ULX4M-LD v003

2025-04-04

Intergalaktik d.o.o.
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Year: 2025

click on mouse pointer arrow on top of right toolbar
and double-click on sheet to open

power
BANK POWER
1V1/1V2
1V35
2V5
3V3
File: power.kicad_sch

usb
BANK6
CLK25
JTAG
USB
File: usb.kicad_sch

blinkey
3X BTN
8X LED
File: blinkey.kicad_sch

ram
BANK2
BANK3
DDR3
GPDI0
File: ram.kicad_sch

serdes
BANK 50
BANK 51
SERDES
File: serdes.kicad_sch

gpio
BANK0
BANK7
CM4 connector
File: gpio.kicad_sch

gpdi
BANK1
DSI
SD
GPDI
File: gpdi.kicad_sch

ethernet
Ethernet-KSZ9031RNXCA
File: ethernet.kicad_sch

DDR3
DDR3-AS4C256M16D3
File: ddr3.kicad_sch

flash
BANK8
FLASH-IS25LP128F
File: flash.kicad_sch

drawings
File: drawings.kicad_sch

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Blinkey	6
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SerDes	10
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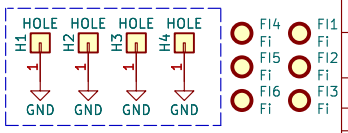
Blender render top side



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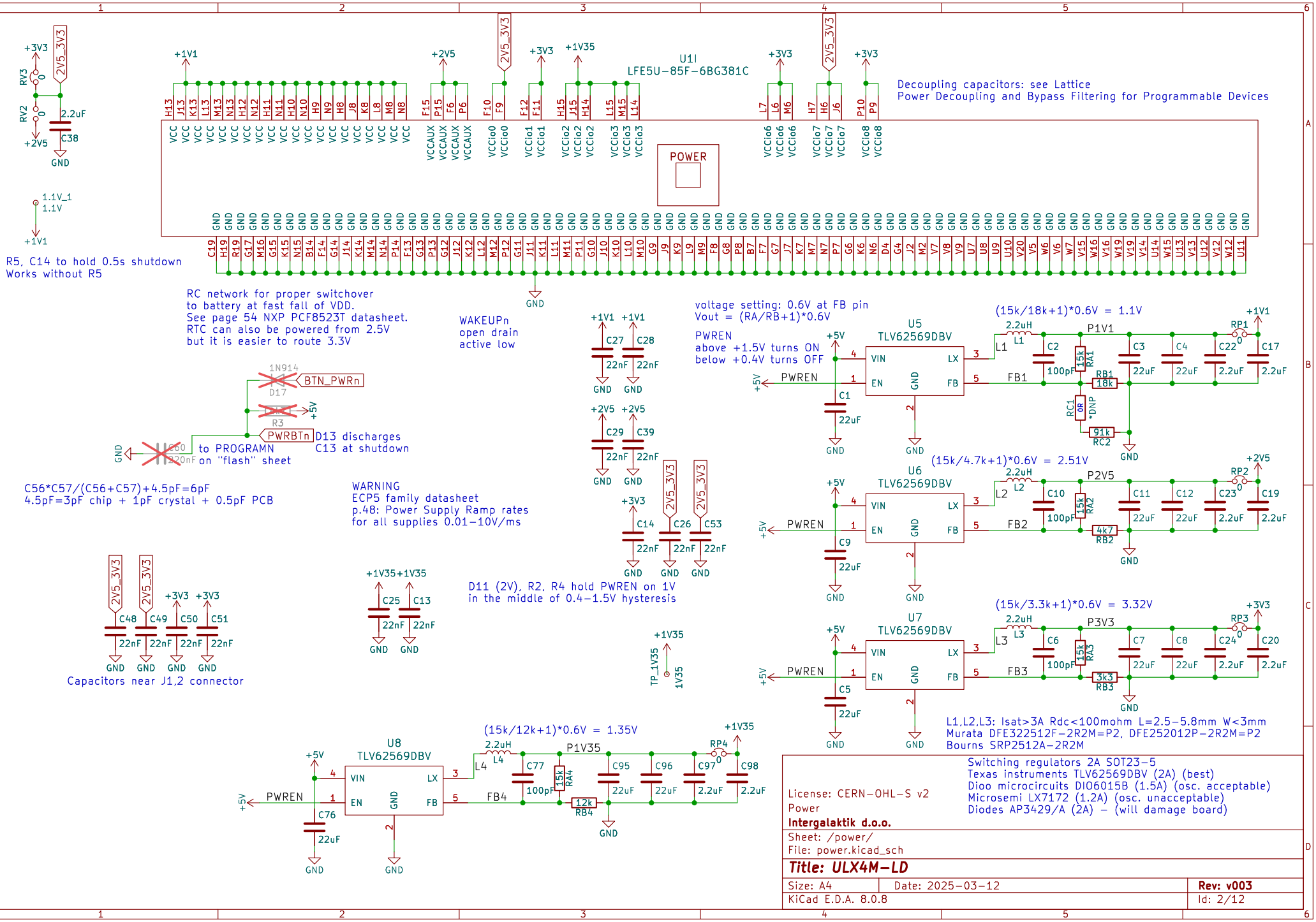
Sheet: /
File: ulx4m-ld.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
KiCad E.D.A. 8.0.8		Id: 1/12


