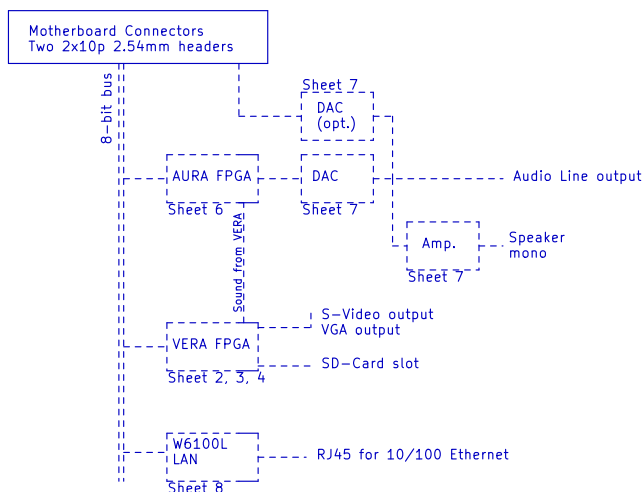


# OpenX65 Video/Audio & Ethernet Board ("V/A-B0")

## Block Diagram:



- FID101 Fiducial
- FID102 Fiducial
- FID103 Fiducial
- H101 MountingHole
- H102 MountingHole
- H103 MountingHole
- H104 MountingHole

This schematic contains portions of work done by Frank van den Hoe for the project VERA: <https://github.com/fvdhoef/vera-module>

## Revision History:

Rev. / Date	Description
rev01 / 28.4.2023	Initial design, PCB 100x100mm 2-layers. VERA with VGA and S-Video outputs. AURA with line-out and amp/speaker, 2 DAC. LAN by W6100L

