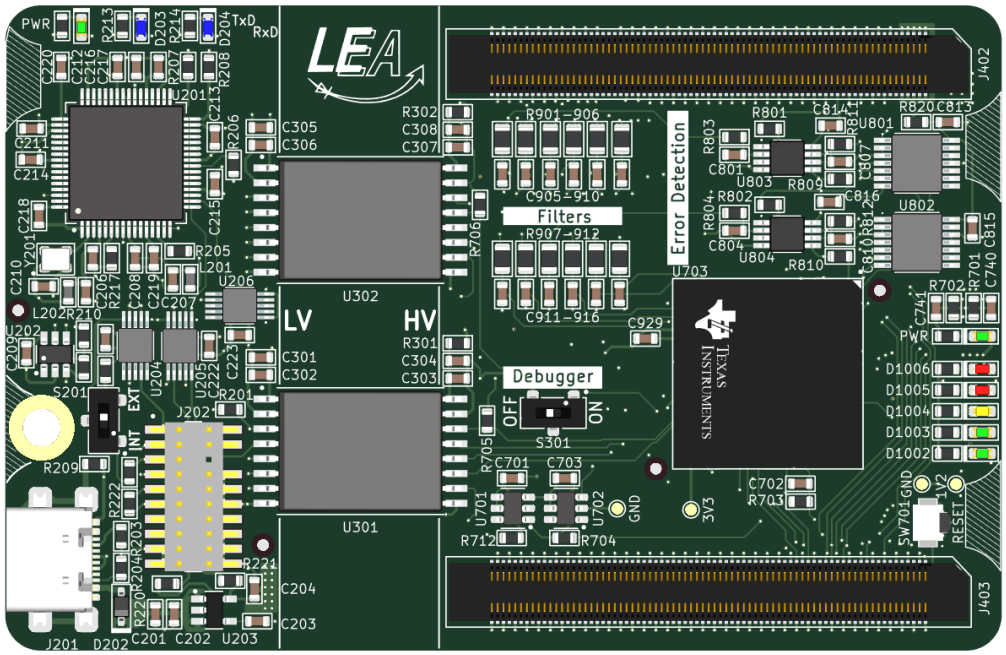


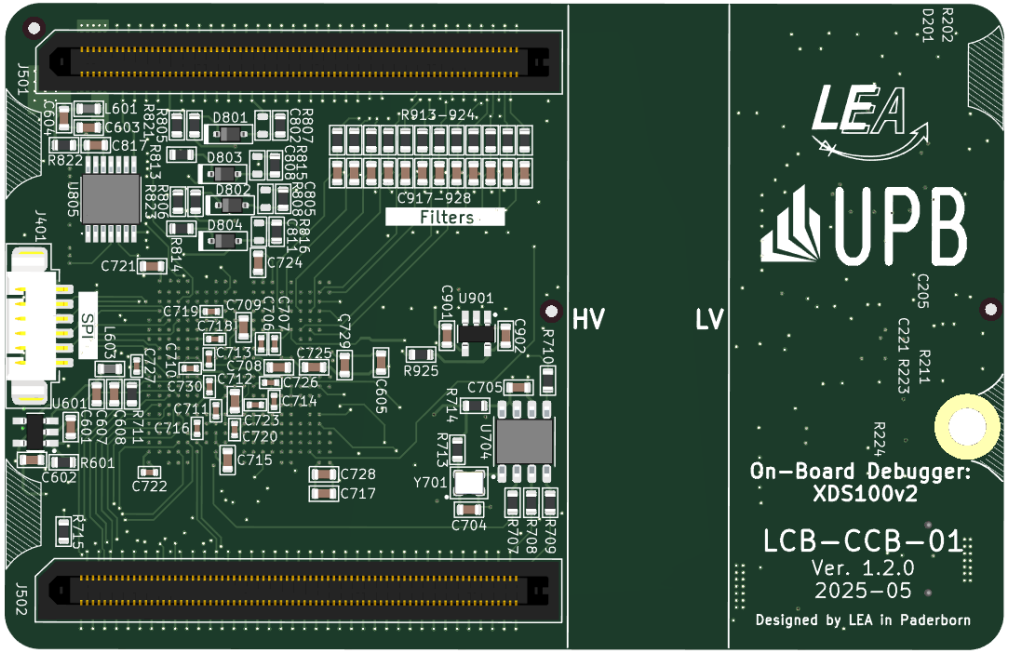


LEA Logo

LEA Logo

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

Fiducial medium

USB-C Cable

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https://github.com/upb-lea/LEA_control_board

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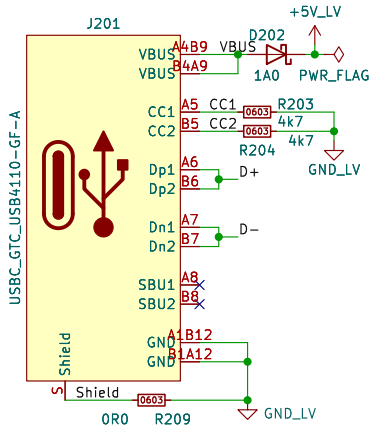
Sheet: /
File: LCB-CCB-01.kicad_sch

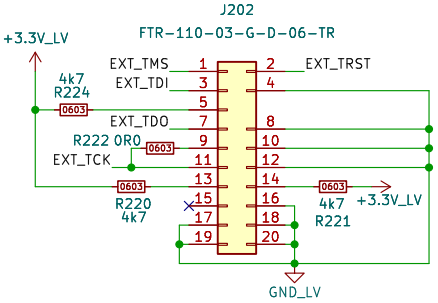
*Title: LCB-CCB-01: Control Board – Debugger XDS100 / JTAG*

| Size: A4 | Date: 2025-05-27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 1/11 |