U1I
LFE5U-85F-6BG381C
POWER
Decoupling capacitors: see Lattice
Power Decoupling and Bypass Filtering for Programmable Devices
R5, C14 to hold 0.5s shutdown
Works without R5
RC network for proper switchover
to battery at fast fall of VDD.
See page 54 NXP PCF8523T datasheet.
RTC can also be powered from 2.5V
but it is easier to route 3.3V
WAKEUPn
open drain
active low
BTN_PWRn
PWRBTn
D13 discharges
C13 at shutdown
to PROGRAMN
on "flash" sheet
C56*C57/(C56+C57)+4.5pF=6pF
4.5pF=3pF chip + 1pF crystal + 0.5pF PCB
WARNING
ECP5 family datasheet
p.48: Power Supply Ramp rates
for all supplies 0.01-10V/ms
D11 (2V), R2, R4 hold PWREN on 1V
in the middle of 0.4-1.5V hysteresis
Capacitors near J1,2 connector
voltage setting: 0.6V at FB pin
Vout = (RA/RB+1)*0.6V
PWREN
above +1.5V turns ON
below +0.4V turns OFF
U5
TLV62569DBV
(15k/18k+1)*0.6V = 1.1V
U6
TLV62569DBV
(15k/4.7k+1)*0.6V = 2.51V
U7
TLV62569DBV
(15k/3.3k+1)*0.6V = 3.32V
U8
TLV62569DBV
(15k/12k+1)*0.6V = 1.35V
L1,L2,L3: Isat>3A Rdc<100mohm L=2.5-5.8mm W<3mm
Murata DFE322512F-2R2M=P2, DFE252012P-2R2M=P2
Bourns SRP2512A-2R2M
Switching regulators 2A SOT23-5
Texas instruments TLV62569DBV (2A) (best)
Dioo microcircuits DIO6015B (1.5A) (osc. acceptable)
Microsemi LX7172 (1.2A) (osc. unacceptable)
Diodes AP3429/A (2A) - (will damage board)
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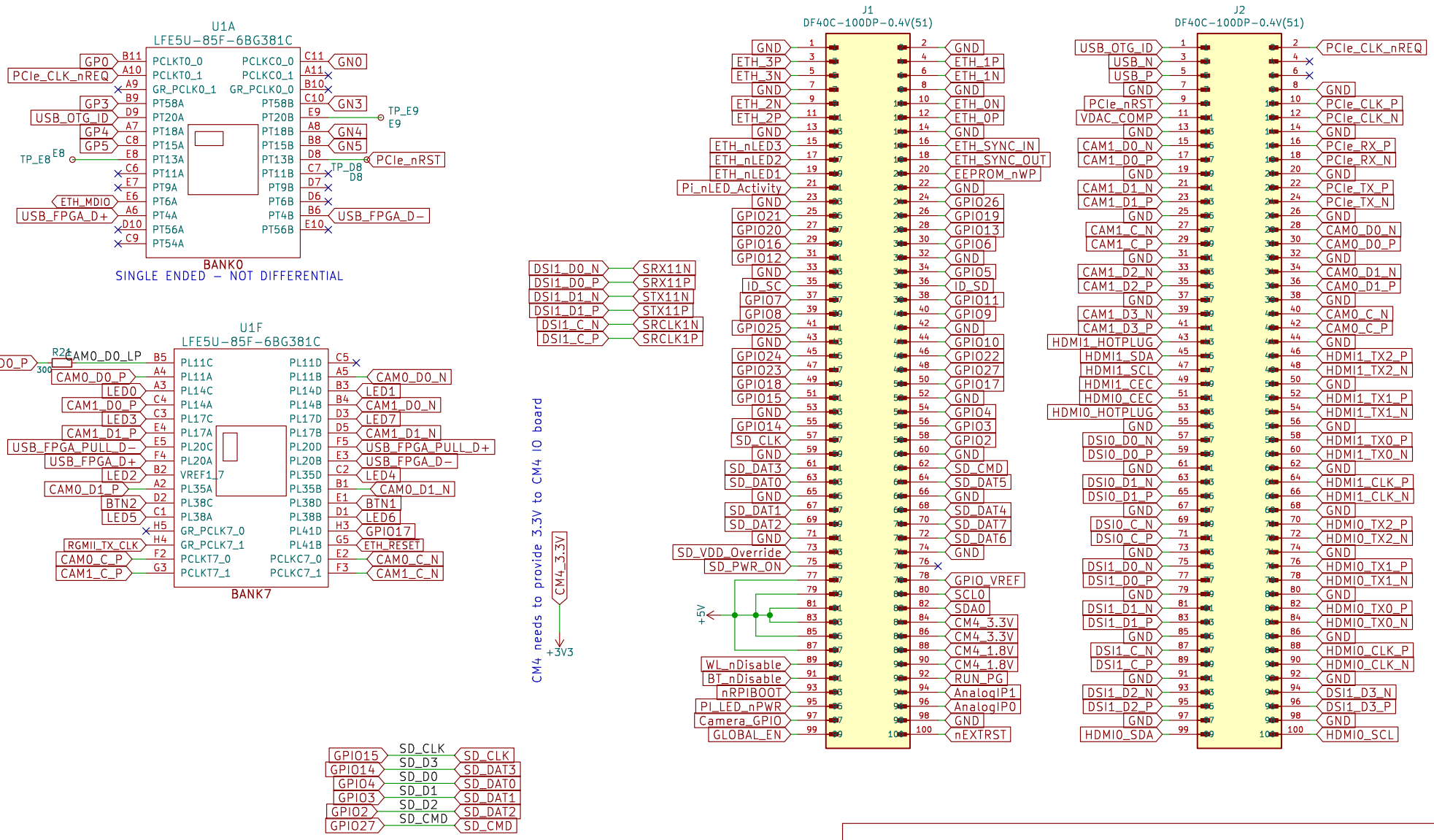
Power
Intergalaktik d.o.o.
Sheet: /power/
File: power.kicad_sch
Title: ULX4M-LD
Size: A4
Date: 2025-03-12
Rev: v003
KiCad E.D.A. 8.0.8
Id: 2/12



