

PBA-CD-15

phyBOARD Polis i.MX 8M Mini

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Project: PBA-CD-15 phyBOARD Polis i.MX8M Mini		Department : F&E Author: T.Jacobus, T. Metz	
09.08.2021	PCB-No.: 1532.1	Revision : 002	Sheet 1 of 22

Overview

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Switch	Function ON	Function OFF
S1-Pad1	Alternate Boot	SOM Boot config (eMMC)
S1-Pad2	Alternate Boot Boot from QSPI	Alternate Boot Boot from SD-Card
S1-Pad3	serial downloader	internal Boot
S1-Pad4	serial1 RS485	serial1 RS232
S1-Pad5		
S1-Pad6		
S2	resetting SOM	---
S3	pulling OnOff-Pin to GND	---

Z1

PHYTEC

Logo

DMC1

DMC

DMC

DMC2

DMC

DMC

Z2

Fiducial-Round

Z4

Fiducial-Square

Z3

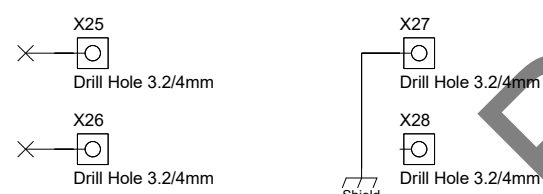
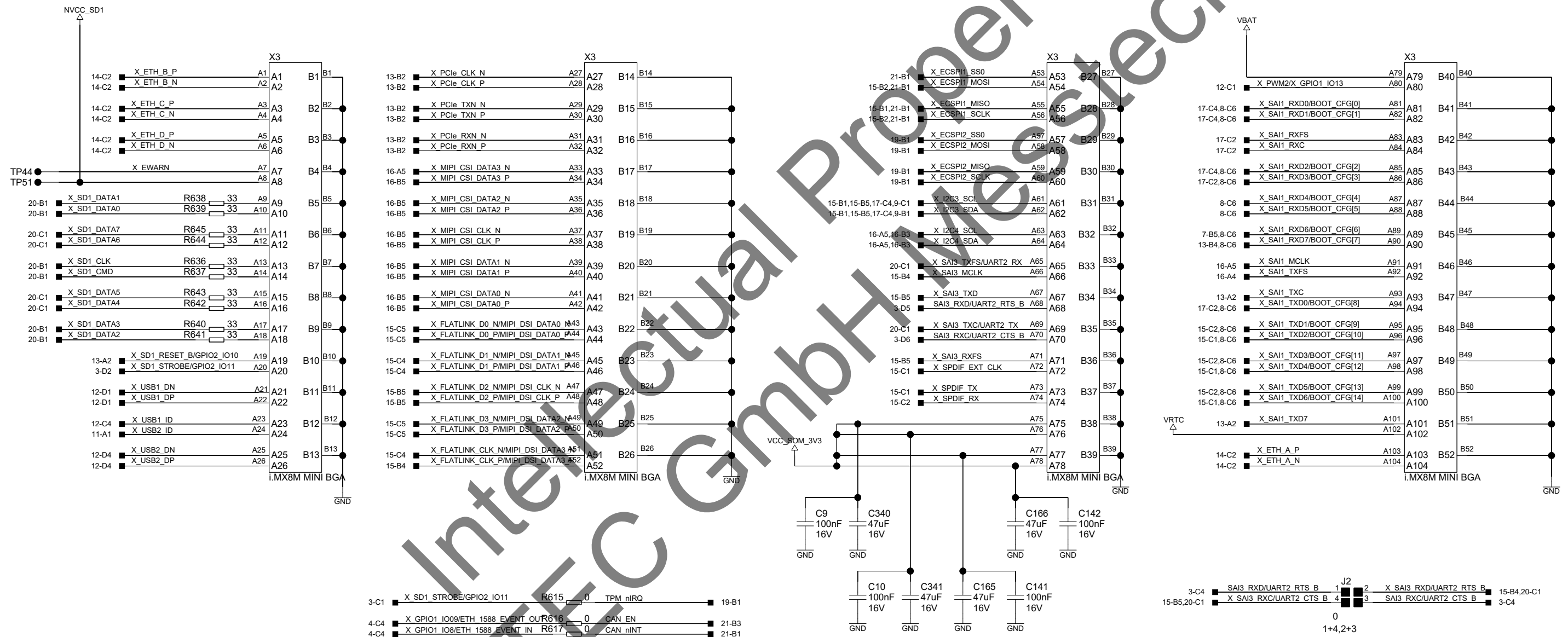
Fiducial-Round

Z5

Fiducial-Square

SOM Connector Page 1

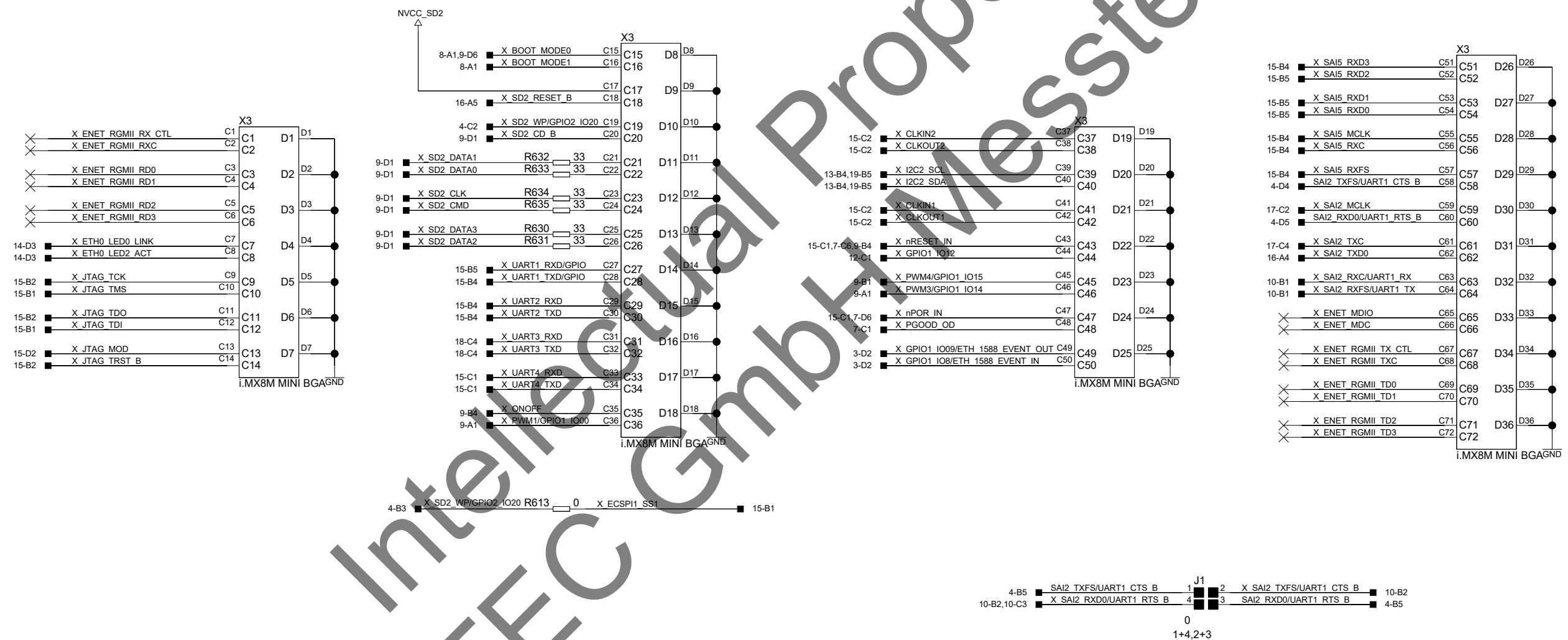
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SOM Connector Page 2

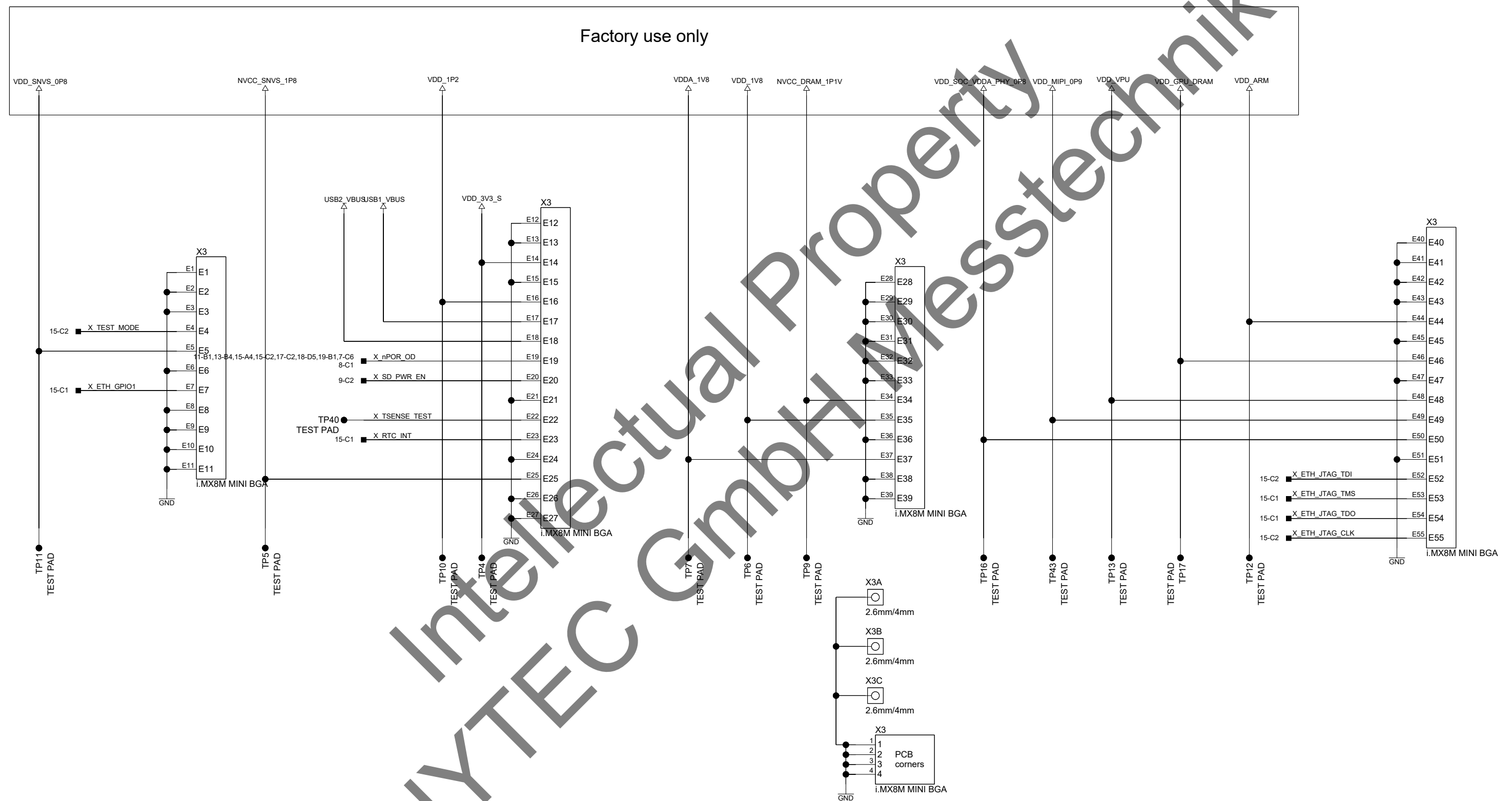
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SOM Connector Page 3