## Sheets:

Video VERA FPGA



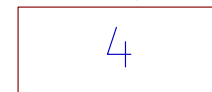
Soubor: vabo-sheet-02.kicad\_sch

Video Outputs



Soubor: vabo-sheet-03.kicad\_sch

VERA SPI-Flash, SDC



Soubor: vabo-sheet-04.kicad\_sch

Motherboard Connectors



Soubor: vabo-sheet-05.kicad\_sch

Audio AURA FPGA



Soubor: vabo-sheet-06.kicad\_sch

Audio DAC, Output



Soubor: vabo-sheet-07.kicad\_sch

Ethernet



Soubor: vabo-sheet-08.kicad\_sch

Block Diagram

FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /

File: openX65-vabo.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

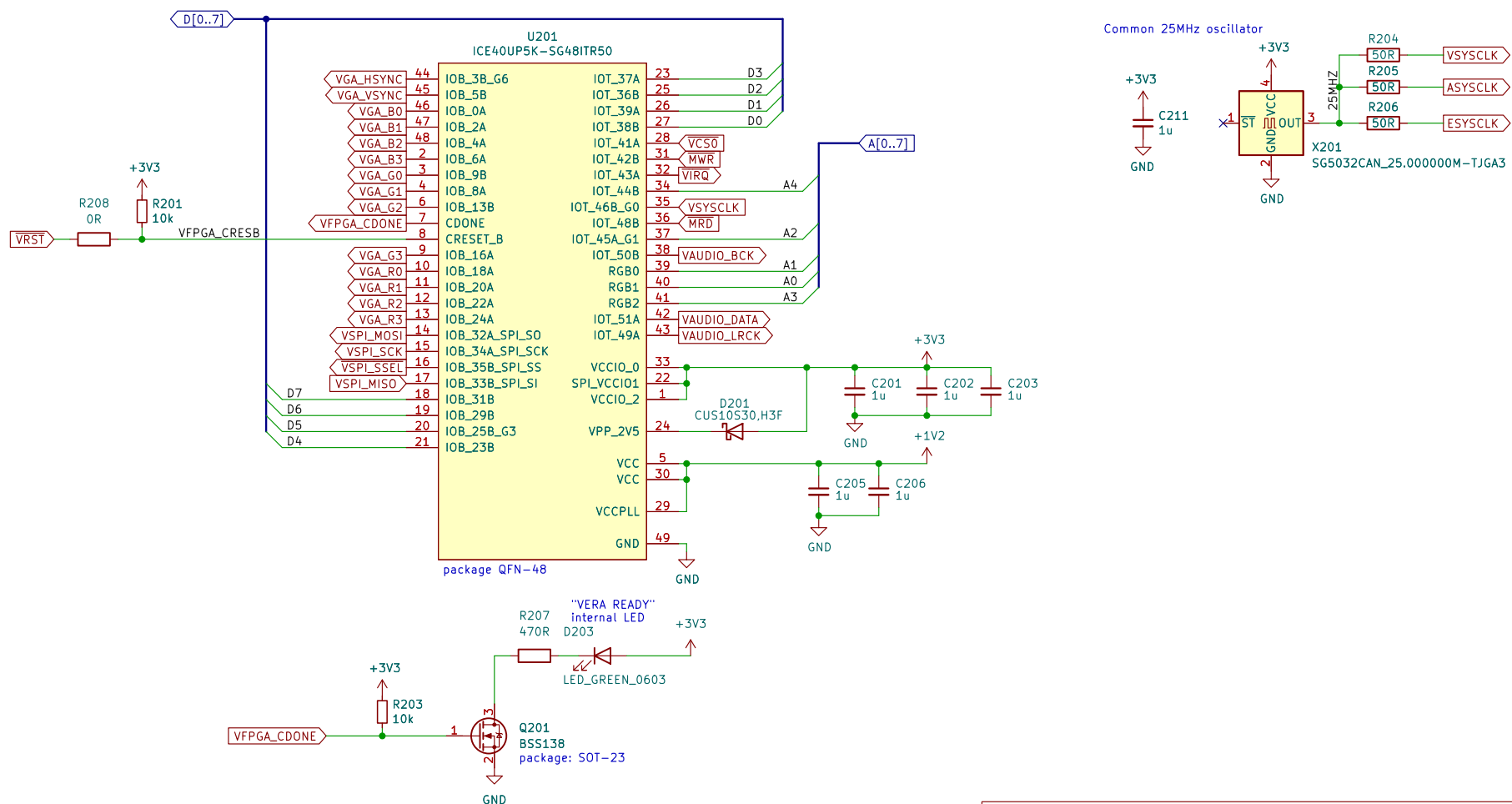
Size: A4 Date: 2023-04-28

KiCad E.D.A. kicad 6.0.11-3.fc36

Rev: rev01

Id: 1/8

# "VERA" FPGA – Video Embedded Retro Adapter



This schematic contains portions of work done by Frank van den Hoe for the project VERA: <https://github.com/fvdhoe/vera-module>

VERA FPGA design by Frank van den Hoe  
FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /Video VERA FPGA/  
File: vabo-sheet-02.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

