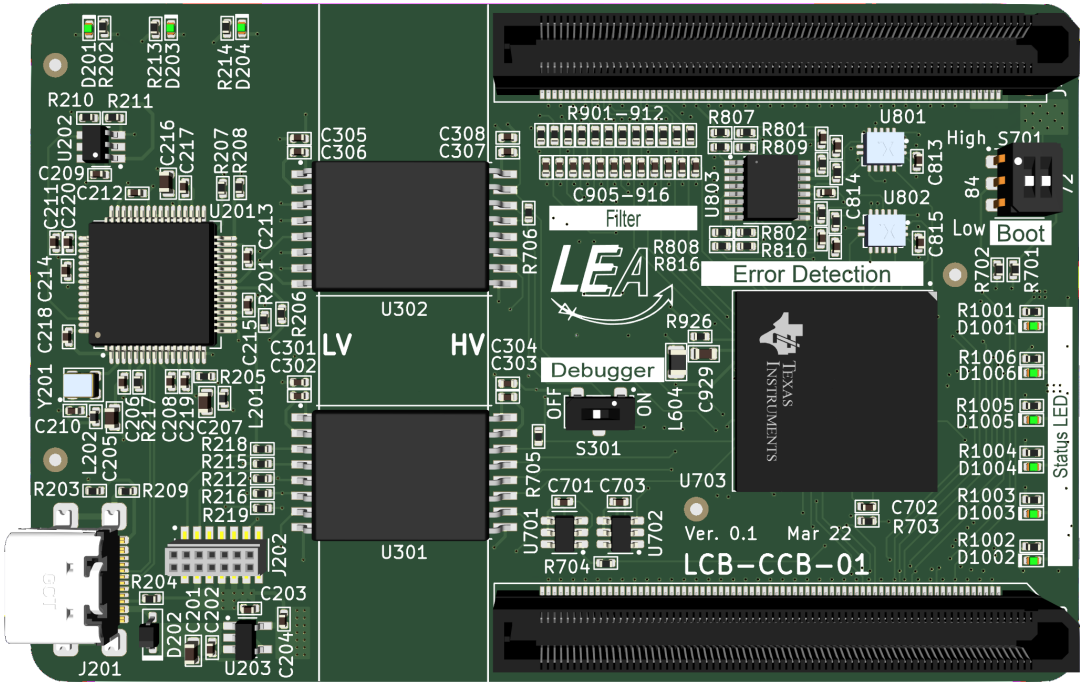
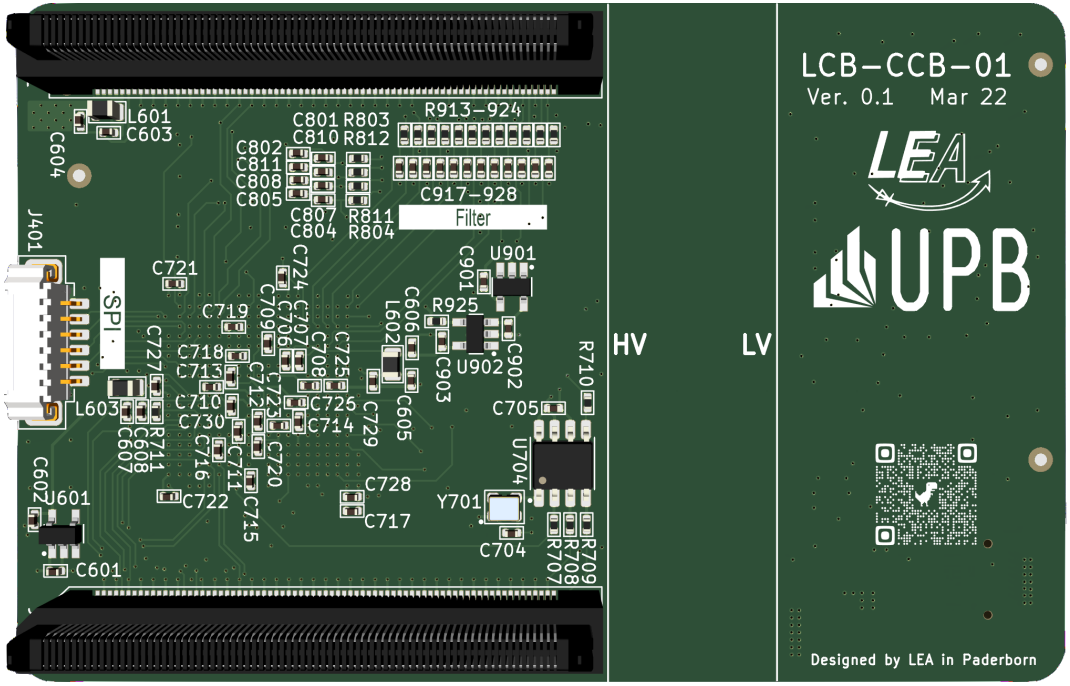




XDS100 – Page 2

Isolation – Page 3

Connector Top – Page 4

Connector Bottom – Page 5

Power – Page 6

MCU – Page 7

Error Detection – Page 8

Analog Filter – Page 9

Status LEDs – Page 10

MCU GPIOs – Page 11

Components reference:
2XX -> Page 2
3XX -> Page 3
4XX -> Page 4
5XX -> Page 5
6XX -> Page 6
7XX -> Page 7
8XX -> Page 8
9XX -> Page 9
1XXX -> Page 10

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

ACCESSORY901
USB-C Cable

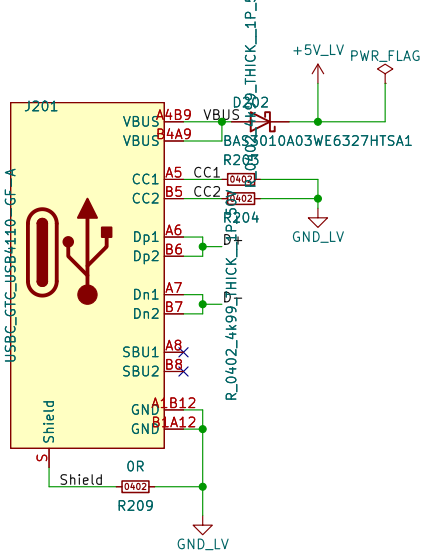
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