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GPIO 2.54 mm connectors
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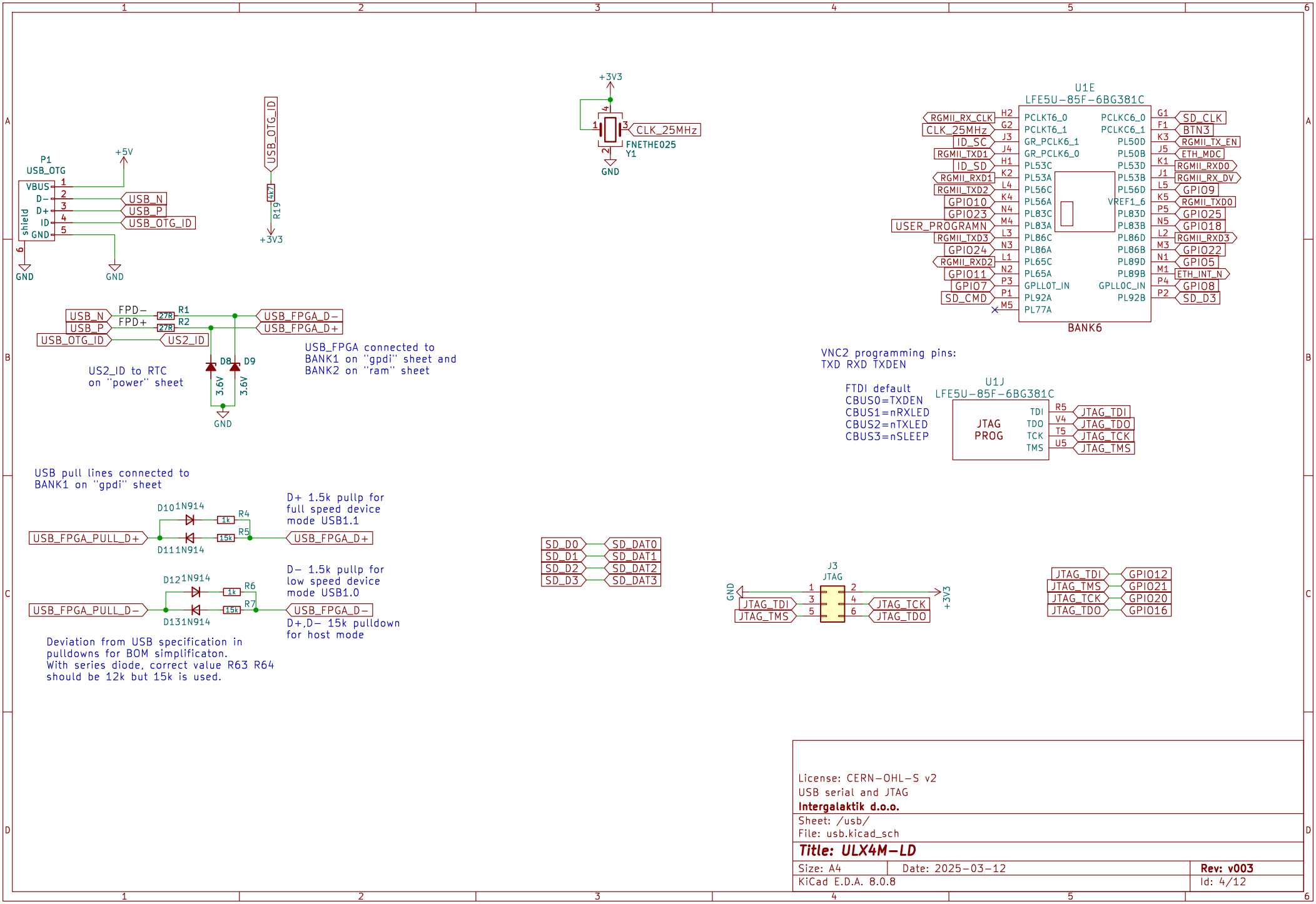
Sheet: /gpio/
File: gpio.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
KiCad E.D.A. 8.0.8		Id: 3/12