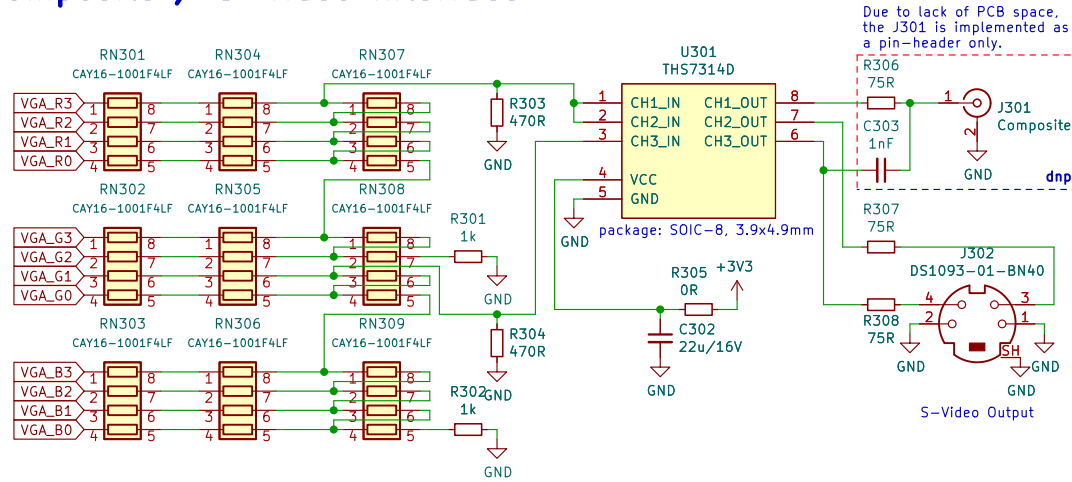
Size: A4 Date: 2023-04-28

KiCad E.D.A. kicad 6.0.11-3.fc36

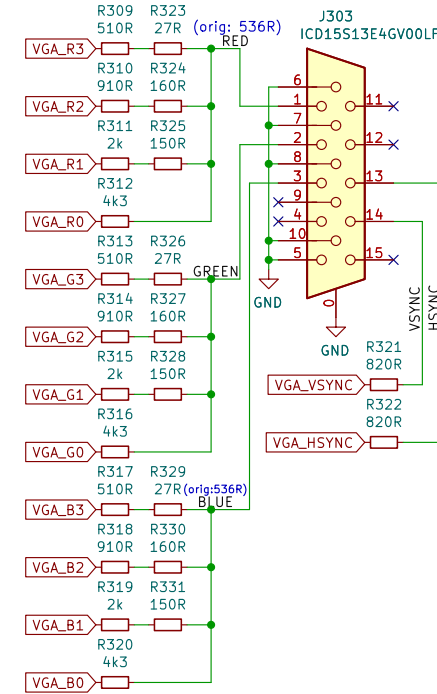
Rev: rev01

Id: 2/8

## Composite / S-video interface



## VGA interface



This schematic contains portions of work done by Frank van den Hoe for the project VERA: <https://github.com/fvdhoe/vera-module>

Video outputs from VERA  
FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /Video Outputs/  
File: vabo-sheet-03.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

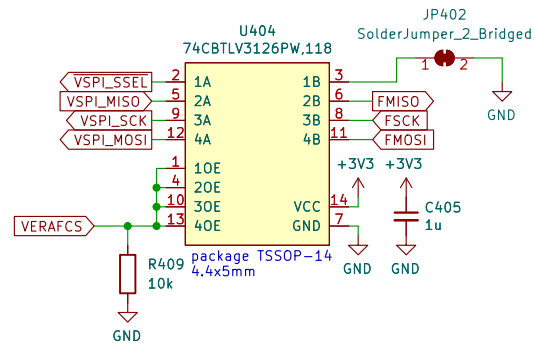
Size: A4 Date: 2023-04-28

KiCad E.D.A. kicad 6.0.11-3.fc36

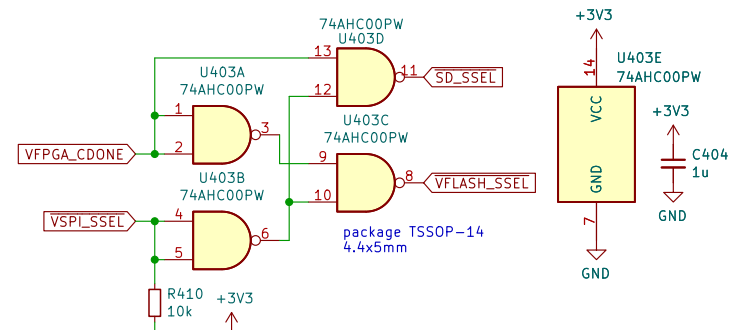
Rev: rev01

Id: 3/8

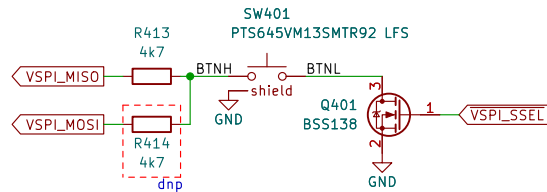
## FTDI/ICD access multiplexer to VERA SPI flash memory



