

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	
17.07.2019	PCB-No.: 1532.0	Revision : 003	Sheet 1 of 22

Overview

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Switch	Function ON	Function OFF
S1-Pad1	Boot from SD-Card	SOM Boot config (eMMC)
S1-Pad2	UART3 connected to A/V-Con.	UART3 connected to FTDI (only when debug-cable is plugged in)
S1-Pad3	select SD-Card	select WIFI
S1-Pad4	serial downloader	internal Boot
S1-Pad5	serial downloader	internal Boot
S2	resetting SOM	---
S3	pulling OnOff-Pin to GND	---

I2C2 Addresses

Part	Address
TPM Chip (U7)	---

I2C3 Addresses

Part	Address
Voice-Array Connector (X38)	---
mini PCle (X6)	---
Expansion Connector (X8)	---
A/V - Connector (X34)	---

I2C4 Addresses

Part	Address
MIPI-CSI-1 Con. (X10)	---

Z1

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Logo

DMC1

DMC

DMC

DMC2

DMC

DMC

Z2

Fiducial-Round

Z4

Fiducial-Square

Z3

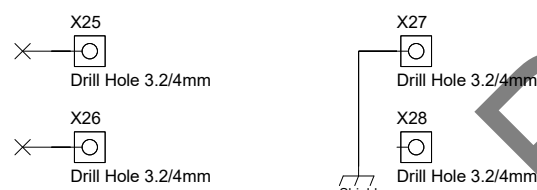
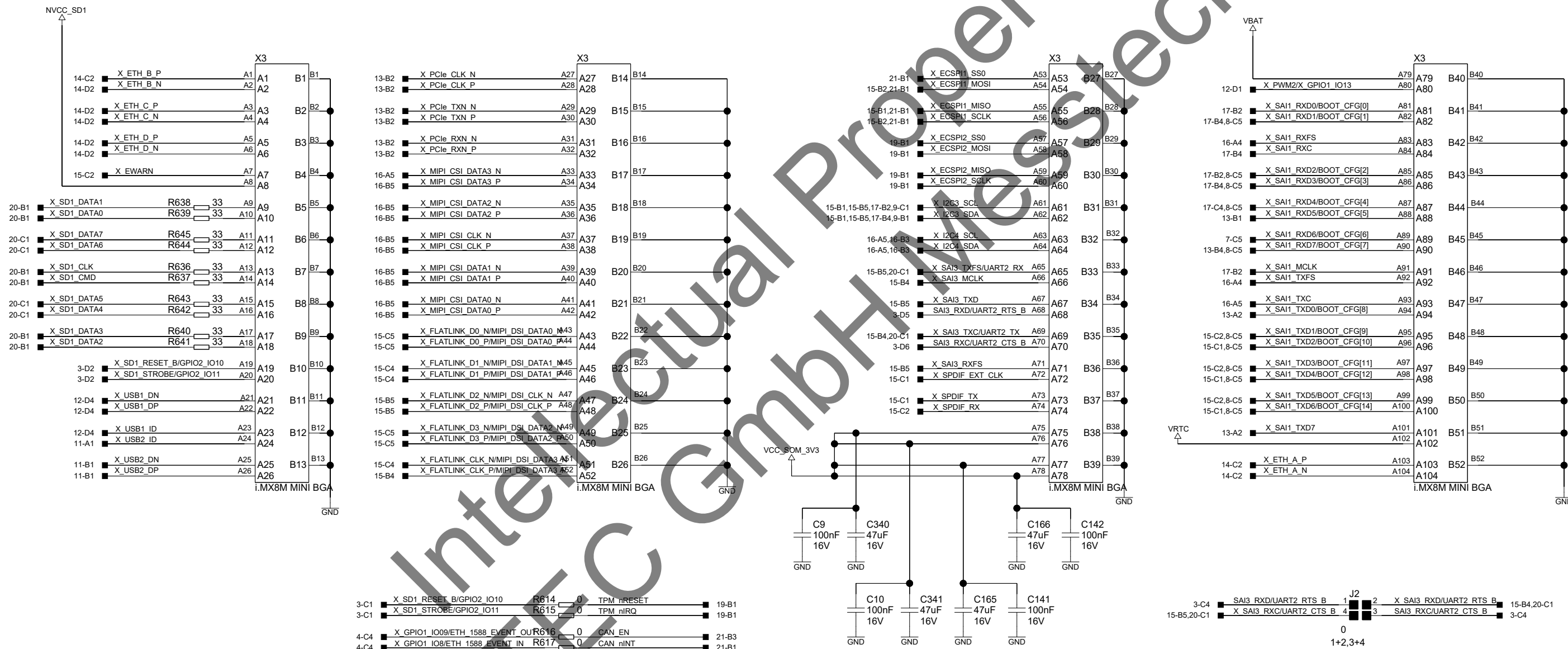
Fiducial-Round