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USB serial and JTAG
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Sheet: /usb/
File: usb.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
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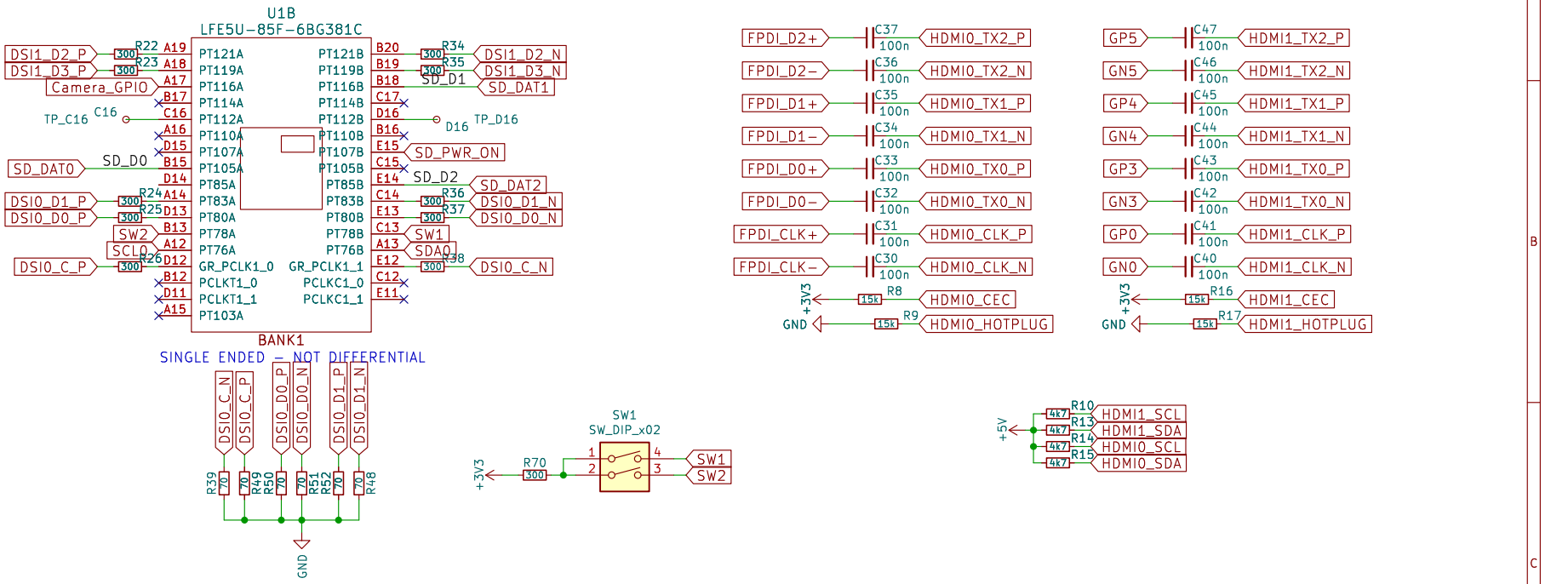

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General Purpose Differential Interface
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Sheet: /gpdi/
File: gpdi.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
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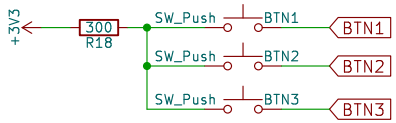
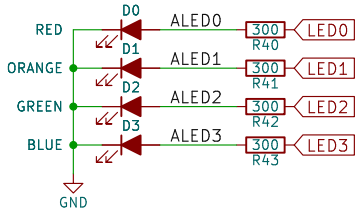
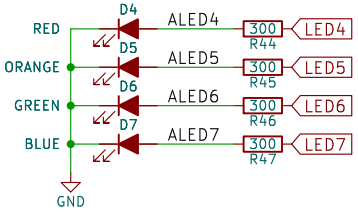
ST7789/SSD1331/SSD1351/SSD1306
compatible LCD/OLED 0.96/1.3/1.54" PCB
14x14 units
1 unit = 2.54 mm







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Buttons, LEDs, OLED display
Intergalaktik d.o.o.