## VERA SPI pins multiplexing

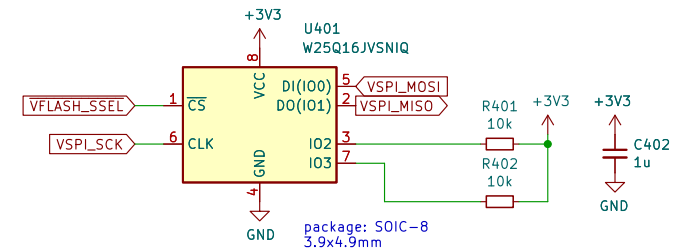


## VERA push-button Piggy-back on MISO line

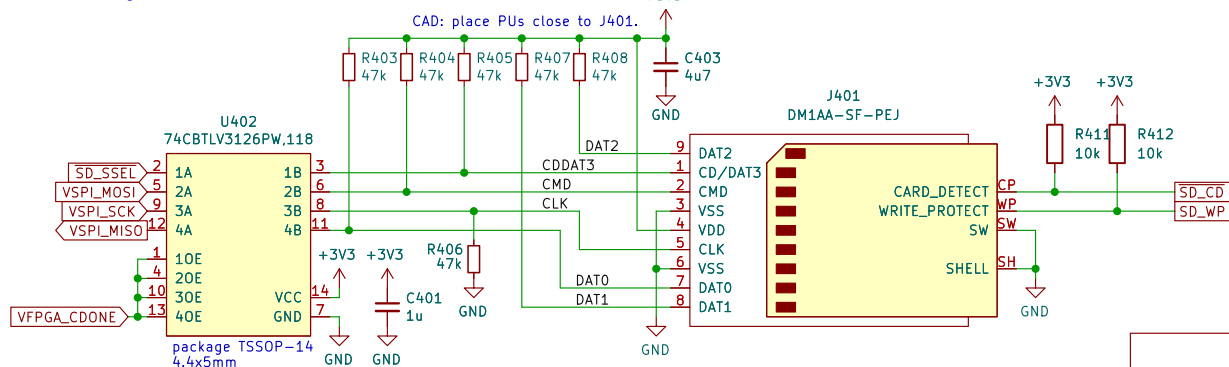


Inputs	Outputs	Description
VFPGA_CDONE	SD_SSEL	FPGA configuring from the SPI-Flash, or FTDI/ICD accessing.
VSPI_SSEL	VFLASH_SSEL	FPGA empty/in-reset
VSPI_SSEL	VFLASH_SSEL	FPGA loaded; User Design r/w to SDC
VSPI_SSEL	VFLASH_SSEL	FPGA loaded; idle

## SPI flash for VERA Bitstream



## Secure Digital Interface – like an "FDD"



This schematic contains portions of work done by Frank van den Hoe for the project VERA: <https://github.com/fvdhoef/vera-module>

VERA SPI multiplexing, SDC interface  
FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /VERA SPI-Flash, SDC/  
File: vabo-sheet-04.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

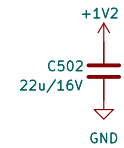
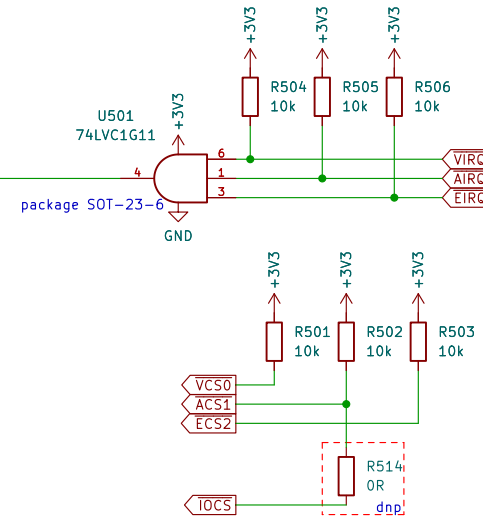
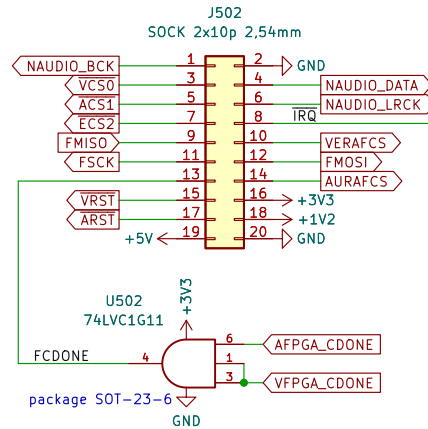
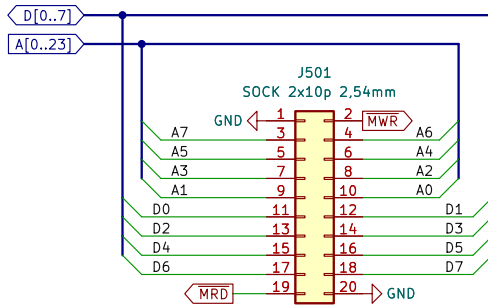
Size: A4 Date: 2023-04-28

