown
Push again = Boot

**IR Receiver**

+3.3VP
R42 47R
C2 0.1uF
VS
OUT
GND
U1 GP1UXC41QS
GND
R8 47R
R10 NOP
GPIO26
GPIO25(GEN6)

## Shutdown Delay Driver

Power-OFF Delay Timing CR (40 Sec)
D6 1N4148W
R22 1MEG
C22 33uF/16V
GND
+3.3V
R35 100k
Q6 2N7002
AO3401A Q1
R5 100k
D7 1N4148W
R23 100k
Q DIS VCC TR
CV
THR GND
U6 LMC555CMX
R19 1k
C45 0.1uF
C23 1uF/50V
Power-ON Delay Timing CR (.1 Sec)

AO3401A Q5
GZ2012D601TF FB2
C14 0.1uF
R36 100k
U3 AMS1117-5.0
VI VO
ADJ
C7 0.1uF
C11 0.1uF
C13 220uF/6.3V
+5VA (ADC/DAC Power)
U7 AMS1117-3.3
VI VO
ADJ
C40 0.1uF
C42 0.1uF
C44 1uF
+3.3VA (ADC/DAC Power)
GNDA
GND

## SMPS 12V -> 5V, 3A

10uF/16V C21
1uF/16V C20
0.1uF C18
U5 TPS5430DDA
VIN BOOT
EN PH
GND VSENSE
GNDPAD
3.3V R35
R32 10k
C41 0.1uF
L3 22uH(3A)
R18 10k
C19 0.1uF
C43 22uF/6.3V
3A max. +5V (Raspberry-Pi Power)
R17 3.2k
D14 D_Schottky_5A
GND

**I2C OEL DISPLAY (OPTIONAL)**
M96-16-SSD1306, etc...
J8
GND
+3.3VP
Header_01x04
R67 2.2k
R68 2.2k
+3.3VP
RP_SDA
RP_SCL

**FTDI TTL-232R-3V3 USB-UART DEBUG Cable**
J4
GND
CTS
GPIO15(RXD0)
GPIO14(TXD0)
RTS
Header_01x06

Jumper_NO_Small JP3
DSP_RES
R39 47R
R40 NOP
LRK_IN3 47R

## Raspberry-Pi Slot

Conn_02x20_Odd_Even
P1
+5V
GPIO2(SDA1)
GPIO3(SCL1)
GPIO4(GCLK)
GPIO14(TXD0)
GPIO15(RXD0)
GPIO17(GEN0)
GPIO27(GEN2)
GPIO22(GEN3)
R3 47R BCK_IN3
GPIO23(GEN4)
GPIO24(GEN5)
GPIO10(SPI0_MOSI)
GPIO9(SPI0_MISO)
GPIO11(SPI0_SCK)
GPIO25(GEN6)
GPIO8(SPI0_CE_N)
GPIO7(SPI1_CE_N)
ID_SD
ID_SC
GPIO5
GPIO6
GPIO13(PWM1)
GPIO12(PWM0)
GPIO19(SPI1_MOSI)
GPIO16
GPIO26 R1 47R
GPIO20(SPI1_MOSI)
R4 47R DAT_IN3
GND

## Combo384 Slot

A1 Combo384
Amanero Combo384
F3 3V3OUT
F2 3V3OUT
F1 GND
F0 DSD_ON
DSD128 MCLK
GND LRLK
GND BCLK
GND DATA
GND GND
SDA SCL
MUTE PLUG
D12 1N4148W
USB_MUTE
MCK_IN2
LRK_IN2
BCK_IN2
DAT_IN2
VBUS
D19 LED_BLUE
R42 1k
D13 NOP
GND

amanero technologies

## Power Status LED

+3.3V
R6 330R
D3 LED_ABGR
RED = SHOUTDOWN/MUTE
GRN = RASPI ENABLED
BLU = POWER ON

| | |
|---|---|
| SHUT OFF | |
| RASPI RUN | |
| POWER ON | |

Q3 2N7002
Q8 2N7002
R16 100k
R37 100k
MUTE
+5V
GND

**Mounting Holes**
GND M2.5
M2.5

## SOURCE SELECT SWITCH

S1A SR10010F-0204-20F0B-C7-N-0027_ALT
COM_1
NC_1
NO_1
NO_2
NO_3
2.64V - 0V
20%=0.66V
40%=1.32V
60%=1.98V
80%=2.64V
+3.3V
AUX5
Q14 2N7002
R108 100k
USB_MUTE

