

A

A

B

B

C

C

D

D

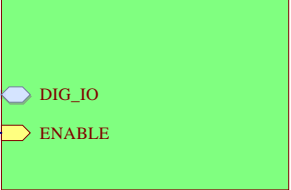
15V_PS
15V_PowerSupply.SchDoc



CarrierConnector
DigitalCarrierPlug.SchDoc



SigCon_top
SignalConditioning



DIG_IO

ENABLE

3V3_PER

1

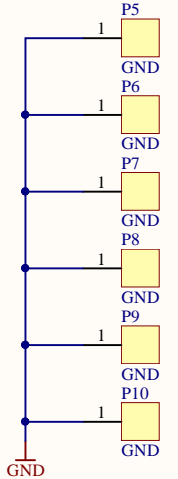
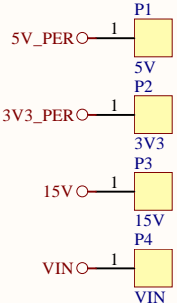
R20

2

R_TF

3

Note: Driving source is external (carrier board or just voltage)



Revision

2v01

Serial
Serial #

Project

UltraZohm_DigitalVoltage

Designer

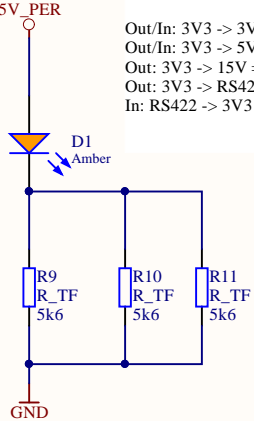
T. Wendt

Date

08/2020

LED to show which variant is chosen
Colors:

- Out/In: 3V3 -> 3V3 = Amber (2 resistors, MPN: 150060AS75000)
- Out/In: 3V3 -> 5V = Blue (3 resistors, MPN: 150060BS75000)
- Out: 3V3 -> 15V = Green (3 resistors, MPN: 150060GS75000)
- Out: 3V3 -> RS422 = Red (2 resistors, MPN: 150060RS75000)
- In: RS422 -> 3V3 = Yellow (2 resistors, MPN: 150060YS75000)



Title TopSheet.SchDoc		Technische Hochschule Nürnberg Georg Simon Ohm Fürther Straße 250 90429 Nürnberg GERMANY	
Size: A4	Revision: 2v01		
Date: 03.08.2020	Time: 20:09:54		
Project: ultrazohm_digital_voltage_3U_1vxx.PrjPCB	Sheet 1 of 16		
		Author: T. Wendt	

