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IPE-380-06

Luis Ardila

Institute for Data Processing and Electronics (IPE)



Karlsruher Institut für Technologie

Sheet: /

File: atca-simple-loopback-hub.kicad\_sch

**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26

KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0

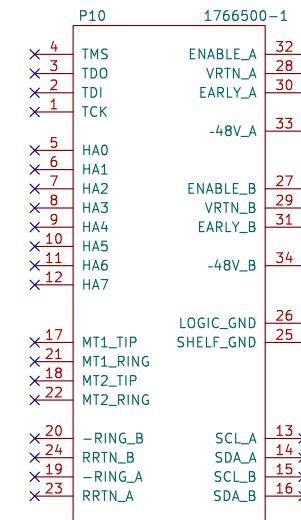
Id: 1/14

1 2 3 4 5 6

A

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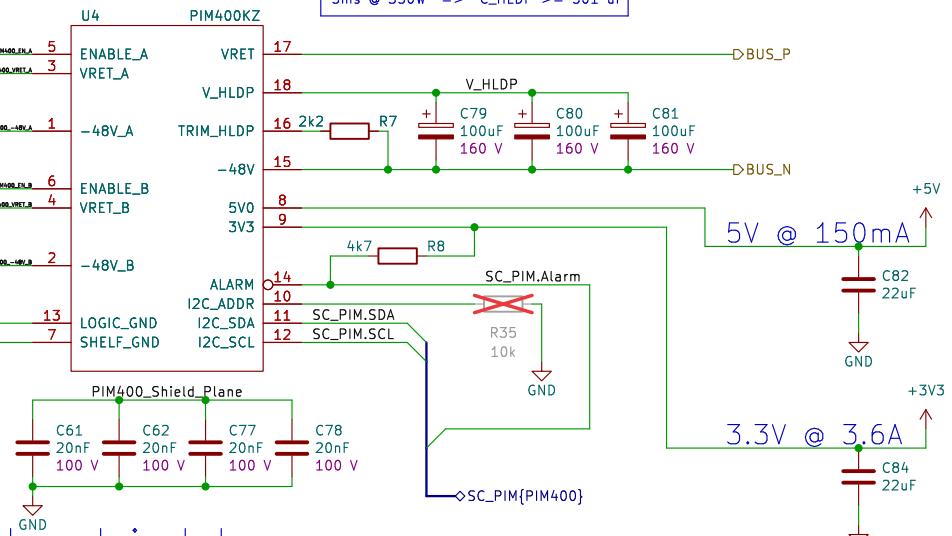
## Zone 1 Connector (P10)



CHANGE HOLDUP (

## -48V Power

$V_{HLDI} = 91 \text{ V} \Rightarrow R_{TRIM} = 2.2 \text{ k}$   
 $5\text{ms} @ 400\text{W} \Rightarrow C_{HLDI} \geq 572 \mu\text{F}$   
 $5\text{ms} @ 350\text{W} \Rightarrow C_{HLDI} \geq 501 \mu\text{F}$



check shield specs

I2C Address = 8'b0101\_111X, 8'h5E, 7'h2F

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Sheet: /ATCA\_Z1/  
 File: ATCA\_Z1.kicad\_sch

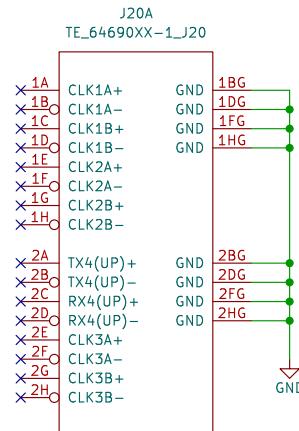
**Title: ATCA Simple Loopback HUB**

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 KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