Z5

Fiducial-Square

SOM Connector Page 1

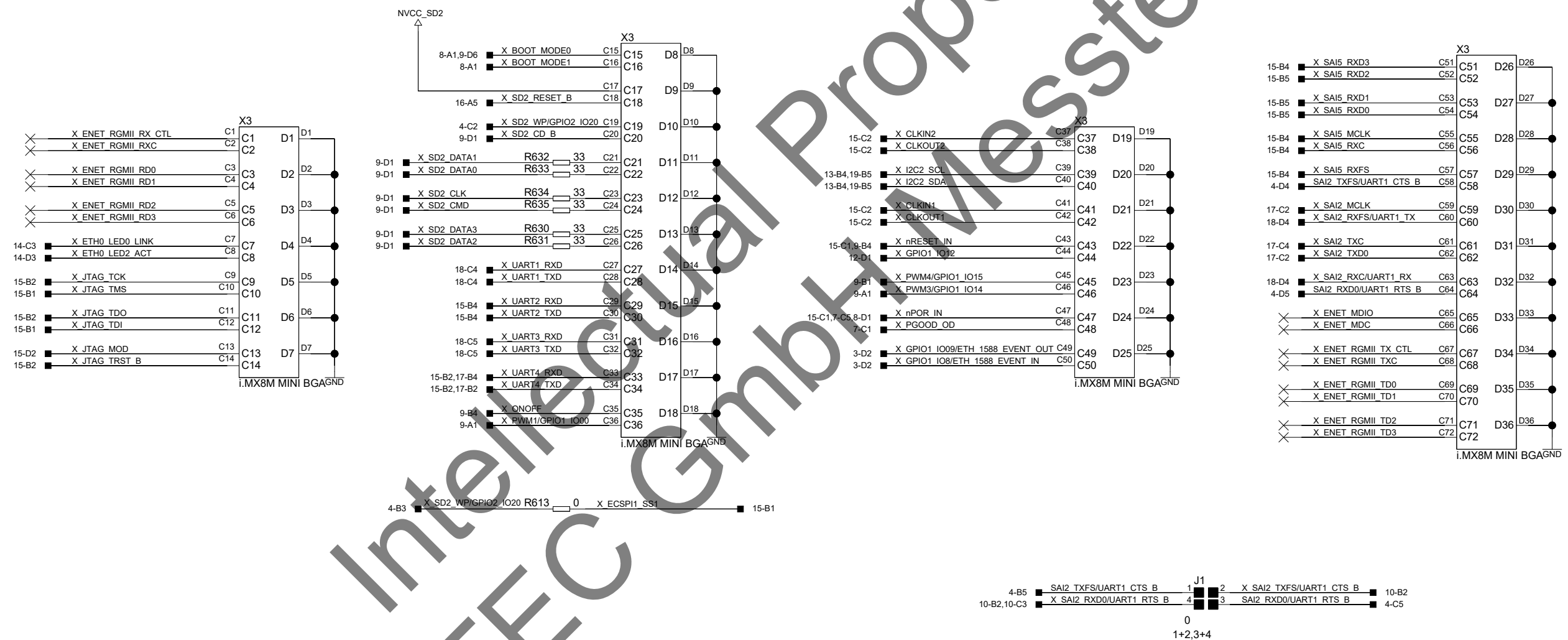
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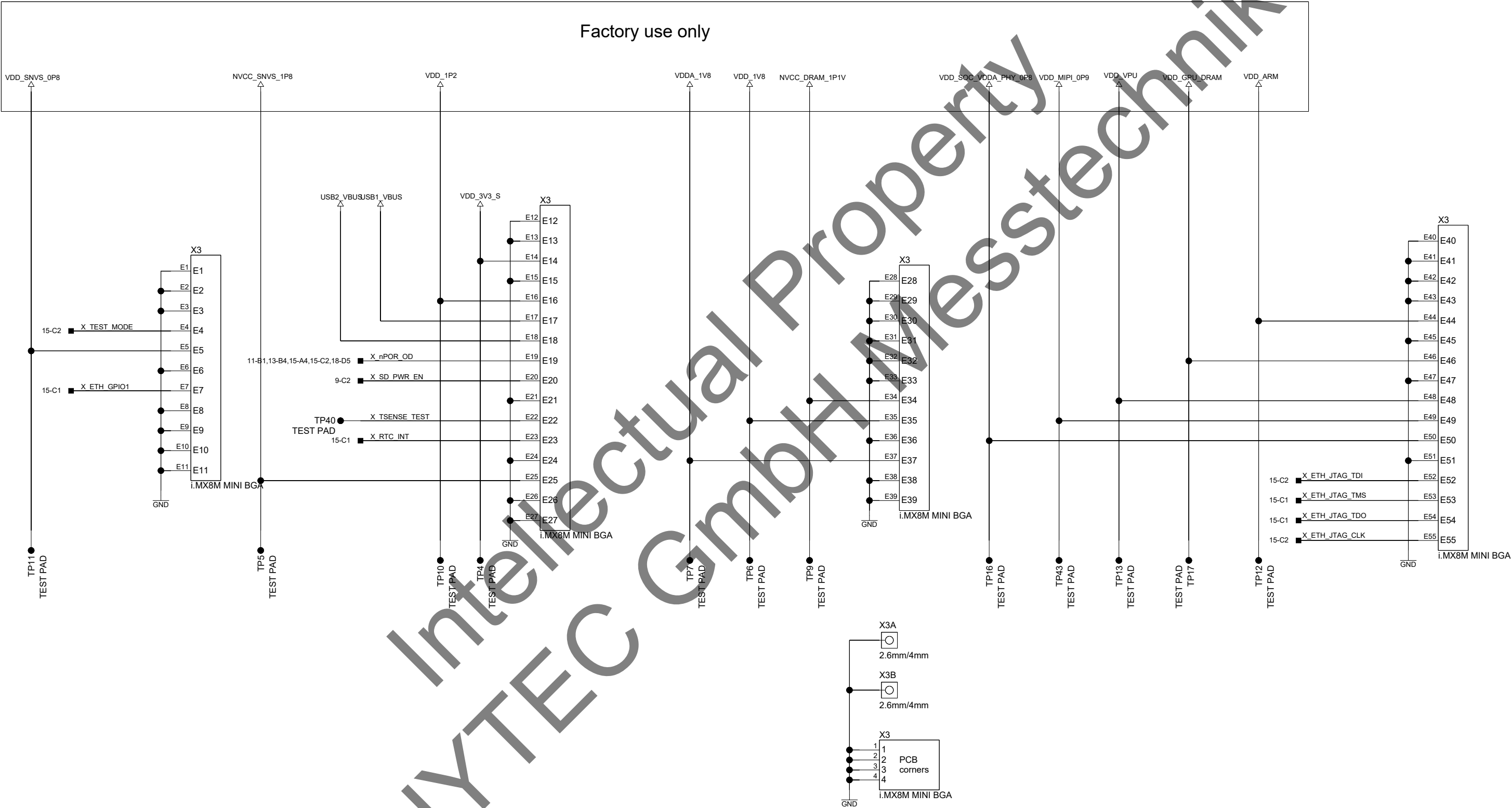
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SOM Connector Page 2