A

B

C

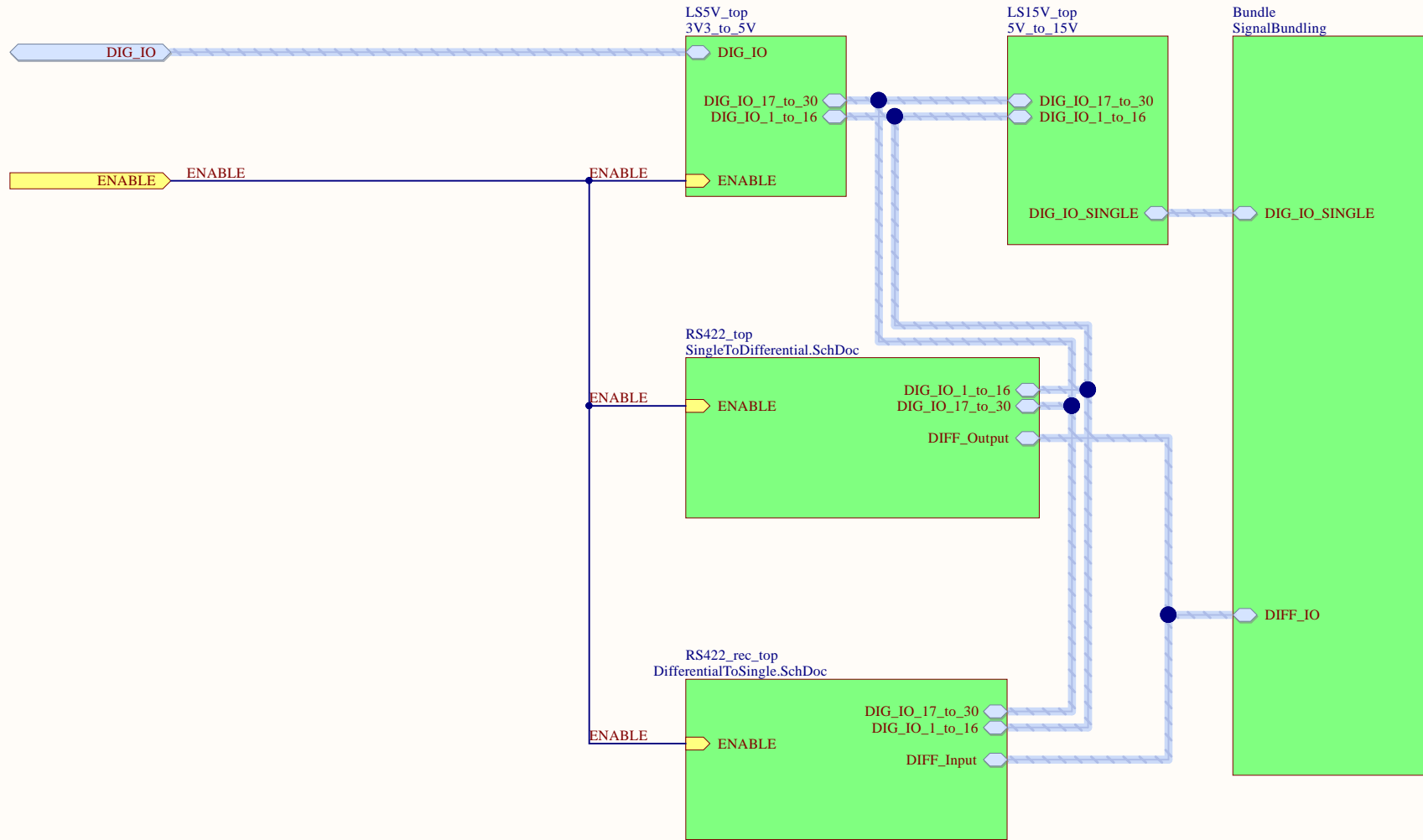
D

A

B

C

D



A

A

B

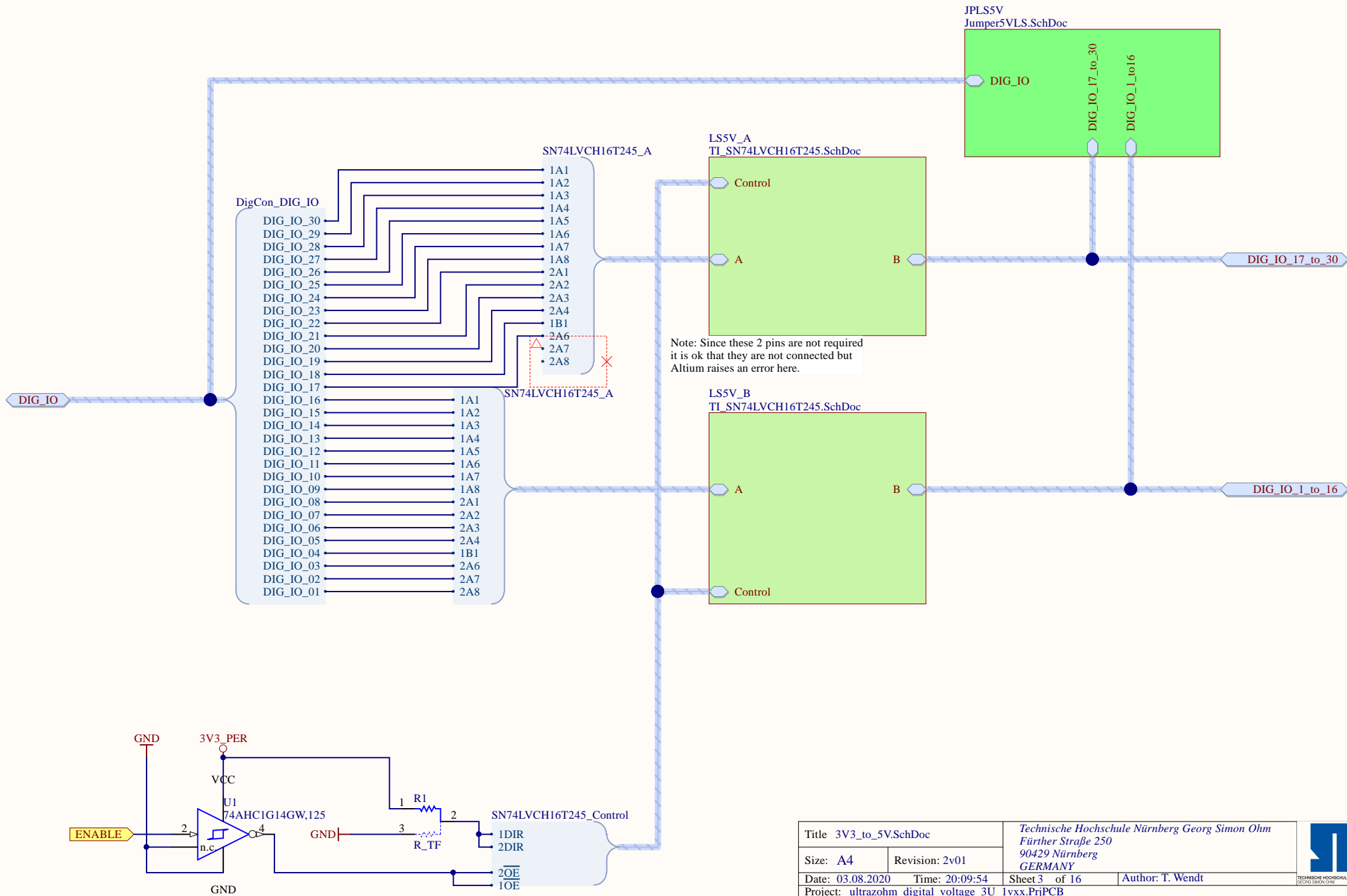
B

C

C

D

D



SN74LVCH16T245_B

2B8 DIG_IO_5V_A1
2B7 DIG_IO_5V_B1
2B6 DIG_IO_5V_C1
2B5 DIG_IO_5V_D1
2B4 DIG_IO_5V_E1
2B3 DIG_IO_5V_F1
2B2 DIG_IO_5V_A2
2B1 DIG_IO_5V_B2
1B8 DIG_IO_5V_C2
1B7 DIG_IO_5V_D2
1B6 DIG_IO_5V_E2
1B5 DIG_IO_5V_F2
1B4 DIG_IO_5V_A3
1B3 DIG_IO_5V_B3
1B2 DIG_IO_5V_C3
1B1 DIG_IO_5V_D3

DIG_IO_1_to_16

DIG_IO_5V_A[1..5]
DIG_IO_5V_B[1..5]
DIG_IO_5V_C[1..5]
DIG_IO_5V_D[1..5]
DIG_IO_5V_E[1..5]
DIG_IO_5V_F[1..5]

DIG_IO_SINGLE

DIG_IO_SINGLE_A[1..5]
DIG_IO_SINGLE_B[1..5]
DIG_IO_SINGLE_C[1..5]
DIG_IO_SINGLE_D[1..5]
DIG_IO_SINGLE_E[1..5]
DIG_IO_SINGLE_F[1..5]

DIG_O_15V_A[1..5]
DIG_O_15V_B[1..5]
DIG_O_15V_C[1..5]
DIG_O_15V_D[1..5]
DIG_O_15V_E[1..5]
DIG_O_15V_F[1..5]

DIG_IO_SINGLE

Note: Since these 2 pins are not required
it is ok that they are not connected but
Altium raises an error here.

