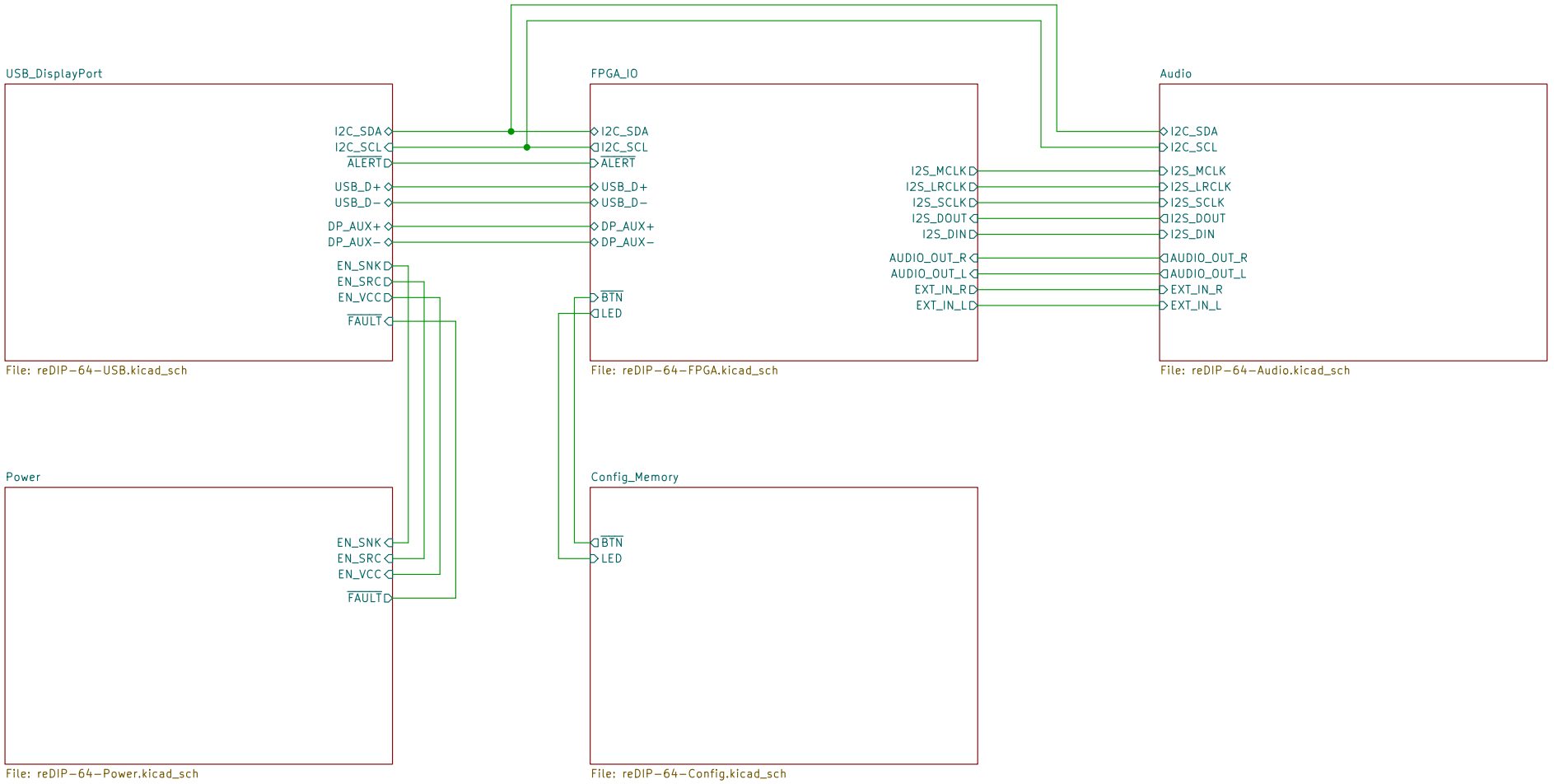


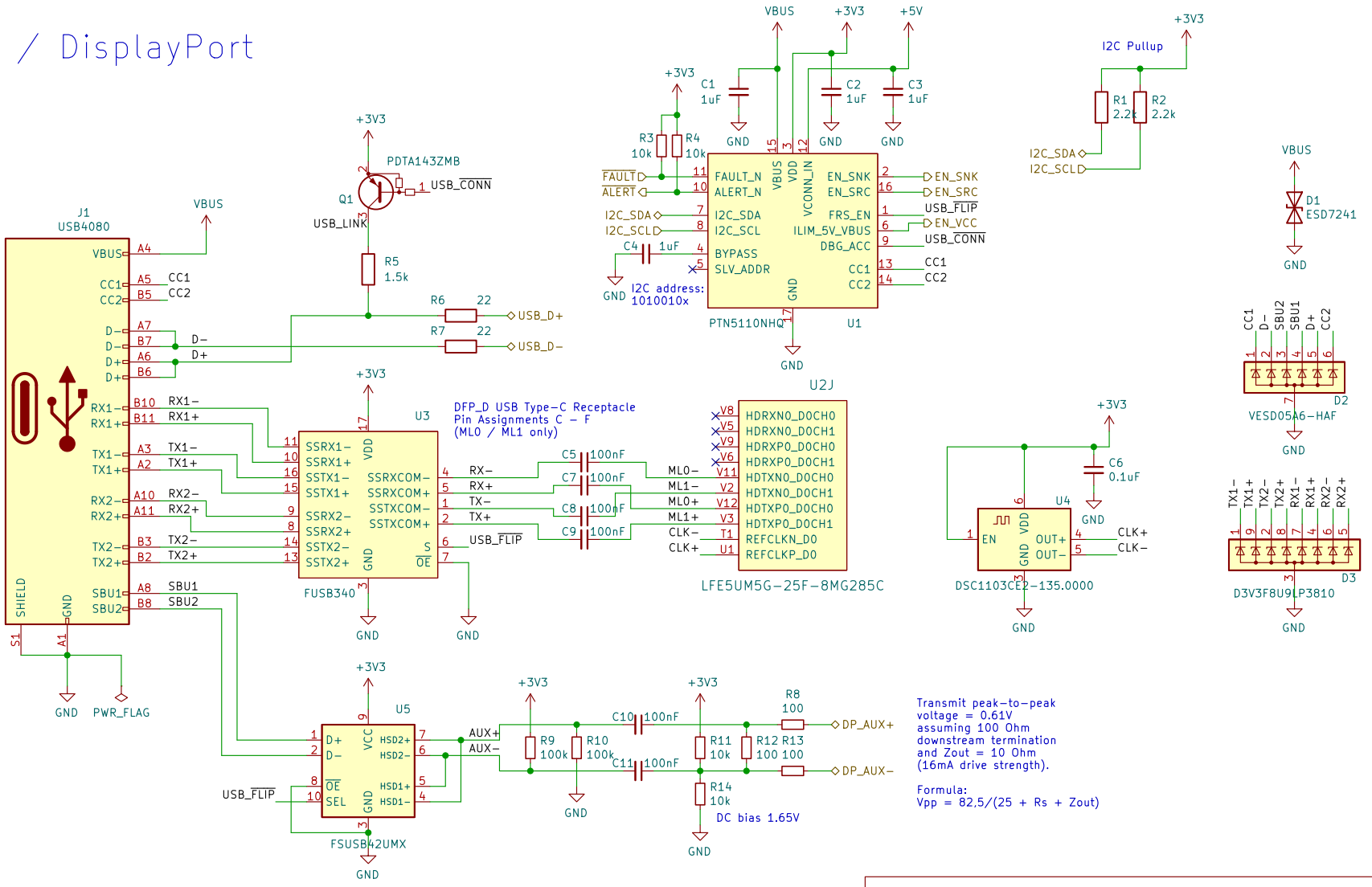
Nimrod

Sheet: /
File: reDIP−64.kicad_sch

Title: reDIP 64