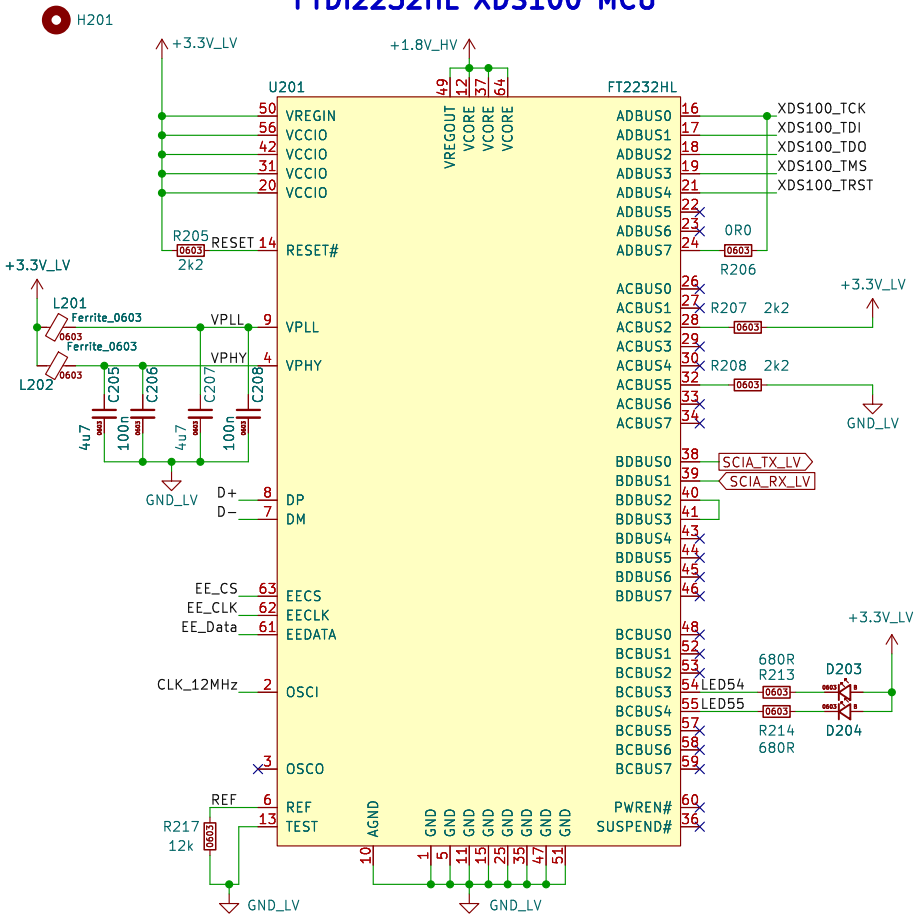
## XDS100 USB-C Port



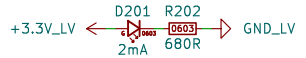

## External Debugger



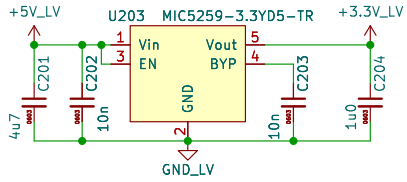

## FTDI2232HL XDS100 MCU



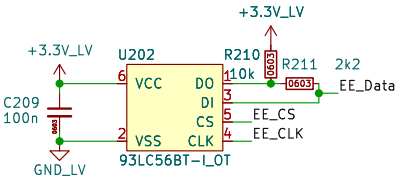

## Power Status LED



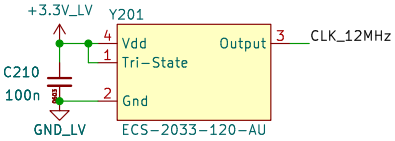

## LDO 3.3V



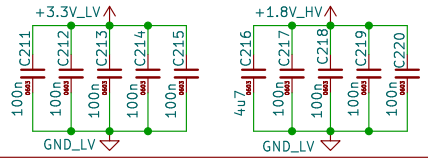

## EEPROM XDS100



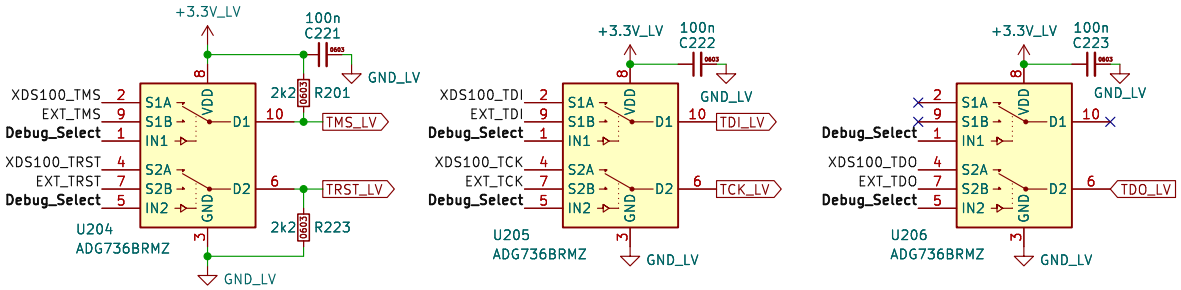

## 12 MHz Clock

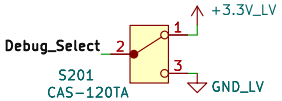



## Decoupling Capacitors MCU FT2232HL




## Debugger Selection



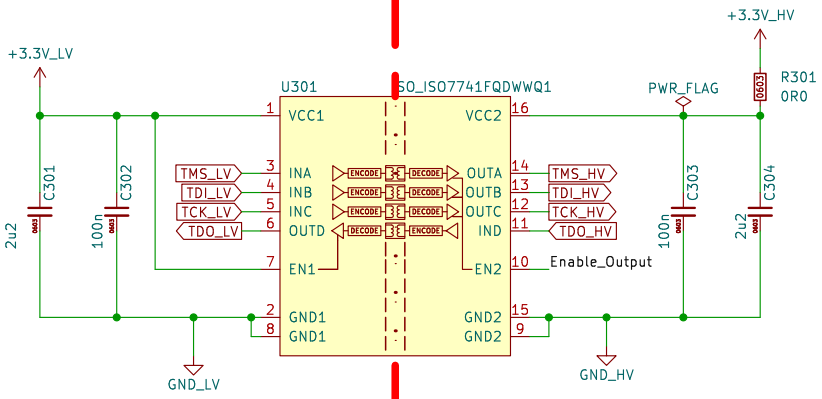

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

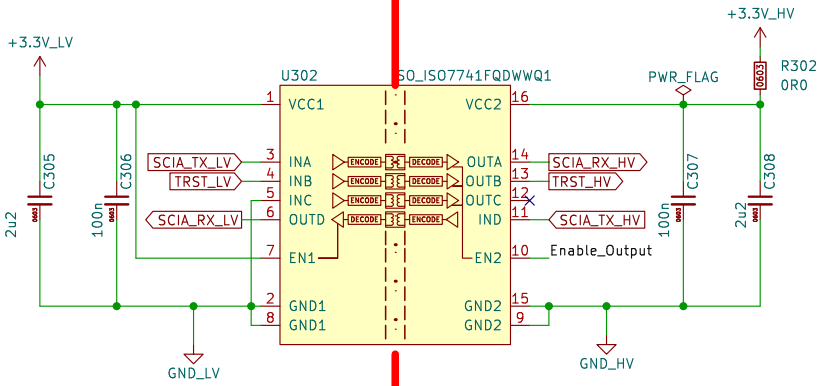
Sheet: /XDS100 - Page 2/
File: Debugger.kicad_sch

**Title: LCB-CCB-01: Control Board - Debugger XDS100 / JTAG**

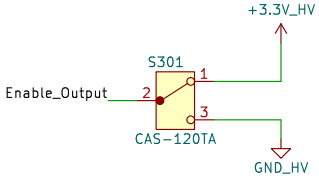
| Size: A4 | Date: 2025-05-27 | Rev: 1.2.0 |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 2/11 |

# JTAG and SCI Isolation




## Enable/Disable Debugger



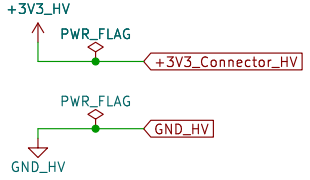

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Isolation - Page 3/
File: Isolation.kicad_sch

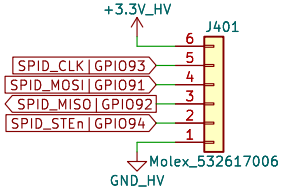
**Title: LCB-CCB-01: Control Board - Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025-05-27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 3/11 |