SN74LVCH16T245_B

2B8
2B7 DIG_IO_5V_E3
2B6 DIG_IO_5V_F3
2B5 DIG_IO_5V_A4
2B4 DIG_IO_5V_B4
2B3 DIG_IO_5V_C4
2B2 DIG_IO_5V_D4
2B1 DIG_IO_5V_E4
1B8 DIG_IO_5V_F4
1B7 DIG_IO_5V_A5
1B6 DIG_IO_5V_B5
1B5 DIG_IO_5V_C5
1B4 DIG_IO_5V_D5
1B3 DIG_IO_5V_E5
1B2 DIG_IO_5V_F5
1B1

DIG_IO_17_to_30

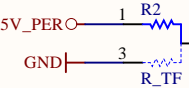
REPEAT(LS15V,1,5)
ONSEMI_MC14504BDR2G

DIG_IO_5V_A
DIG_IO_5V_B
DIG_IO_5V_C
DIG_IO_5V_E
DIG_IO_5V_F
DIG_IO_5V_D

REPEAT(AIN)
REPEAT(BIN)
REPEAT(CIN)
REPEAT(DIN)
REPEAT(EIN)
REPEAT(FIN)
REPEAT(AOUT)
REPEAT(BOUT)
REPEAT(COUT)
REPEAT(DOUT)
REPEAT(EOUT)
REPEAT(FOUT)

DIG_IO_SINGLE_A
DIG_IO_SINGLE_B
DIG_IO_SINGLE_C
DIG_IO_SINGLE_E
DIG_IO_SINGLE_F
DIG_IO_SINGLE_D

S50
S50
S50
S50
S50
S50



MODE

A

A

B

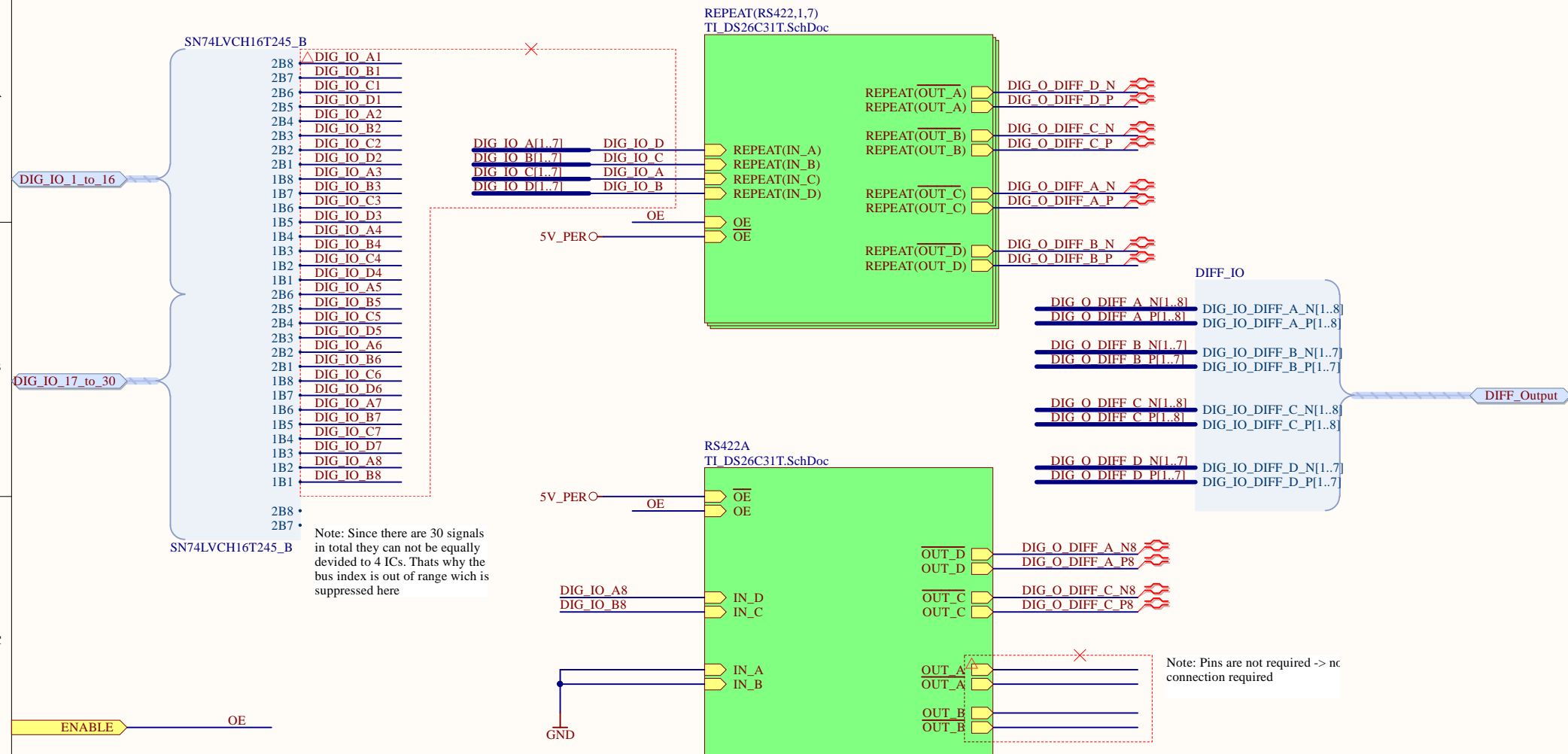
B

C

C

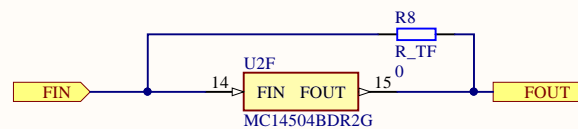
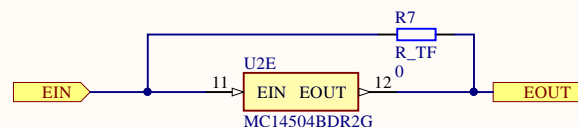
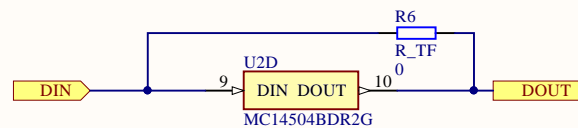
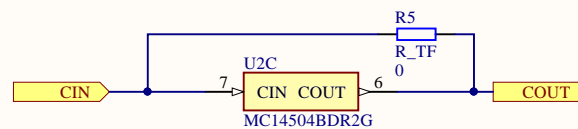
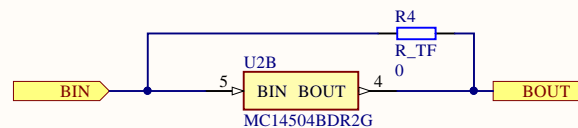
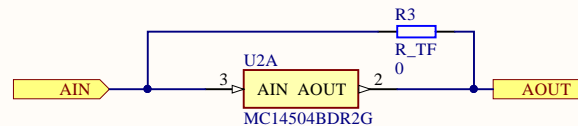
D

D



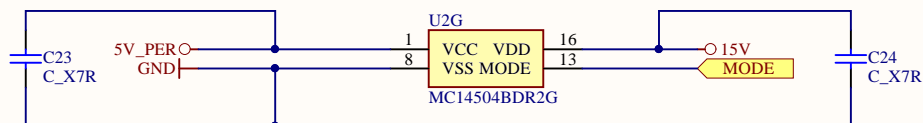
A

A



Voltages:
VCC = voltage level of the input signal
VDD = output voltage level

Application:
MODE = VCC -> TTL logic level input
MODE = VSS -> CMOS logic level input