KiCad E.D.A. kicad 6.0.11-3.fc36

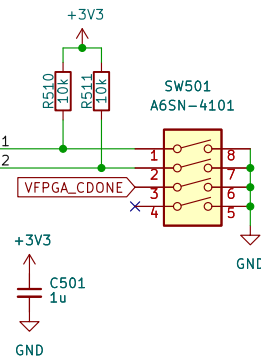
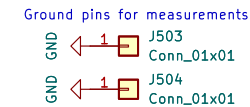
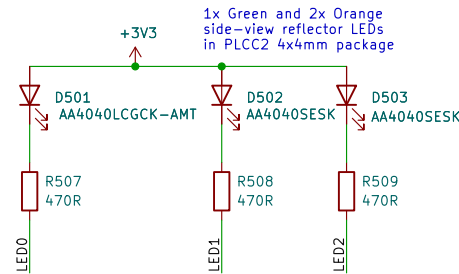
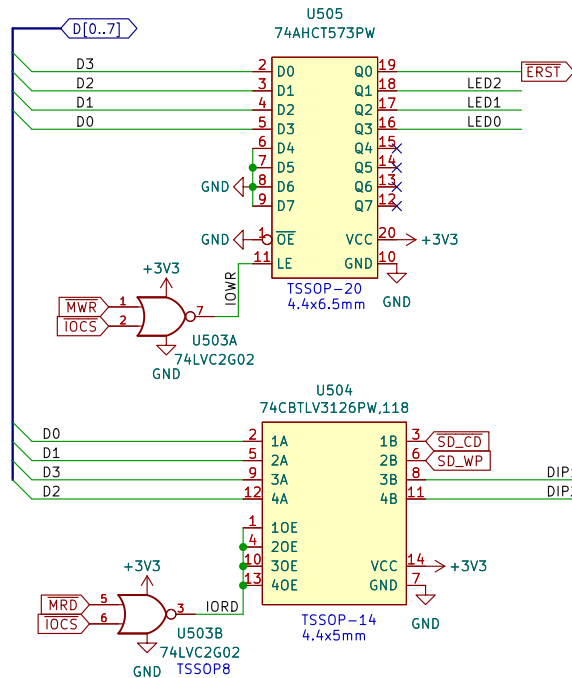
Rev: rev01

Id: 4/8

## Connectors to the Motherboard



## I/O: LEDs & DIP Switches



Motherboard Connectors, simple I/O  
FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /Motherboard Connectors/  
File: vabo-sheet-05.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

Size: A4 Date: 2023-04-28

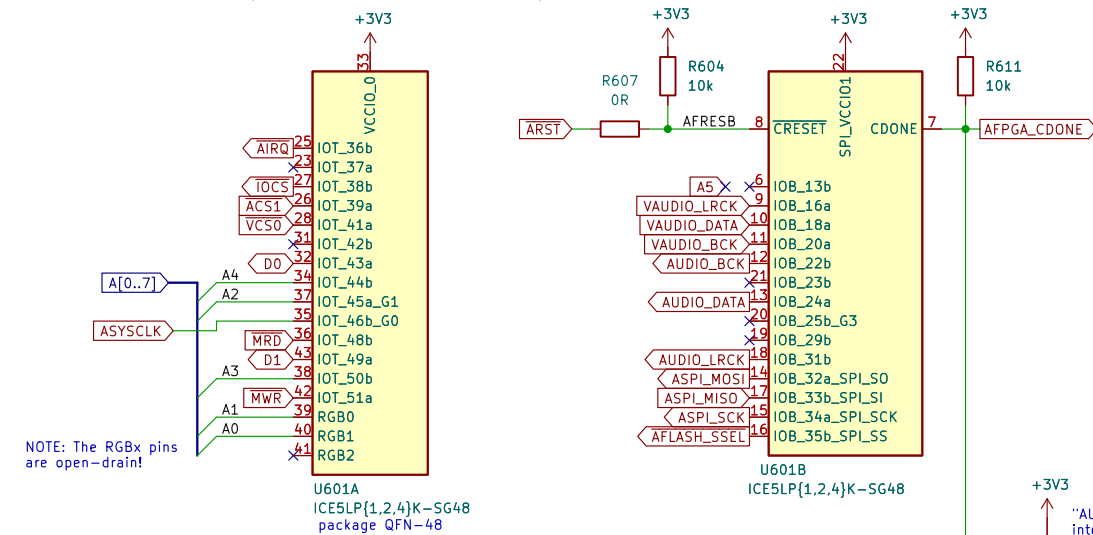
KiCad E.D.A. kicad 6.0.11-3.fc36

Rev: rev01

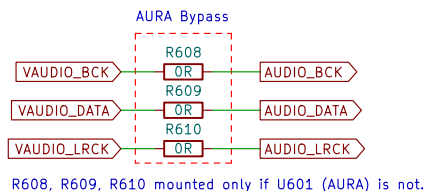
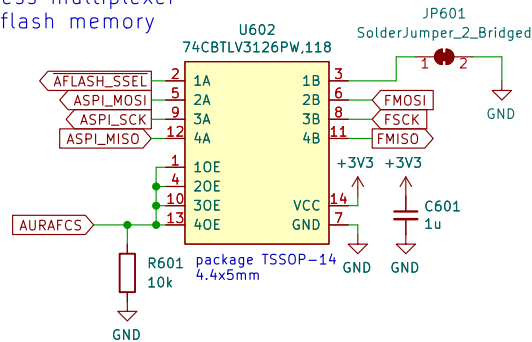
Id: 5/8