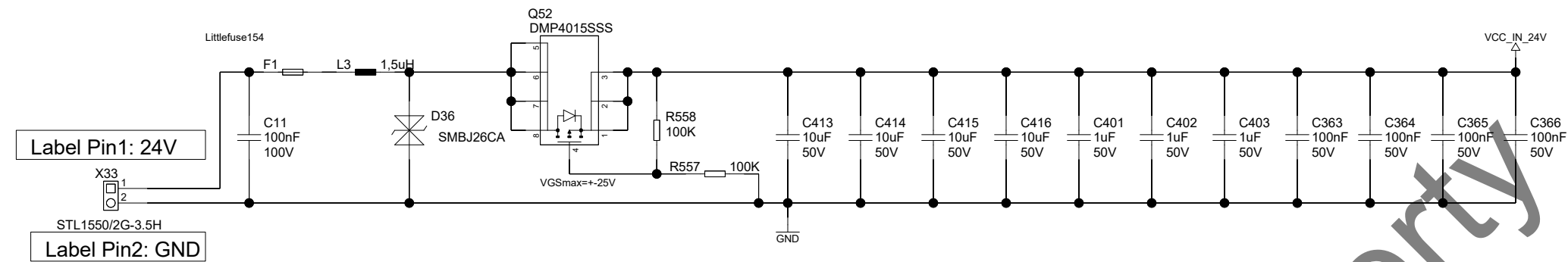
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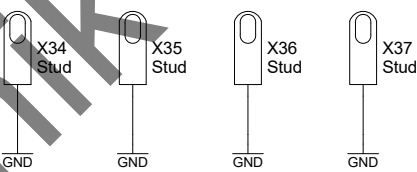
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Power1

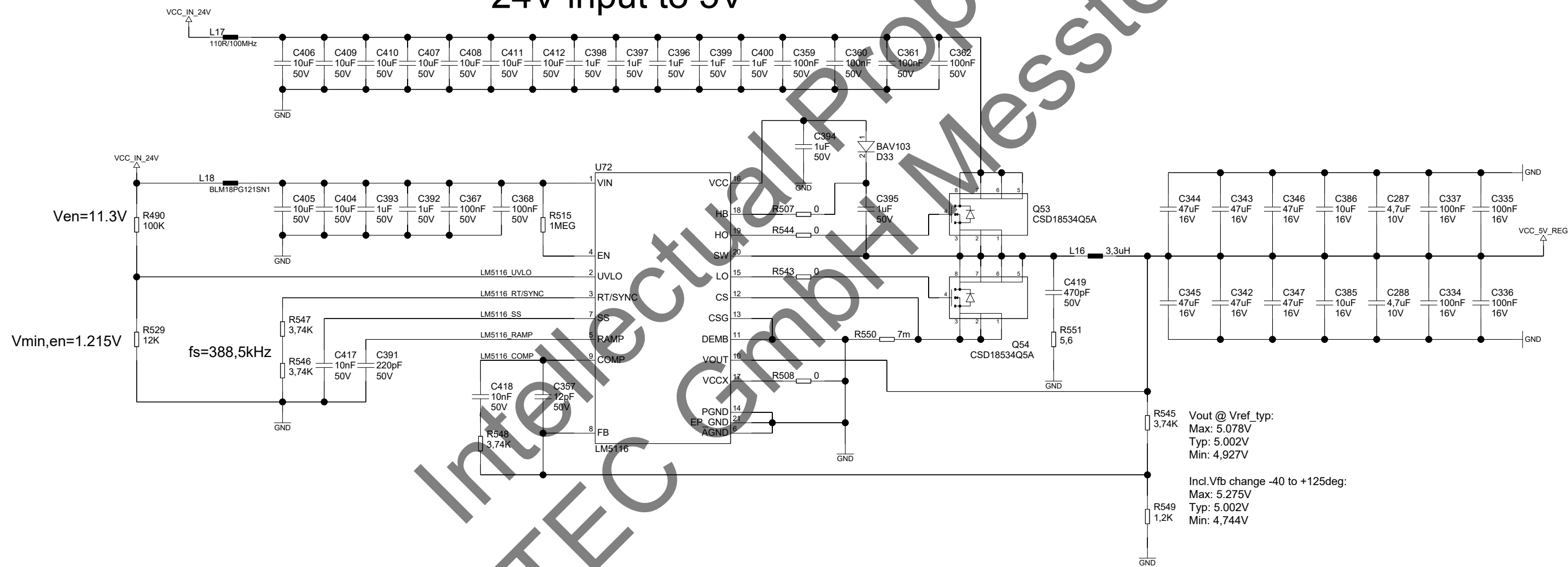
reverse polarity
protection



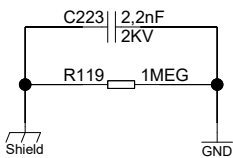
GND for Measurement



24V input to 5V



Shield



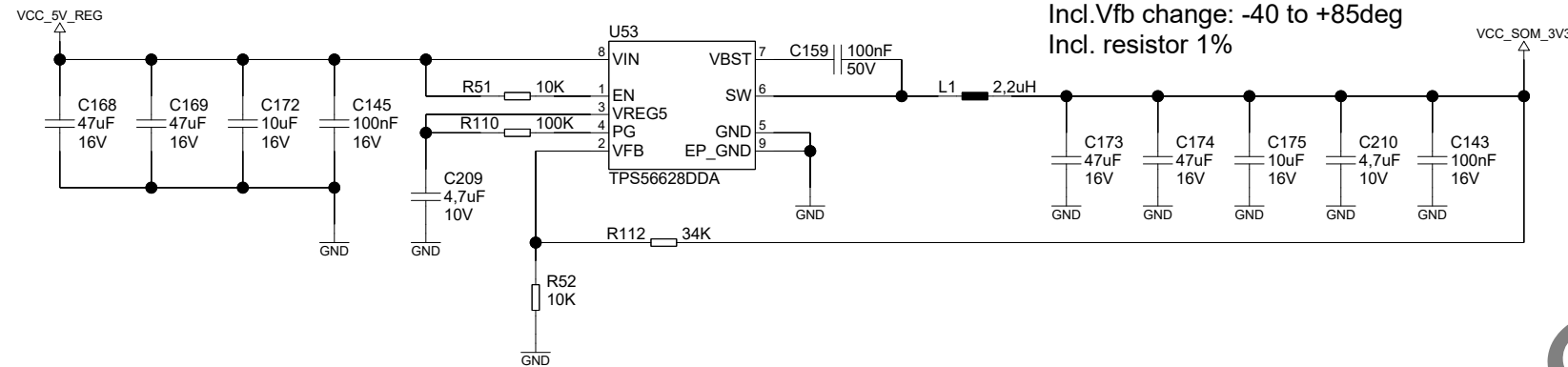
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Power2

3.3V / 6A

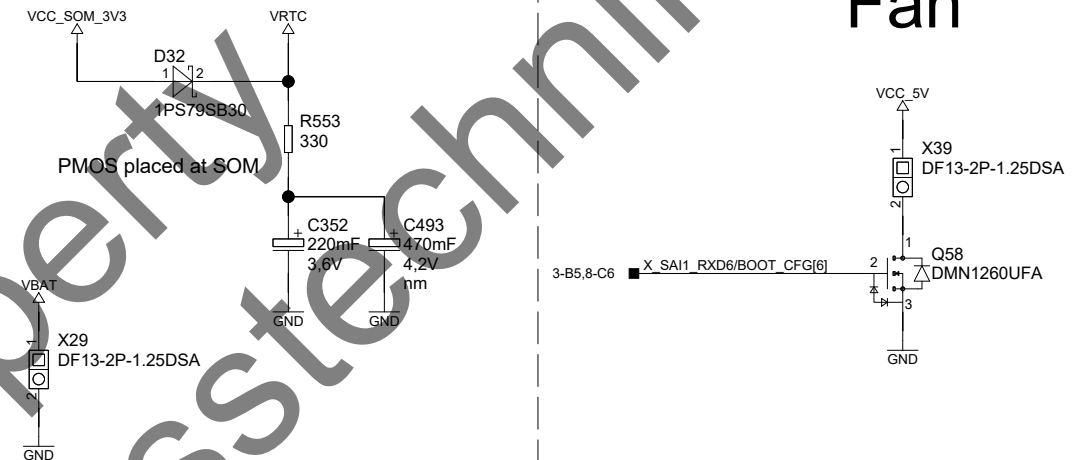
Vmin: 3,254V
Vtyp: 3,366V
Vmax:3,481V
Incl.Vfb change: -40 to +85deg
Incl. resistor 1%