Sheet: /
File: Control_Board.kicad_sch

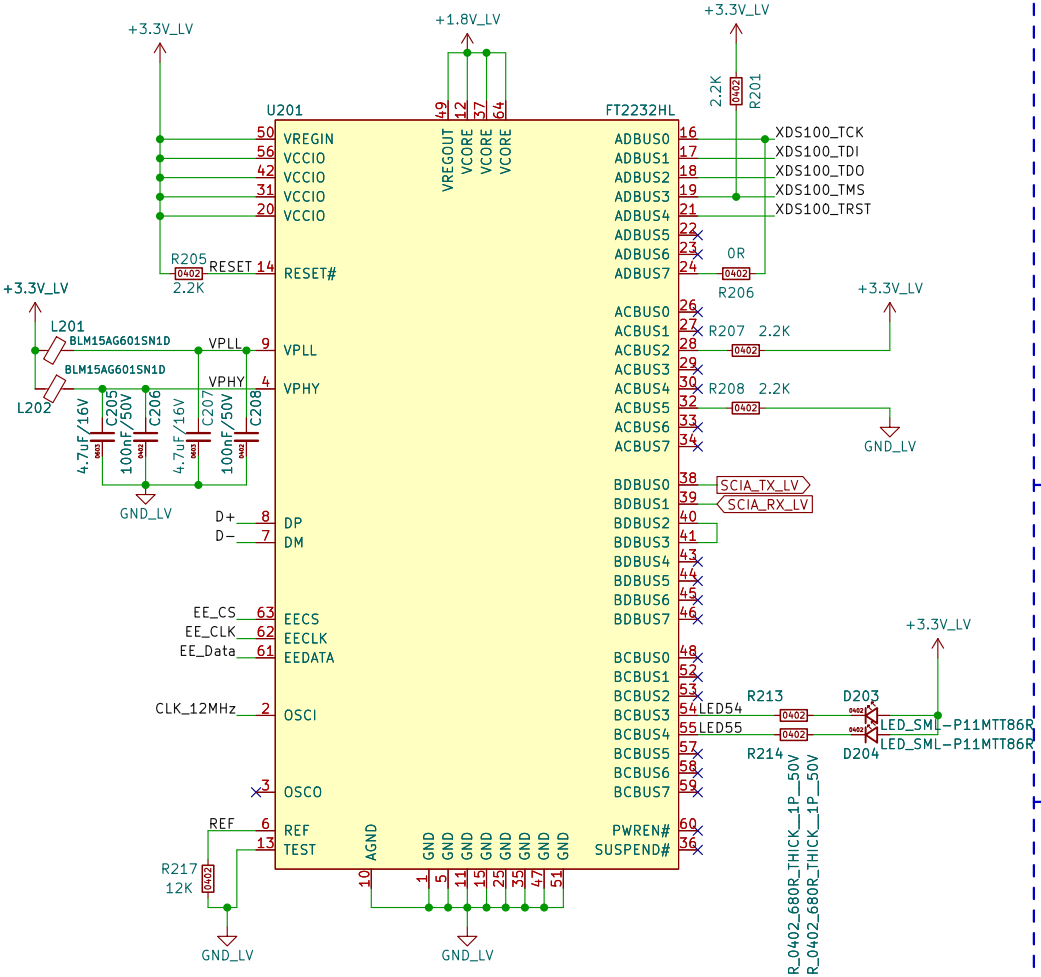
Title: LCB-CCB-01: Control Board

Size: A4	Date: 2022-03-17	Rev: 0.1
KiCad E.D.A. kicad (6.0.11)		Id: 1/11

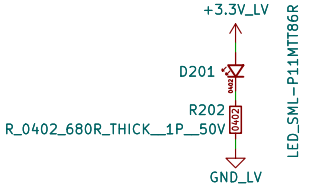
XDS100 USB-C Port



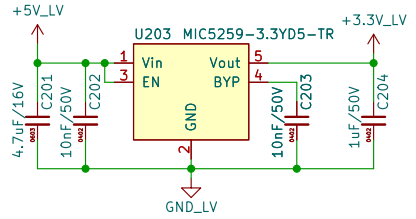
FTDI2232HL XDS100 MCU



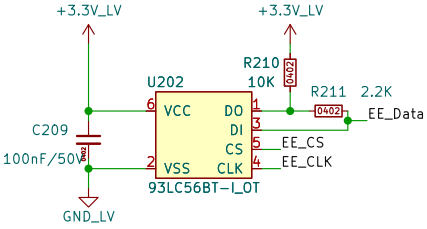
Power Status LED



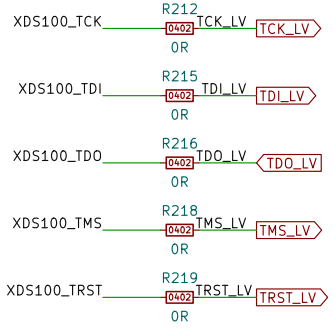
LDO 3.3V



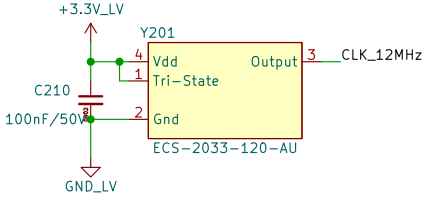
EEPROM XDS100



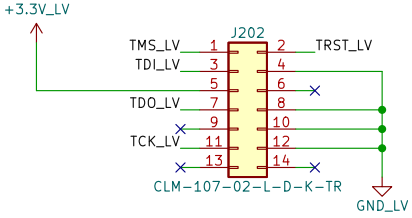
Disconnect XDS100



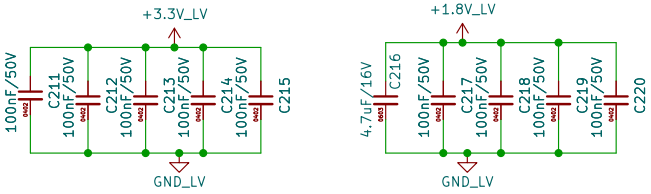
12 MHz Clock



External Debugger



Decoupling Capacitors MCU FT2232HL



PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

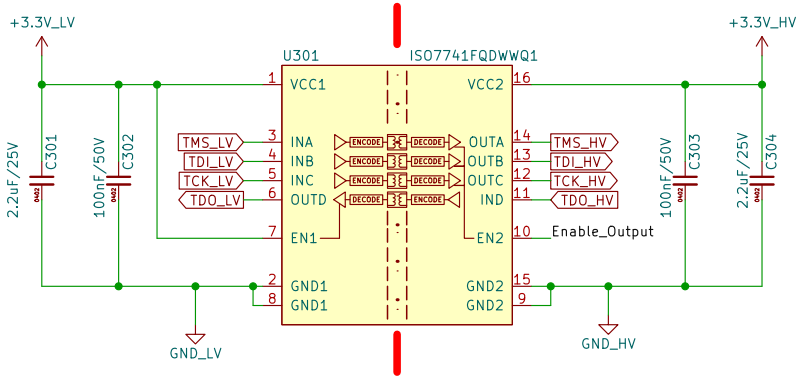
Sheet: /XDS100 - Page 2/

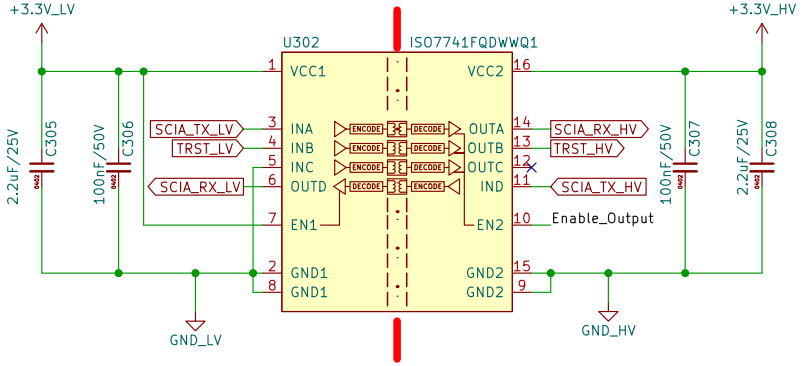
File: Debugger.kicad_sch

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

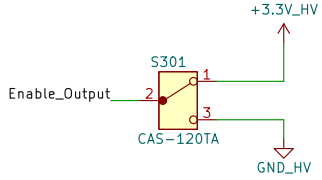
Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 2/11

JTAG and SCI ISOLATION





Enable/Disable Debugger



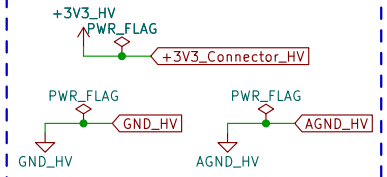
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

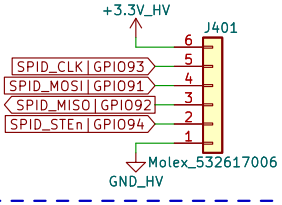
Title: LCB-CCB-01: Control Board - Isolation

Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 3/11

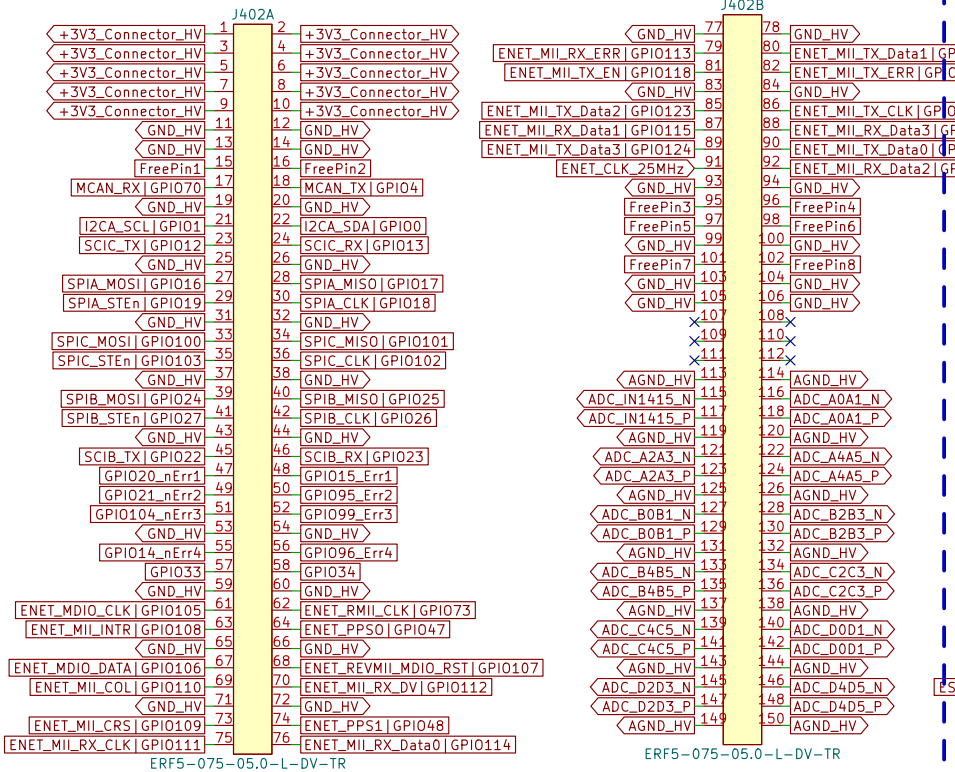
Supply for shield boards



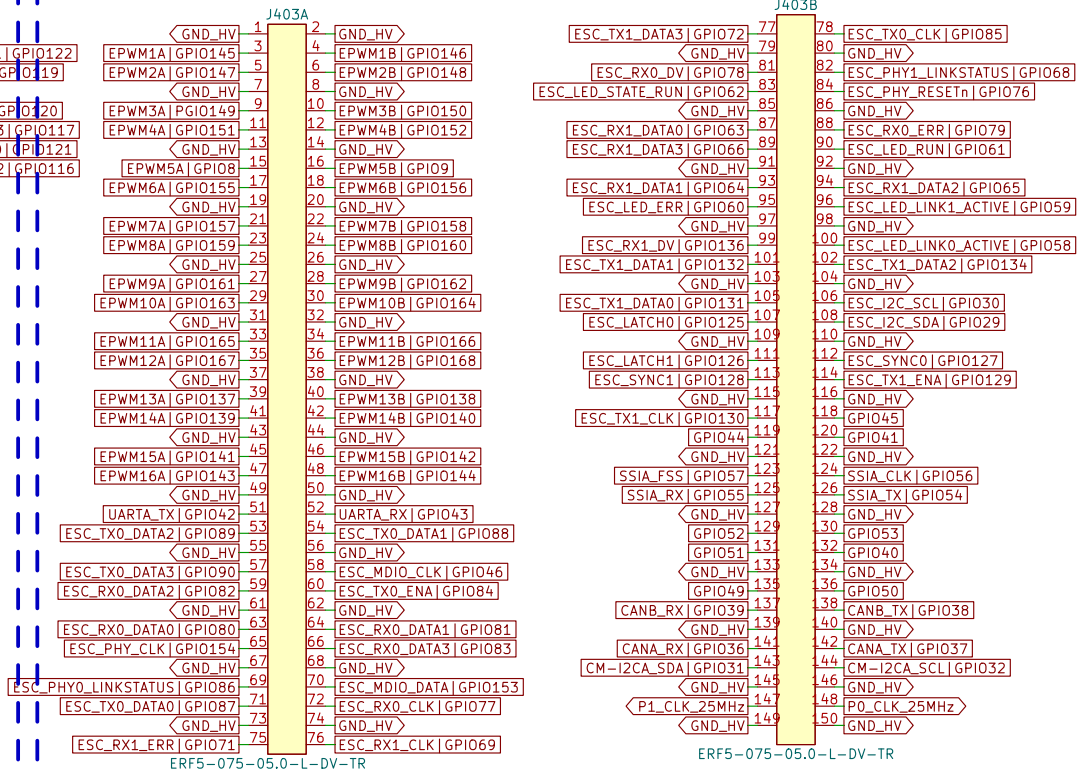
Supply and SPI for extension board



TOP LEFT CONNECTOR