Size: A4	Date: 2022−04−10	**Rev: 1.0**
KiCad E.D.A. kicad 6.0.4−1.fc35		Id: 1/6

USB / DisplayPort



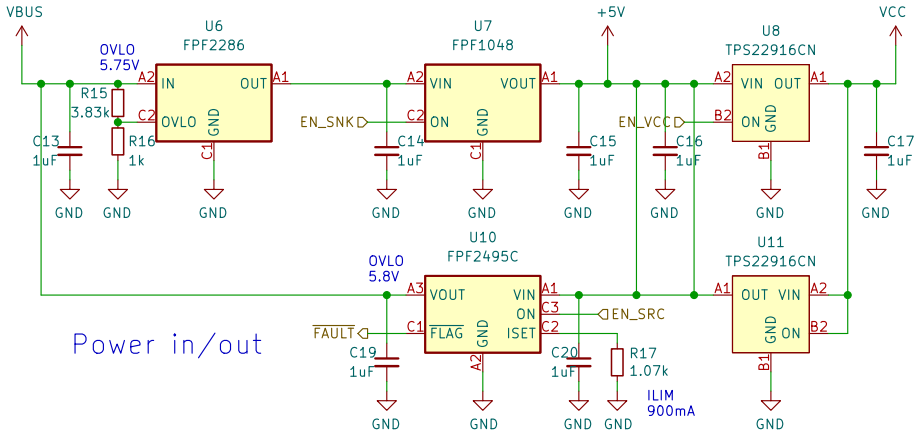
Nimrod

Sheet: /USB_DisplayPort/