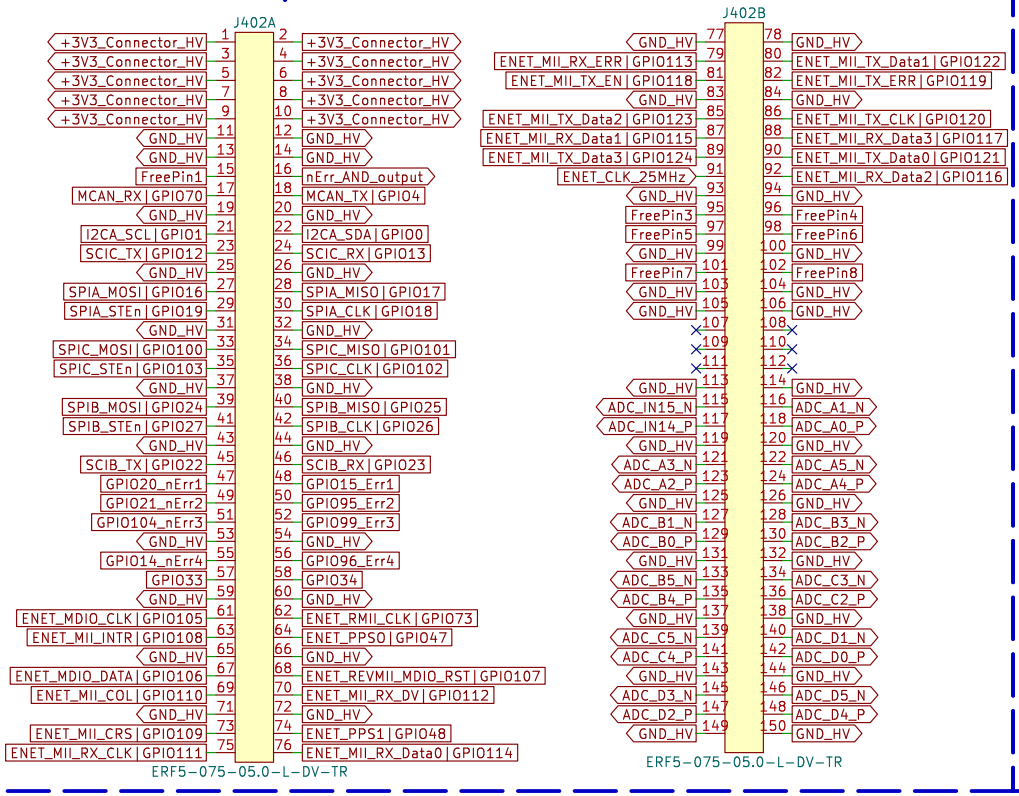
## Supply for shield boards



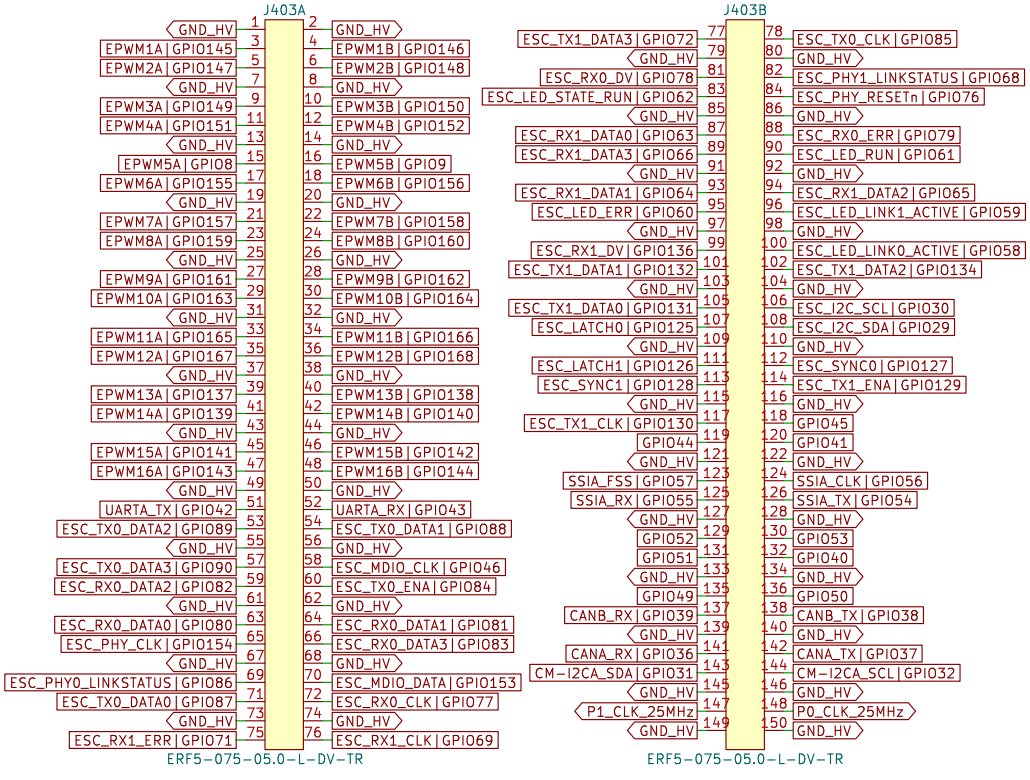

## Supply and SPI for extension board




# Top J402 Connector




# Top J403 Connector



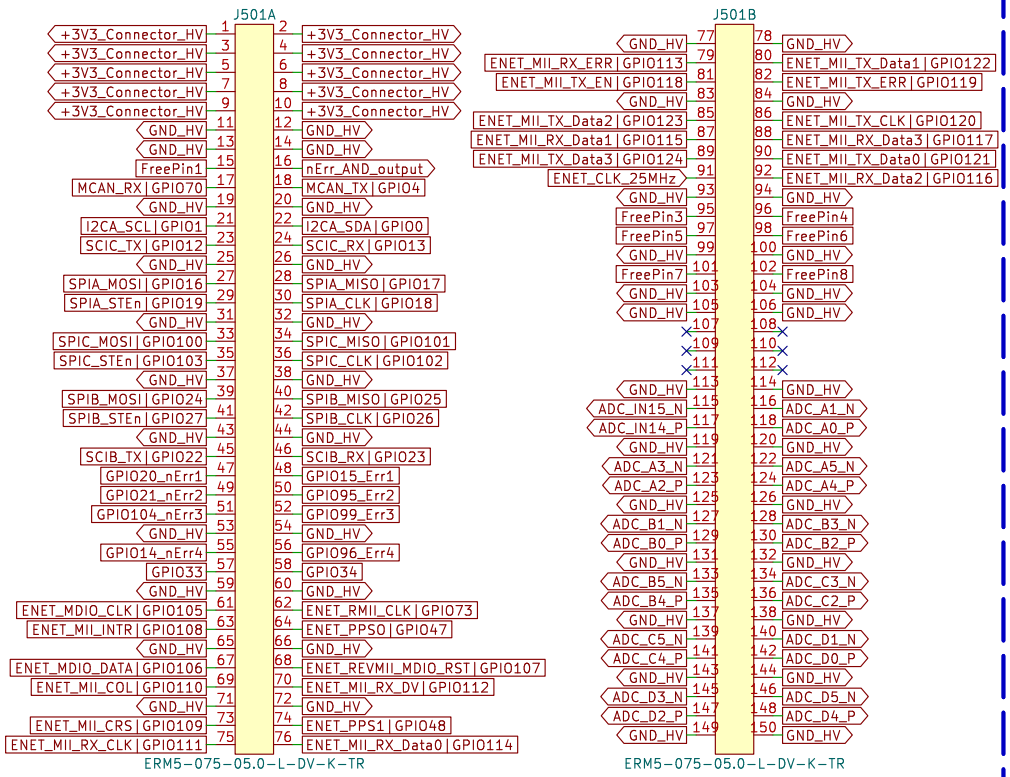