Sheet: /blinkey/
File: blinkey.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
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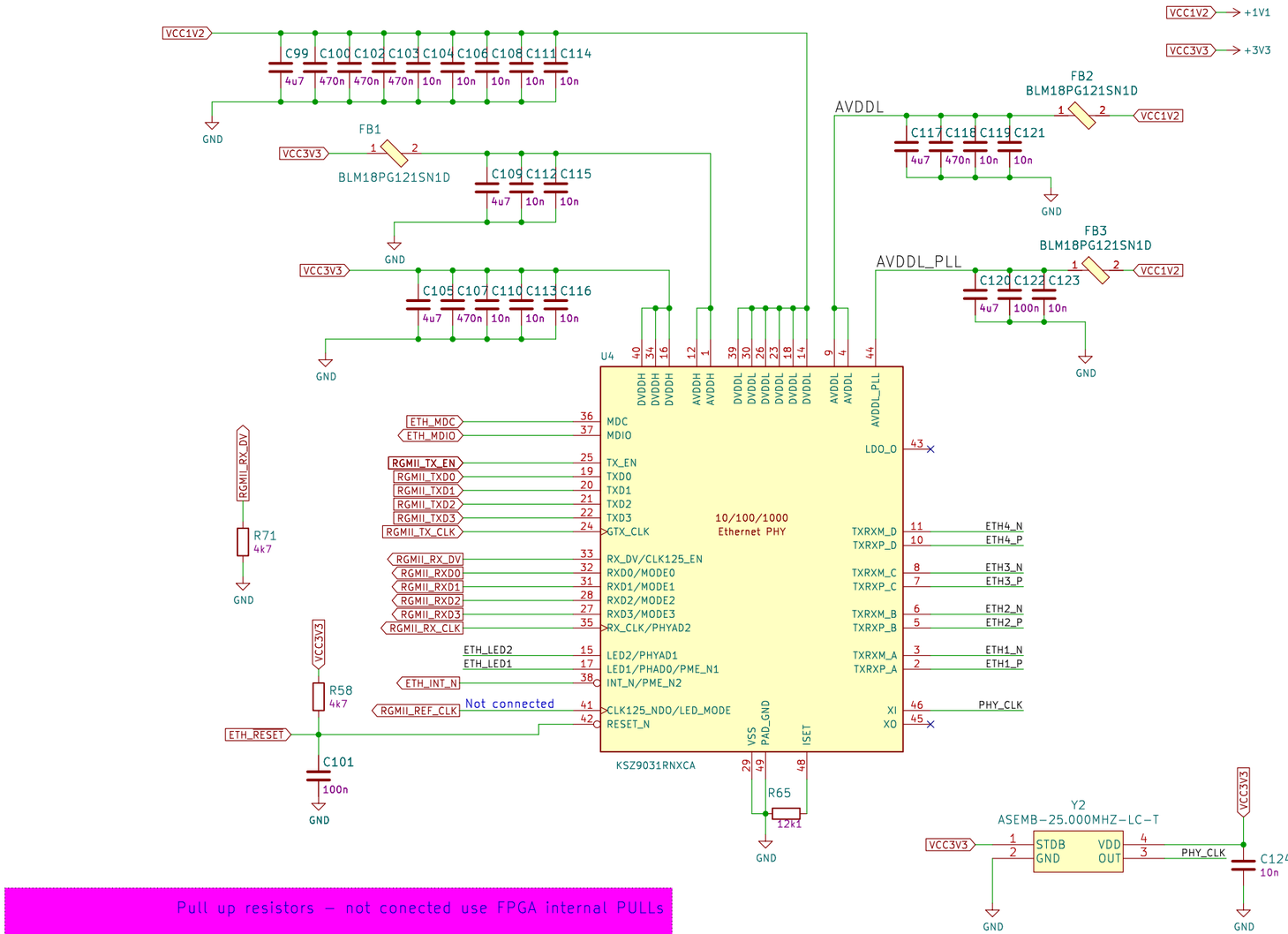

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Reference - ecp5-dc-scm

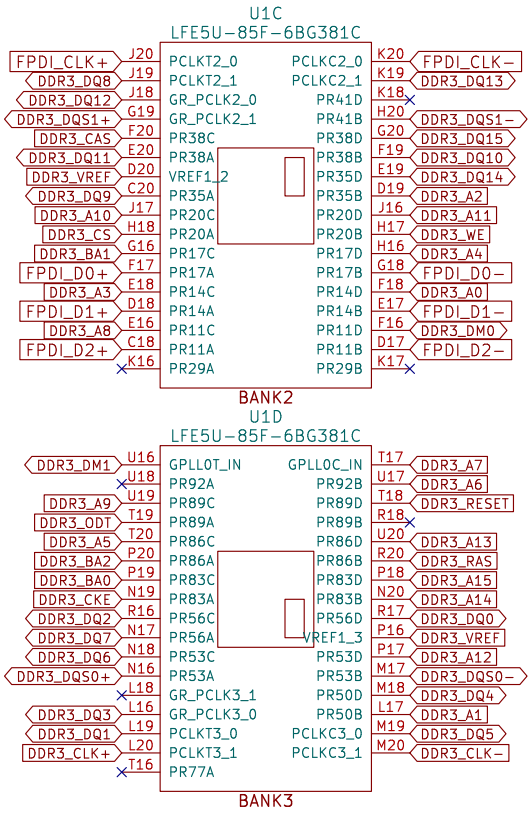
Intergalaktik d.o.o.