File: reDIP−64−USB.kicad_sch

Title: reDIP 64

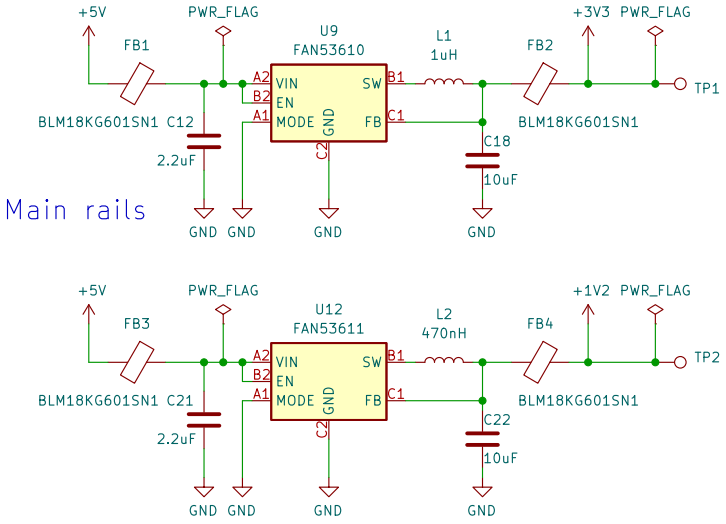
Size: A4	Date: 2022−04−10	**Rev: 1.0**
KiCad E.D.A. kicad 6.0.4−1.fc35		Id: 2/6