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Connector Top – Page 4/
File: Connector_Top.kicad_sch

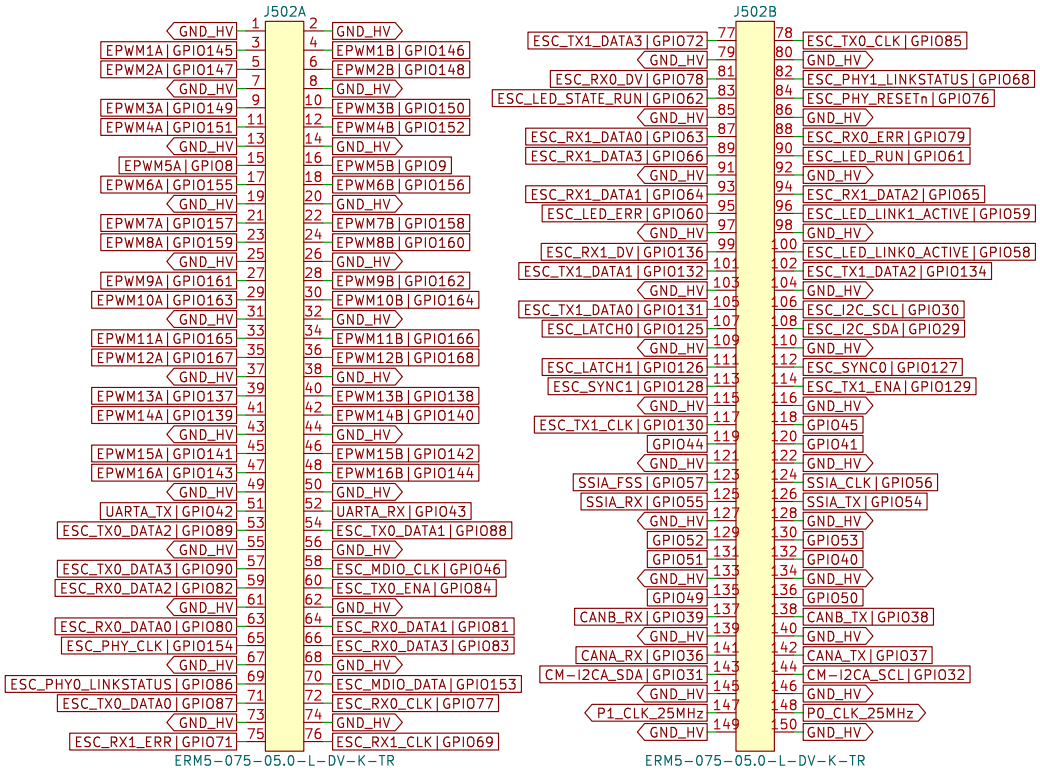
**Title: LCB–CCB–01: Control Board – Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025-05-27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 4/11 |