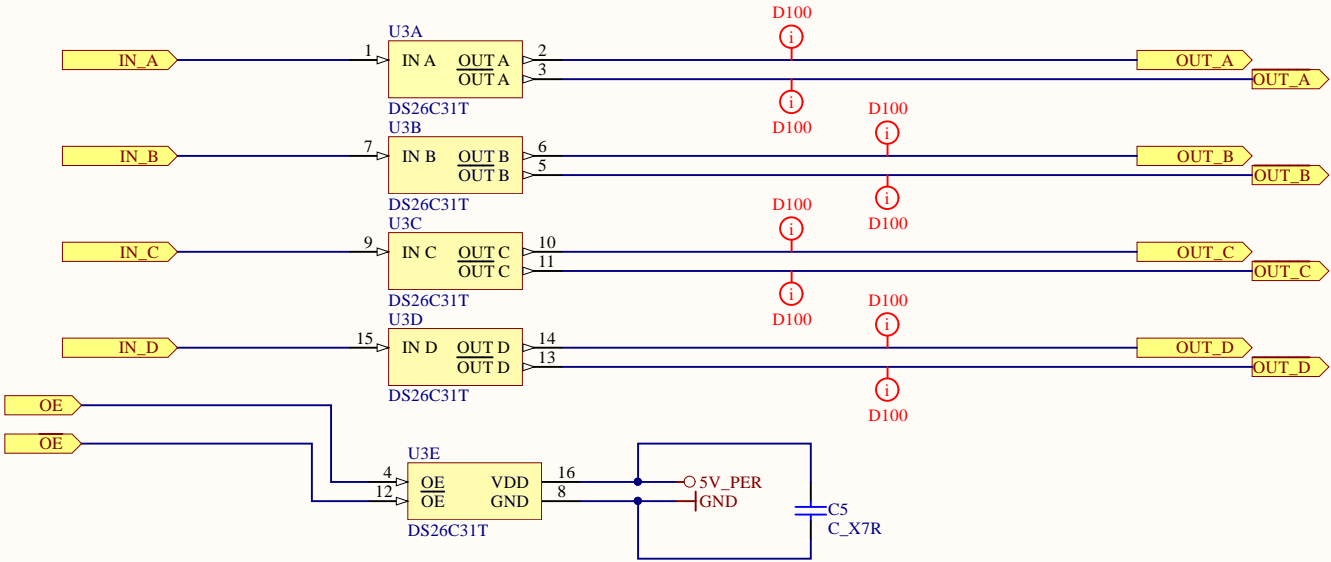


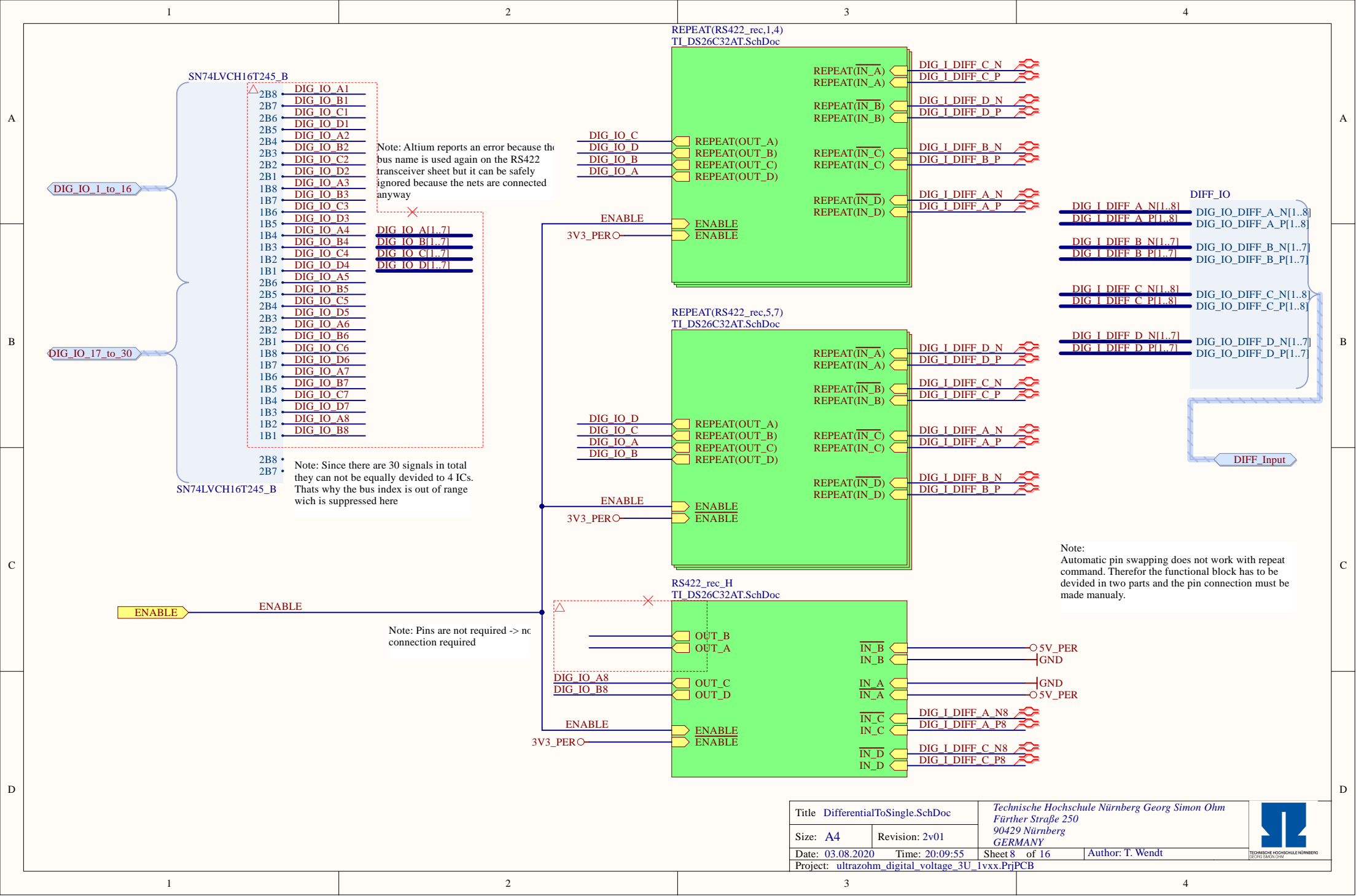
D

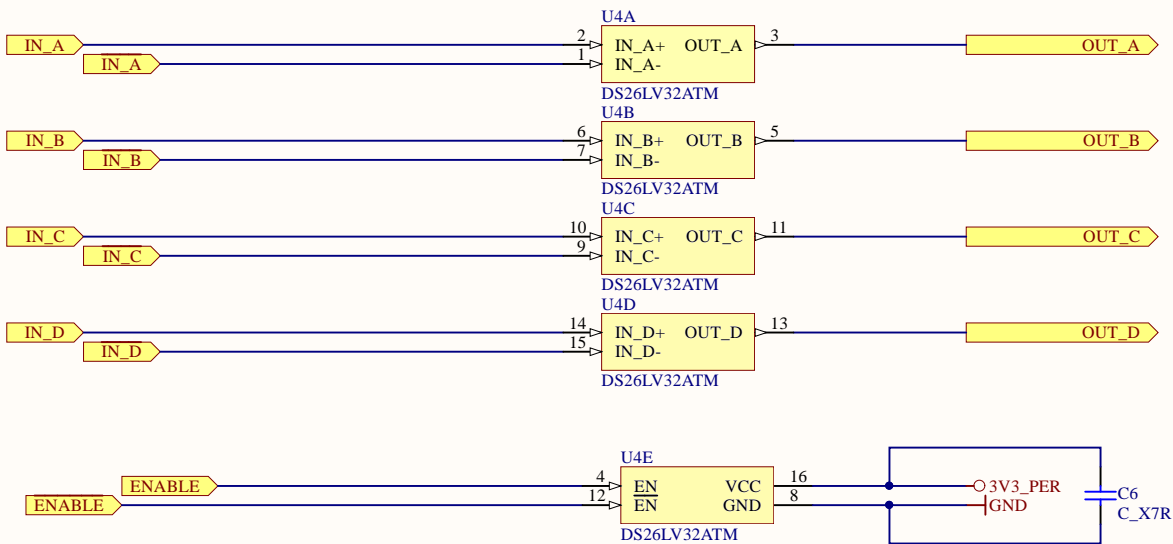
D

Application:
VDD_min = 4.5V
VDD_max = 5.5V

VIN_high_min = 2.0V