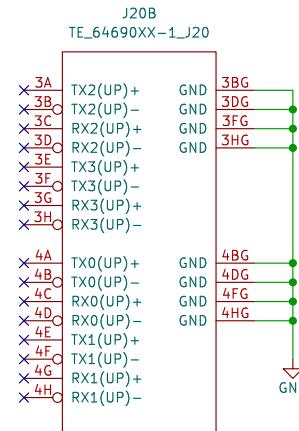
Rev: 1.0  
 Id: 2/14

1 2 3 4 5 6

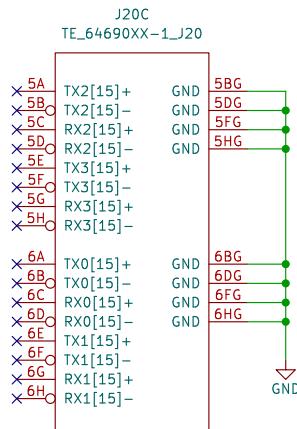
## CLOCK INTERFACE



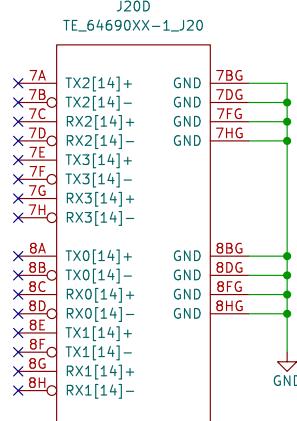
## UPDATE INTERFACE



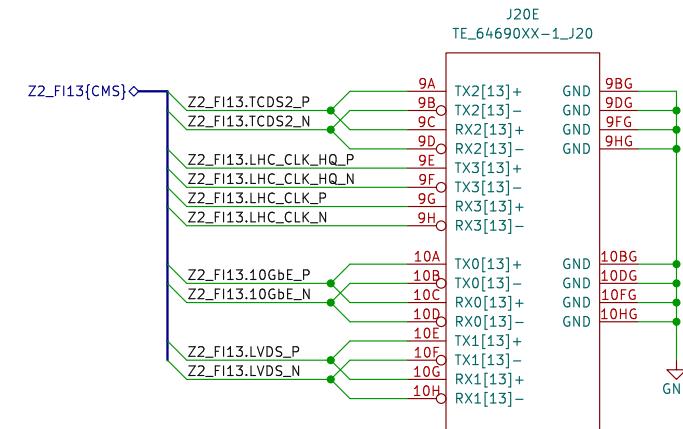
## FABRIC INTERFACE 15



## FABRIC INTERFACE 14



## FABRIC INTERFACE 13



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Sheet: /J20/

File: ATCA\_Z2\_J20.kicad\_sch

**Title: ATCA Simple Loopback HUB**

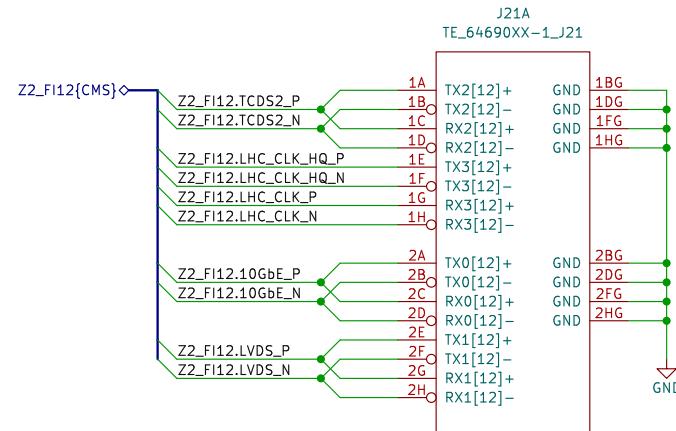
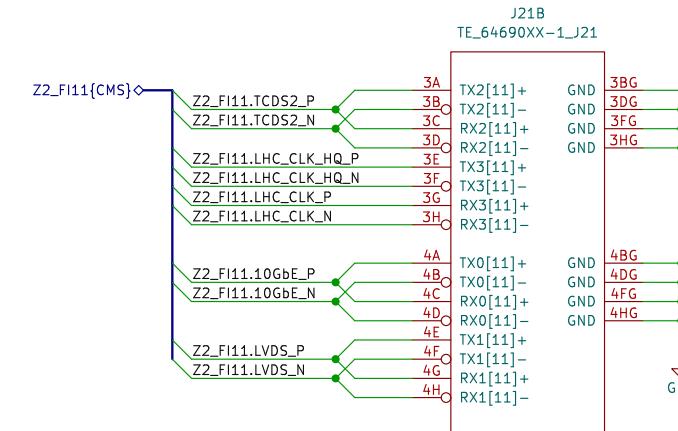
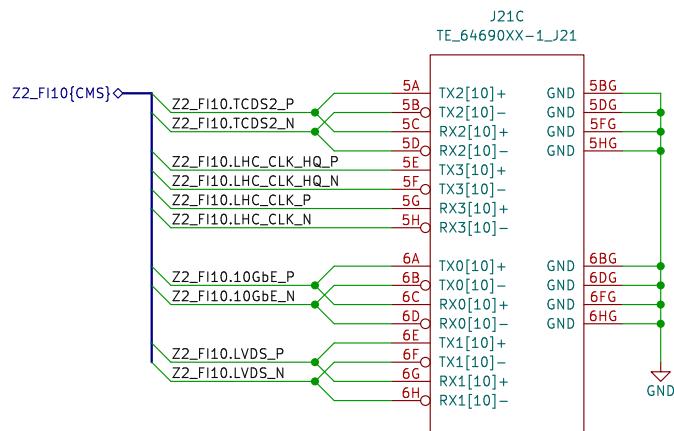
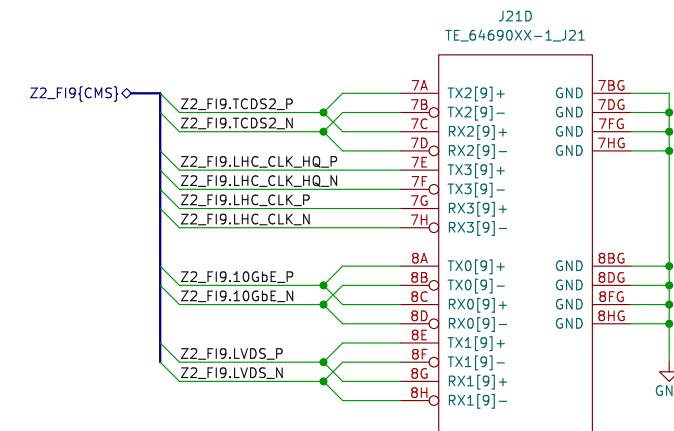
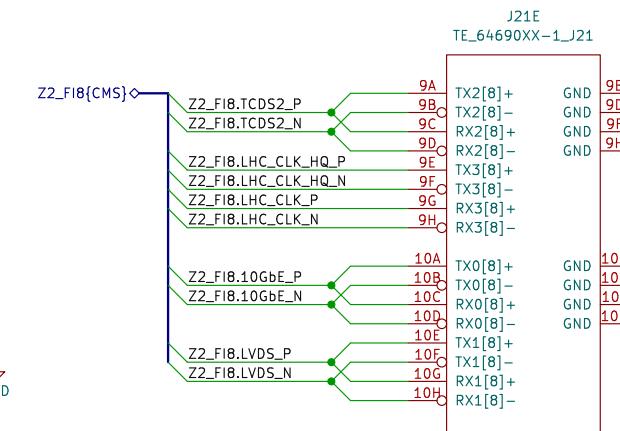
Size: A4 Date: 2023-09-26

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1 2 3 4 5 6

**FABRIC INTERFACE 12****FABRIC INTERFACE 11****FABRIC INTERFACE 10****FABRIC INTERFACE 9****FABRIC INTERFACE 8**

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Sheet: /J21/

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**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26