# "AURA" FPGA – Audio Retro Adapter

For X16 compatibility, AURA will implement the YM2151 FM-Synthesis (the chip is long out of production).  
One possible design is JT51 at <https://github.com/jotego/jt51>  
which requires about 2K gates (i.e. ICE5LP2K-SG48 – to be validated)



FTDI/ICD access multiplexer  
to AURA SPI flash memory



AURA FPGA  
FOR X65.EU DESIGNED BY JSYKORA.INFO

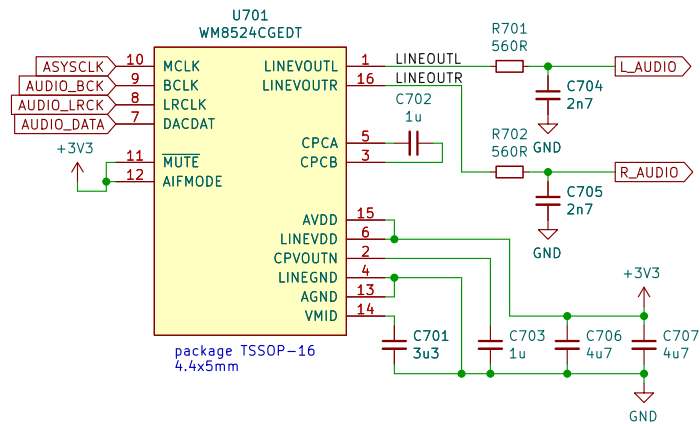
Sheet: /Audio AURA FPGA/  
File: vabo-sheet-06.kicad\_sch

Title: OpenX65 – Video/Audio & Ethernet Board

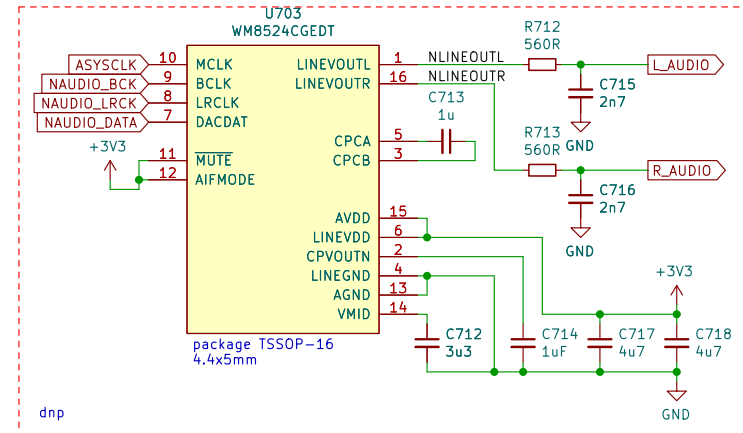
Size: A4 Date: 2023-04-28  
KiCad E.D.A. kicad 6.0.11-3.fc36