# Bottom J501 Connector




# Bottom J502 Connector





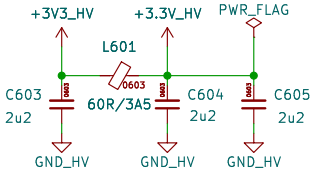
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

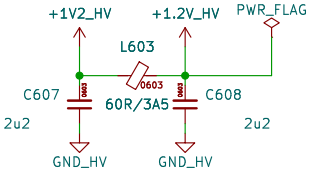

Sheet: /Connector Bottom – Page 5/
File: Connector_Bottom.kicad_sch

**Title: LCB-CCB-01: Control Board – Debugger XDS100 / JTAG**

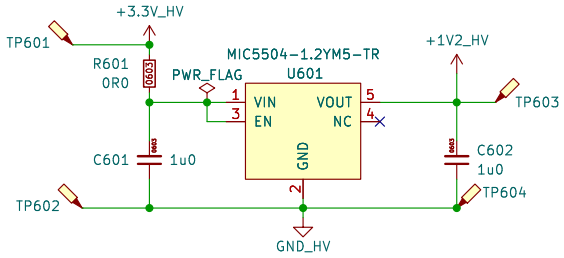
| Size: A4 | Date: 2025-05-27 | Rev: 1.2.0 |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 5/11 |

# Ferrit Beads




# LDO 1.2V for MCU Core



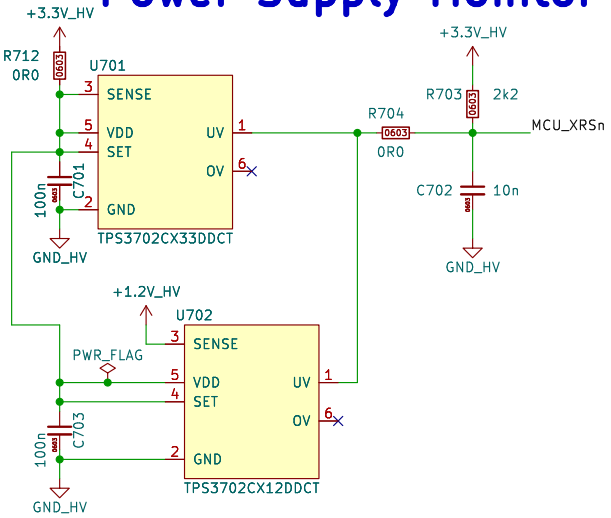

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Power – Page 6/
File: Power.kicad_sch

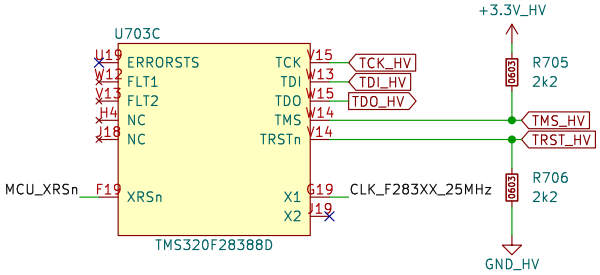
**Title: LCB–CCB–01: Control Board – Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025–05–27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 6/11 |