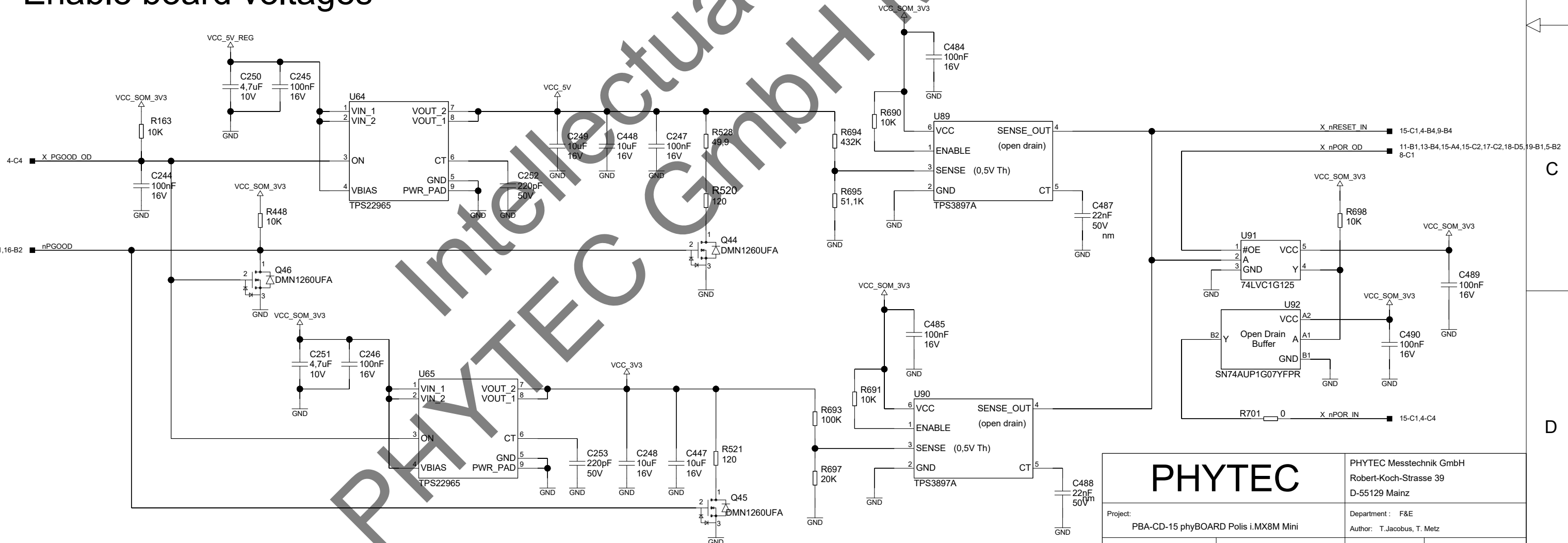
Gold CAP

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Fan



Enable board voltages



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Bootmode Configuration

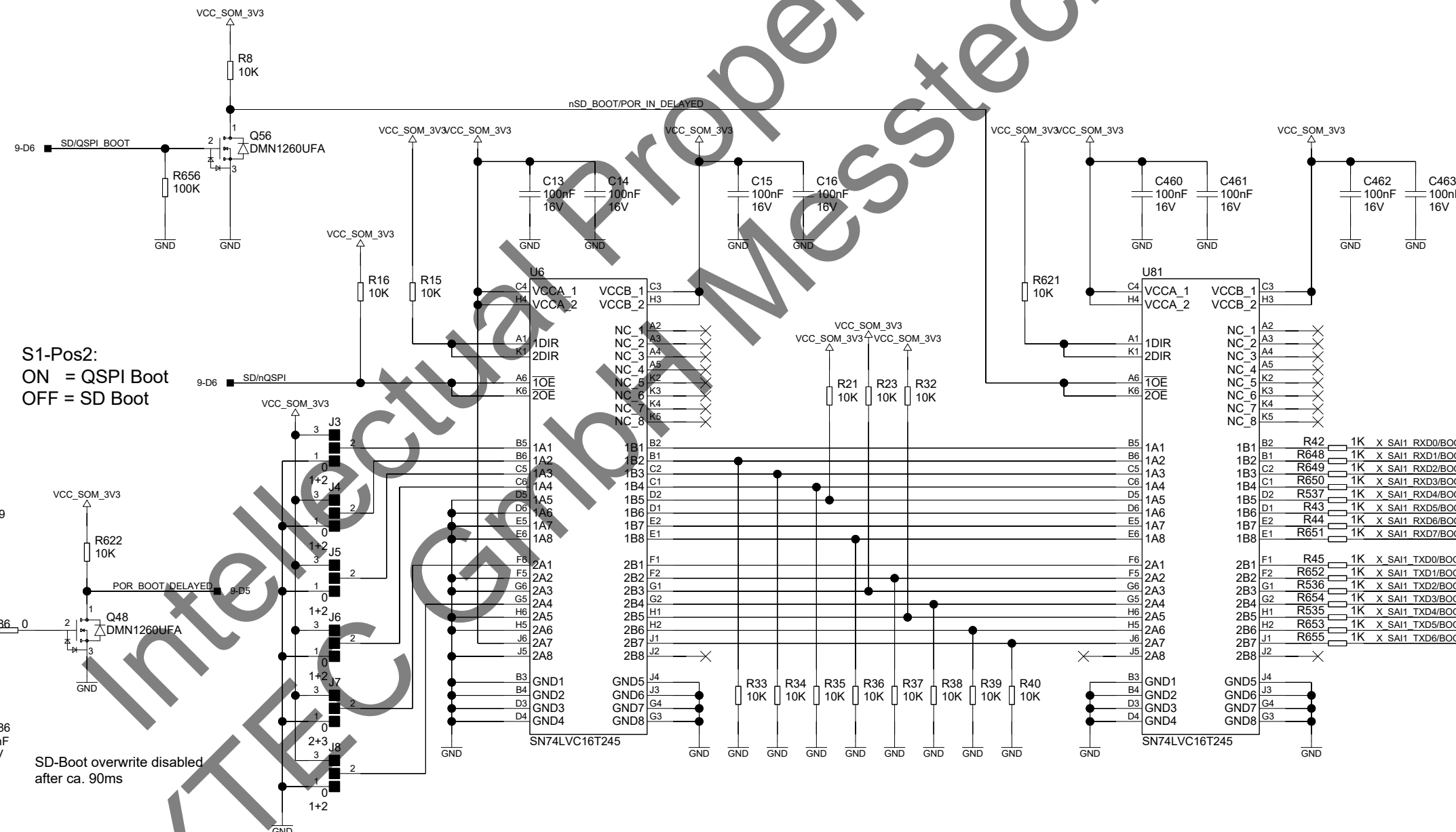
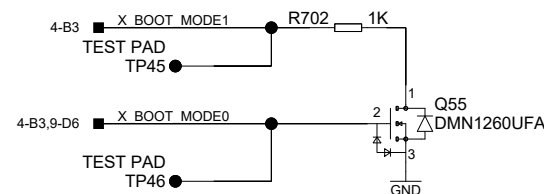
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BOOT_MODE[1:0]	BOOT TYPE
00	Boot from fuses
01	Serial Downloader
10	Internal Boot (GPIO overwrite)
11	Reserved

Resistors for [10]
placed at SOM

Default eMMC Boot

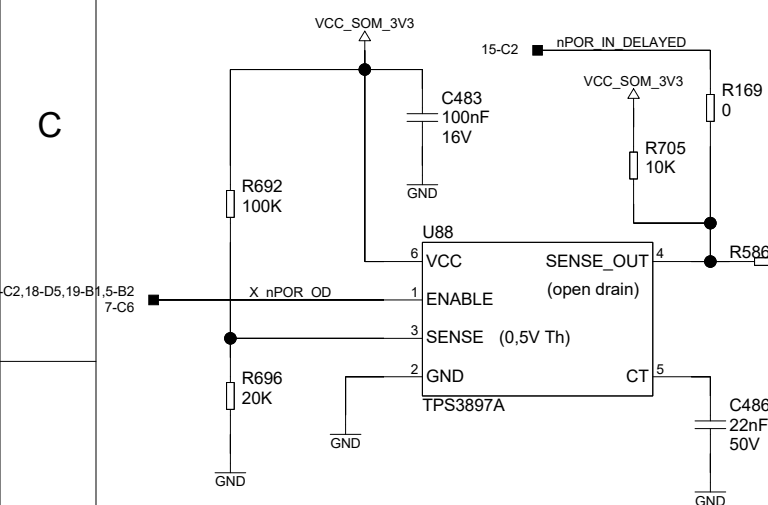
BOOT_CFG	[15]	[14]	[13]	[12]	[11]	[10]	[9]	[8]	[7]	[6]	[5]	[4]	[3]	[2]	[1]	[0]
Default/ eMMC	0	0	1	0	0	0	1	0	0	0	1	0	0	1	1	0
Overwrite/ SD-Card	x	0	0	1	0	1	0	x	0	x	x	1	0	0	0	x
Overwrite/ QSPI	x	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Jumper QSPI					J8			J7				J6	J5	J4	J3	



Alternate Boot

S1-Pos1:
ON = Alternate Boot
OFF = eMMC

S1-Pos2:
ON = QSPI Boot
OFF = SD Boot



SD-Boot overwrite disabled
after ca. 90ms

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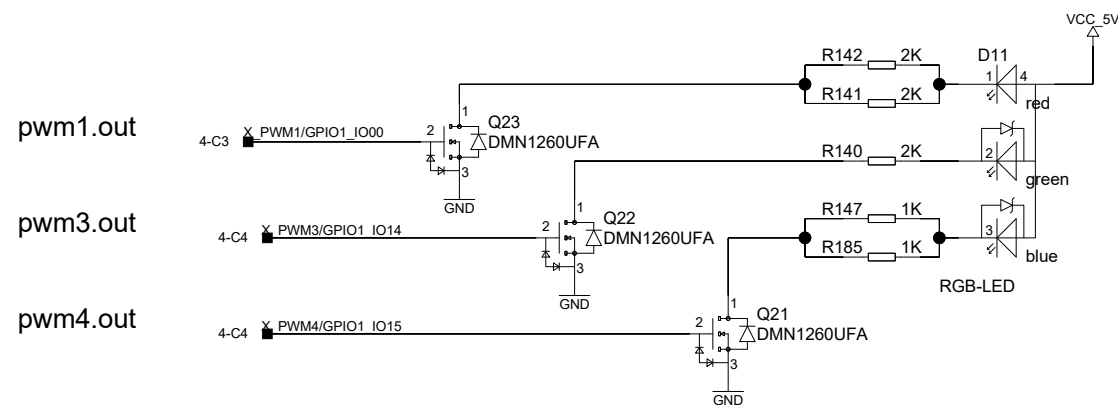
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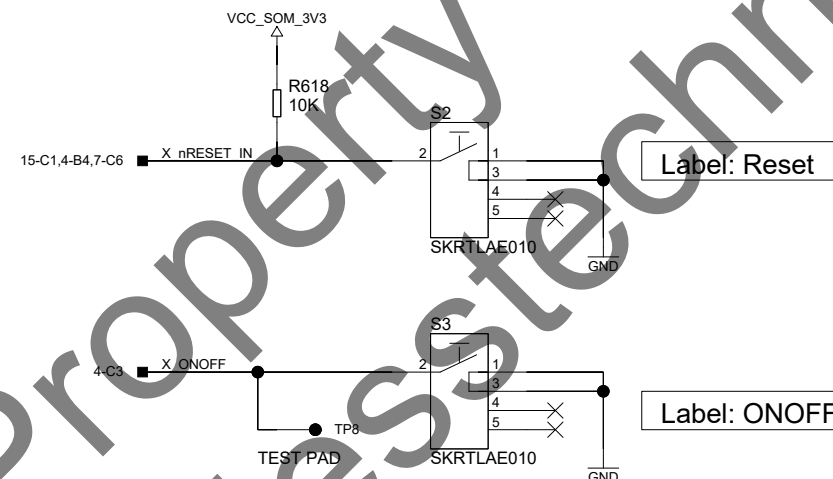
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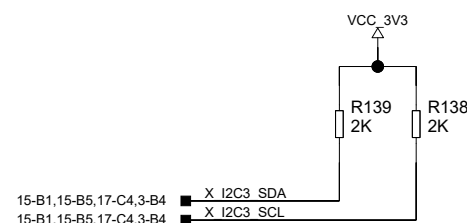
RGB LED