Sheet: /ethernet/

File: ethernet.kicad_sch

Title: ULX4M-LD

Size: A3	Date: 2025-03-12	**Rev: v003**
KiCad E.D.A. 8.0.8		Id: 7/12



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SDRAM memory
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Sheet: /ram/
File: ram.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
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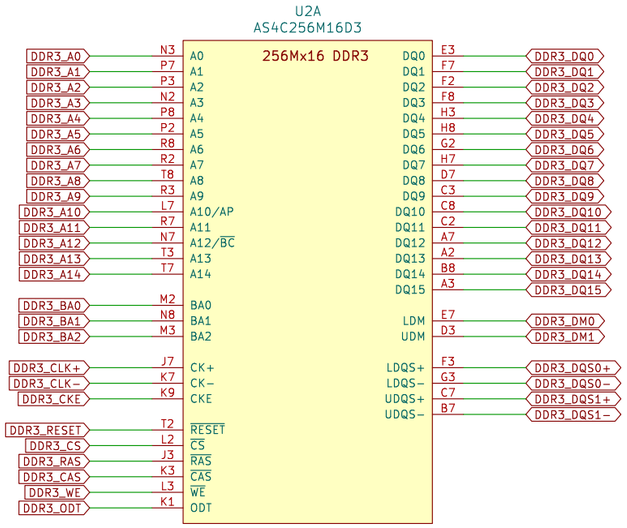
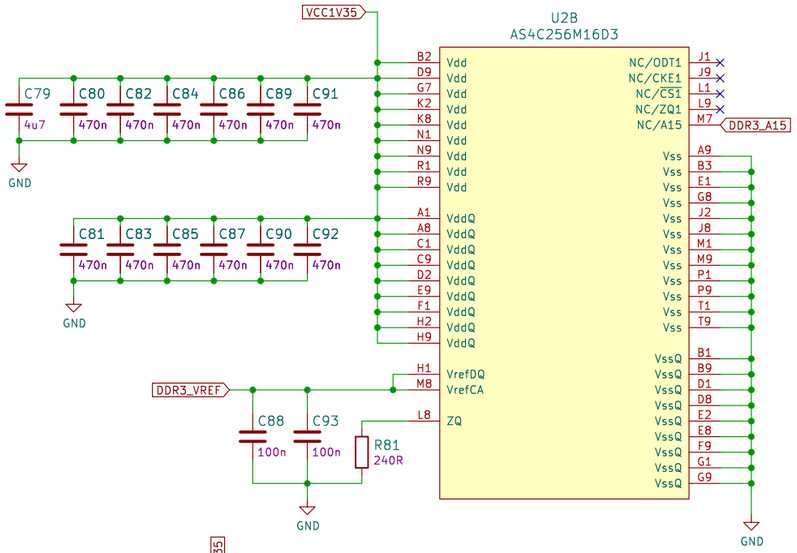
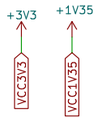
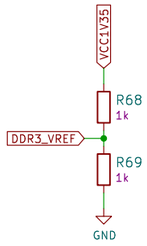
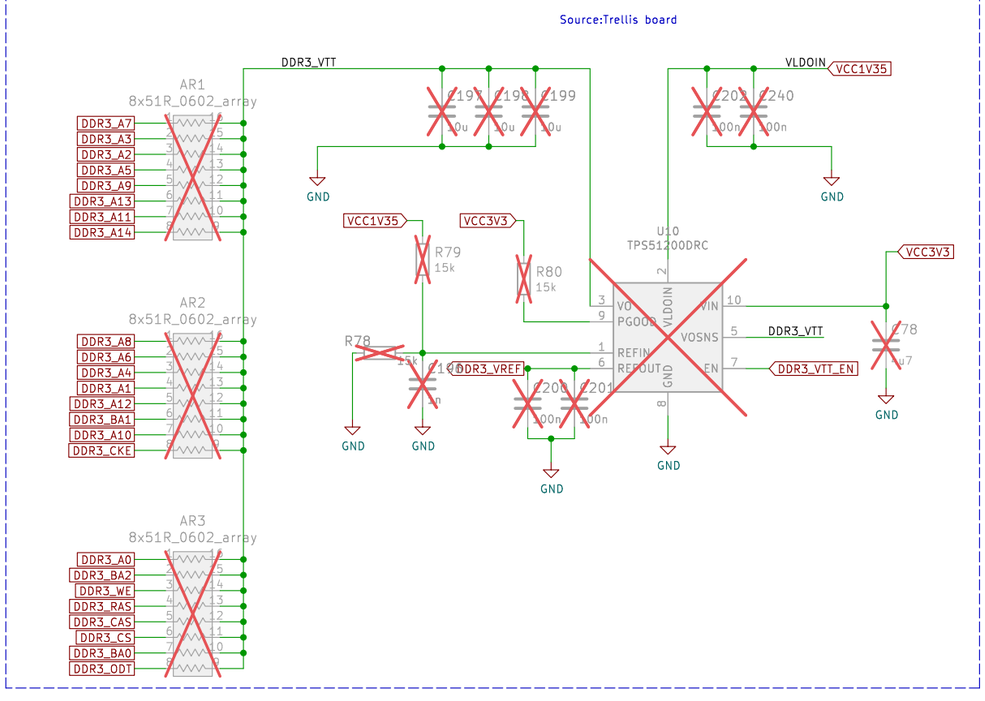