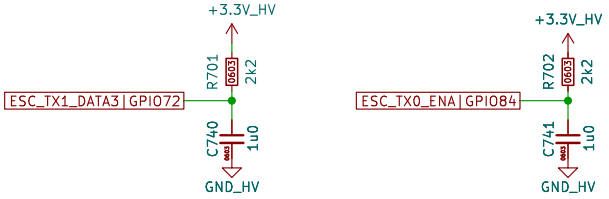
# Power Supply Monitor



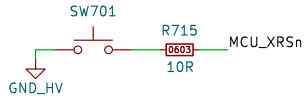

# JTAG, CLK, Reset



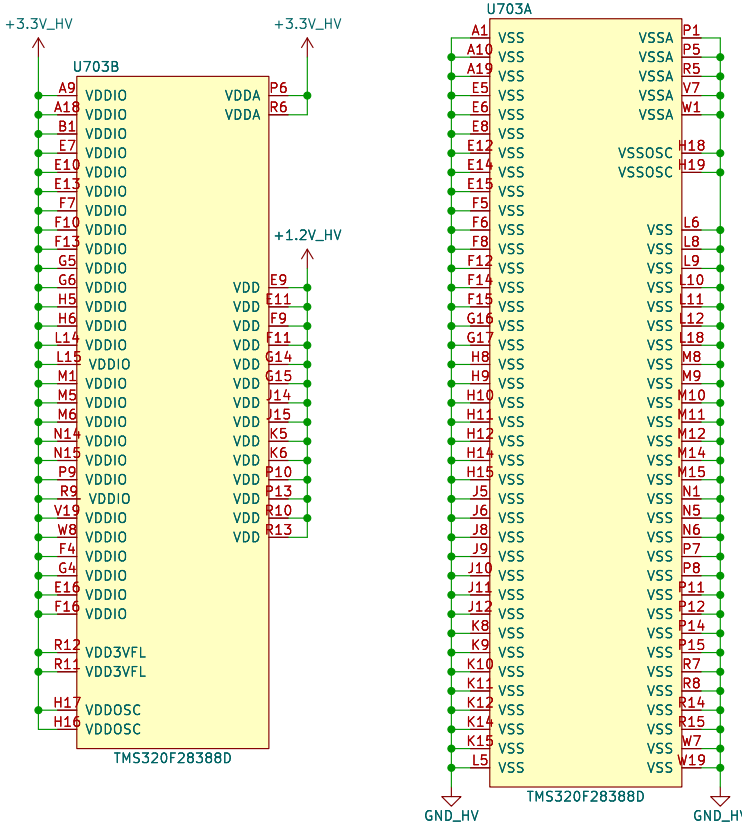

# Boot Mode Pins



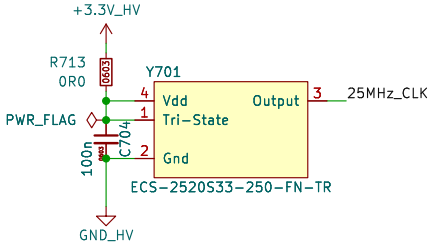

# Reset Switch



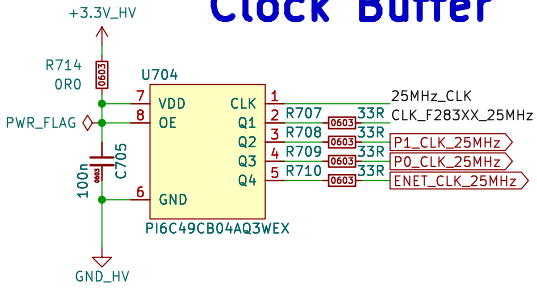

# F2838D MCU Supply Pins



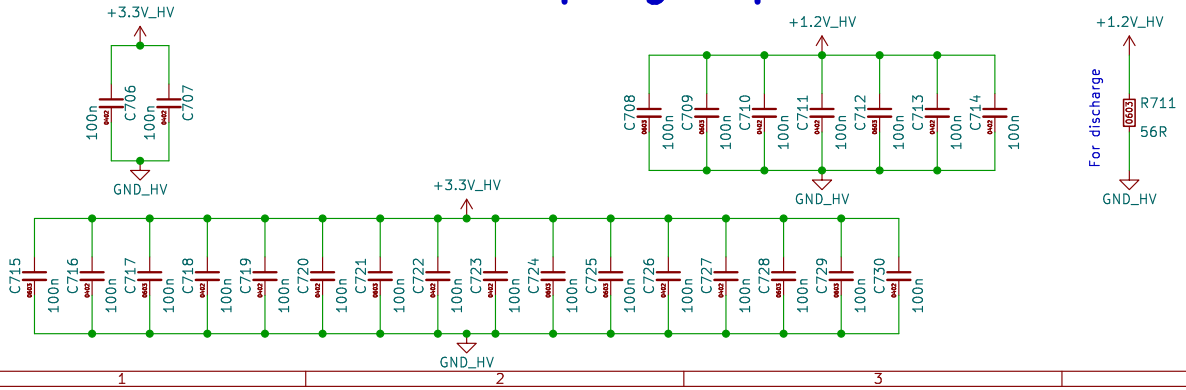

# 25MHz Clock




# Clock Buffer




# F28388D MCU Decoupling Capacitors

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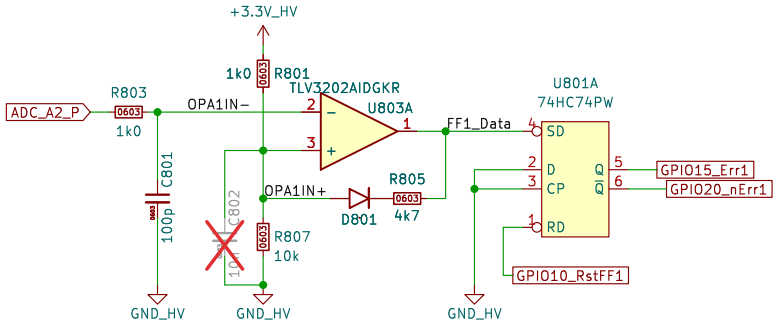
Sheet: /MCU - Page 7/
File: MCU.kicad_sch

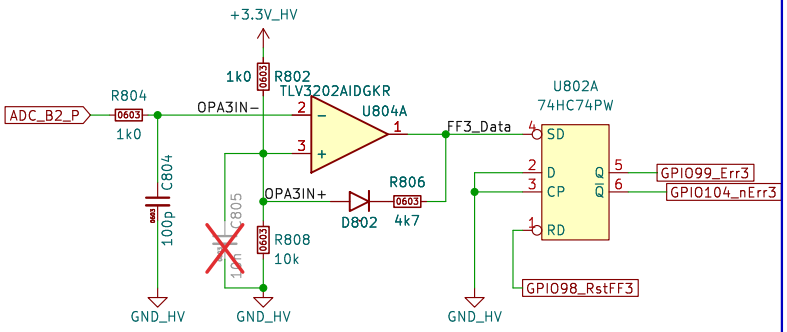
**Title: LCB-CCB-01: Control Board - Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025-05-27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 7/11 |