Power

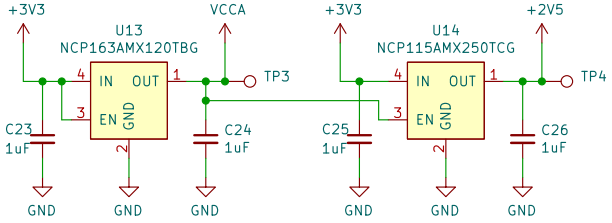


Power in/out

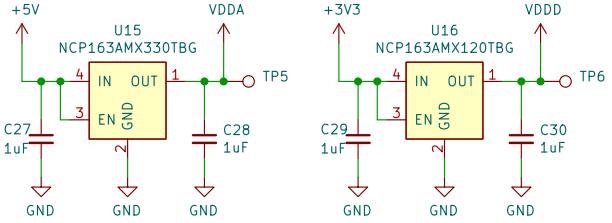
Main rails

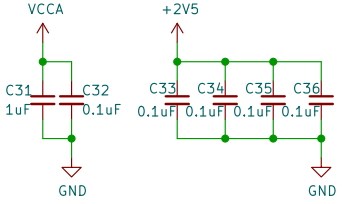


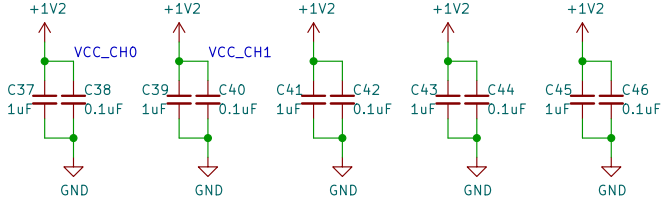
FPGA

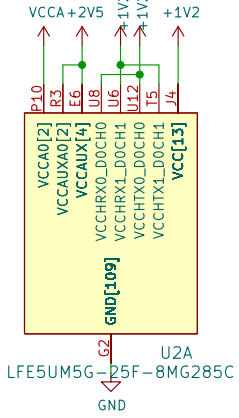


Audio

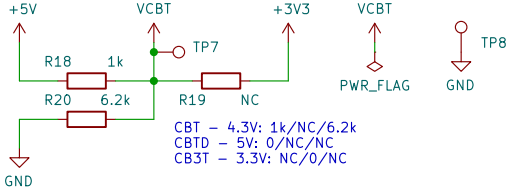








Level shifters

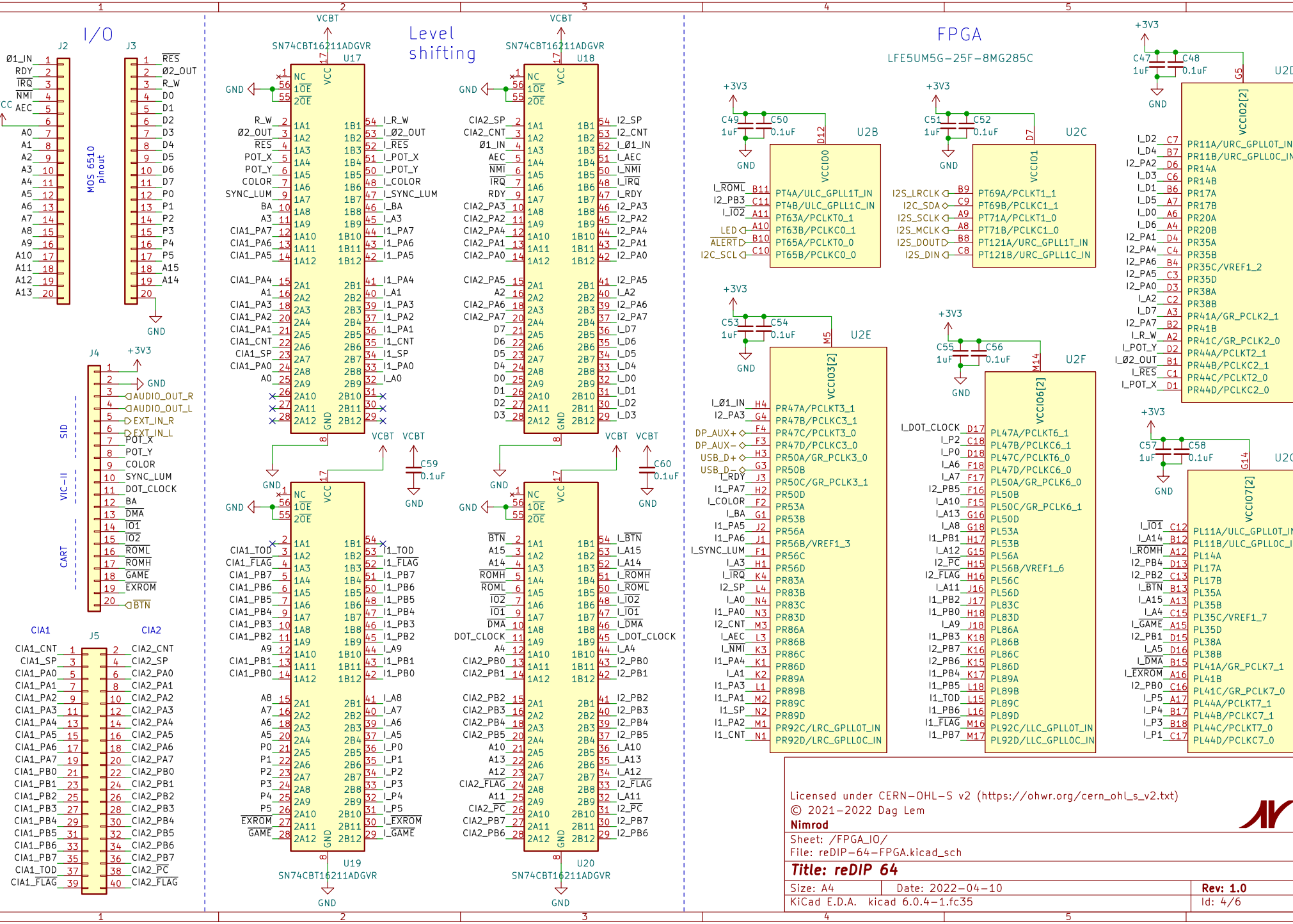


Nimrod

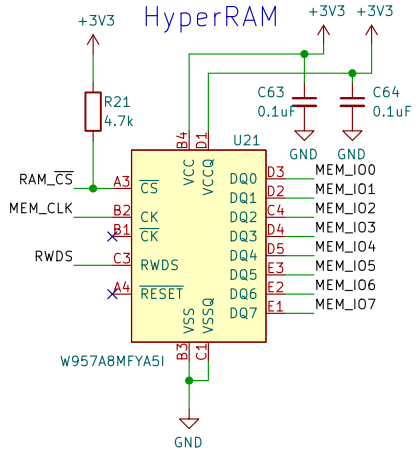
Sheet: /Power/
File: reDIP-64-Power.kicad_sch

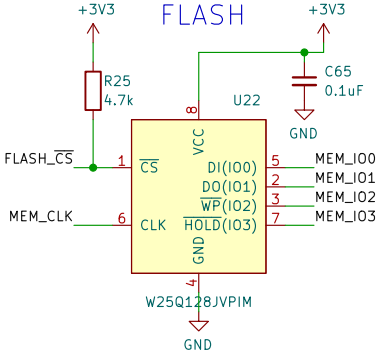