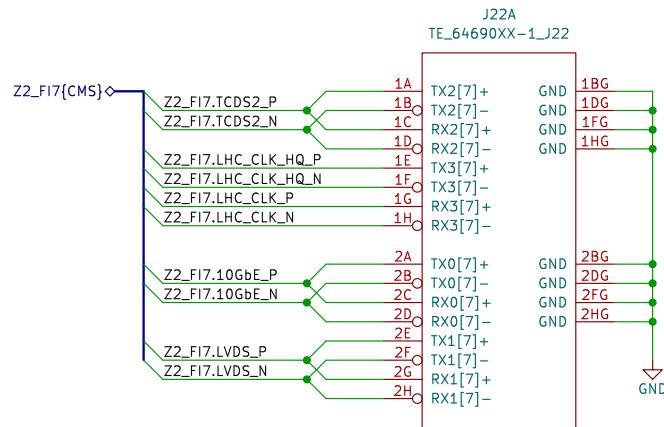
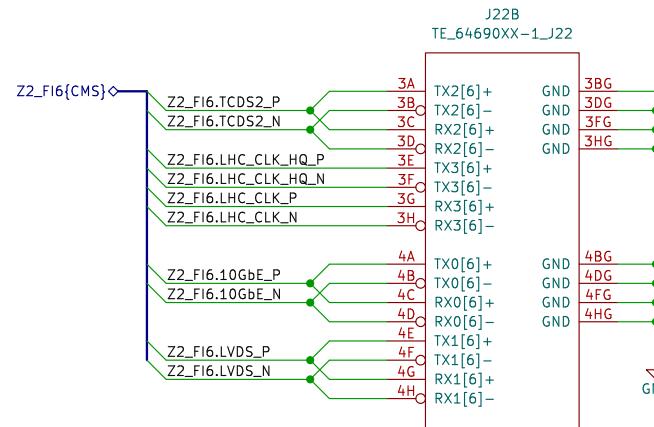
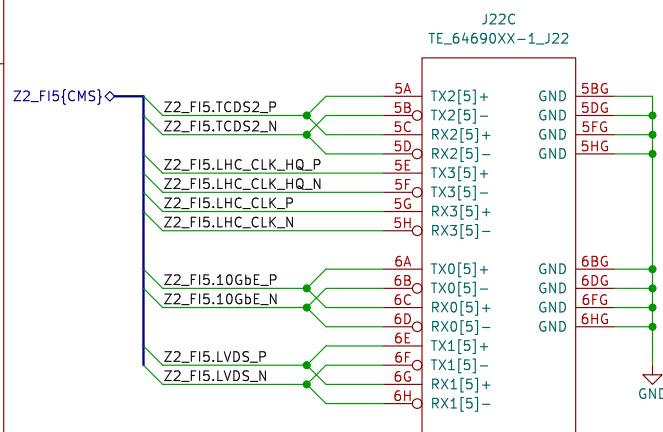
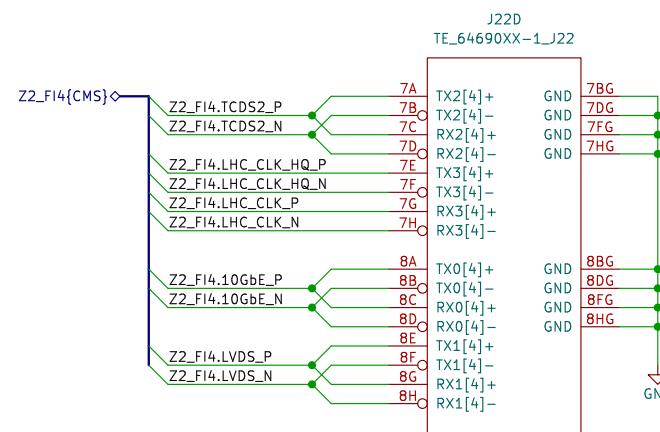
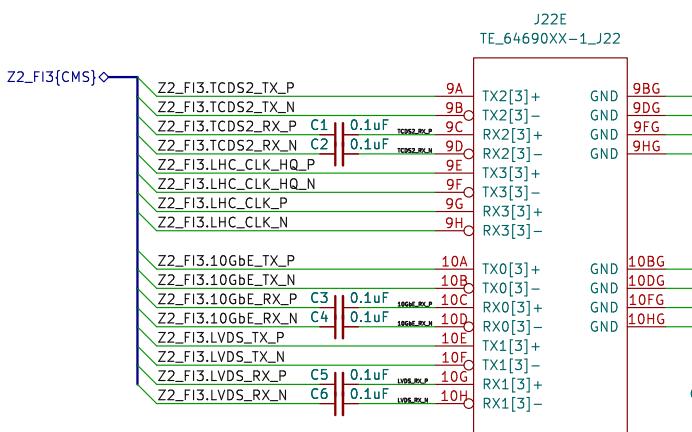
KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0

Id: 4/14

1 2 3 4 5 6

1 2 3 4 5 6

**FABRIC INTERFACE 7****FABRIC INTERFACE 6****FABRIC INTERFACE 5****FABRIC INTERFACE 4****FABRIC INTERFACE 3****NOTES:**

- 1) Fabric Interface (FI) 3 is the only one that is broken out to the front panel
- 2) FI3 has capacitors at the RX channel since the TX channel has capacitors at the receiving RX channel in the slot board

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Sheet: /J22/

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**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26

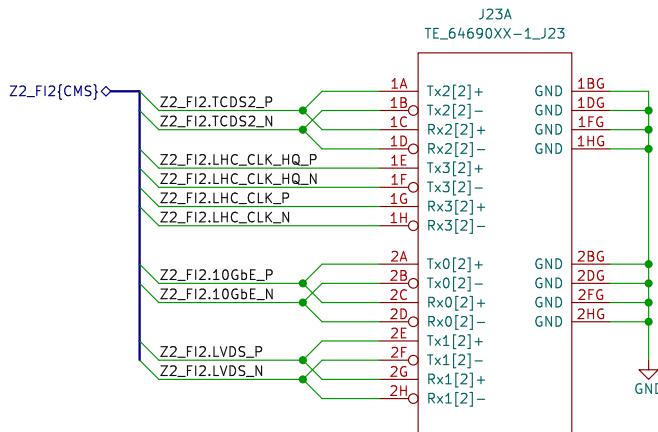
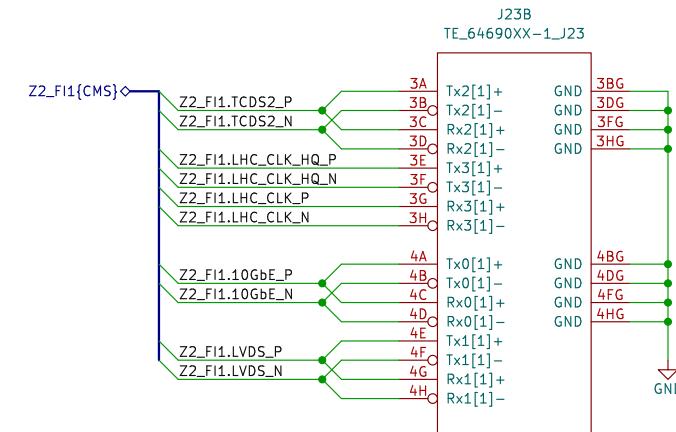
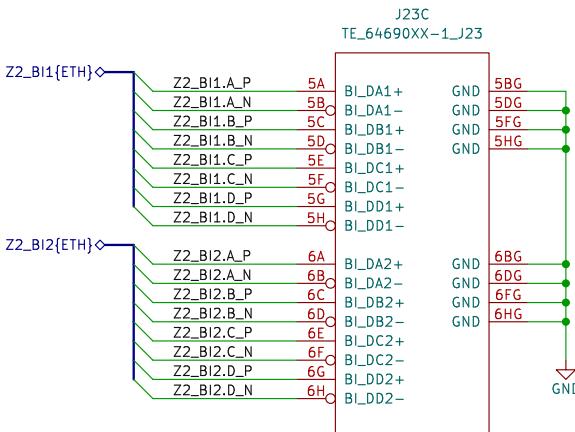
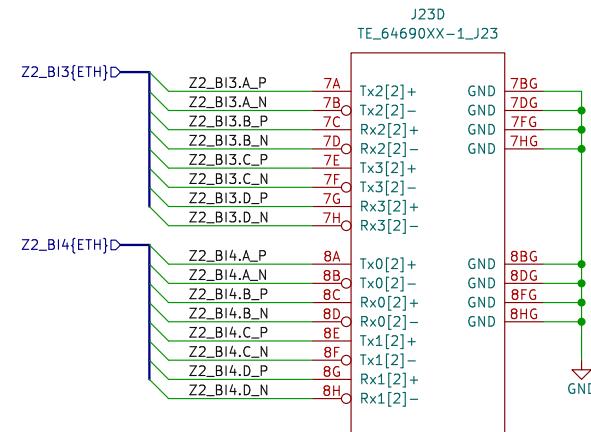
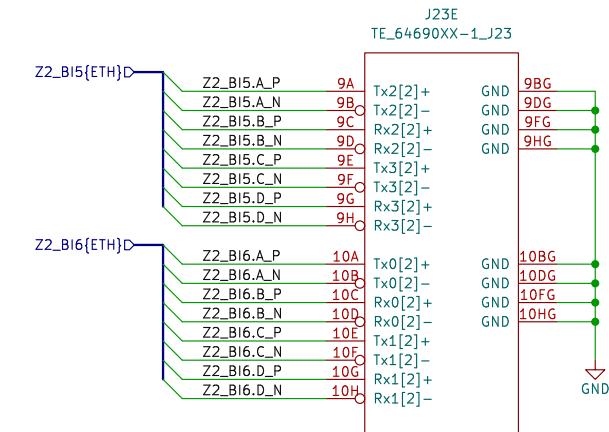
KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0