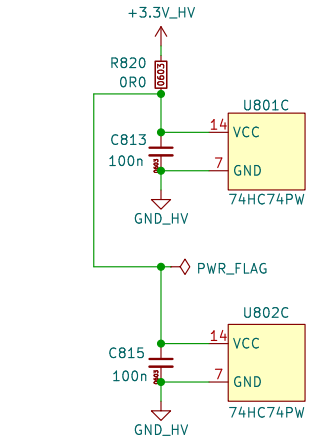
# Error1 – A2



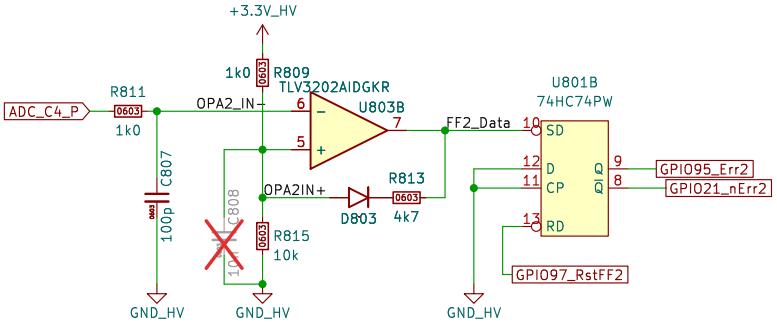

# Error3 – B2



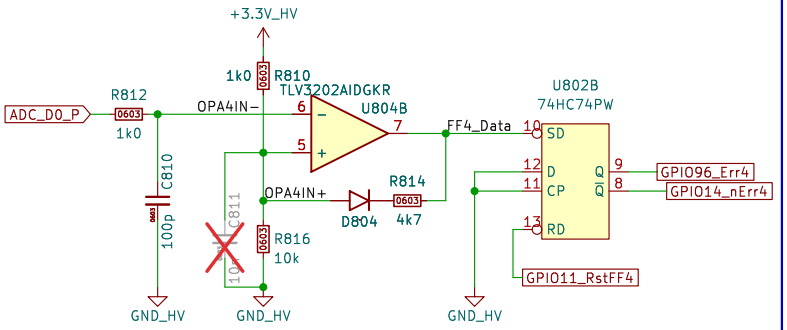

# Power Supply

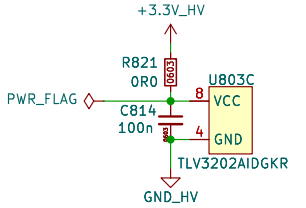


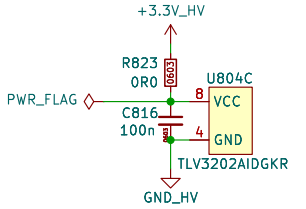

# Error2 – C4



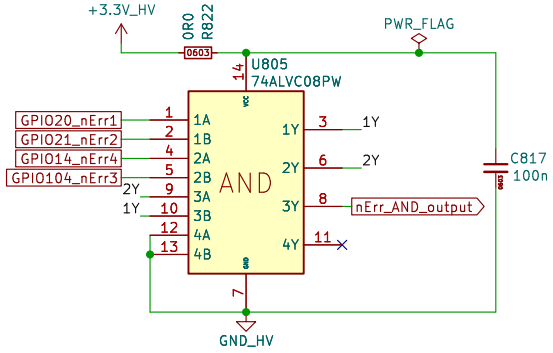

# Error4 – D0




# Error AND Gate



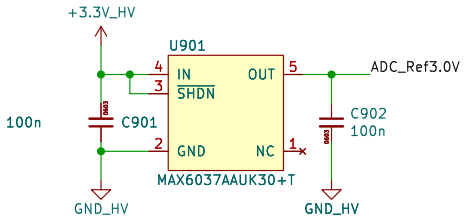

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Error Detection – Page 8/
File: ErrorcComparator.kicad_sch

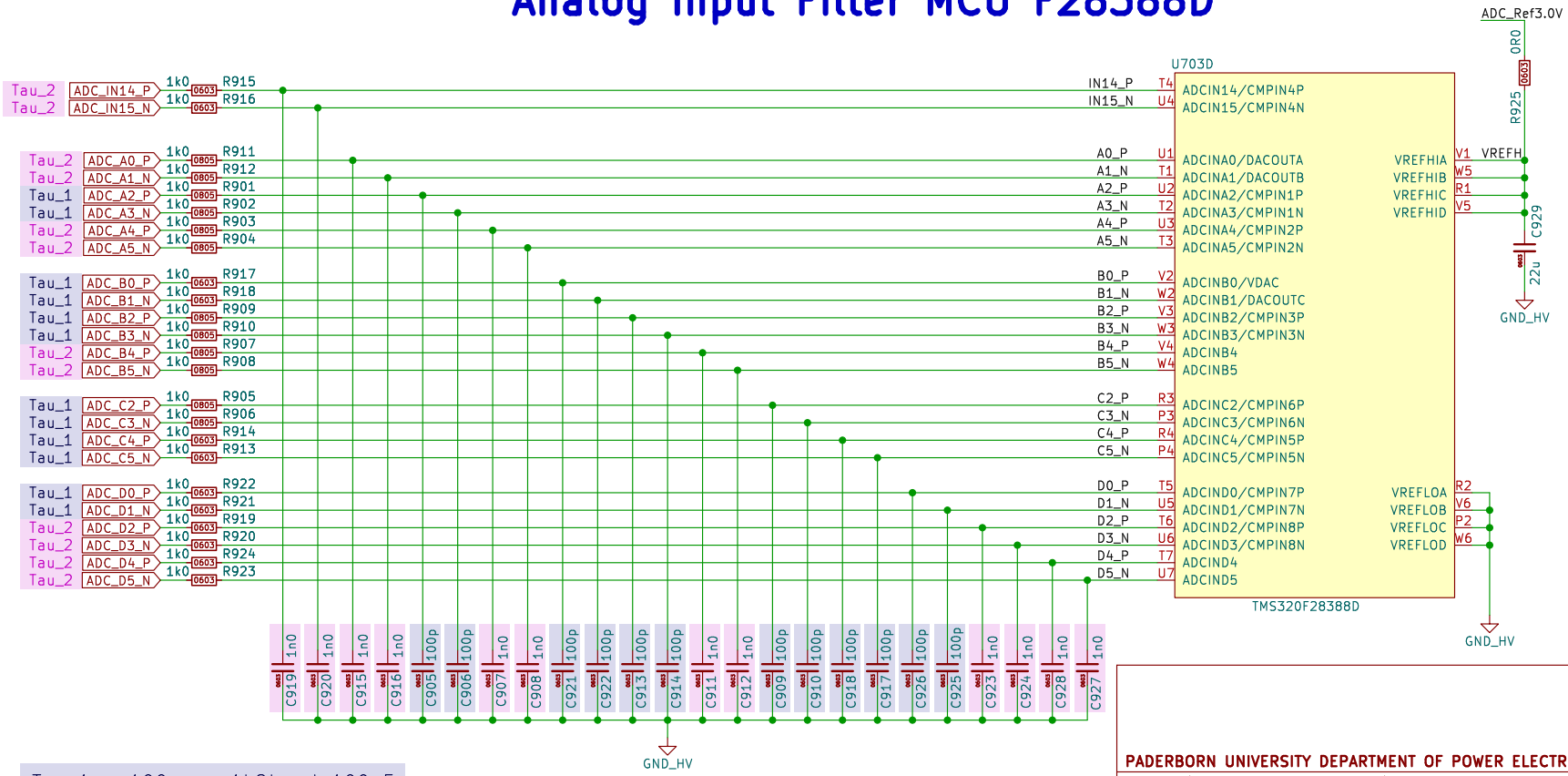
**Title: LCB–CCB–01: Control Board – Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025–05–27 | Rev: 1.2.0 |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 8/11 |