VIN_low_max = 0.8V







Application:
VDD_min = 3.0V
VDD_max = 3.6V

A

B

C

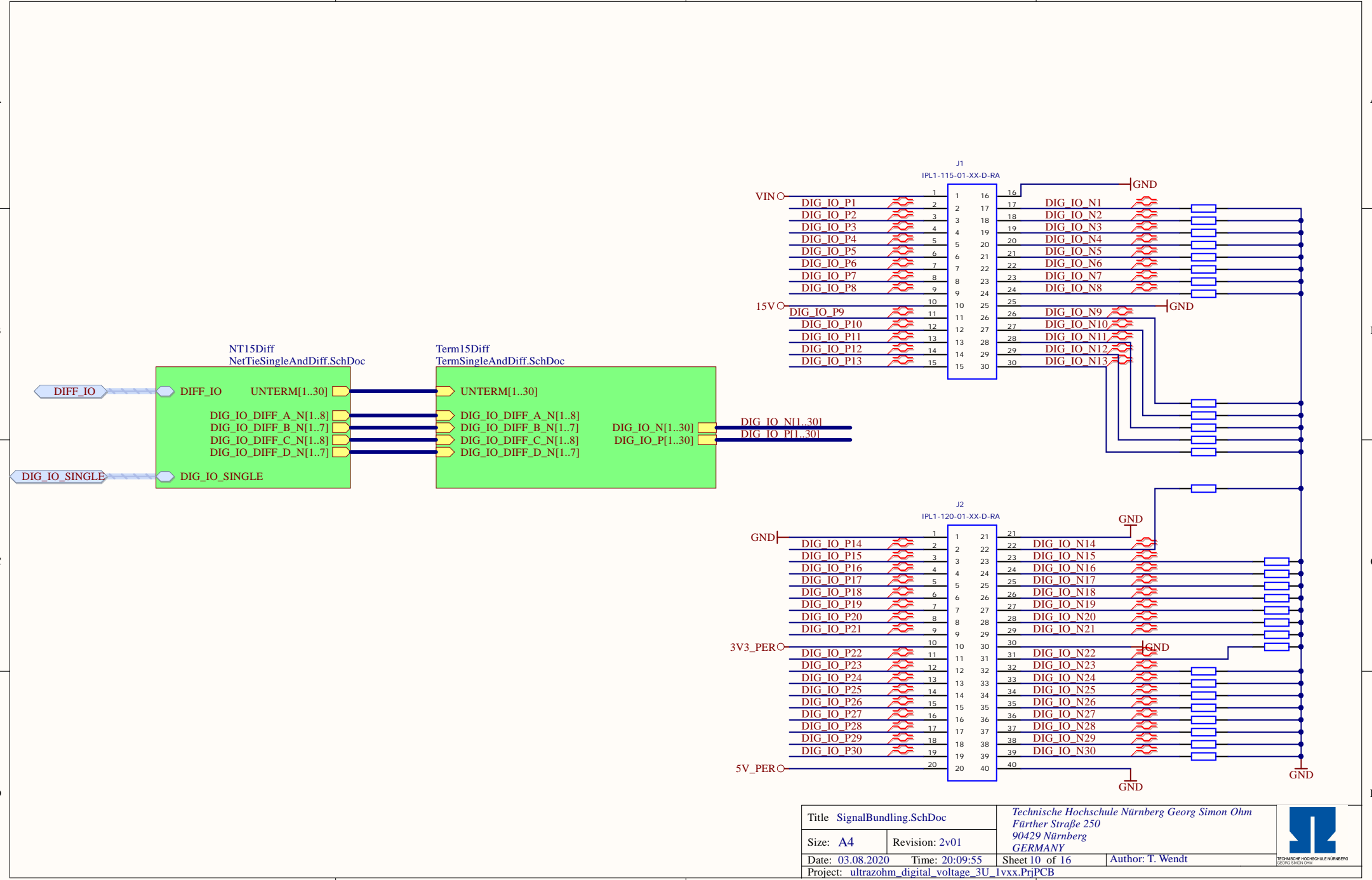
D

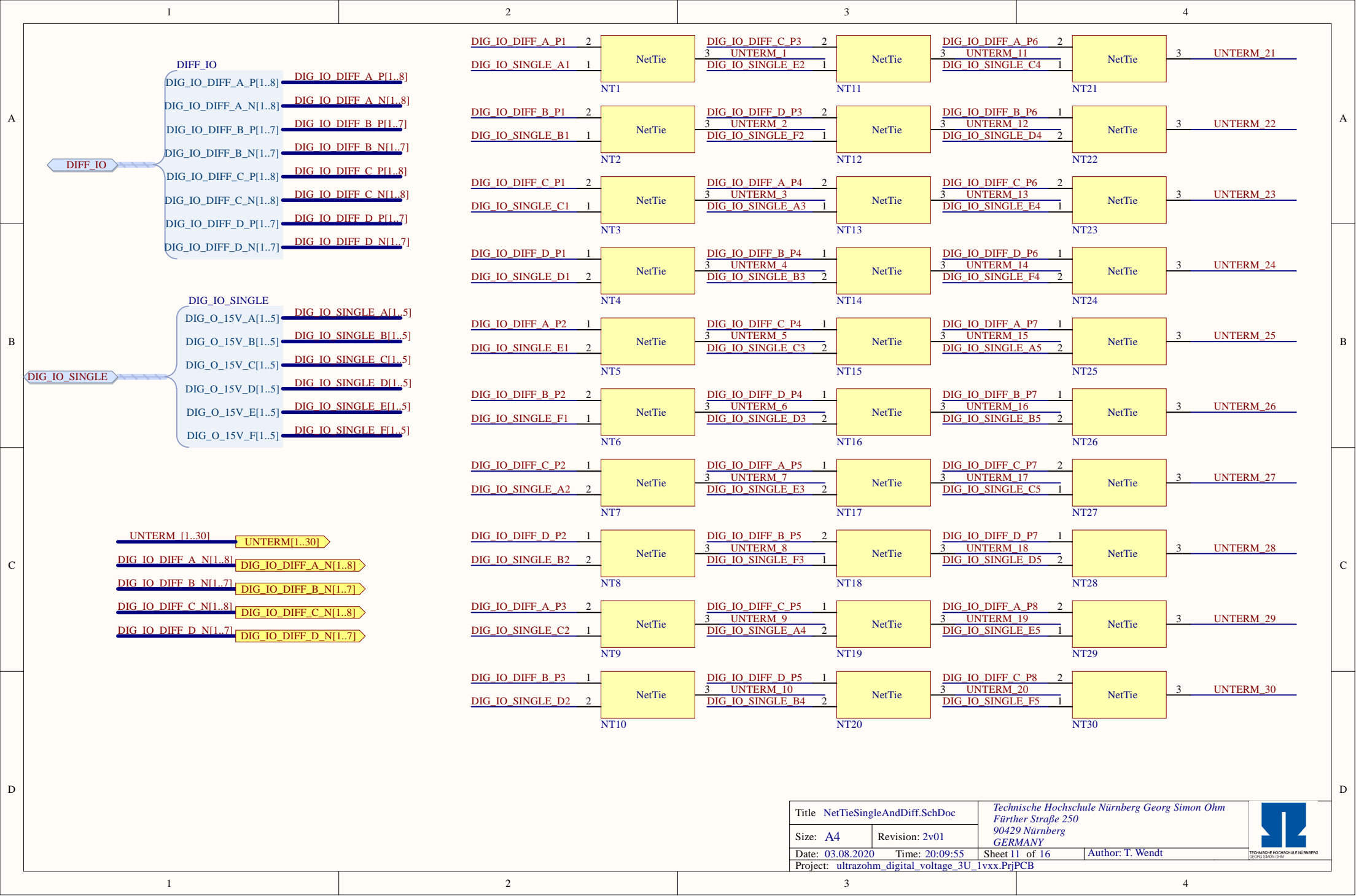
A