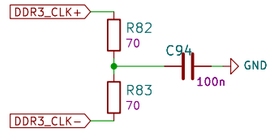






Not used on v001 – footprints are removed





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Reference – ecp5-dc-scm
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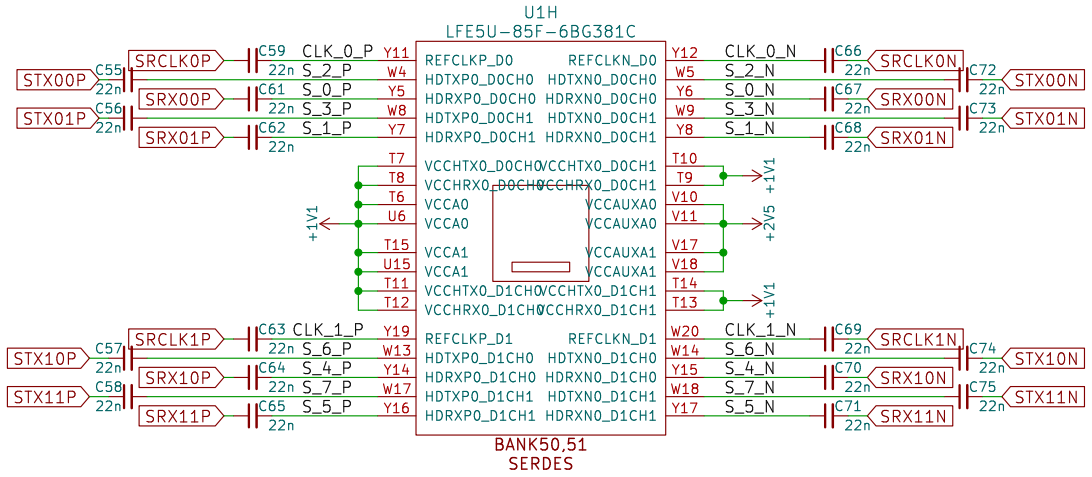
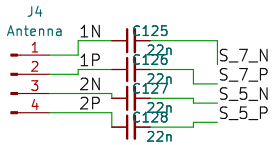
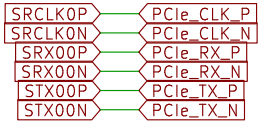
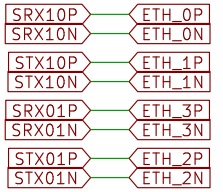
Sheet: /DDR3/
File: ddr3.kicad_sch
Title: ULX4M-LD
Size: A3 | Date: 2025-03-12 | **Rev: v003**
KiCad E.D.A. 8.0.8 | Id: 9/12









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serdes
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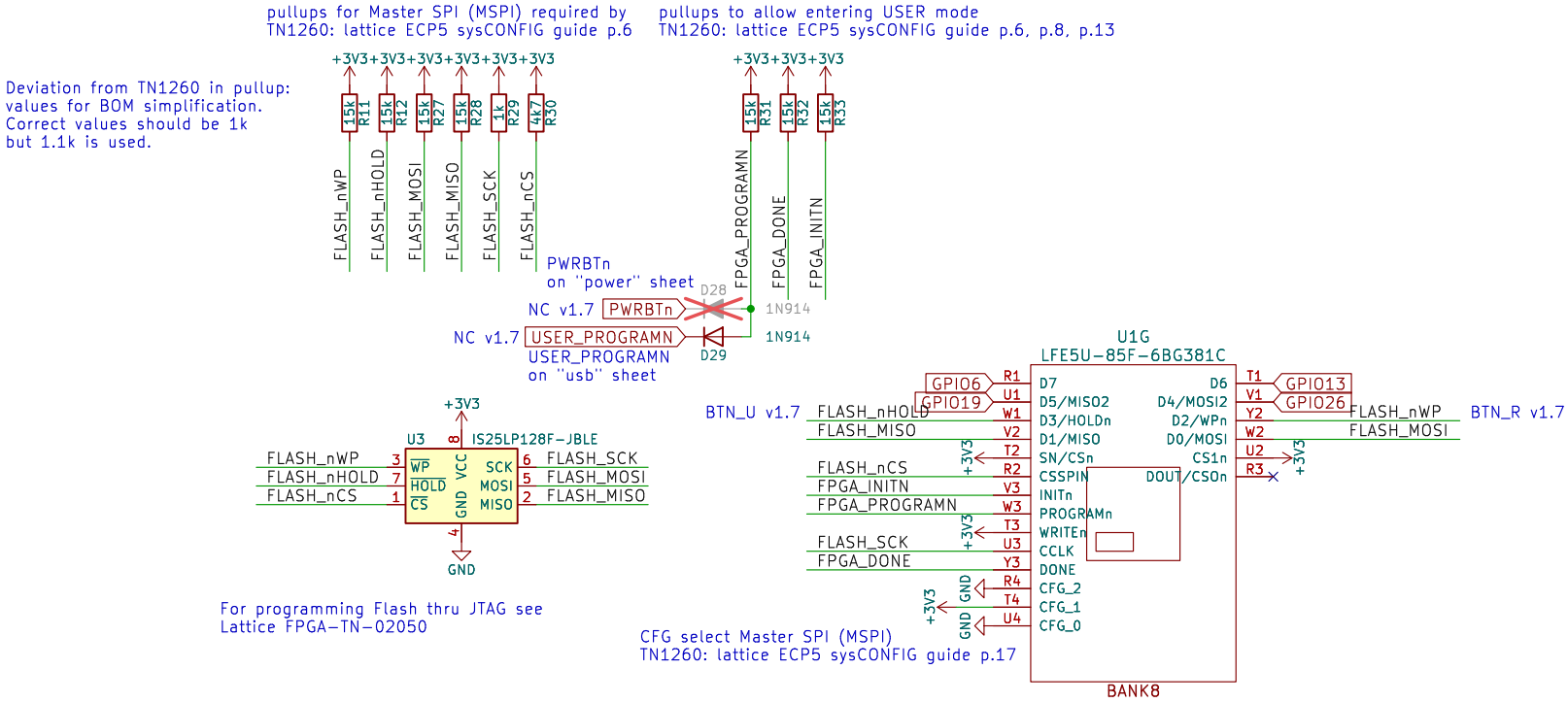
Sheet: /serdes/
File: serdes.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
KiCad E.D.A. 8.0.8		Id: 10/12