Rev: rev01  
Id: 6/8

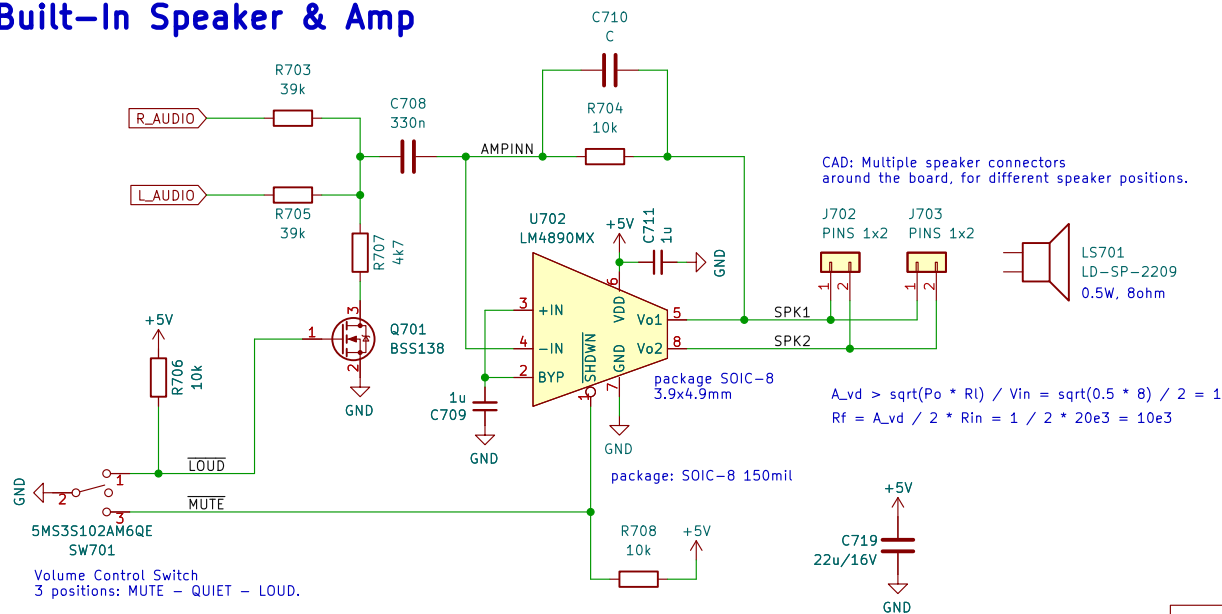
## Audio DAC (PCM/PSG in VERA, FM in AURA)



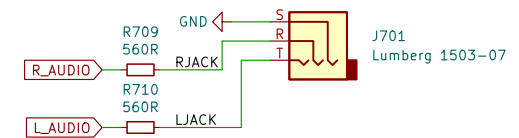
## Audio DAC (Sound from NORA) – optional.



## Built-In Speaker & Amp



## 3.5mm jack – AUDIO LINE output



This schematic contains portions of work done by Frank van den Hoe for the project VERA: <https://github.com/fvdhoef/vera-module>

Audio DAC, Speaker Amplifier, and Line Output  
FOR X65.EU DESIGNED BY JSYKORA.INFO