Reset Button/ ONOFF Button

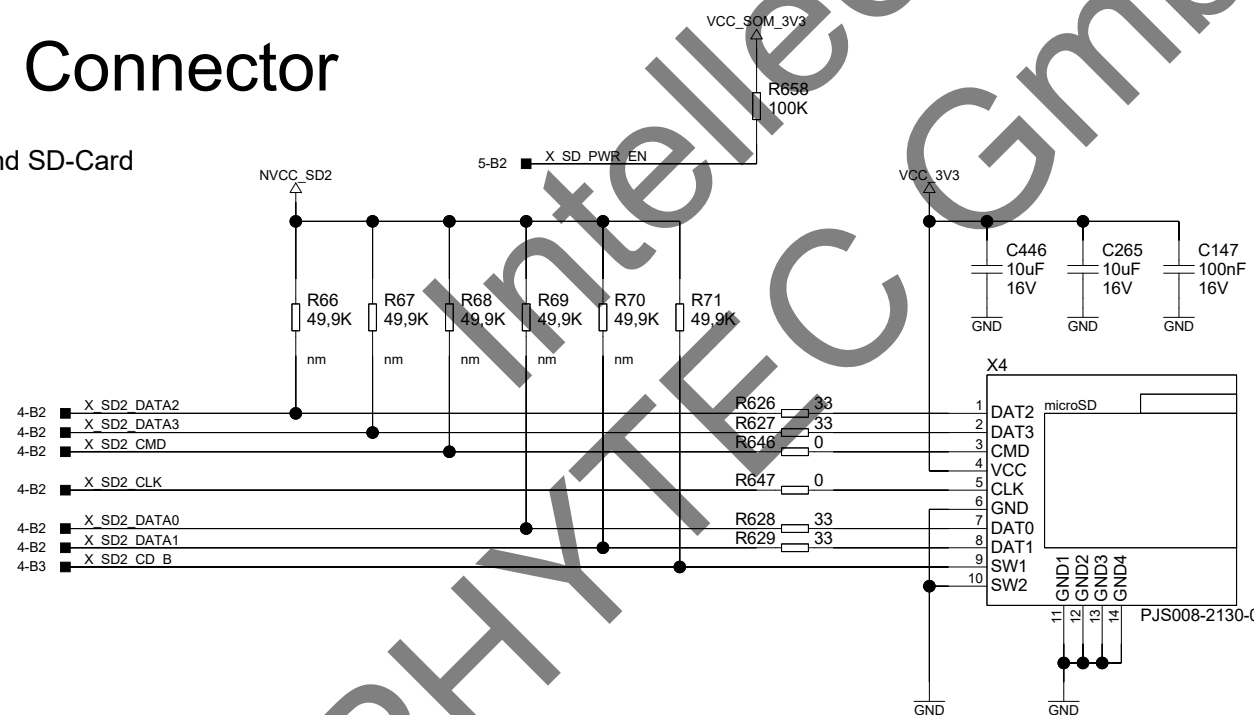


I2C3



uSD-Card Connector

S1-Pos3:
select between WIFI and SD-Card
ON: SD-Card
OFF: WIFI



Dip-Switch

Label Pos1:
Pad12(ON): Alternate-BOOT
Pad1(OFF): Default-BOOT

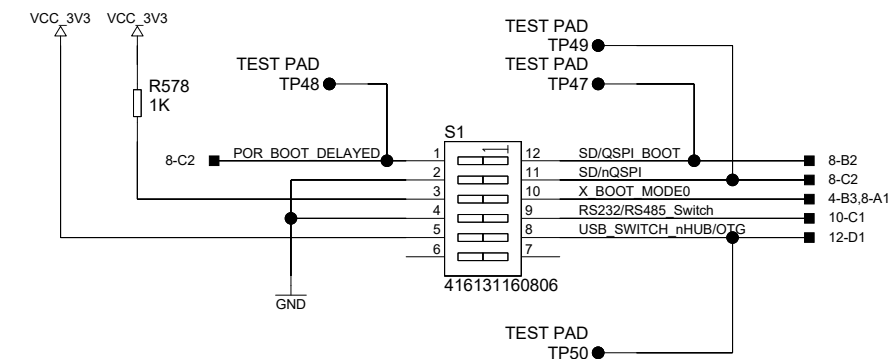
Label Pos2:
Pad11 (ON): QSPI-BOOT
Pad2 (OFF): SD-BOOT

Label Pos3:
Pad10 (ON): Serial Downloader
Pad3 (OFF): Internal Boot

Label Pos4:
Pad9 (ON): UART1 RS485
Pad4 (OFF): UART1 RS232

Label Pos5: iMX8 NANO only
Pad8 (ON): USB NANO OTG Port
Pad5 (OFF): USB NANO HUB

Label Pos6:
Pad7 (ON):
Pad6 (OFF):



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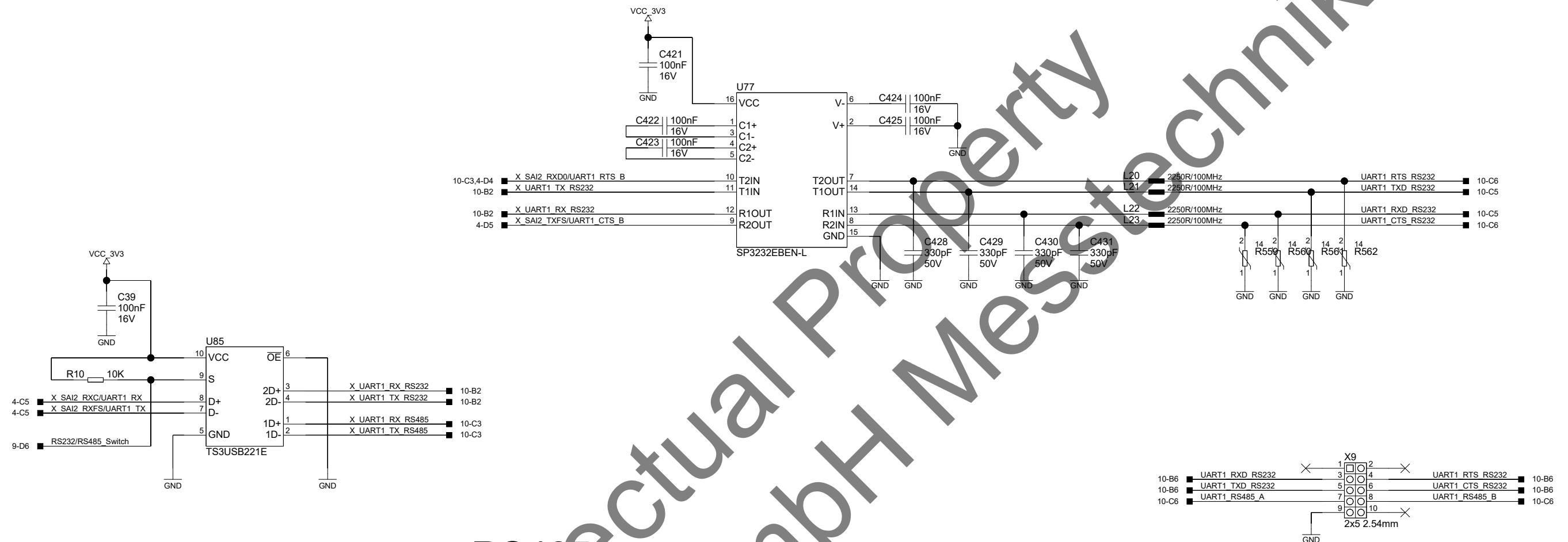
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UART Multiplexer

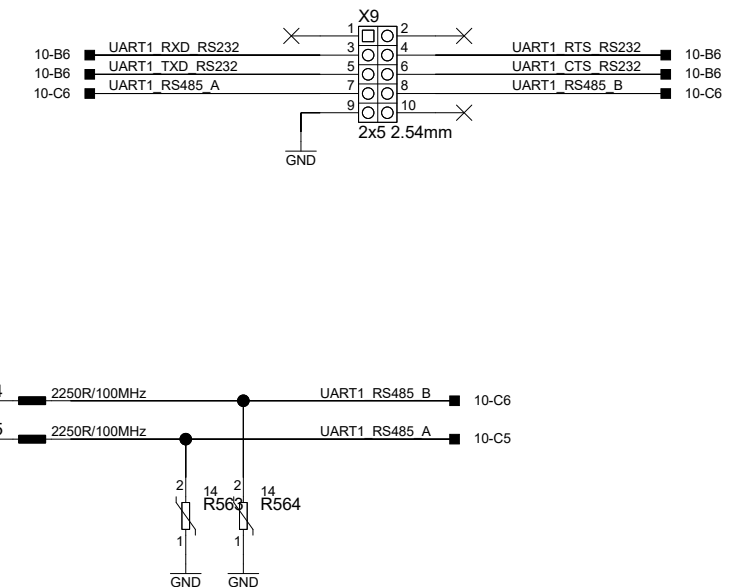
RS232

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RS485

CTS not needed



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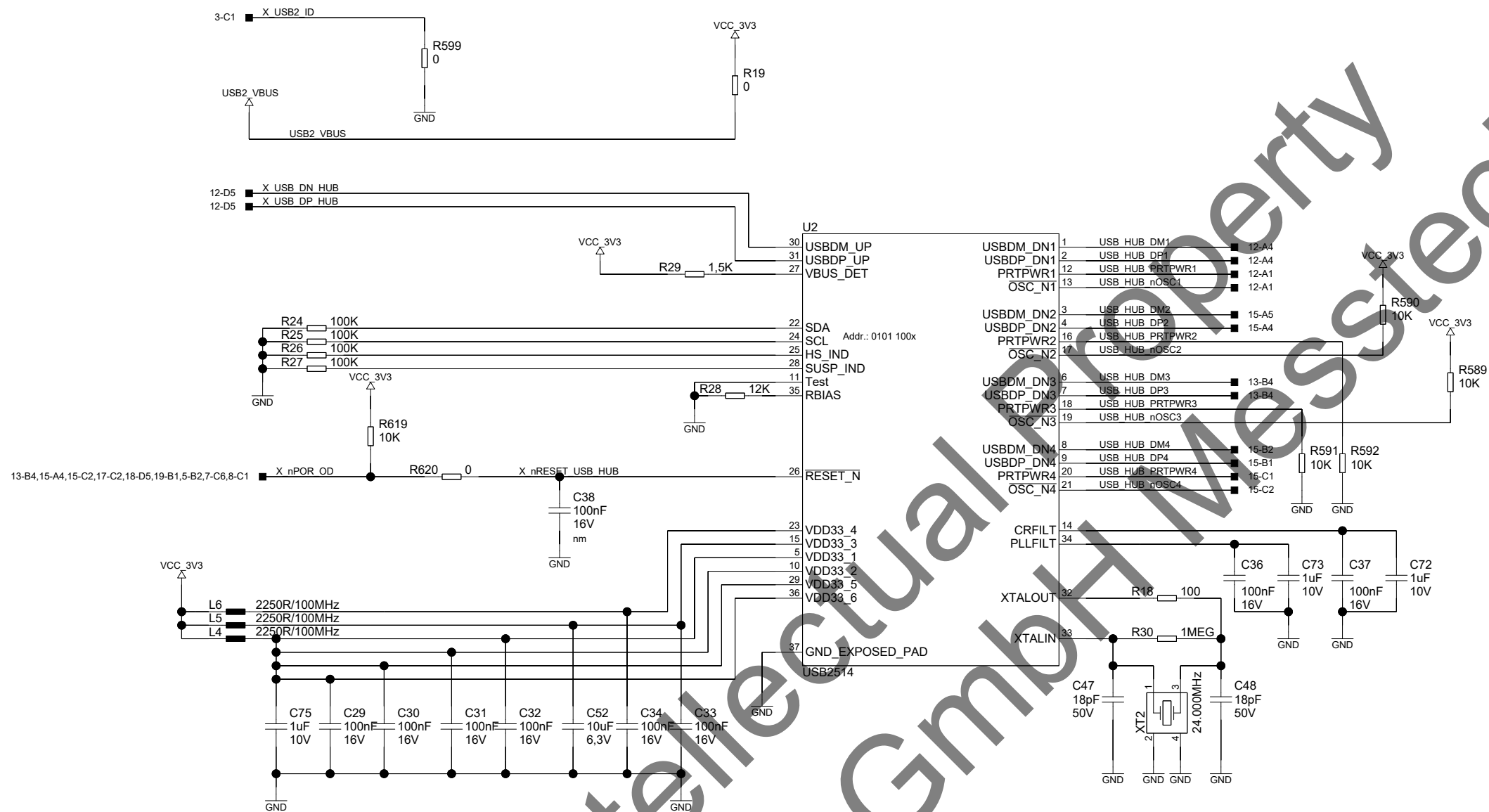
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USB-HUB