# 3V Reference Voltage




# Analog Input Filter MCU F28388D



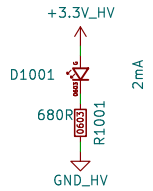

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Analog Filter – Page 9/
File: AnalogFilter.kicad_sch

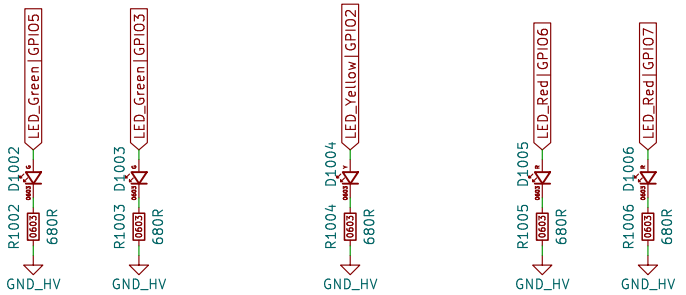
**Title: LCB–CCB–01: Control Board – Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025-05-27 | Rev: 1.2.0 |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 9/11 |

## Power LED




## Status LEDs



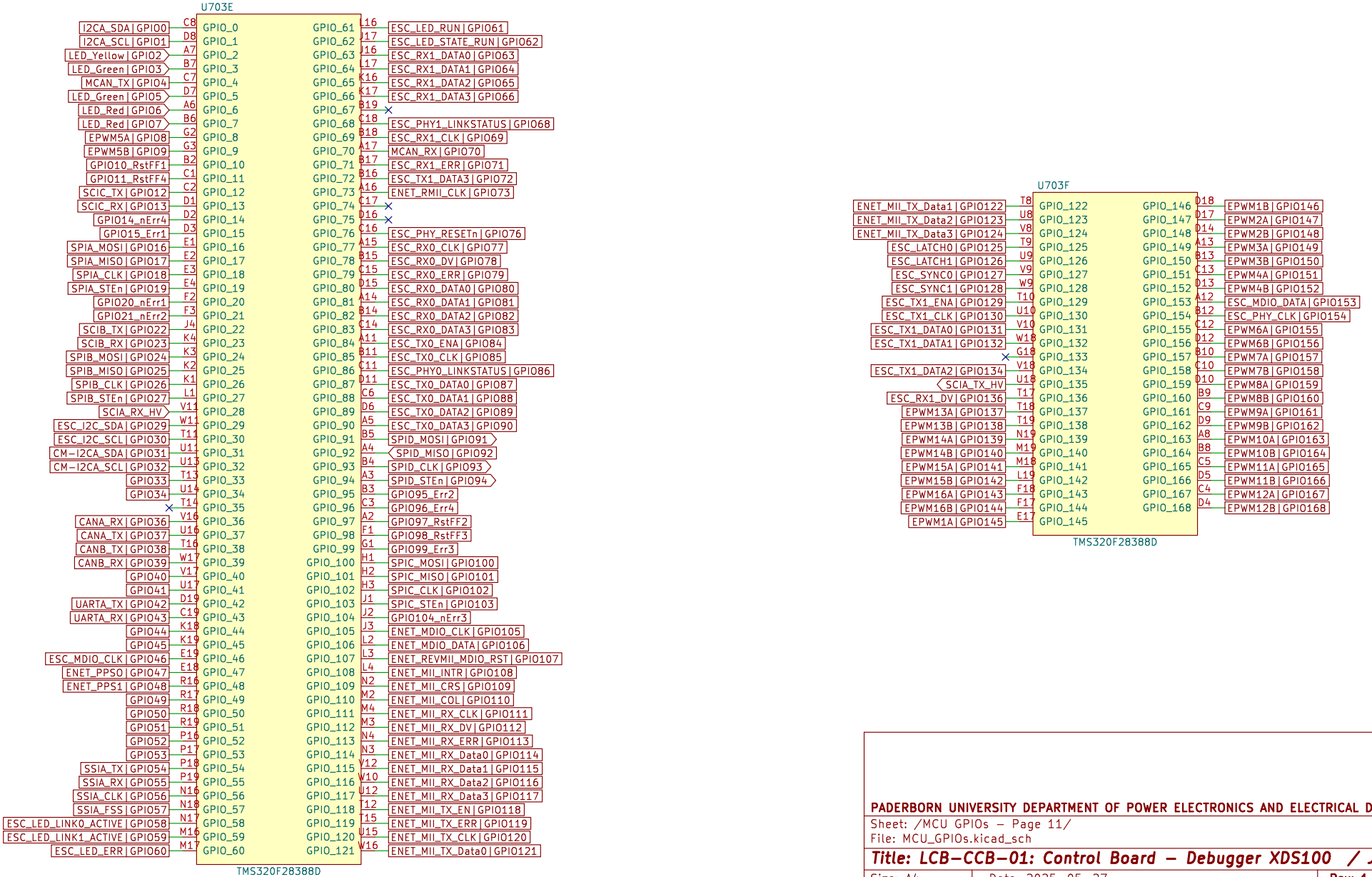

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /Status LEDs – Page 10/
File: LEDS.kicad_sch

**Title: LCB–CCB–01: Control Board – Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025–05–27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 10/11 |

# F28388D MCU GPIO Configuration




PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /MCU GPIOs - Page 11/
File: MCU_GPIOs.kicad_sch

**Title: LCB-CCB-01: Control Board - Debugger XDS100 / JTAG**

| Size: A4 | Date: 2025-05-27 | **Rev: 1.2.0** |
|---|---|---|
| KiCad E.D.A. 9.0.2 | | Id: 11/11 |