Sheet: /Audio DAC, Output/  
File: vabo-sheet-07.kicad\_sch

**Title: OpenX65 – Video/Audio & Ethernet Board**

Size: A4 Date: 2023-04-28

KiCad E.D.A. kicad 6.0.11-3.fc36

Rev: rev01

Id: 7/8

# 10/100Mbit Ethernet Interface

10/100Mbit Ethernet Interface

3V3

3V3D

3V3A

3V3B

3V3C

3V3D

3V3E

3V3F

3V3G

3V3H

3V3I

3V3J

3V3K

3V3L

3V3M

3V3N

3V3O

3V3P

3V3Q

3V3R

3V3S

3V3T

3V3U

3V3V

3V3W

3V3X

3V3Y

3V3Z

3V3AA

3V3AB

3V3AC

3V3AD

3V3AE

3V3AF

3V3AG

3V3AH

3V3AI

3V3AJ

3V3AK

3V3AL

3V3AM

3V3AN

3V3AO

3V3AP

3V3AQ

3V3AR

3V3AS

3V3AT

3V3AU

3V3AV

3V3AW

3V3AX

3V3AY

3V3AZ

3V3BA

3V3BB

3V3BC

3V3BD

3V3BE

3V3BF

3V3BG

3V3BH

3V3BI

3V3BJ

3V3BK

3V3BL

3V3BM

3V3BN

3V3BO

3V3BP

3V3BQ

3V3BR

3V3BS

3V3BT

3V3BU

3V3BV

3V3BW

3V3BX

3V3BY

3V3BZ

3V3CA

3V3CB

3V3CC

3V3CD

3V3CE

3V3CF

3V3CG

3V3CH

3V3CI

3V3CJ

3V3CK

3V3CL

3V3CM

3V3CN

3V3CO

3V3CP

3V3CQ

3V3CR

3V3CS

3V3CT

3V3CU

3V3CV

3V3CW

3V3CX

3V3CY

3V3CZ

3V3DA

3V3DB

3V3DC

3V3DD

3V3DE

3V3DF

3V3DG

3V3DH

3V3DI

3V3DJ

3V3DK

3V3DL

3V3DM

3V3DN

3V3DO

3V3DP

3V3DQ

3V3DR

3V3DS

3V3DT

3V3DU

3V3DV

3V3DW

3V3DX

3V3DY

3V3DZ

3V3EA

3V3EB

3V3EC

3V3ED

3V3EE

3V3EF

3V3EG

3V3EH

3V3EI

3V3EJ

3V3EK

3V3EL

3V3EM

3V3EN

3V3EO

3V3EP

3V3EQ

3V3ER

3V3ES

3V3ET

3V3EU

3V3EV

3V3EW

3V3EX

3V3EY

3V3EZ

3V3FA

3V3FB

3V3FC

3V3FD

3V3FE

3V3FF

3V3FG

3V3FH

3V3FI

3V3FJ

3V3FK

3V3FL

3V3FM

3V3FN

3V3FO

3V3FP

3V3FQ

3V3FR

3V3FS

3V3FT

3V3FU

3V3FV

3V3FW

3V3FX

3V3FY

3V3FZ

3V3GA

3V3GB

3V3GC

3V3GD

3V3GE

3V3GF

3V3GG

3V3GH

3V3GI

3V3GJ

3V3GK

3V3GL

3V3GM

3V3GN

3V3GO

3V3GP

3V3GQ

3V3GR

3V3GS

3V3GT

3V3GU

3V3GV

3V3GW

3V3GX

3V3GY

3V3GZ

3V3HA

3V3HB

3V3HC

3V3HD

3V3HE

3V3HF

3V3HG

3V3HH

3V3HI

3V3HJ

3V3HK

3V3HL

3V3HM

3V3HN

3V3HO

3V3HP

3V3HQ

3V3HR

3V3HS

3V3HT

3V3HU

3V3HV

3V3HW

3V3HX

3V3HY

3V3HZ

3V3IA

3V3IB

3V3IC

3V3ID

3V3IE

3V3IF

3V3IG

3V3IH

3V3II

3V3IJ

3V3IK

3V3IL

3V3IM

3V3IN

3V3IO

3V3IP

3V3IQ

3V3IR

3V3IS

3V3IT

3V3IU

3V3IV

3V3IW

3V3IX

3V3IY

3V3IZ

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3V3JB

3V3JC

3V3JD

3V3JE

3V3JF

3V3JG

3V3JH

3V3JI

3V3JJ

3V3JK

3V3JL

3V3JM

3V3JN

3V3JO

3V3JP

3V3JQ

3V3JR

3V3JS

3V3JT

3V3JU

3V3JV

3V3JW

3V3JX

3V3JY

3V3JZ

3V3KA

3V3KB

3V3KC

3V3KD

3V3KE

3V3KF

3V3KG

3V3KH

3V3KI

3V3KJ

3V3KK

3V3KL

3V3KM

3V3KN

3V3KO

3V3KP

3V3KQ

3V3KR

3V3KS

3V3KT

3V3KU

3V3KV

3V3KW

3V3KX

3V3KY

3V3KZ

3V3LA

3V3LB

3V3LC

3V3LD

3V3LE

3V3LF

3V3LG

3V3LH

3V3LI

3V3LJ

3V3LK

3V3LL

3V3LM

3V3LN

3V3LO

3V3LP

3V3LQ

3V3LR

3V3LS

3V3LT

3V3LU

3V3LV

3V3LW

3V3LX

3V3LY

3V3LZ

3V3MA

3V3MB

3V3MC

3V3MD

3V3ME

3V3MF

3V3MG

3V3MH

3V3MI

3V3MJ

3V3MK

3V3ML

3V3MM

3V3MN

3V3MO

3V3MP

3V3MQ

3V3MR

3V3MS

3V3MT

3V3MU

3V3MV

3V3MW

3V3MX

3V3MY

3V3MZ

3V3NA

3V3NB

3V3NC

3V3ND

3V3NE

3V3NF

3V3NG

3V3NH

3V3NI

3V3NJ

3V3NK

3V3NL

3V3NM

3V3NN

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3V3NQ

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3V3OD

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3V3OF

3V3OG

3V3OH

3V3OI

3V3OJ

3V3OK

3V3OL

3V3OM

3V3ON

3V3OO

3V3OP

3V3OQ

3V3OR

3V3OS

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3V3OY

3V3OZ

3V3PA

3V3PB

Sheet: /Ethernet/		D
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<b>Title: OpenX65 – Video/Audio &amp; Ethernet Board</b>		
Size: A4	Date: 2023-04-28	<b>Rev: rev01</b>
KiCad E.D.A. kicad 6.0.11-3.fc36		Id: 8/8