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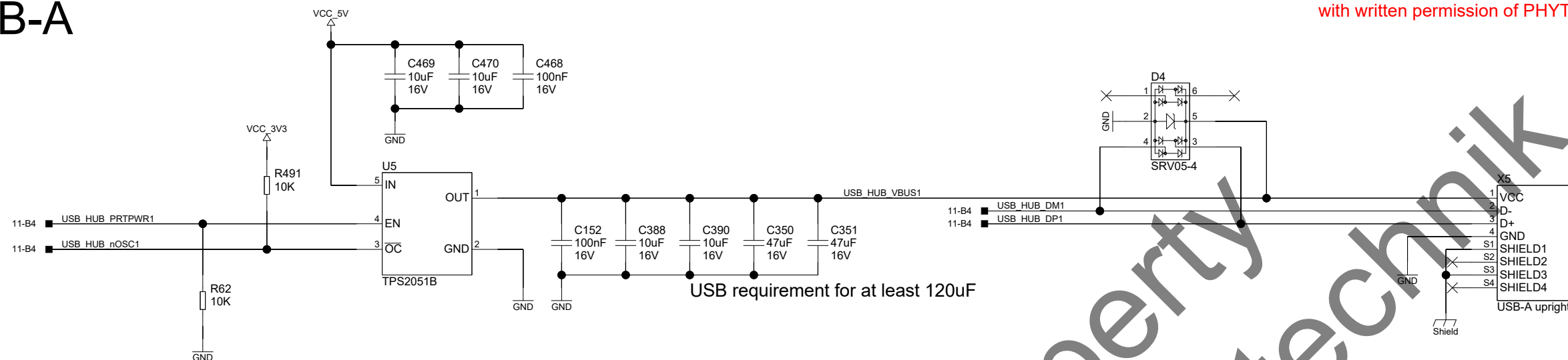
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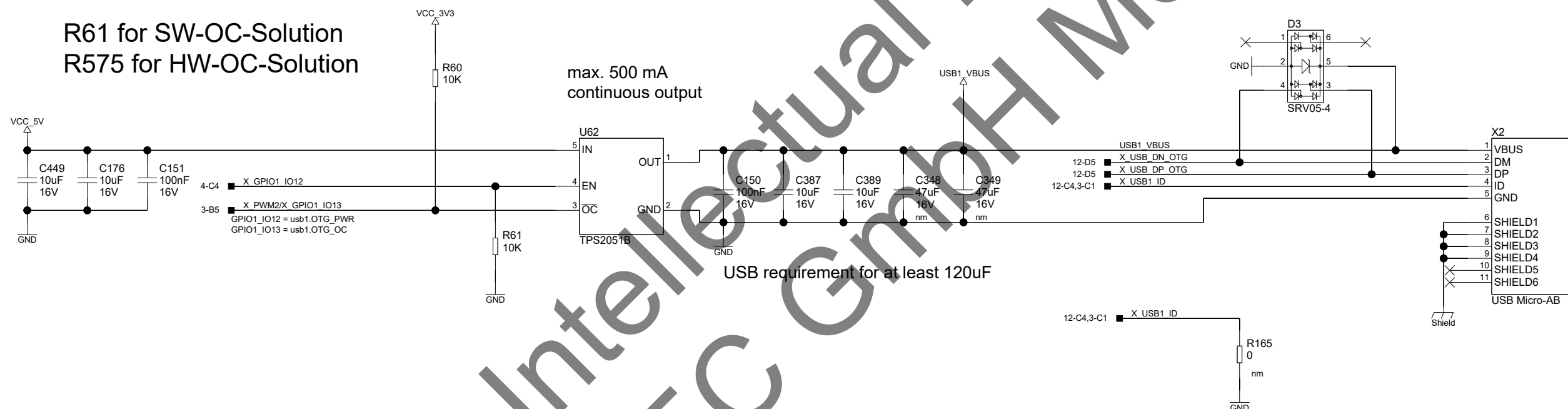
USB-A



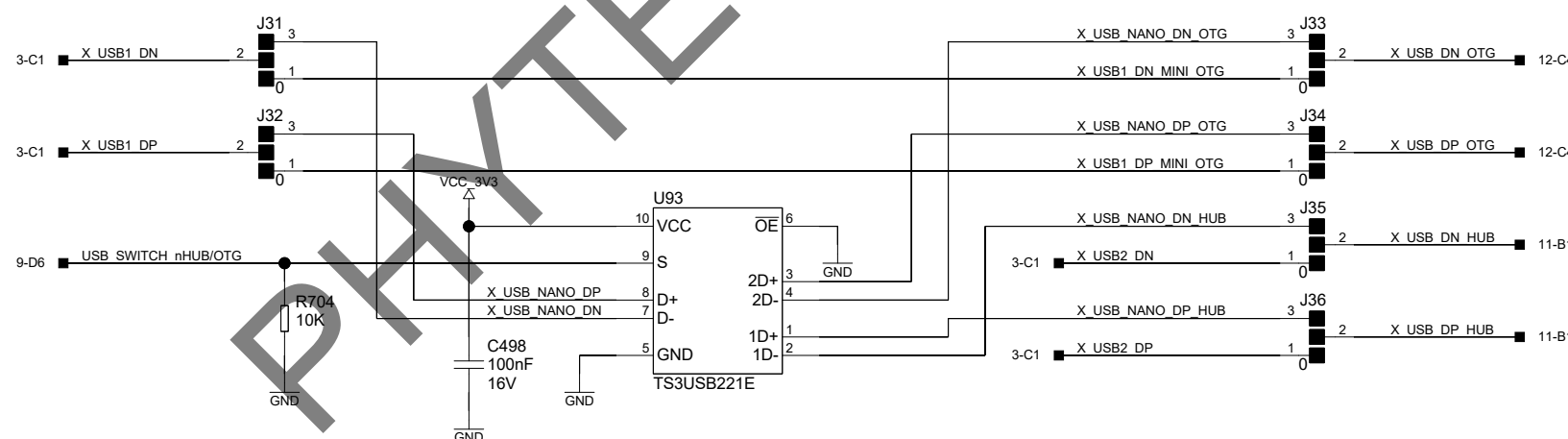
USB OTG

USB OTG1 useable for serial downloader

R61 for SW-OC-Solution
R575 for HW-OC-Solution



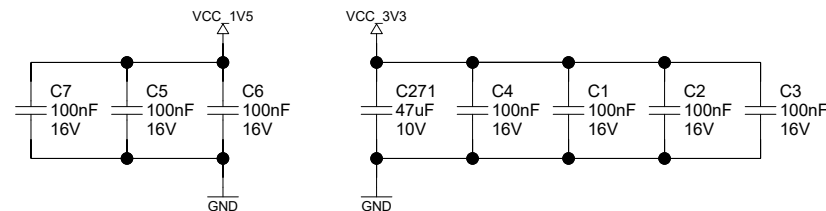
USB Switch



Modul	J31	J32	J33	J34	J35	J36	U93
iMX8M Mini	1+2	1+2	1+2	1+2	1+2	1+2	nm
iMX8M NANO	2+3	2+3	2+3	2+3	2+3	2+3	mount

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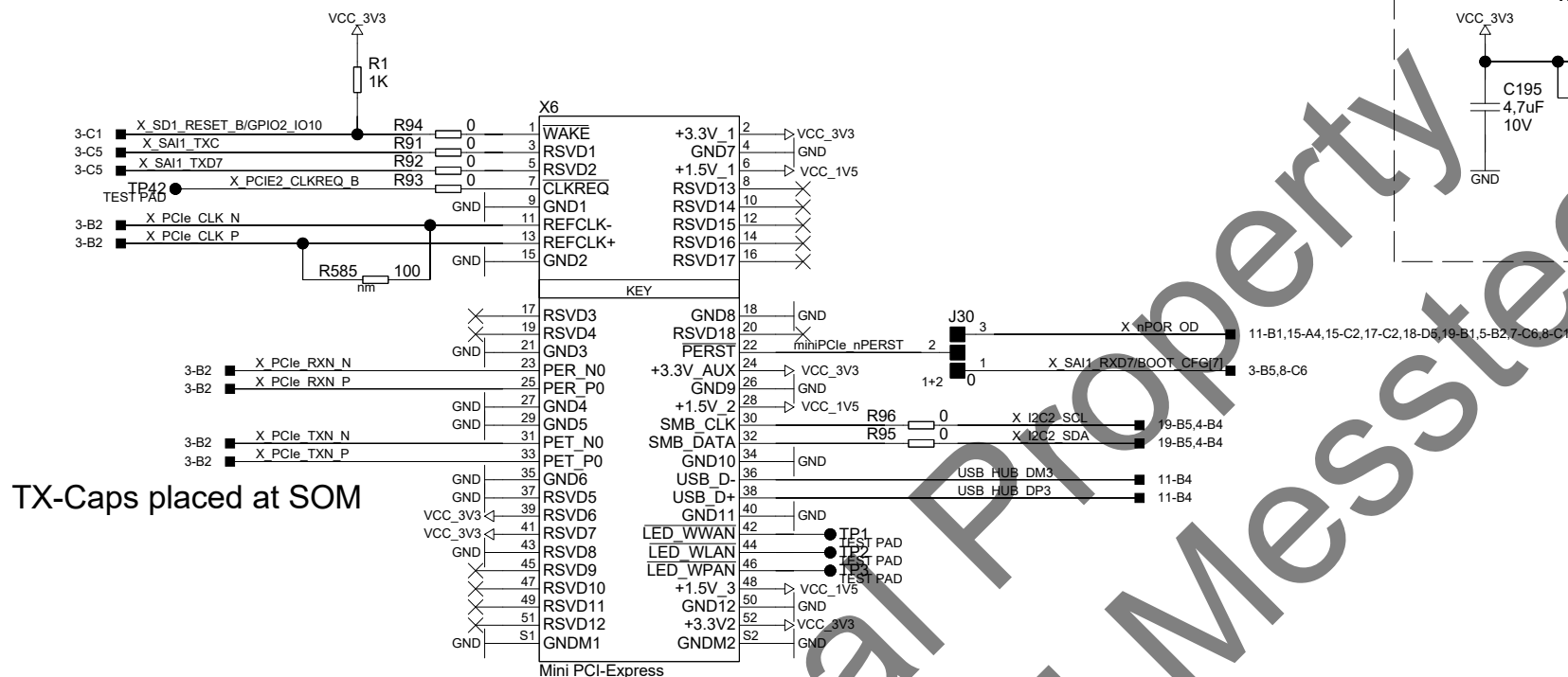
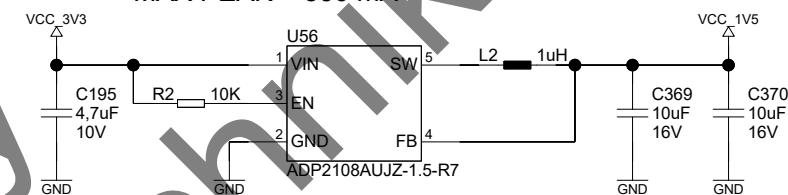
miniPCle