Id: 5/14

1 2 3 4 5 6

1 2 3 4 5 6

**FABRIC INTERFACE 2****FABRIC INTERFACE 1****BASE INTERFACE 1-2****BASE INTERFACE 3-4****BASE INTERFACE 5-6**

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Sheet: J23/

File: ATCA\_Z2\_J23.kicad\_sch

**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26

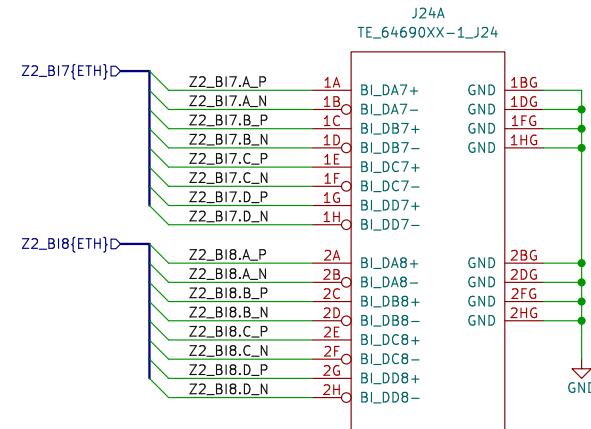
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Rev: 1.0

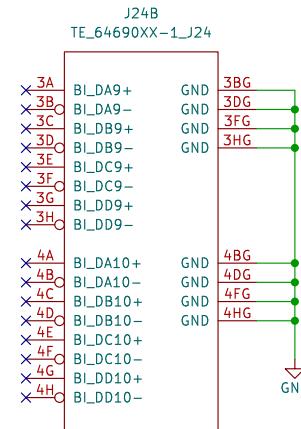
Id: 6/14

1 2 3 4 5 6

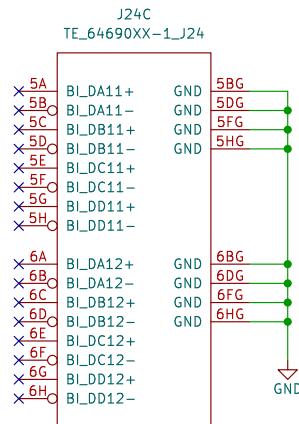
## BASE INTERFACE 7–8



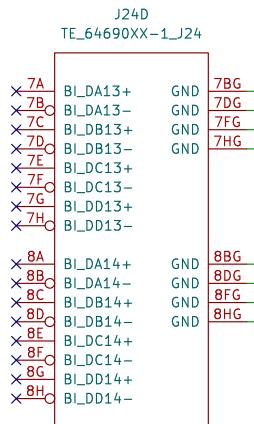
## BASE INTERFACE 9–10



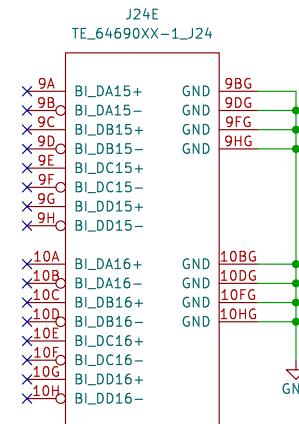