TOP RIGHT CONNECTOR



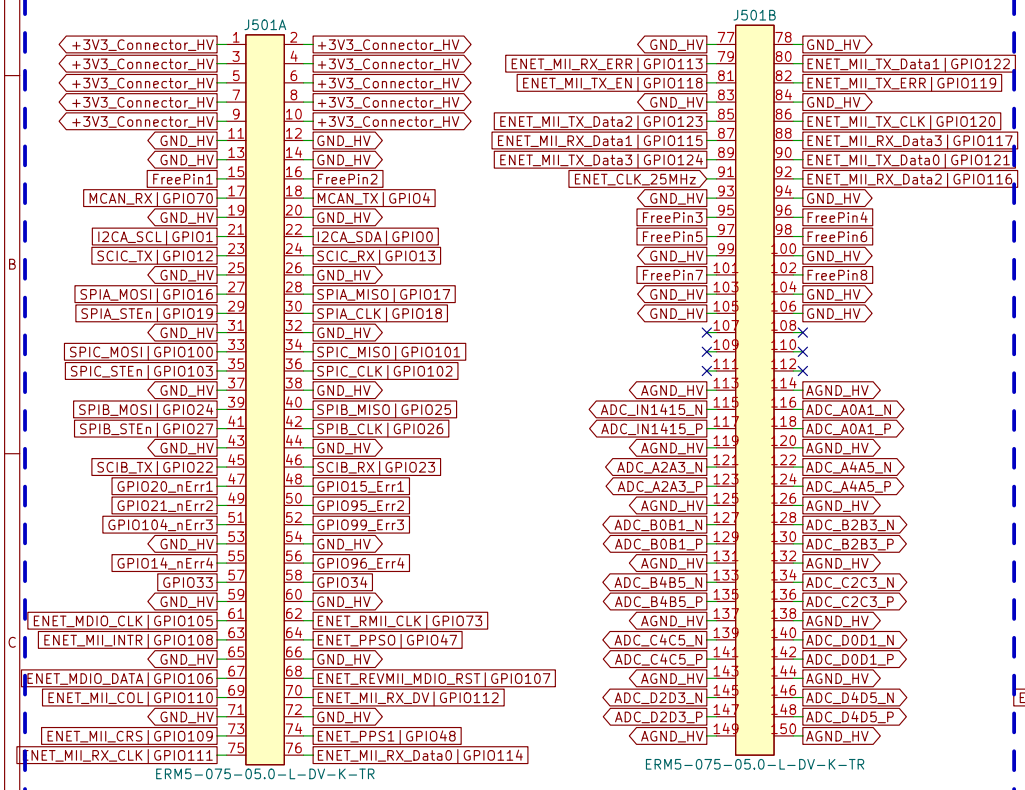
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

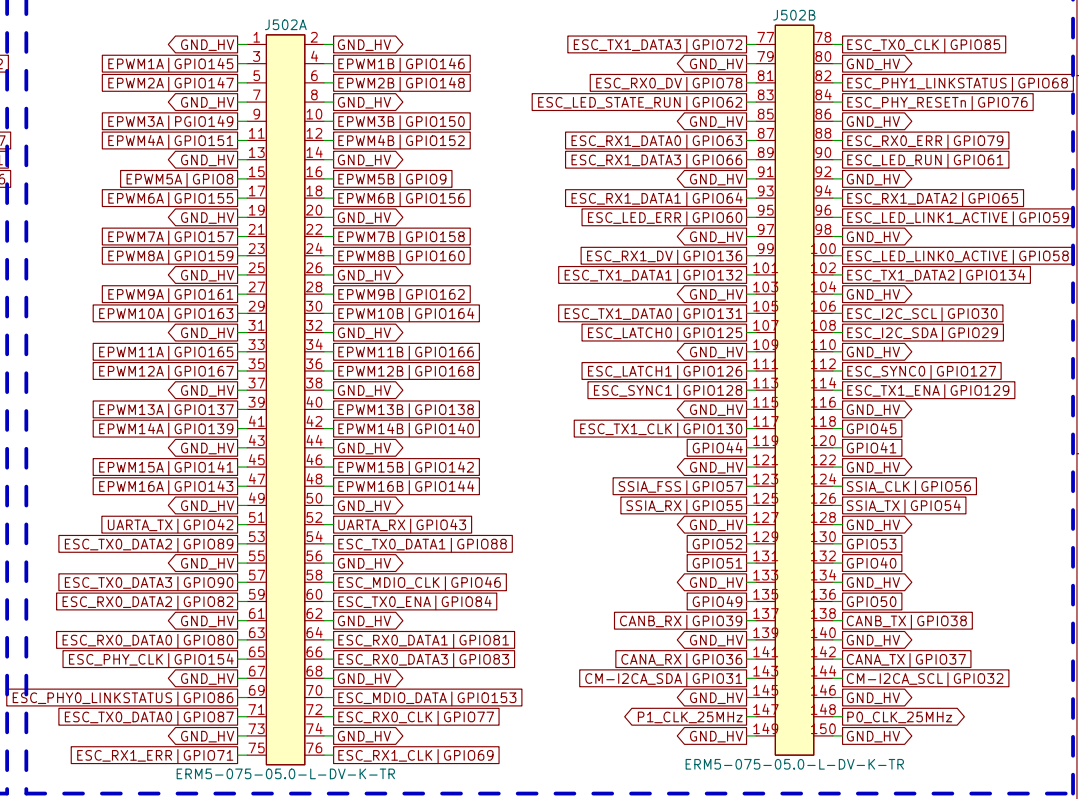
Title: LCB-CCB-01: Control Board - Top Connector

Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 4/11

BOTTOM LEFT CONNECTOR



BOTTOM RIGHT CONNECTOR



PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

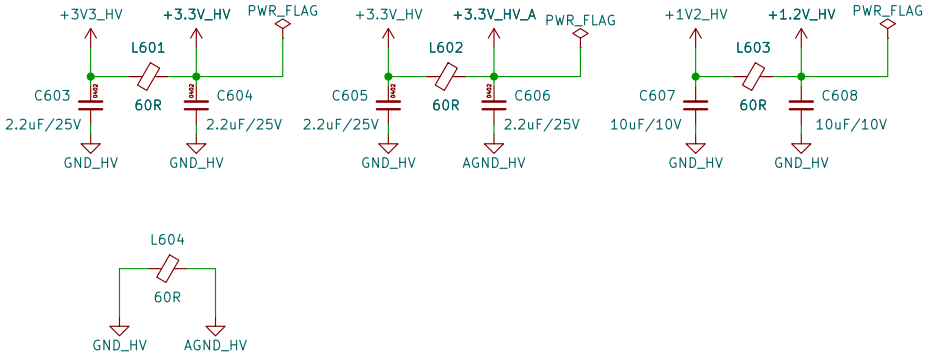
Sheet: /Connector Bottom – Page 5/

File: Connector_Bottom.kicad_sch

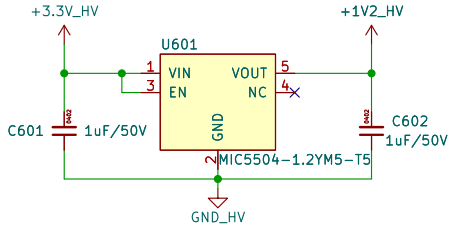
Title: LCB–CCB–01: Control Board – Bottom Connector

Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 5/11

Ferrit Beads



LDO 1.2V for MCU Core



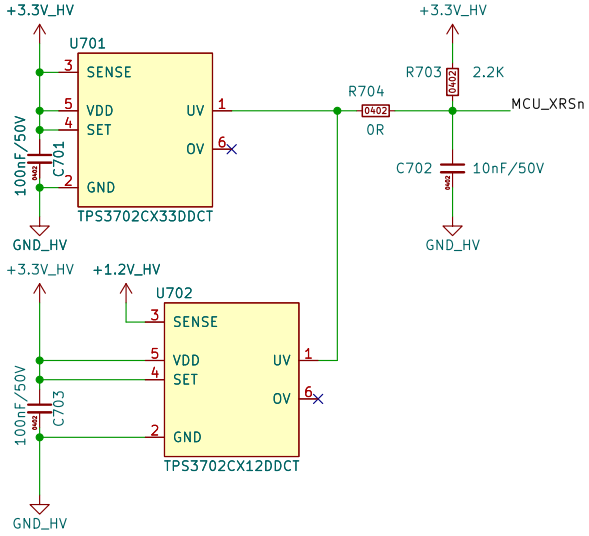
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

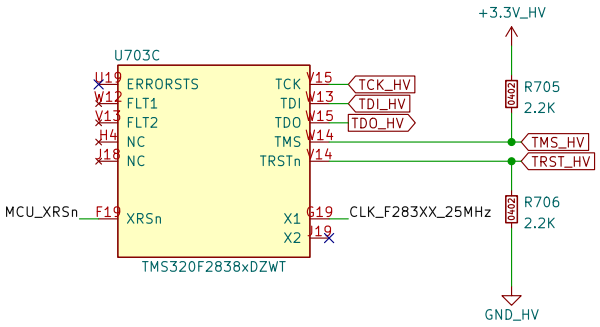
Title: LCB-CCB-01: Control Board - Power

Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 6/11

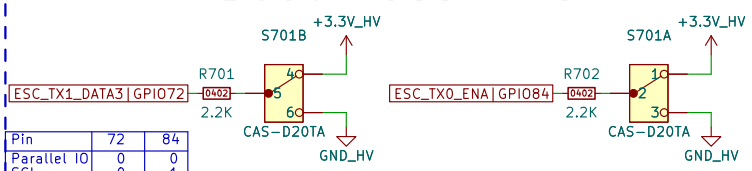
Power Supply Monitor



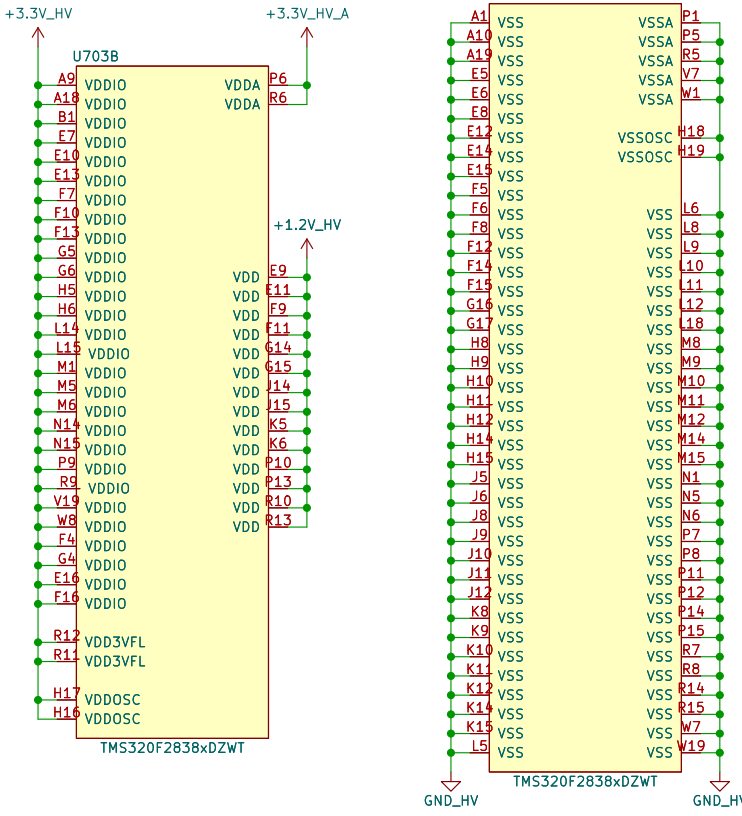
JTAG, CLK, Reset



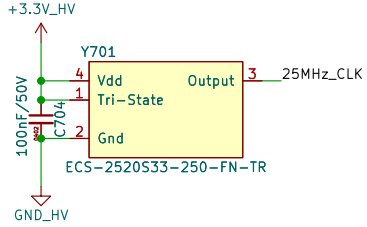
Boot Mode Pins



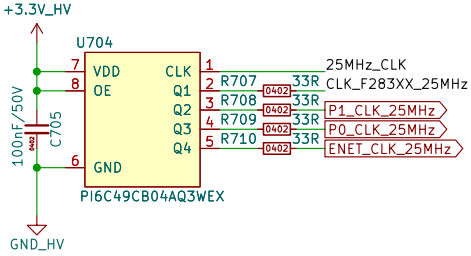
F2838x MCU Supply Pins



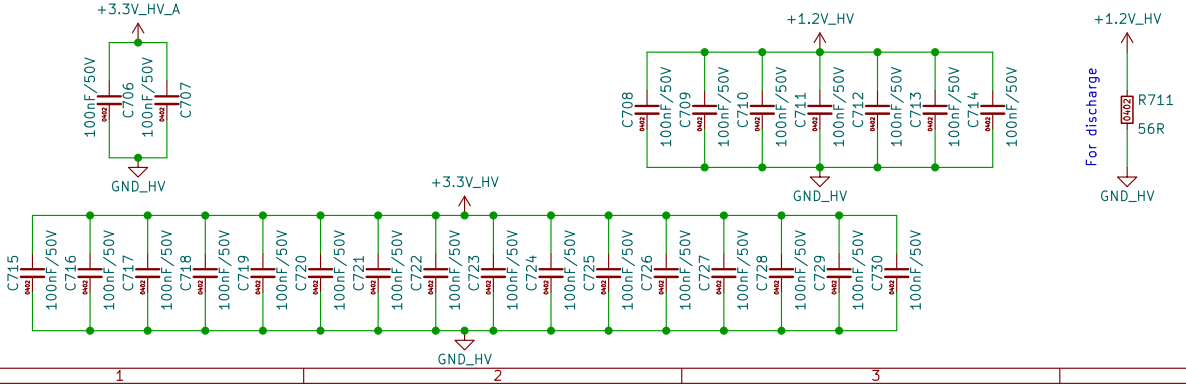
25MHz Clock



Clock Buffer



F2838x MCU Decoupling Capacitors



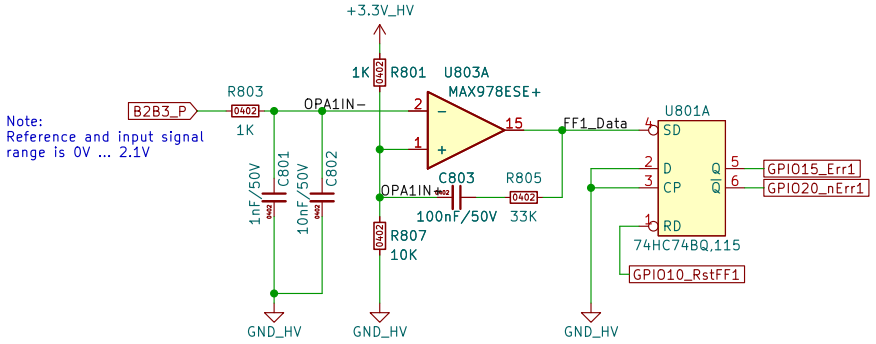
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