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miniPCle/Exp. 1V5 Supply

Power needed:
MAX = 375 mA
MAX PEAK = 500 mA



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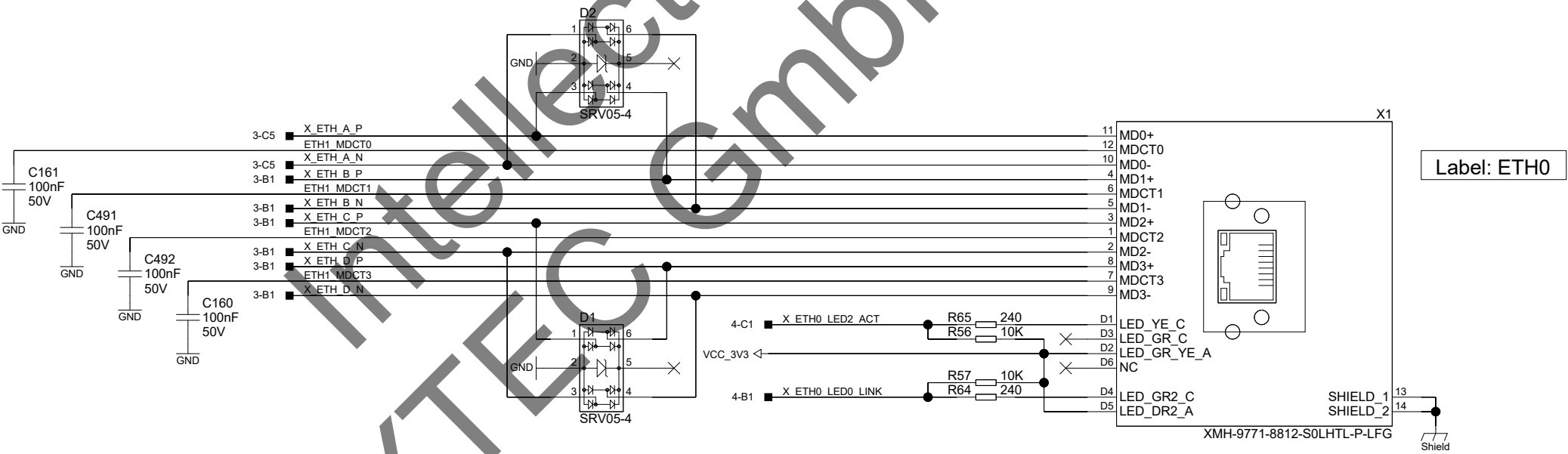
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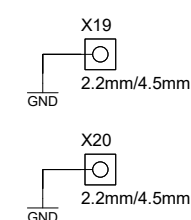
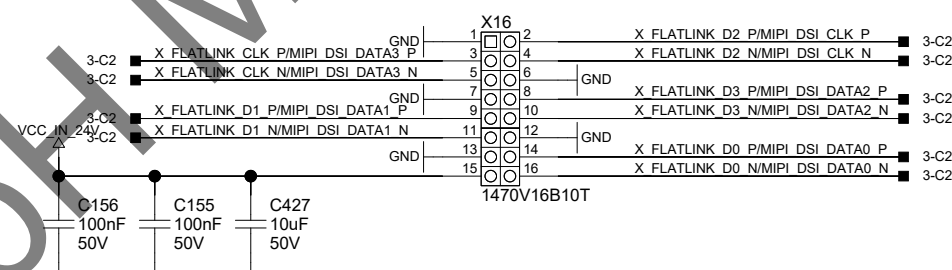
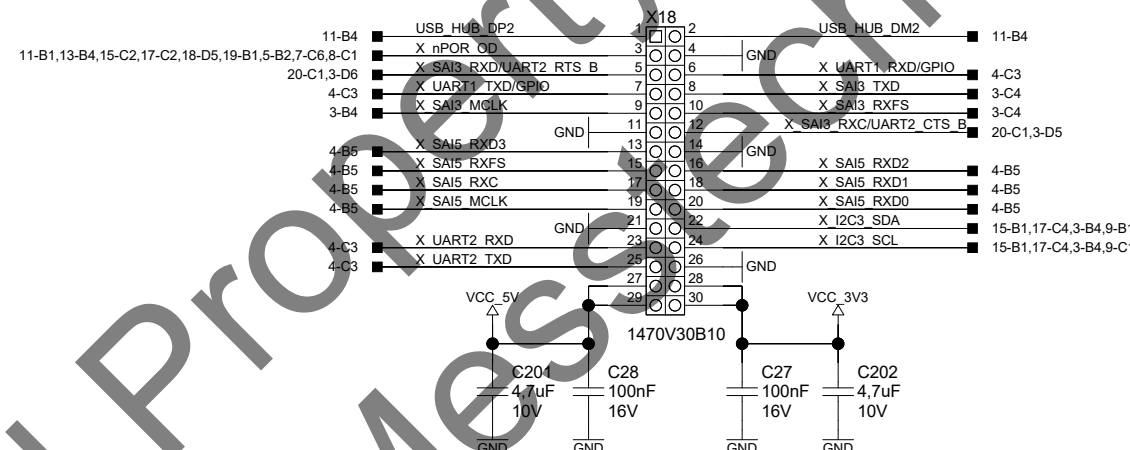
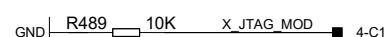
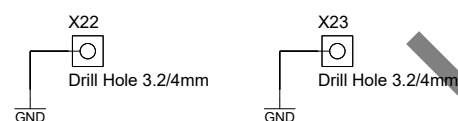
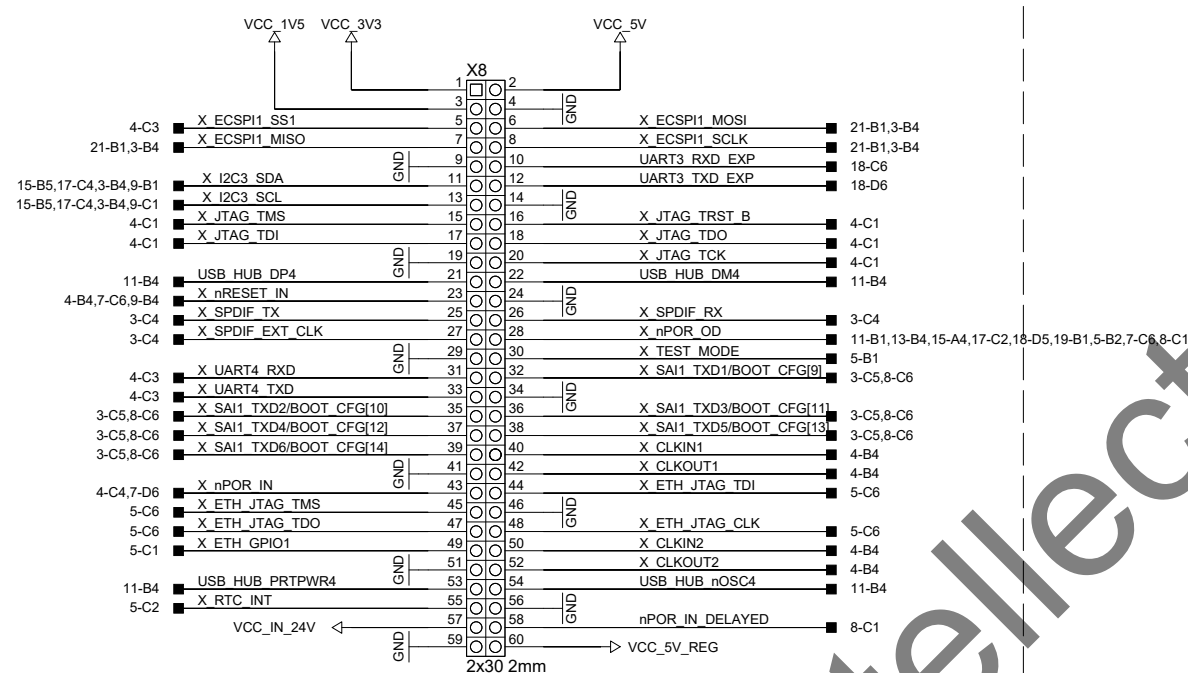
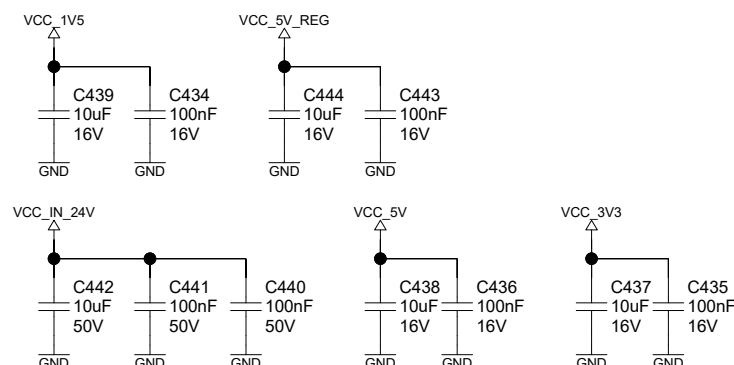
ENET Gbit-Connector



Expansion Connector

Audio/Video-Connector

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place capacitors along the trace