## BASE INTERFACE 11–12



## BASE INTERFACE 13–14



## BASE INTERFACE 15–16



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Sheet: /J24/

File: ATCA\_Z2\_J24.kicad\_sch

**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26

KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0

Id: 7/14

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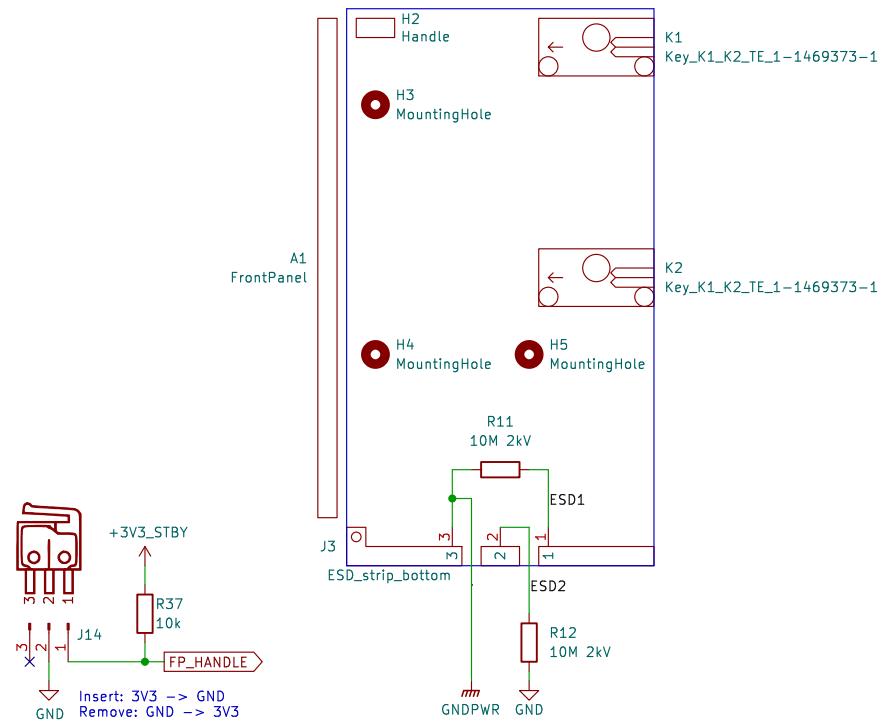
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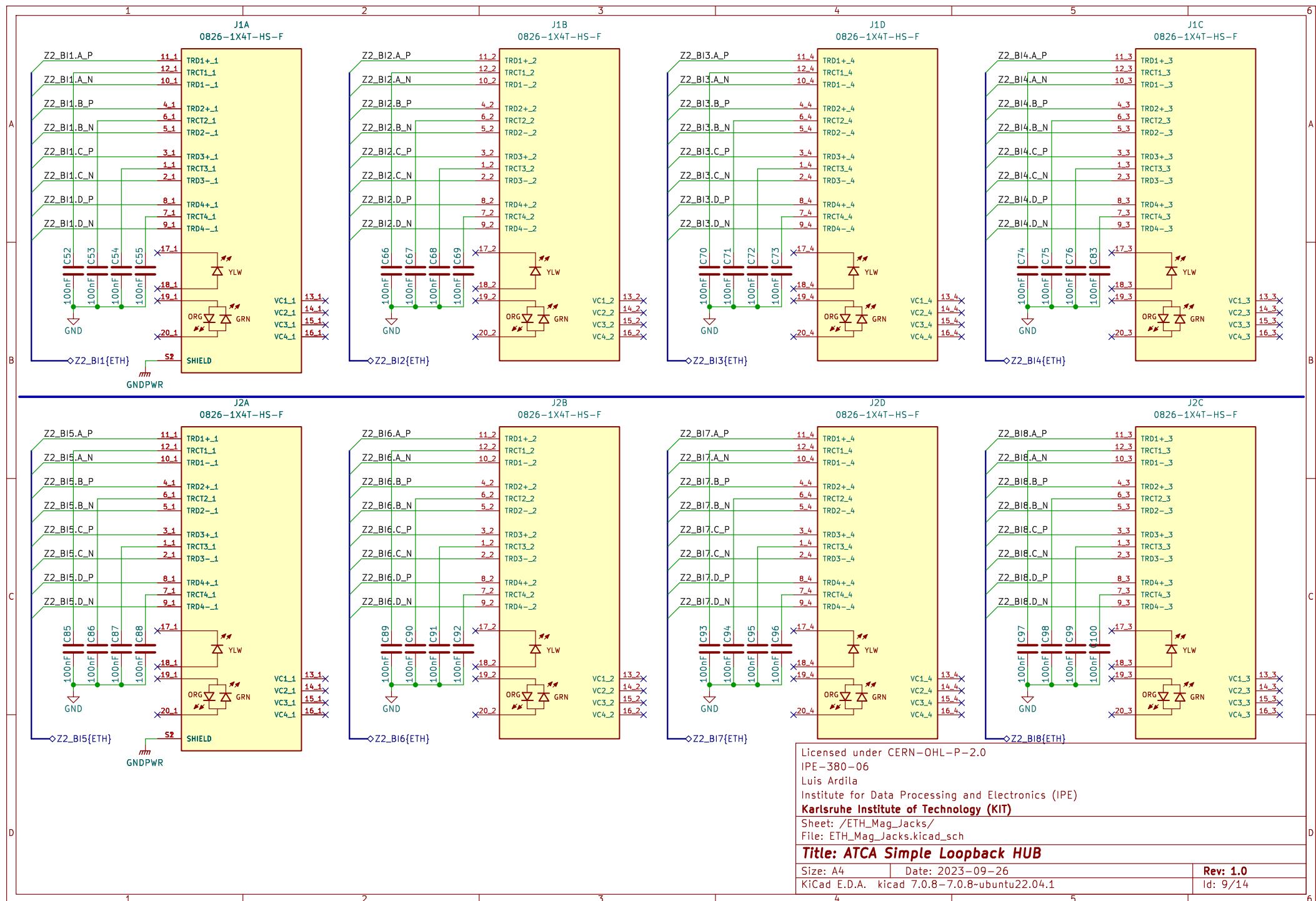
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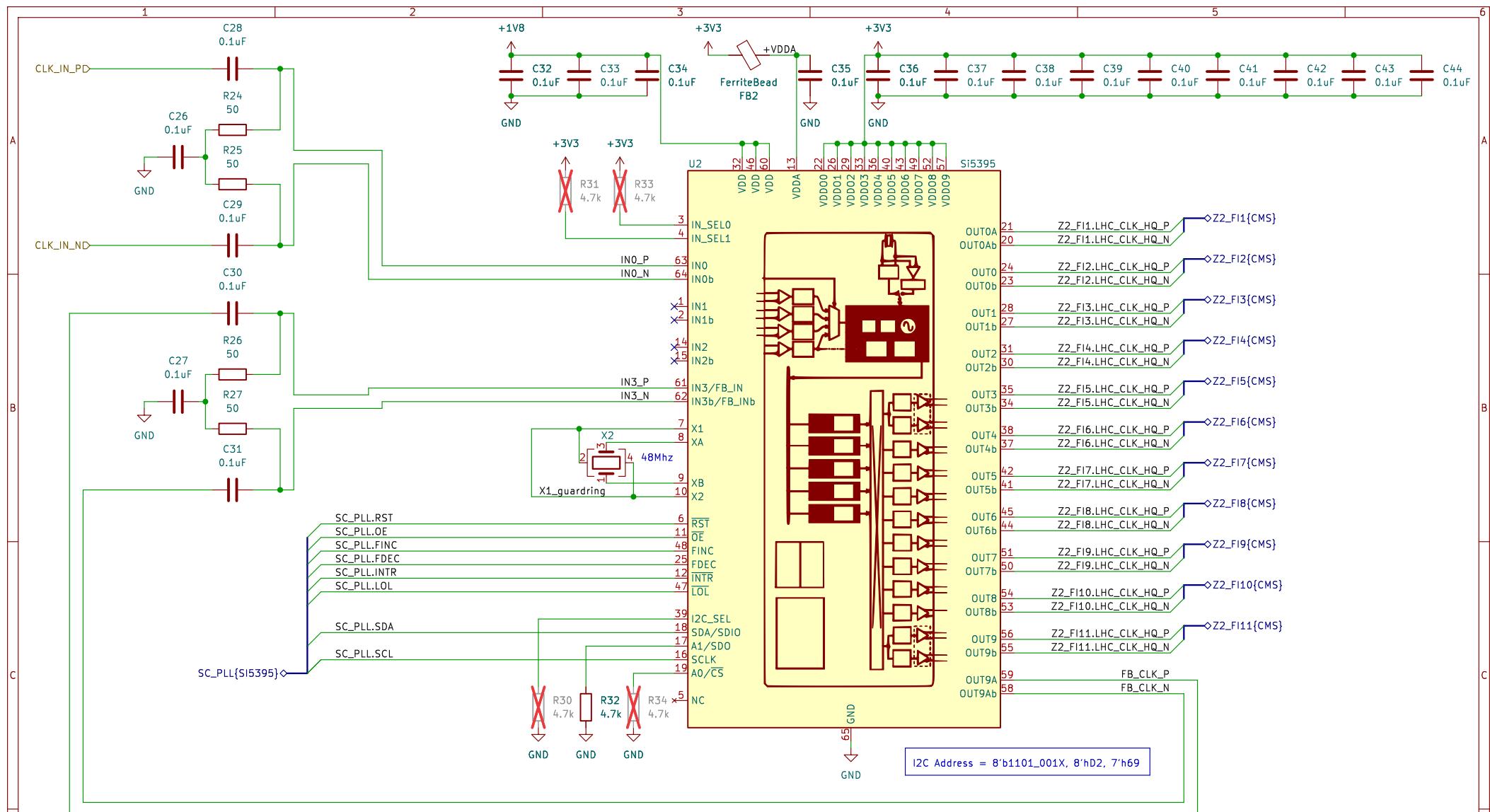
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### Title: ATCA Simple Loopback HUB