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SPI flash
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Sheet: /flash/
File: flash.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
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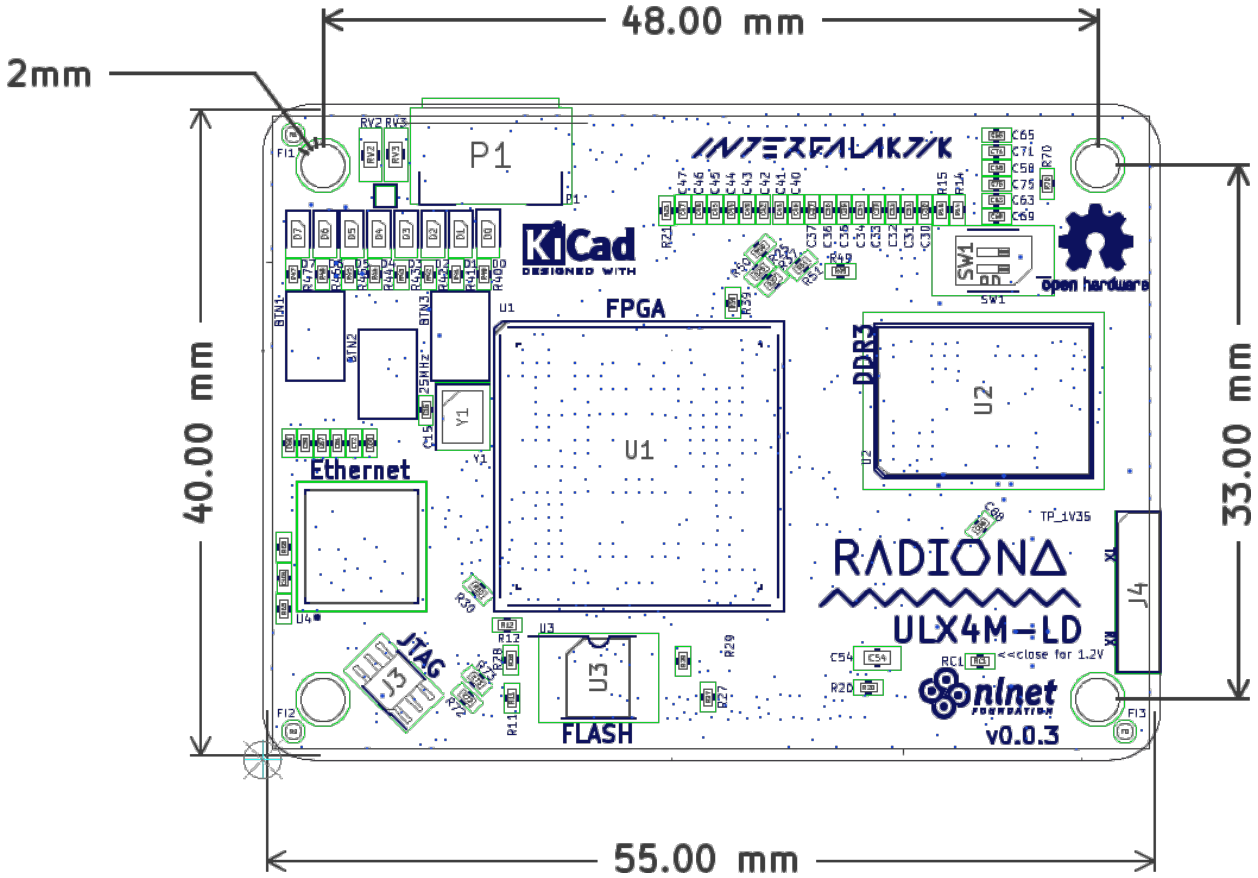

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Sheet: /drawings/
File: drawings.kicad_sch

Title: ULX4M-LD

Size: A4	Date: 2025-03-12	**Rev: v003**
KiCad E.D.A. 8.0.8		Id: 12/12