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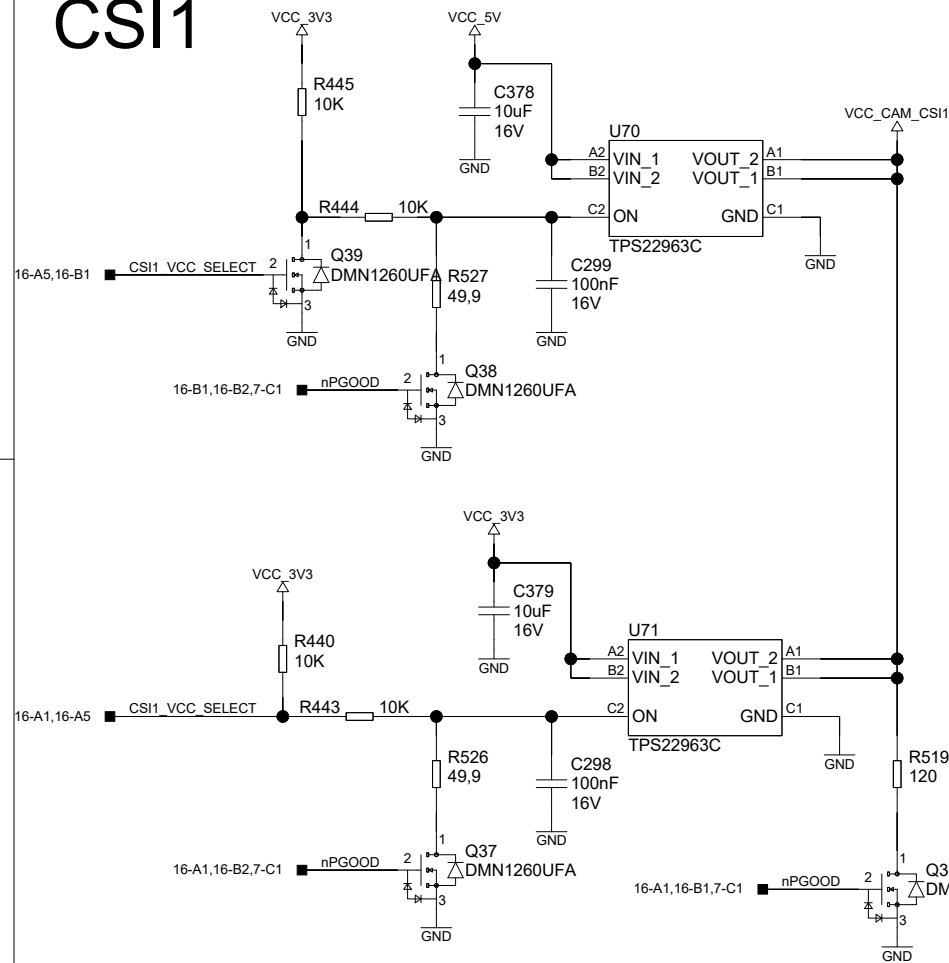
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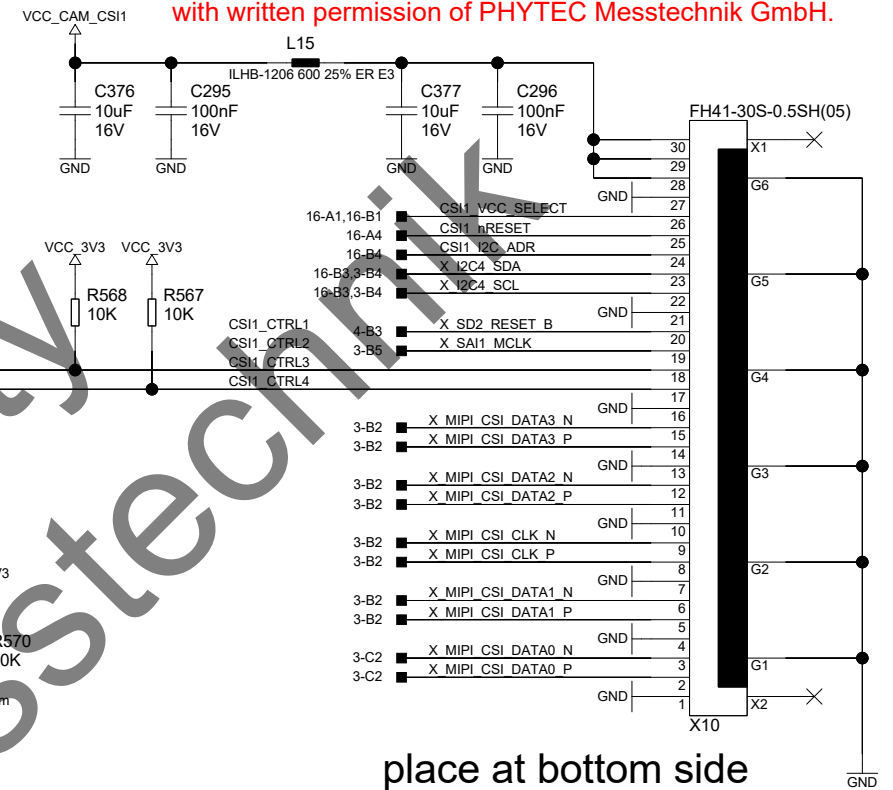
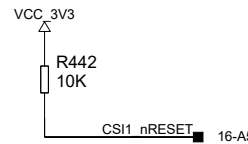
CSI1



3V3:
 $U_c(0,026s) = 0,4V = V_{th_min}$
 $U_c(0,072s) = 1,0V = V_{th_max}$
5V:
 $U_c(0,016s) = 0,4V = V_{th_min}$
 $U_c(0,044s) = 1,0V = V_{th_max}$

t_discharge ca. 150ms
(250uF)

16-A5,3-B4 X I2C4_SDA
16-A5,3-B4 X I2C4_SCL



Label: CSI1

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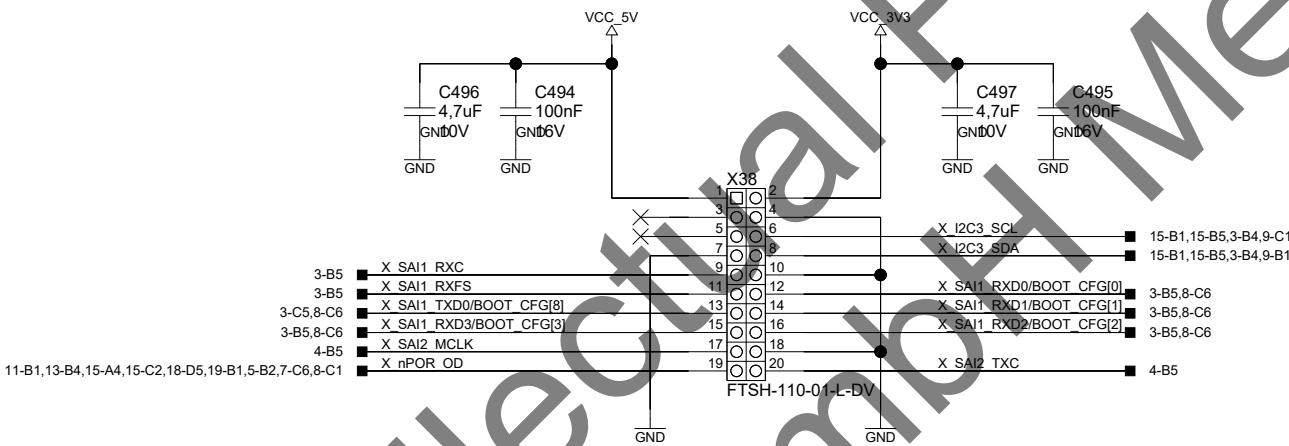
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VOICE ARRAY CONNECTOR

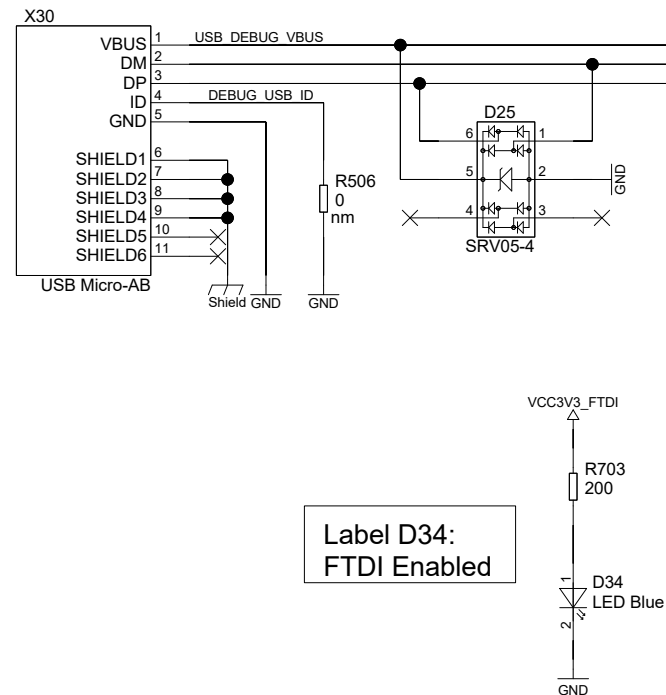
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Debug FTDI