Title: reDIP 64

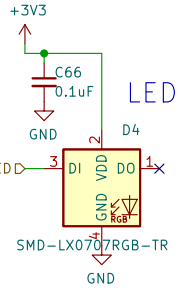
Size: A4	Date: 2022-04-10	**Rev: 1.0**
KiCad E.D.A. kicad 6.0.4-1.fc35		Id: 3/6

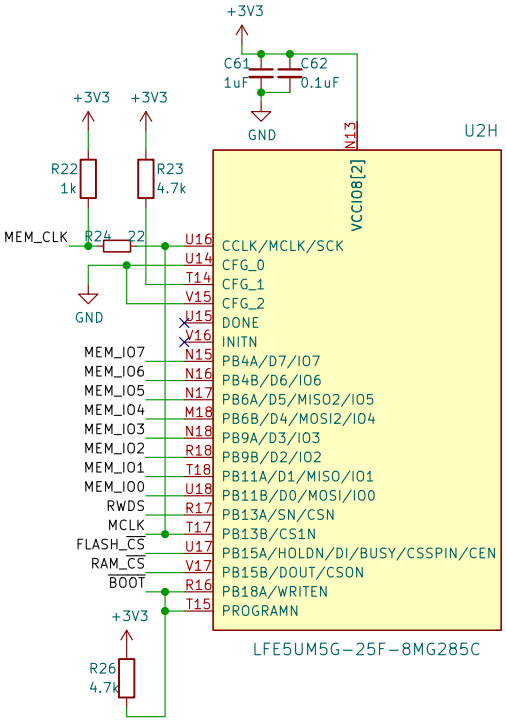

I/O
Level shifting
FPGA
LFE5UM5G-25F-8MG285C
SN74CBT16211ADGVR
MOS 6510 pinout
SID
VIC-II
CART
CIA1
CIA2
Licensed under CERN-OHL-S v2 (https://ohwr.org/cern_ohl_s_v2.txt)
© 2021-2022 Dag Lem
Nimrod
Sheet: /FPGA_IO/
File: reDIP-64-FPGA.kicad_sch
Title: reDIP 64
Size: A4
Date: 2022-04-10
Rev: 1.0
KiCad E.D.A. kicad 6.0.4-1.fc35
Id: 4/6