Size: A4 Date: 2023-09-26  
KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0  
Id: 8/14





NOTES:

- 1) IN\_SEL0 (1): Input Reference Select, pins are internally pulled low
- 2) RSTb (1): Device Reset. This pin is internally pulled-up and can be left unconnected when not in use
- 3) OEb (1): Output Enable. This pin disables all outputs when held high. This pin is internally pulled low and can be left unconnected when not in use.
- 4) FINC (1): Step-up the output frequency of a selected output. This pin is internally pulled low and can be left unconnected when not in use.
- 5) FDEC (1): Step-down the output frequency of a selected output. This pin is internally pulled low and can be left unconnected when not in use.
- 6) INTRb (0): Interrupt, asserted low when a change in device status has occurred. It should be left unconnected when not in use.
- 7) LOLb (0): Loss of Lock, indicates when the DSPLL is locked (high) or out-of-lock (low). It can be left unconnected when not in use.
- 8) I2C\_SEL (1): I2C (I2C\_SEL = 1) or SPI (I2C\_SEL = 0). This pin is internally pulled up by a ~20 kΩ resistor to the voltage selected by the IO\_VDD\_SEL reg
- 9) A1 (1): In I2C mode, this pin is open-drain and functions as the A1 address input pin. It does not have an internal pull-up or pull-down resistor.
- 10) A0 (1): hardware controlled address A0 in I2C mode. This pin is internally pulled-up by a ~20 kΩ resistor and can be left unconnected when not in use.
- 11) Power: 1V8 @ 260mA & 3V3 @ 130 \* 30 \* 12 = 490mA

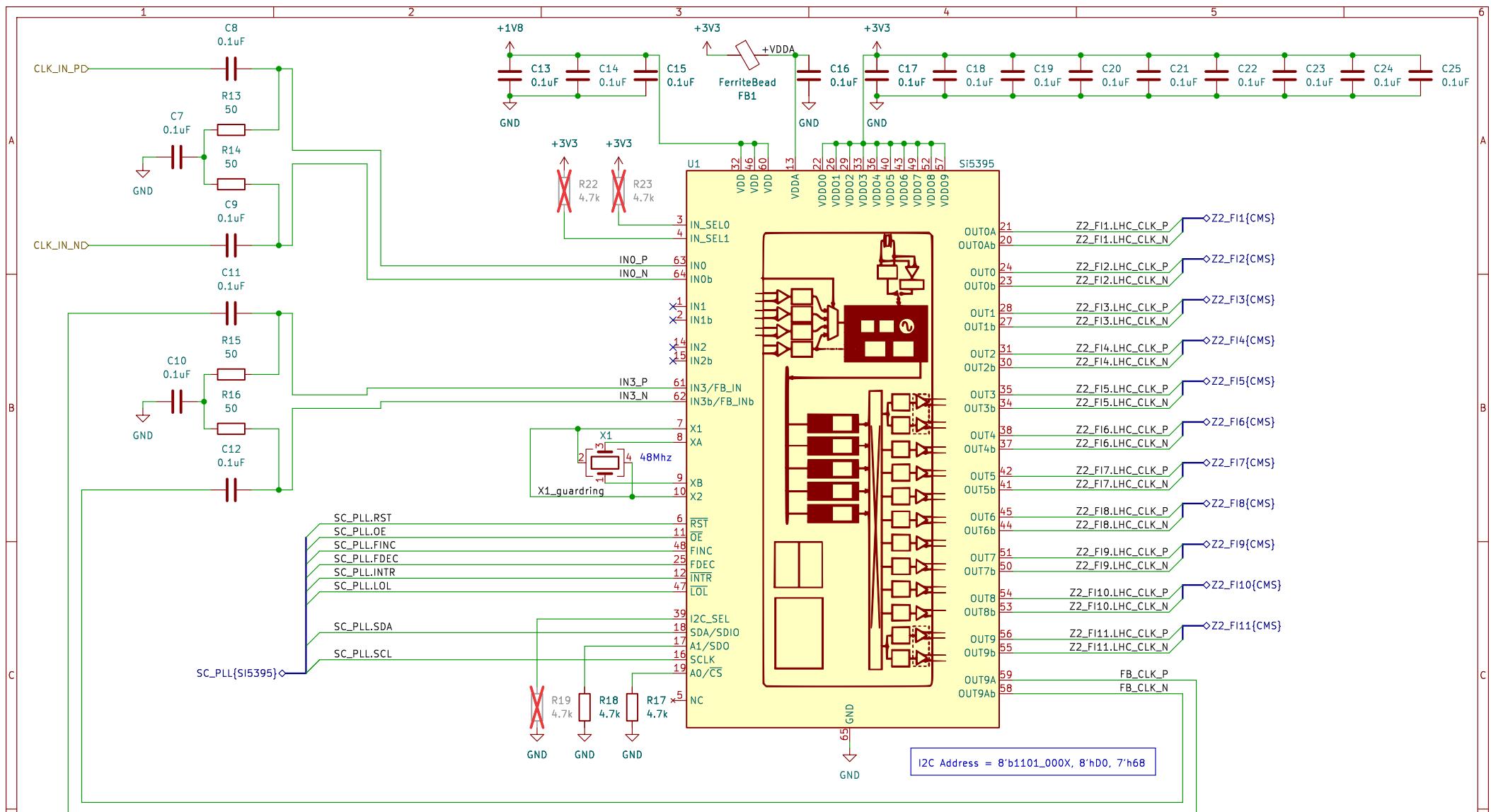
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Sheet: /LHC\_CLK\_HQ/  
 File: LHC\_CLK\_HQ.kicad\_sch

**Title: ATCA Simple Loopback HUB**

Size: A4 Date: 2023-09-26  
 KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.0  
 Id: 10/14



NOTES:

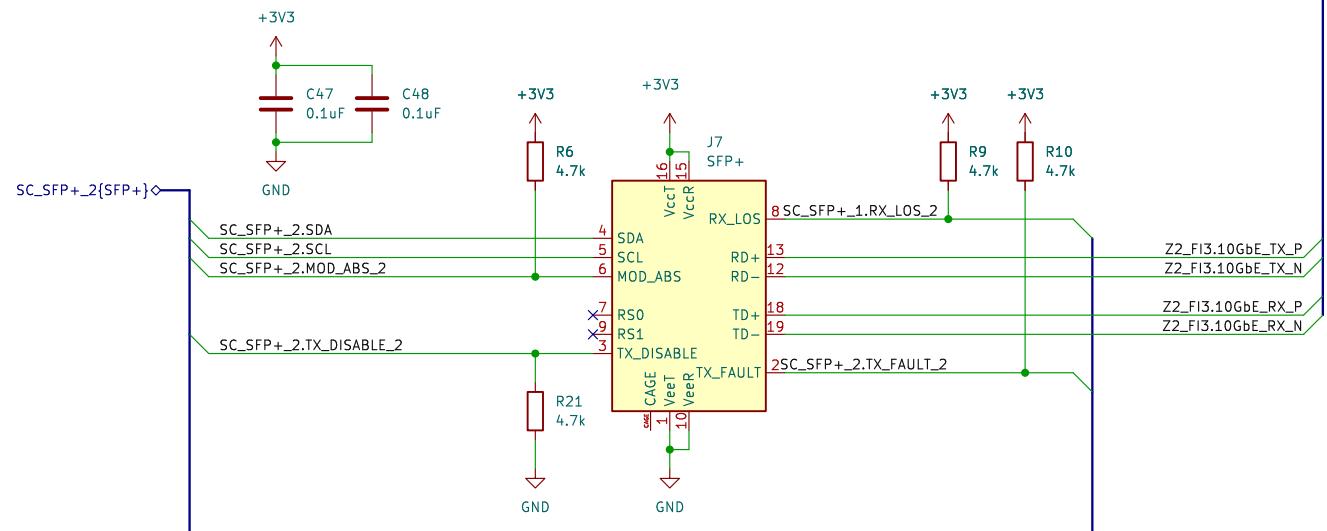
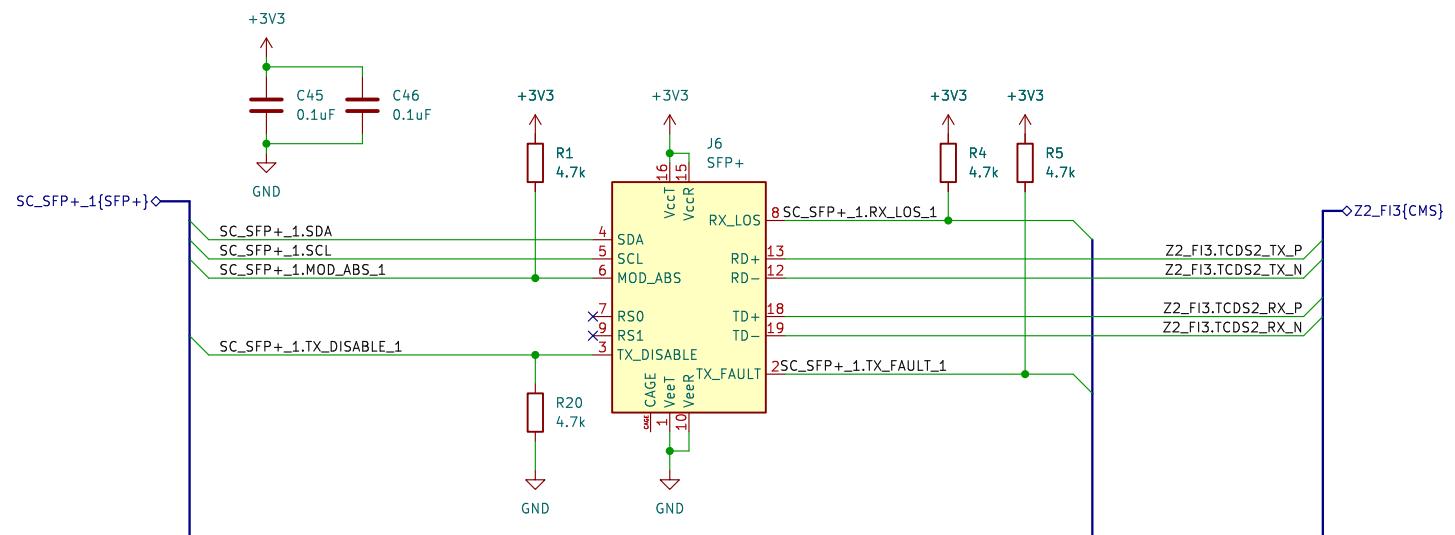
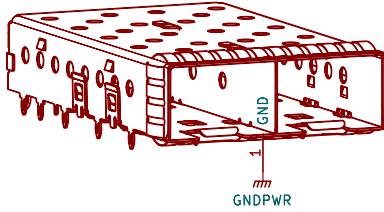
- 1) IN\_SEL (l): Input Reference Select, pins are internally pulled low
- 2) RSTb (l): Device Reset. This pin is internally pulled-up and can be left unconnected when not in use
- 3) OEb (l): Output Enable. This pin disables all outputs when held high. This pin is internally pulled low and can be left unconnected when not in use.
- 4) FINC (l): Step-up the output frequency of a selected output. This pin is internally pulled low and can be left unconnected when not in use.
- 5) FDEC (l): Step-down the output frequency of a selected output. This pin is internally pulled low and can be left unconnected when not in use.
- 6) INTRb (0): Interrupt, asserted low when a change in device status has occurred. It should be left unconnected when not in use.
- 7) LOLb (0): Loss of Lock, indicates when the DSPLL is locked (high) or out-of-lock (low). It can be left unconnected when not in use.
- 8) I2C\_SEL (l): I2C (I2C\_SEL = 1) or SPI (I2C\_SEL = 0). This pin is internally pulled up by a ~20 kΩ resistor to the voltage selected by the IO\_VDD\_SEL reg
- 9) A1 (l): In I2C mode, this pin is open-drain and functions as the A1 address input pin. It does not have an internal pull-up or pull-down resistor.
- 10) A0 (l): hardware controlled address A0 in I2C mode. This pin is internally pulled-up by a ~20 kΩ resistor and can be left unconnected when not in use.
- 11) Power: 1V8 @ 260mA & 3V3 @ 130 + 30 \* 12 = 490mA

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 Sheet: /LHC\_CLK/  
 File: LHC\_CLK.kicad\_sch

### Title: ATCA Simple Loopback HUB

Size: A4 Date: 2023-09-26  
 KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

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#### NOTES:

- 1) TX\_Fault: TX\_Fault is a module output pin that when High, indicates that the module transmitter has detected a fault condition related to laser operation or safety. The TX\_Fault output pin is an open drain/collector and must be pulled up to the Host\_Vcc with 4.7k-10k ohms on the host board.
- 2) TX\_Disable: TX\_Disable is a module input pin. When TX\_Disable is asserted High or Left open, the SFP+ module transmitter output must be turned off. The TX\_DIS pin must be pulled up to VeeT in the SFP+ module.
- 3) RS0/RS1: RS0 and RS1 are module input rate select pins and are pulled low to VeeT with a >30kΩ resistor in the module. RS0 is an input hardware pin which optionally selects the optical receive data path rate coverage for an SFP+ module. RS1 is an input hardware pin which optionally selects the optical transmit path data rate coverage for an SFP+ module.
- 4) MOD\_ABS: Mod\_ABS is pulled up to Host\_Vcc with 4.7kΩ-10kΩ on the host board and connected to VeeT or VeeR in the SFP+ module. MOD\_ABS is then asserted "High" when the SFP+ module is physically absent from a host slot. In the SFP MSA (INF8074) this pin had the same function but is called MOD\_DEF0.
- 5) SCL/SDA: SCL is the 2-wire interface clock and SDA is the 2-wire interface data line. SCL and SDA are pulled up to a voltage in the range of 3.14V to 3.46V on the host.
- 6) RX\_LOS: RX\_LOS when High indicated an optical signal level below that specified in the relevant standard. The RX\_LOS pin is an open drain/collector output and must be pulled up to host Vcc with a 4.7kΩ-10kΩ on the host board. RX\_LOS assert min and de-assert max are defined in the relevant standard.
- 7) Power can be up to 2.5W each SFP+

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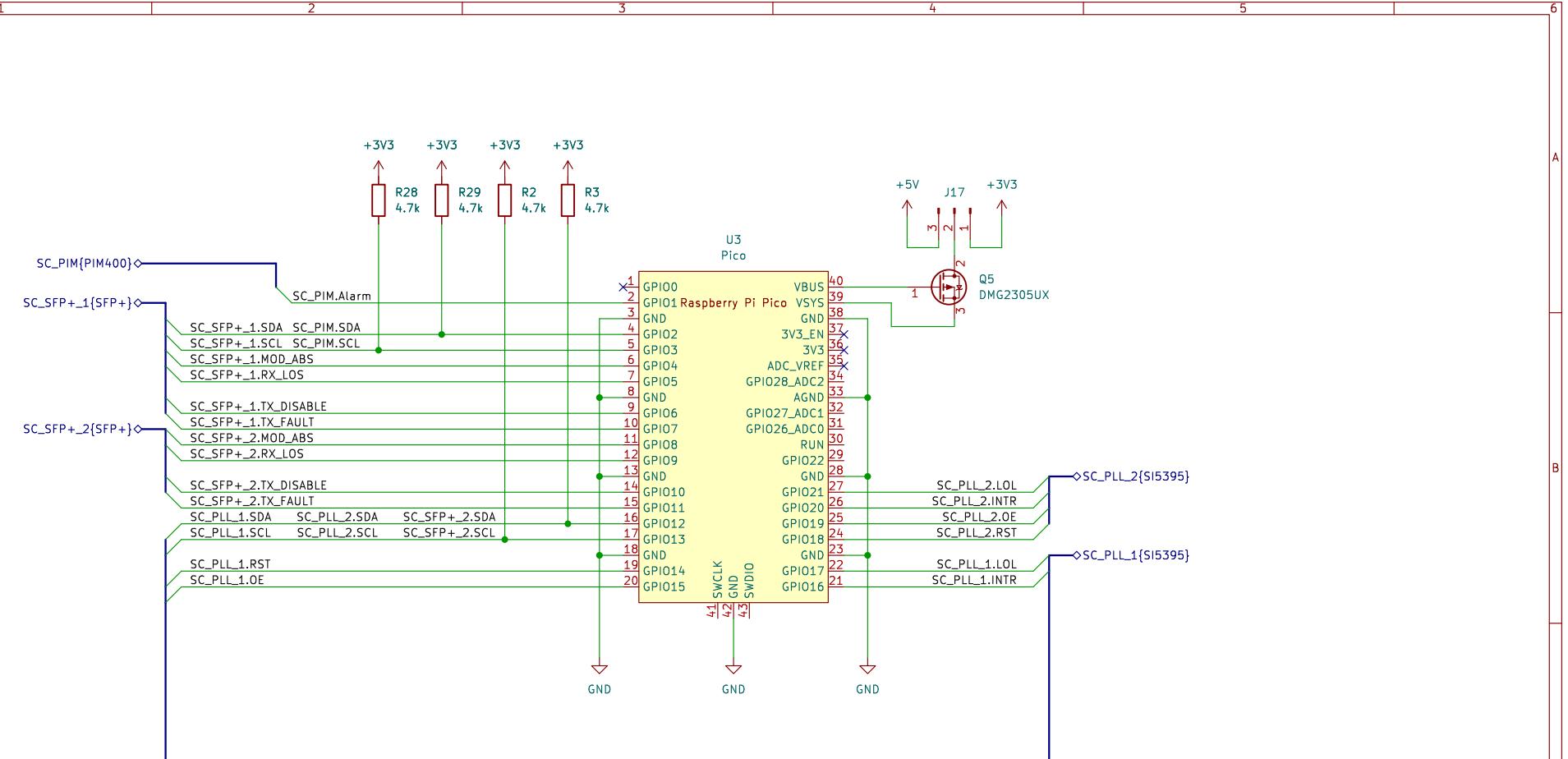
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## I2C BUS 0

SFP+_2 I2C Address =
SI5395_1 I2C Address = 8'b1101_000X, 8'hD0, 7'h68
SI5395_2 I2C Address = 8'b1101_001X, 8'hD2, 7'h69

## I2C BUS 1

SFP+_1 I2C Address =
PIM400 I2C Address = 8'b0101_111X, 8'h5E, 7'h2F

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Sheet: /rpi-pico/

File: rpi-pico.kicad\_sch

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**Rev: 1.0**

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A

A

B

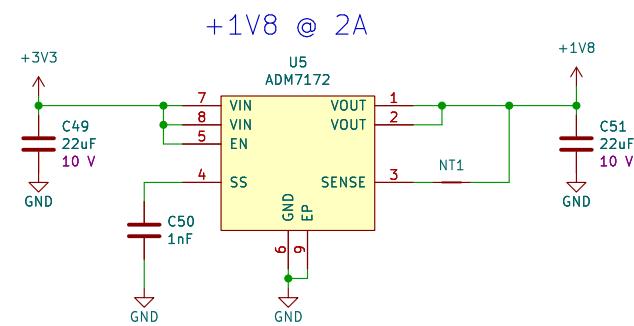
B

C

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D

D



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 Sheet: /PS\_1V8/  
 File: PS\_1V8.kicad\_sch  
**Title: ATCA Simple Loopback HUB**  
 Size: A4 Date: 2023-09-26  
 KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1 Rev: 1.0  
 Id: 14/14