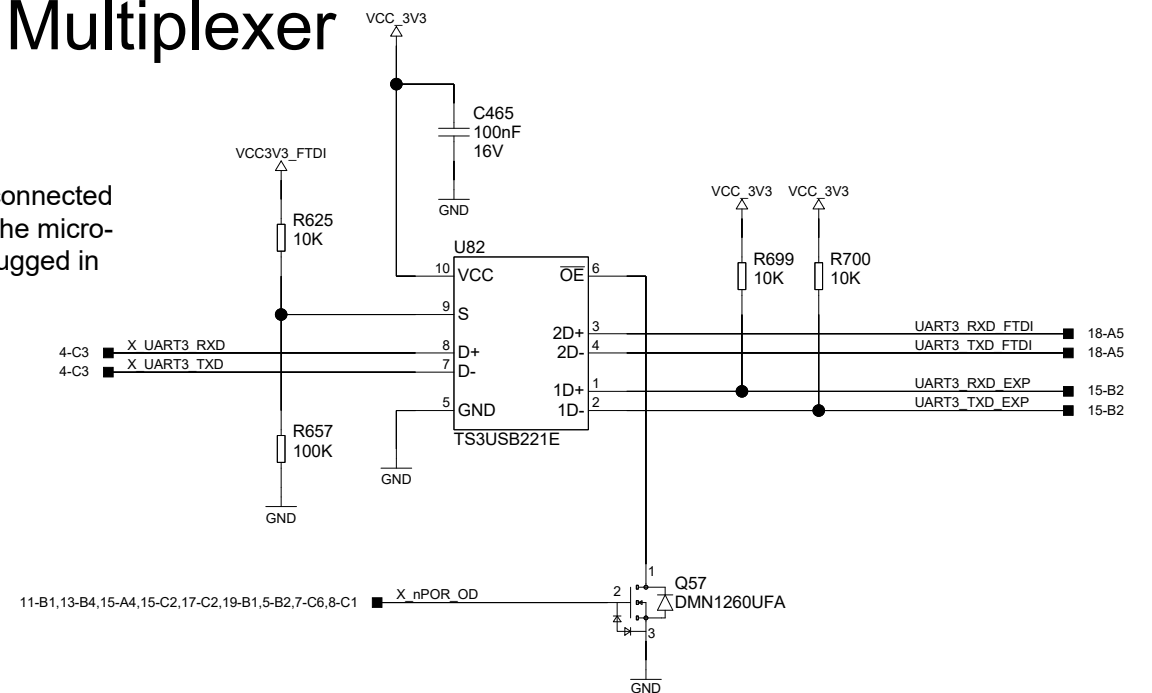
Label: Debug-USB



Label D34:
FTDI Enabled

UART Multiplexer

UART is only connected to FTDI when the micro-usb-cable is plugged in



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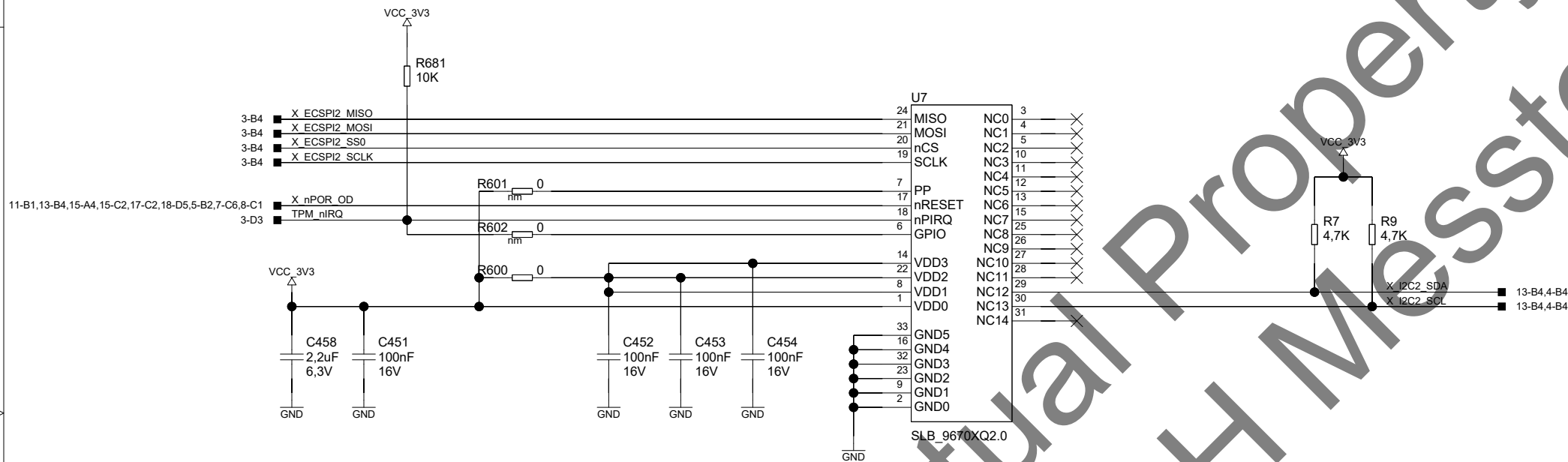
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TPM

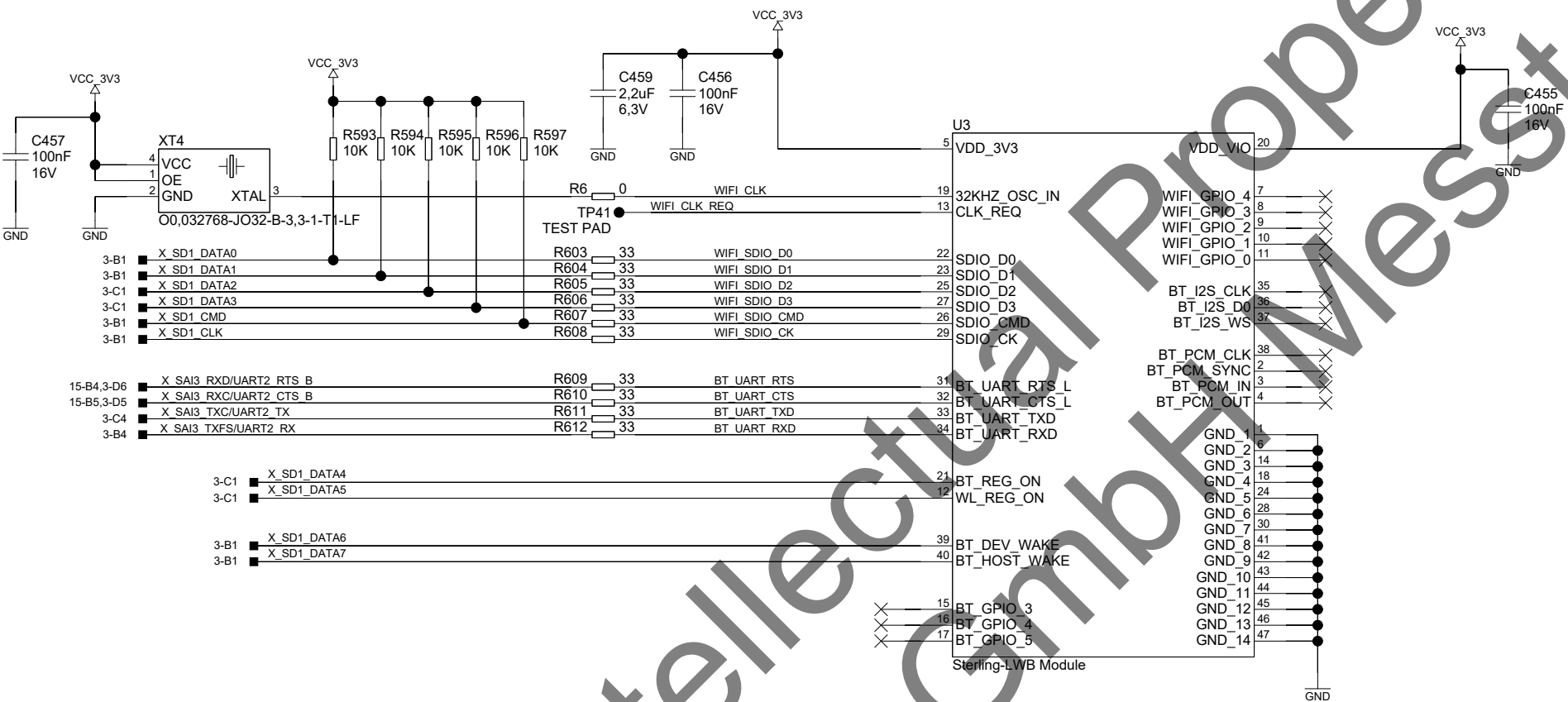
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WLAN

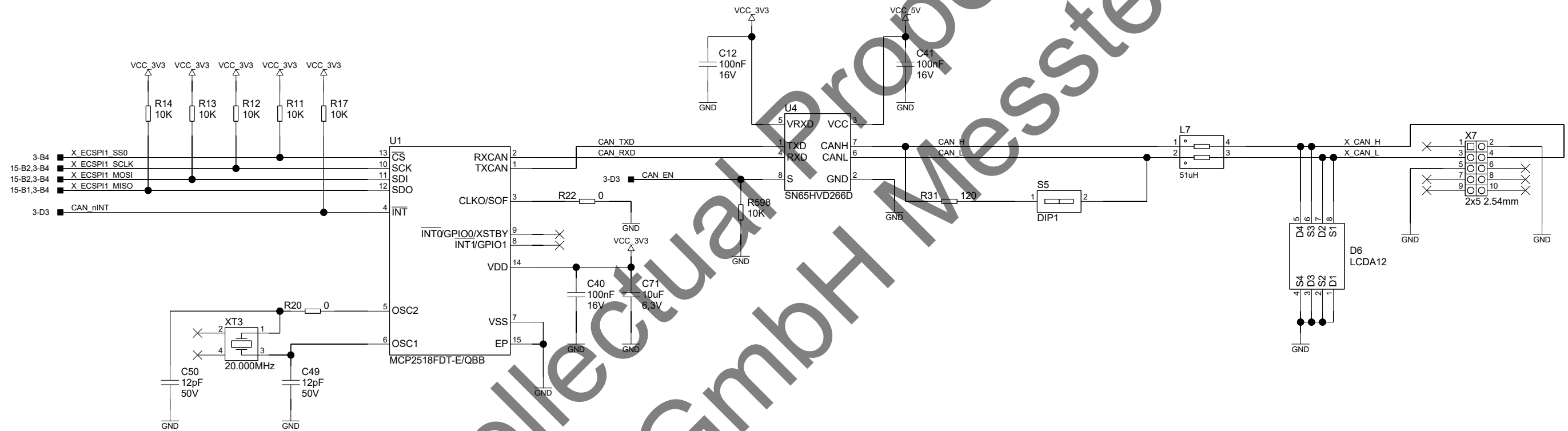
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FD CAN

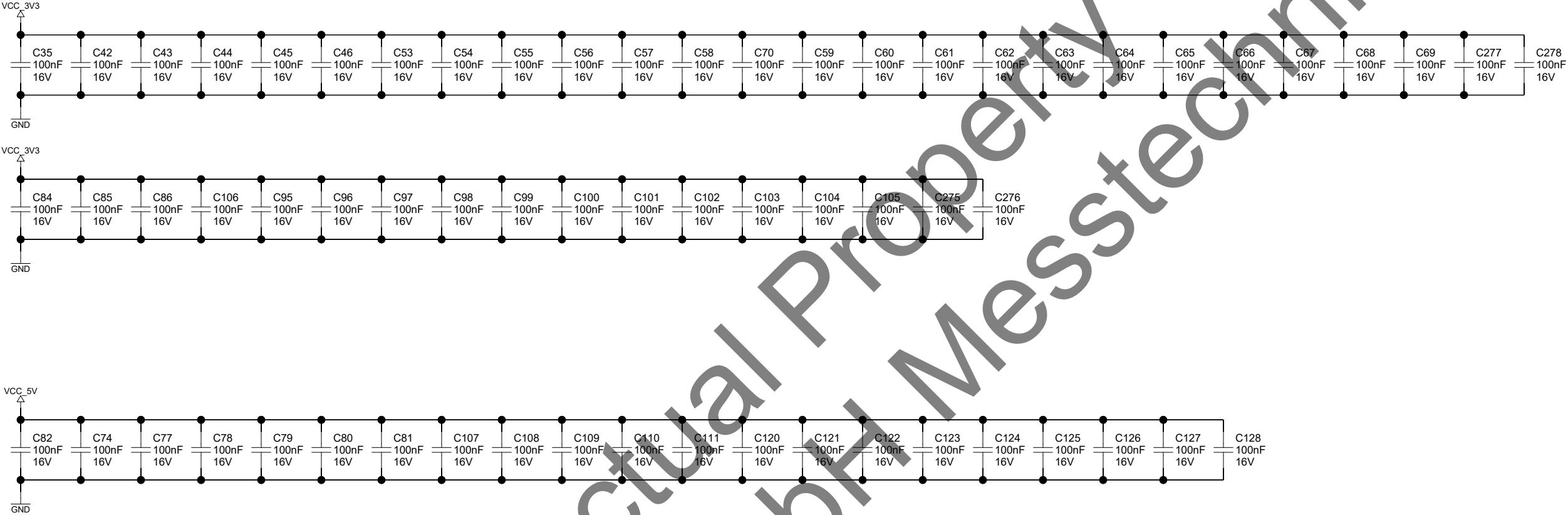
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