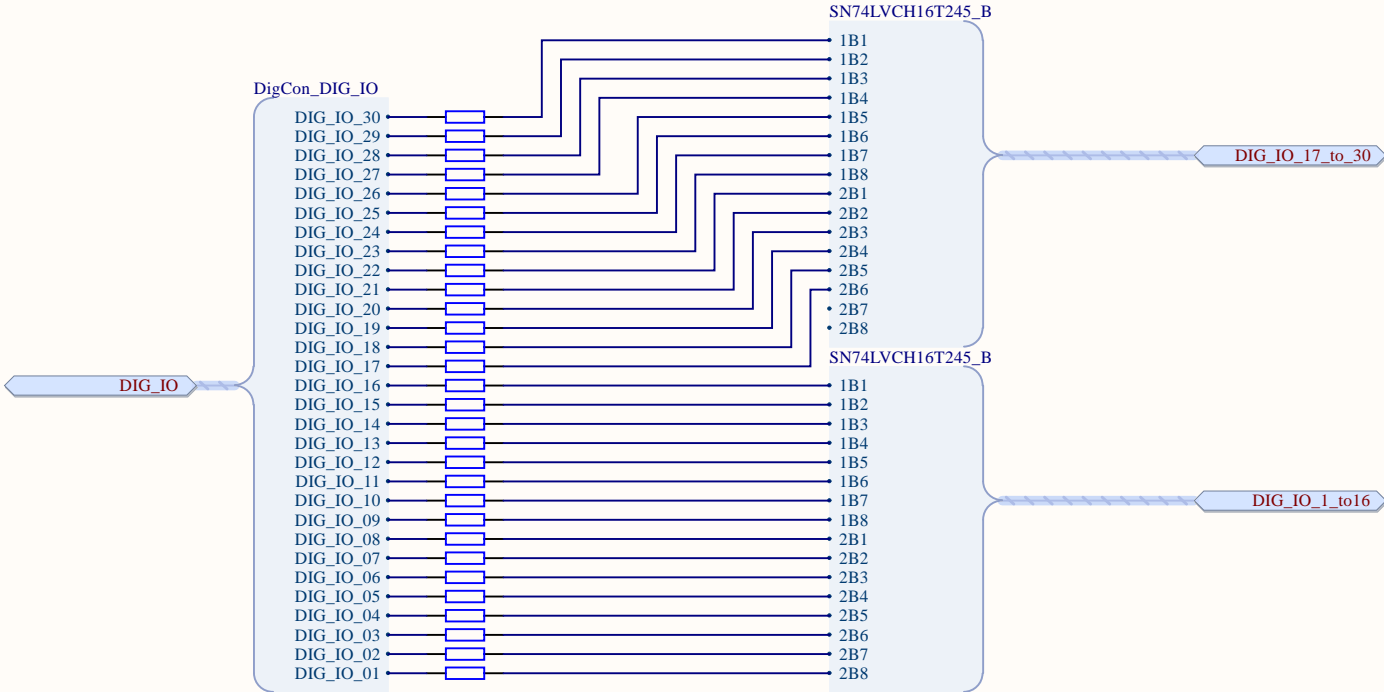
B

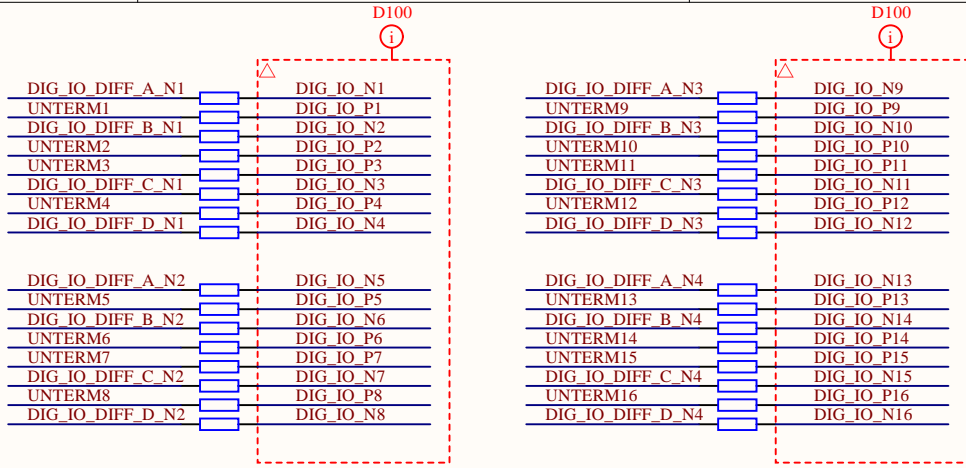
C

D



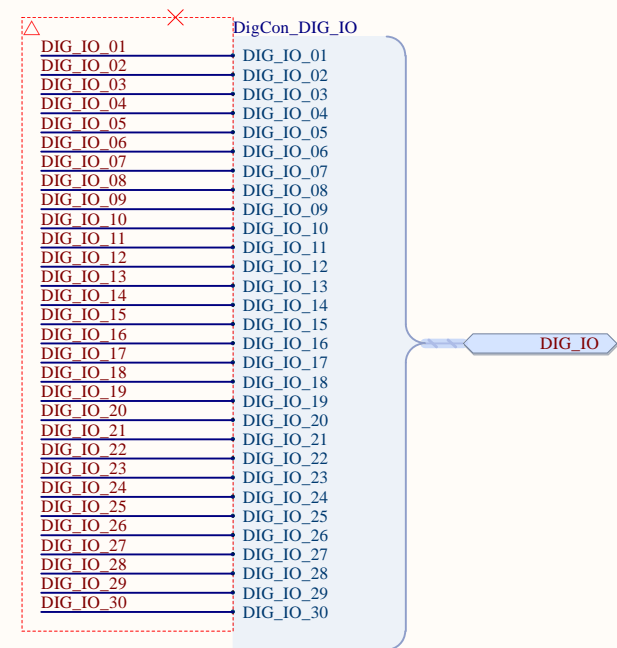
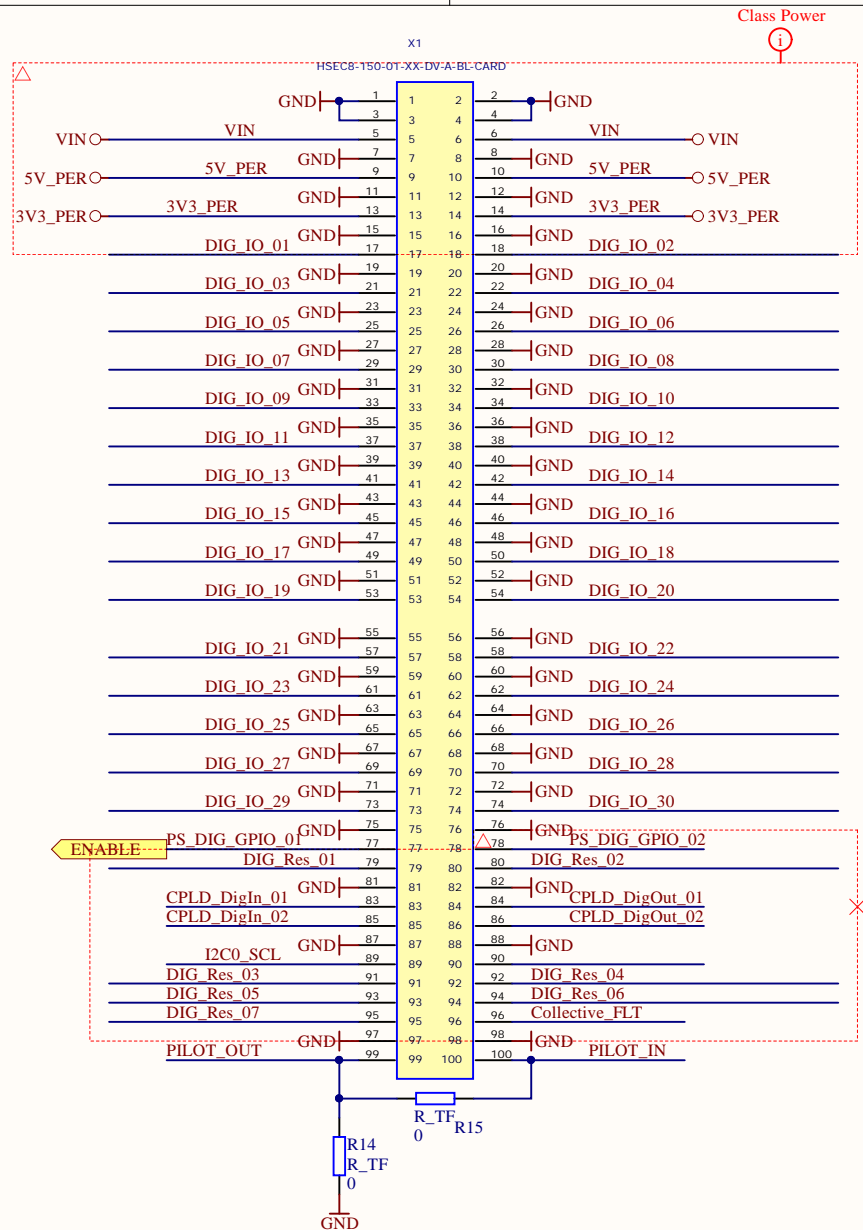






Note: The serial termination resistors are placed at the IO interface and not directly behind the level shifter from 3V3 to 5V, because 30 extra resistors would be required which implies additional assembly effort.