### LOOK-UP-TABLE

| SOURCE | MIN | | MAX |
|---|---|---|---|
| | AUXADC>>5 | | |
| 4:Analog | 12 | - | 15 |
| 3:S/PDIF | 9 | - | 11 |
| 2:USB | 6 | - | 8 |
| 1:RAS-Pi | 3 | - | 5 |
| 0:MUTE | 0 | - | 2 |

R99 1k
R104 1k
R105 1k
R106 1k
R107 1k
GND

S1B
COM_2
NC_2
NO_4
NO_5
NO_6
R100 330R
R101 330R
R102 330R
R103 330R

## LED SOURCE INIDICATOR

J13
ANODE
Raspberry-Pi
USB
S/PDIF
ANALOG
Conn_01x05

# Sheet: DAC

File: DAC.sch

(MasterMode) OPEN=96kHz, SHORT=48kHz

## 24bit ADC
IC2

AUDIO INPUT
J5 Conn_Coaxial_x2

2.09Vrms max.
3.0Vpp max. Zin=60kΩ

PCM1808QPWRQ1

- VINR — VREF
- VINL — AGND
- FMT — VCC
- MD1 — VDD
- MD0 — DGND
- COUT — SCKI
- BCK — LRCK

GZ2012D601TF FB1

Jumper_NC
(Reference Level 0dB = 2Vr.m.s.)

+5VA +3.3V

ADC_MCLK
MCLK / LRK_IN0
I2S2_LRCK

I2S2_BCLK — BCK_IN0
I2S2_DIN — DAT_IN0

U12 ADAU1452

- AVDD
- IOVDD
- IOVDD
- IOVDD
- IOVDD
- VDRIVE
- DVDD ×4
- BCLK_IN0
- LRCLK_IN0/MP10
- SDATA_IN0
- BCLK_IN1
- LRCLK_IN1/MP11
- SDATA_IN1
- BCLK_IN2
- LRCLK_IN2/MP12
- SDATA_IN2
- BCLK_IN3
- LRCLK_IN3/MP13
- SDATA_IN3
- PVDD
- PLL_FILT
- RESET
- SELFBOOT
- XTALIN/MCLK
- XTALOUT
- CLKOUT

- AUXADC_0 — AUX0
- AUXADC_1 — AUX1
- AUXADC_2 — AUX2
- AUXADC_3 — AUX3
- AUXADC_4 — AUX4
- AUXADC_5 — AUX5
- SPDIF_IN — 958RX
- SPDIF_OUT — 958TX
- MP6 — DSP_MP6
- MP7 — DSP_MP7

Temperature Diode
- THD_M
- THD_P

- LRCLK_OUT0/MP4 — LRK_OUT0
- BCLK_OUT0 — BCK_OUT0
- SDATA_OUT0 — DAT_OUT0
- LRCLK_OUT1/MP5 — LRK_OUT1
- BCLK_OUT1 — BCK_OUT1
- SDATA_OUT1 — DAT_OUT1
- LRCLK_OUT2/MP8 — LRK_OUT2
- BCLK_OUT2 — BCK_OUT2
- SDATA_OUT2 — DAT_OUT2
- LRCLK_OUT3/MP9 — LRK_OUT3
- BCLK_OUT3 — BCK_OUT3
- SDATA_OUT3 — DAT_OUT3