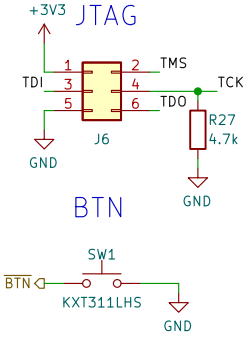
Config / Memory

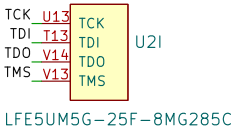












Example derivation of clocks:

* Audio:
  135MHz/5 = 27MHz -> SGTL5000 PLL -> 24.576MHz
* USB:
  135MHz -> ECP5 PLL1 -> 48MHz
* HyperRAM:
  135MHz, 135MHz/2 = 67.5MHz, or 135MHz/3 = 45MHz
* FLASH:
  135MHz, 135MHz/2, or 135MHz/3 (max 50MHz for 03h Read Data Instruction)
  Note: 135MHz is above datasheet maximum FR of 133MHz

Commodore 64, no clock input:

* Ø_COLOR*4:
  135MHz -> ECP PLL2 -> 17.734472MHz*4 (PAL) / 14.31818MHz*4 (NTSC)
* DOT CLOCK:
  Ø_COLOR*4/9 = 7.88MHz (PAL) / Ø_COLOR*4/7 = 8.1818MHz (NTSC)
* COLOR CLOCK:
  Ø_COLOR*4/16 = 4.433618MHz (PAL) / 3.579545MHz (NTSC)

Commodore 64, Ø_COLOR as input:

* Ø_COLOR*4:
  Ø_COLOR -> ECP5 PLL2 -> 17.734472MHz*4 (PAL) / 14.31818MHz*4 (NTSC)
* DOT CLOCK:
  See above
* COLOR CLOCK:
  See above

Commodore 64, DOT CLOCK as input:

* Ø_COLOR*4:
  DOT_CLOCK -> ECP5 PLL2 -> 7.88MHz*9 (PAL) / 8.1818MHz*7 (NTSC)
  Note: 7.88MHz is below datasheet PLL minimum fIN of 8MHz
* COLOR CLOCK:
  See above

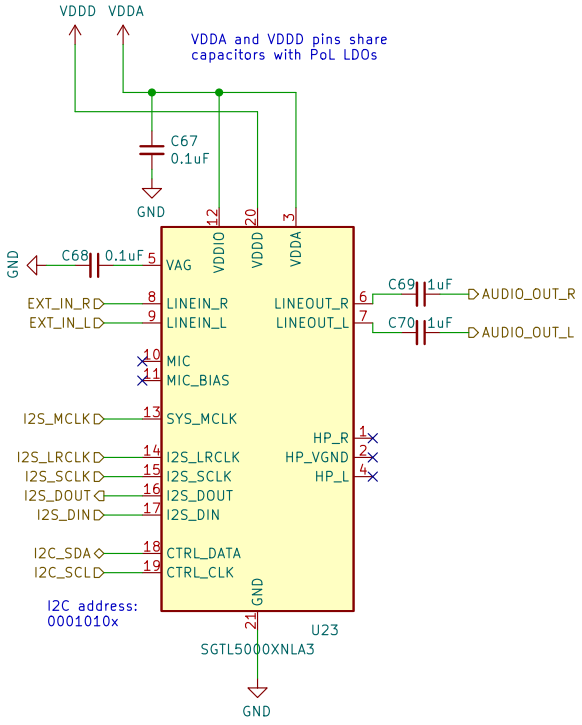
Nimrod

Sheet: /Config_Memory/
File: reDIP-64-Config.kicad_sch

Title: reDIP 64

Size: A4	Date: 2022-04-10	**Rev: 1.0**
KiCad E.D.A. kicad 6.0.4-1.fc35		Id: 5/6

Audio



Nimrod

Sheet: /Audio/
File: reDIP-64-Audio.kicad_sch

Title: reDIP 64

Size: A4	Date: 2022-04-10	**Rev: 1.0**
KiCad E.D.A. kicad 6.0.4-1.fc35		Id: 6/6