Note: If the board is configured as a receiver, the termination resistors can be replaced with jumpers.



A

B

C

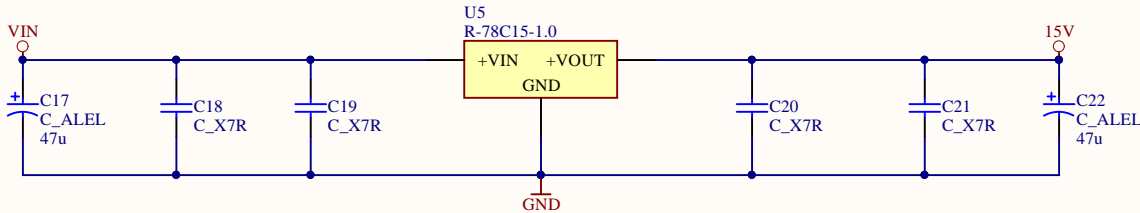
D

A

B

C

D



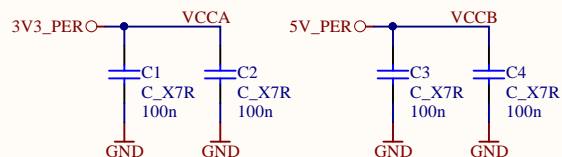
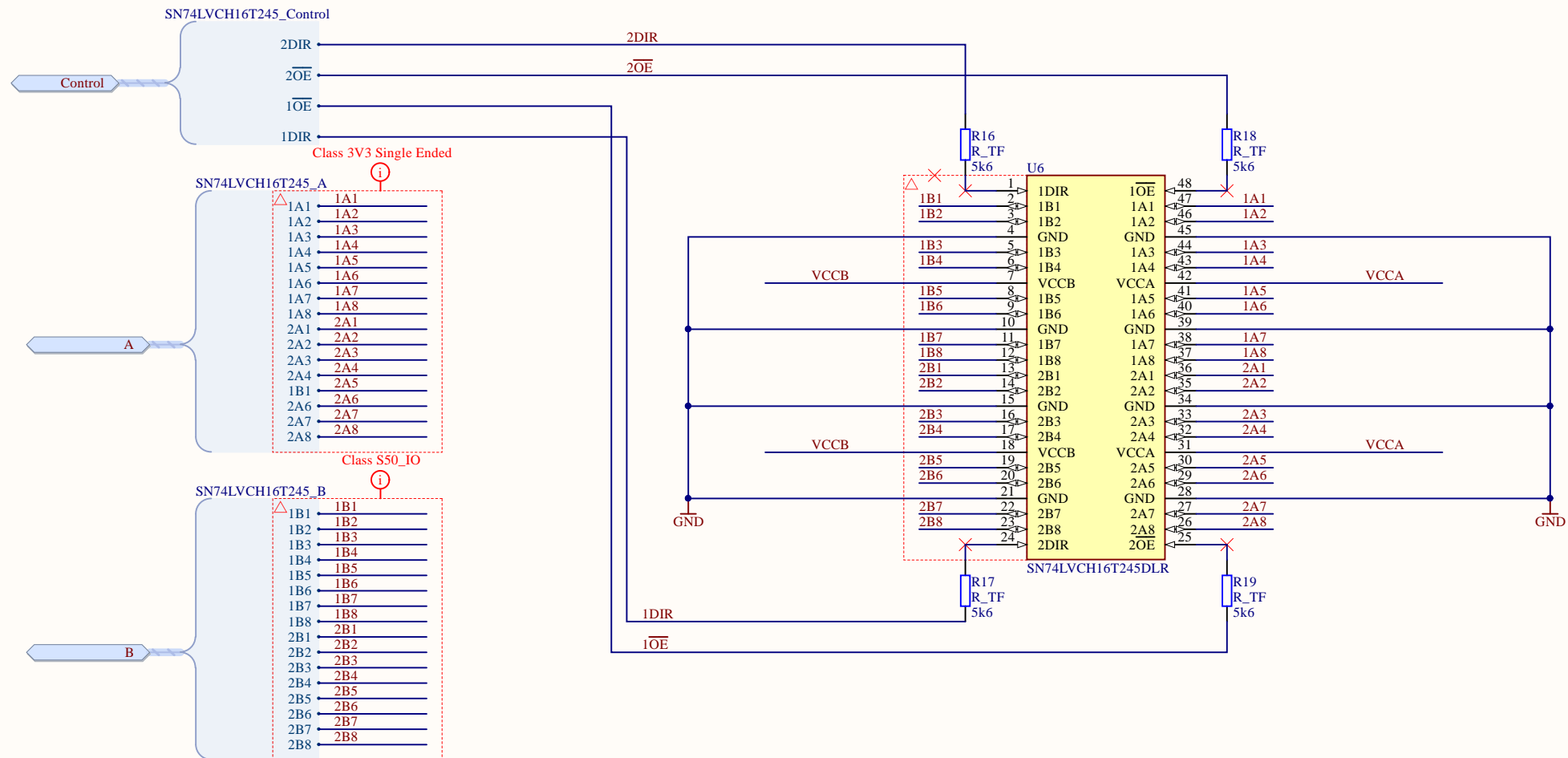
Totally integrated DCDC swichting converter.

Voltages:
Vin_max = 42V
Vin_min = 18V

Vout = 15V

Current:
Iout_max = 1A

Parameters:
VoutName = Name of the net of Vout
VinName = Name of the net of Vin



Application:

Voltages:
 VCCA_min = VCCB_min = 1.65V
 VCCA_max = VCCB_max = 5.5V

Note: Altium warns, that an IO pin (from the 5V LS) is connected to an output pin (from the RS422 transceivers). This does not matter because these parts are not assembled together. It can be suppressed.

Direction pins are driven through the resistors

Title: TI_SN74LVCH16T245.SchDoc

Size: A4

Revision: 2v01

Date: 03.08.2020

Time: 20:09:56

Sheet 17 of 17

Author: T. Wendt

Project: ultrazohm_digital_voltage_3U_1vxx.PrjPCB

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