Master SPI/I2C
- SS_M/MP0 — EEPROM_6
- MOSI_M/MP1 — EEPROM_5
- SCL_M/SCLK_M/MP2 — EEPROM_2
- SDA_M/MISO_M/MP3

Slave SPI/I2C
- MISO/SDA — I2C_SDA
- SCLK/SCL — I2C_SCL
- MOSI/ADDR1
- SS/ADDR0

Exposed_Pad

Ext. I2S INPUT
J3 Conn_01x08
- BCK_IN1
- LRK_IN1
- DAT_IN1
- MCLK4

RCA / EXT / USB / RPI

Y1 24.576MHz TCXO
OT322524.576MJBA4S

74LVC1G04 U15

MCLK
MCLK0
MCLK1
MCLK2
MCLK3
MCLK4

L1 SDFL2012T220KTF 22uH

Optical RX (192k max.)
U2 AUDIO-0 OPT-INPUT PLR135-T10
74LVC1G86 U10 958RX

J11 Conn_Coaxial
T1 PE-65612NL
74LVC1G04 U11

Optical TX
U4 OPT PLT133-T10W
958TX

USBi
J12 IDC_2x5

MASTER VOLUME
RV1 B10K

AUX VOL HEADER
J1 Conn_01x08
- AUX5
- AUX4
- AUX3
- AUX2
- AUX1
- AUX0

RV2 B10K / RV3 B10K / RV4 B10K / RV5 B10K

SW4 SW_NOP_DPDT

OPTIONAL SOCKET

CONFIG EEPROM
U13 25AA1024
- SCK
- MOSI
- MISO
- WP
- HOLD
- CS

J6 8P_DIP_SOCKET
- EEPROM_2
- EEPROM_6
- EEPROM_5

DSP RESET BUTTON
2N7002 Q13
D21 1N4148W
SW7 DSP_RES
DSP-RESET
XSMT
DSP_RES

Signal LED (-20dB)
D17 LED_GRN
CLIP LED (-1dB)
D18 LED_RED
DSP_MP6 / DSP_MP7

NOTE:
Remove U13 when use a J6 DIP package EEPROM.
Remove R43 when you install the SW4 for selectable dual EEPROMs.

SPI EEPROM should be organized by 8 (128kx8, 64kx8, 32kx8, etc.)
The maximum valid memory space is limited up to 512Mbits.
Maybe you can replace U13 EEPROM but you need to change the writing parameters...

25AA1024-I/SM(Microchip, Total=1048576, PageSize=256, N=3)
M95M01-DWMN3TP/K(STM, Total=262144, PageSize=64, N=2)
BR25G1MF-3GE2(ROHM)
CAT25M01VI-GT3(OnSemi)
S-25CM01A0I-J8T1U4(ablic)

2N7002 Q30 — I2C_SDA — RP_SDA
AO3401A Q29
2N7002 Q31 — I2C_SCL — RP_SCL

DSP

# FreeDSP OCTAVIA DAC part

**FreeDSP OVTAVIA (basic version)**

NOT POPULATE : U22, U23, R182, R189, R187, R191, R199, R201, R203, R209, Q26, R208, Q25, R204, R198, R200
CHANE (to Zero Ohm): R181, R188, R183, R190, R213
JUMPER(Between): J28 pin2-Pin3, pin5-pin6

*AS WELL TO THE ANOTHER PART ...*

**FreeDSP OVTAVIA (Differential version)**

NOT POPULATE: Q25, R208 (if you want)

*AS WELL TO THE ANOTHER PART ...*

**FreeDSP OVTAVIA (Balanced version)**

NOT POPULATE: J16, R213, R203

*AS WELL TO THE ANOTHER PART ...*

**FreeDSP OVTAVIA (Extend S/N 6dB stereo version)**

NOT POPULATE:
U26, U21, Q23, Q22, Q24, J20, J27, R202, R206, R205, R207, R212, R196, R197, R192, R193, R194, R195,
R177, R173, R174, R178, R175, R179, R176, R180, U22, Q25, Q27, R208, R210, R209, R210, R203, R198, R199, R188, R181, R189, R182
CHANGE:
(to 10k) R183, R184, R185, R186
(to MJ-518 or Butique Jacks) J16

*AS WELL TO THE ANOTHER PART ...*

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Designed by CyberPit 2023

☐ FreeDSP OVTAVIA (basic version)
☒ FreeDSP OVTAVIA (Differential version)
☐ FreeDSP OVTAVIA (Balanced version)
☐ FreeDSP OVTAVIA (Extend S/N 6dB version)

Sheet: /ADC_IO Part/DAC/
File: DAC.sch

**Title: FreeDSP OCTAVIA DAC part**

| Size: A3 | Date: 2023-03-11 | Rev: 0.2 |
| --- | --- | --- |
| KiCad E.D.A. kicad (5.1.9-0-10_14) | | Id: 3/3 |