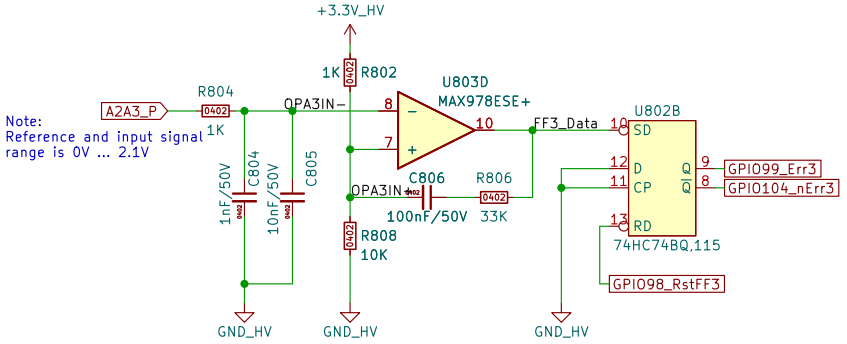
Title: LCB-CCB-01: Control Board - MCU

Size: A4	Date: 2022-03-17	Rev: 0.1
KiCad E.D.A. kicad (6.0.11)		Id: 7/11

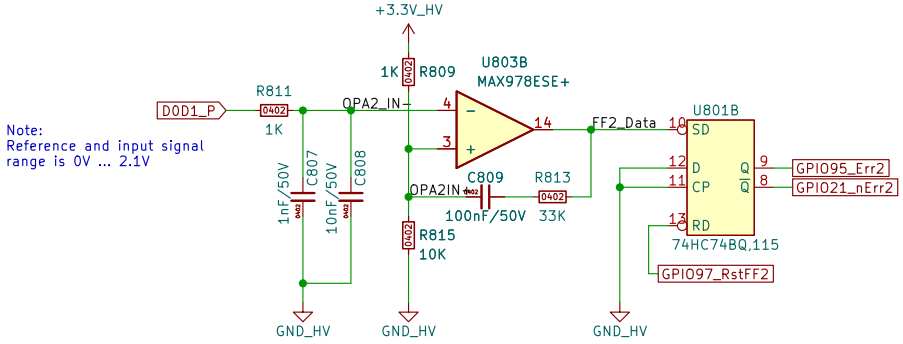
Error1 – B2B3P



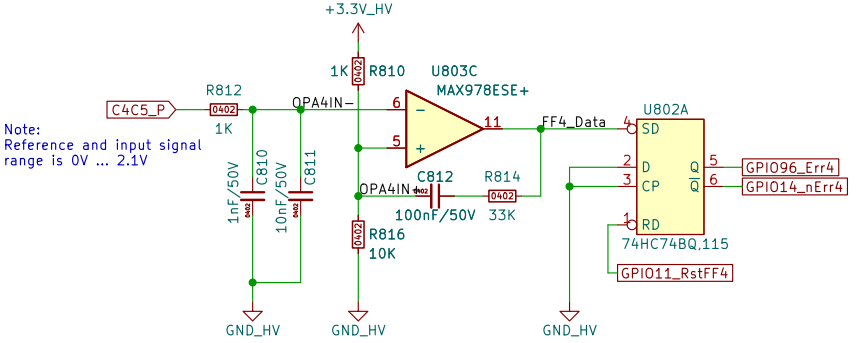
Error3 – A2A3



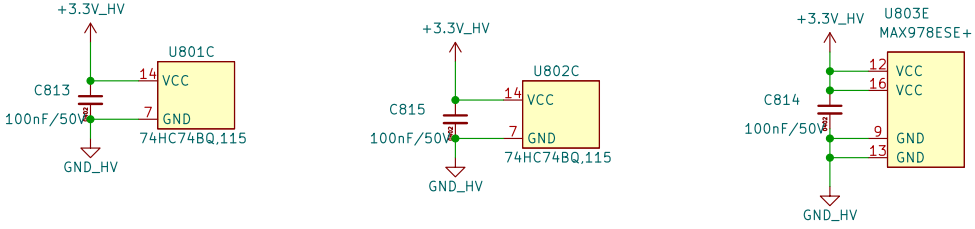
Error2 – D0D1



Error4 – C4C5



Power Supply



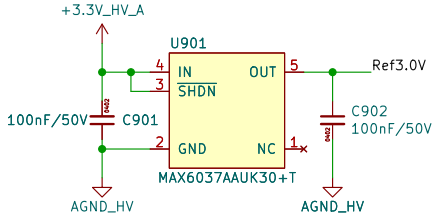
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

Title: LCB–CCB–01: Control Board – Error Detection

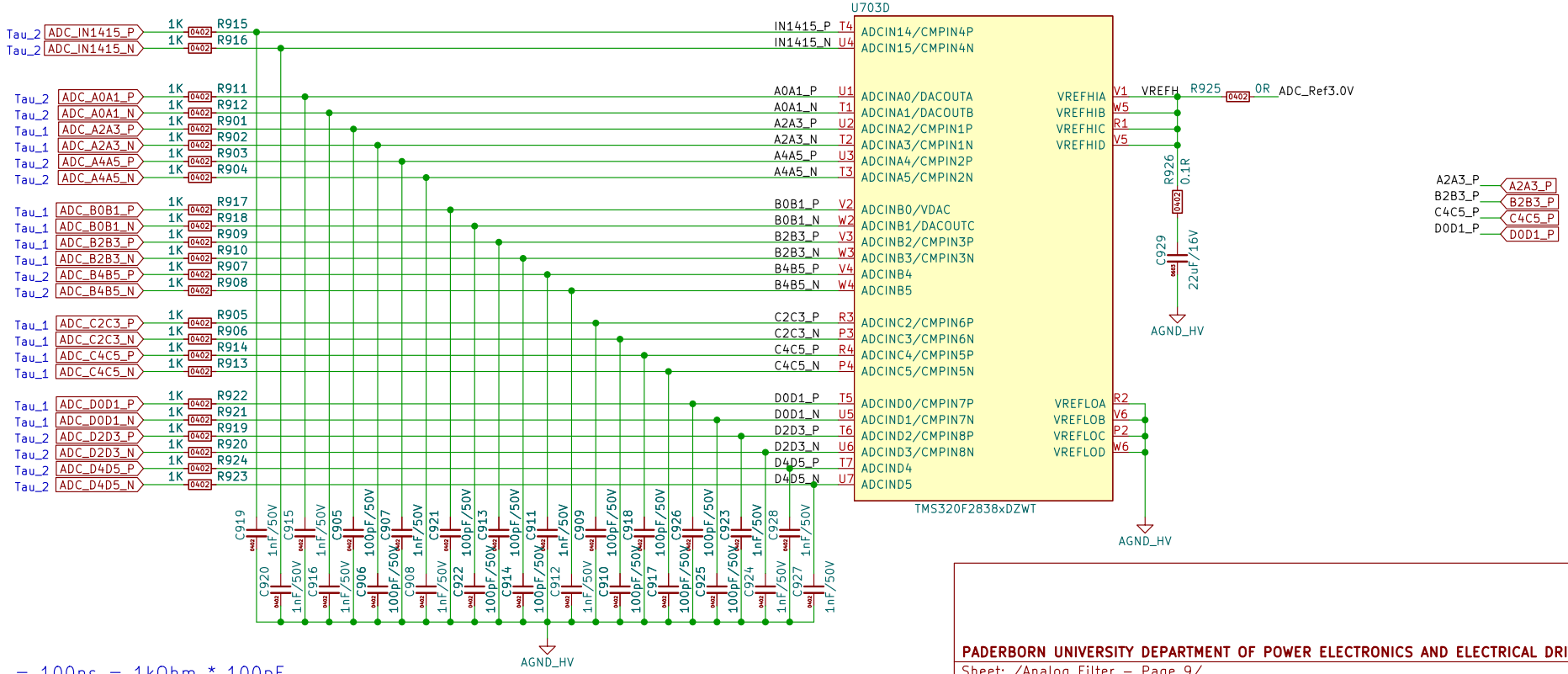
Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 8/11

3V Referenz Voltage



3V Referenz Voltage Buffer

Analog Input Filter MCU F2838X



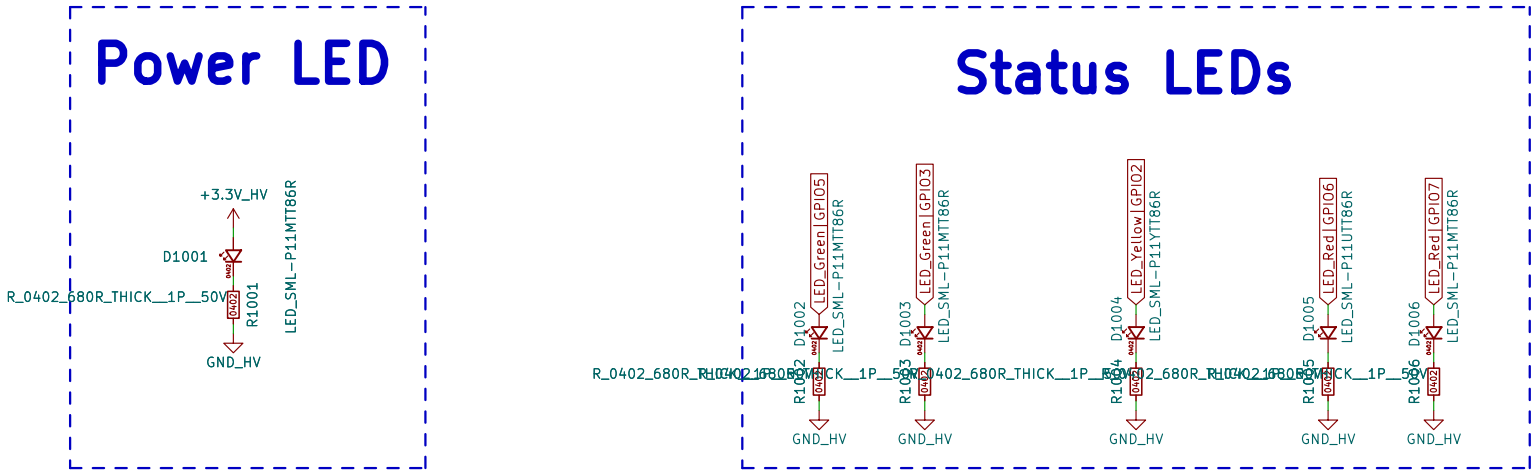
Tau_1 = 100ns = 1kOhm * 100pF
Tau_2 = 1µs = 1kOhm * 1nF

PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

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

Title: LCB–CCB–01: Control Board – Analog Filter

Size: A4	Date: 2022-03-17	Rev: 0.1
KiCad E.D.A. kicad (6.0.11)		Id: 9/11



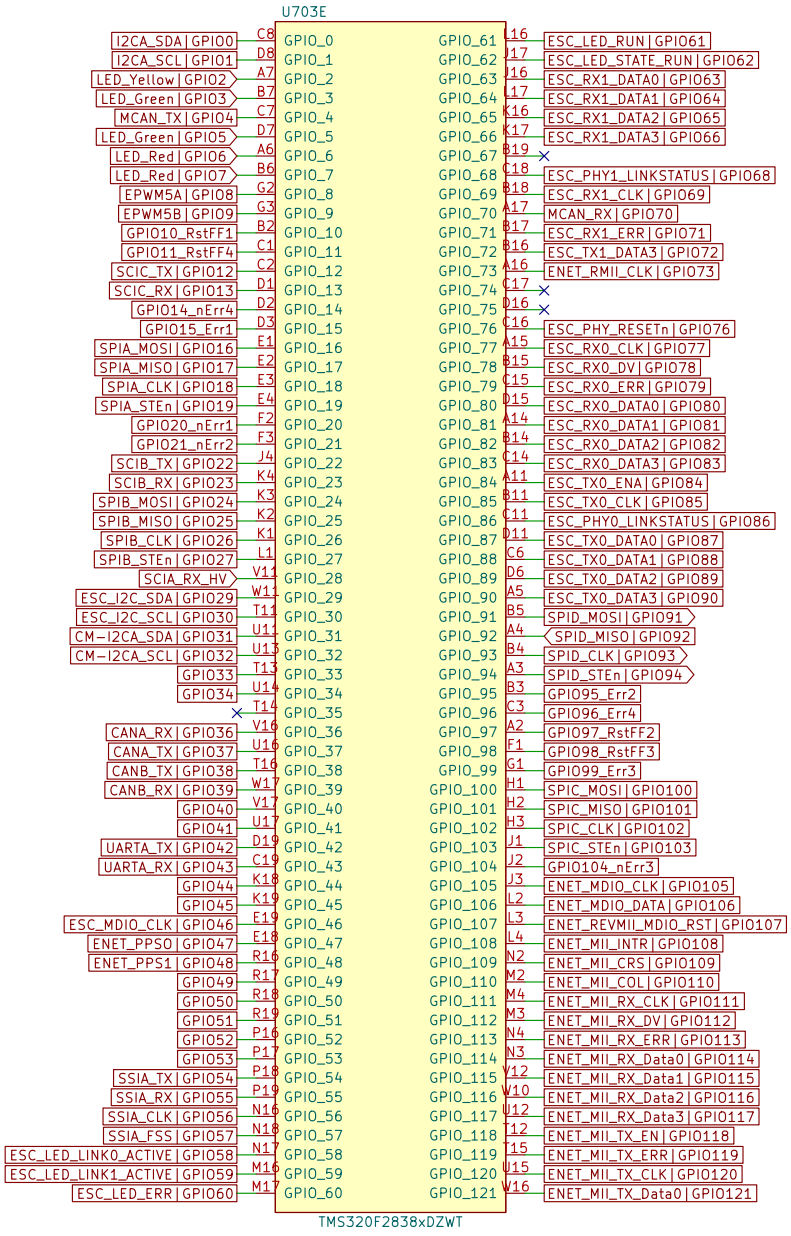
PADERBORN UNIVERSITY DEPARTMENT OF POWER ELECTRONICS AND ELECTRICAL DRIVES

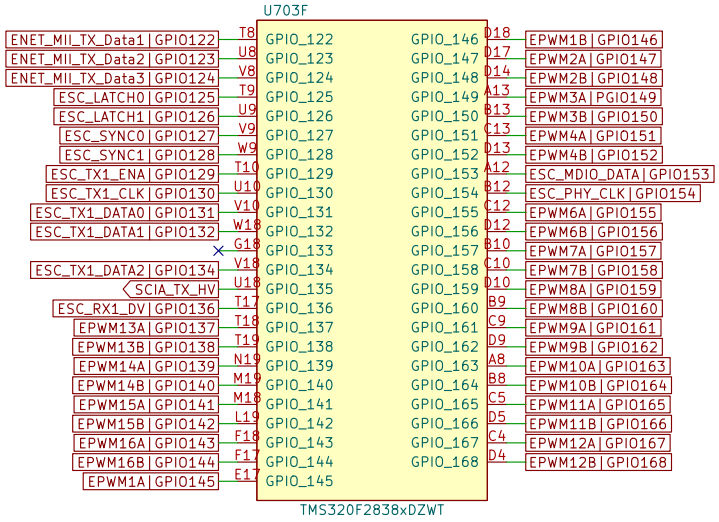
Sheet: /Status LEDs – Page 10/
File: LEDS.kicad_sch

Title: LCB–CCB–01: Control Board – Status LEDs

Size: A4	Date: 2022-03-17	**Rev: 0.1**
KiCad E.D.A. kicad (6.0.11)		Id: 10/11

F2838x 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 – MCU GPIO Configuration

Size: A4	Date: 2022-03-17	Rev: 0.1
KiCad E.D.A. kicad (6.0.11)		Id: 11/11