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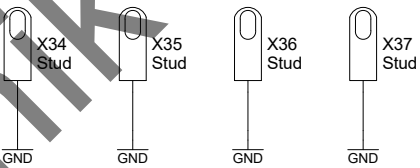
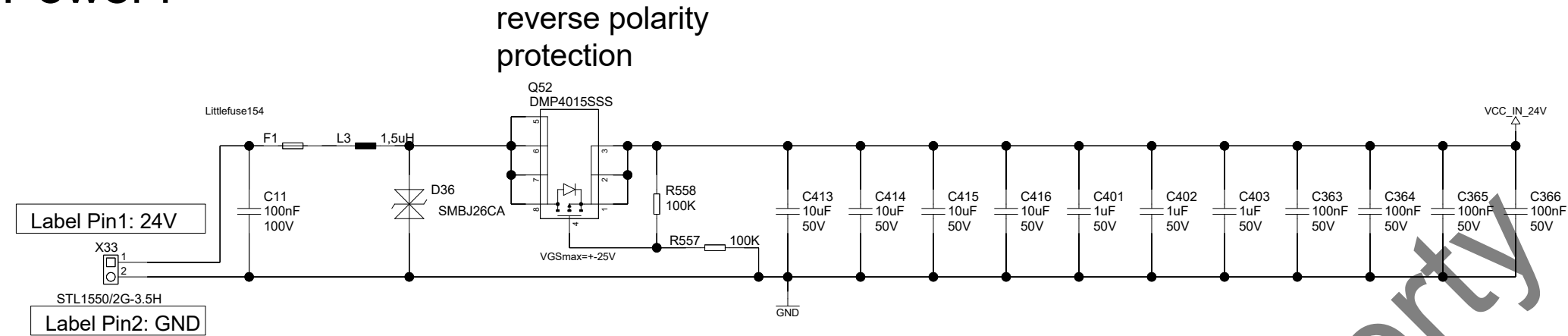


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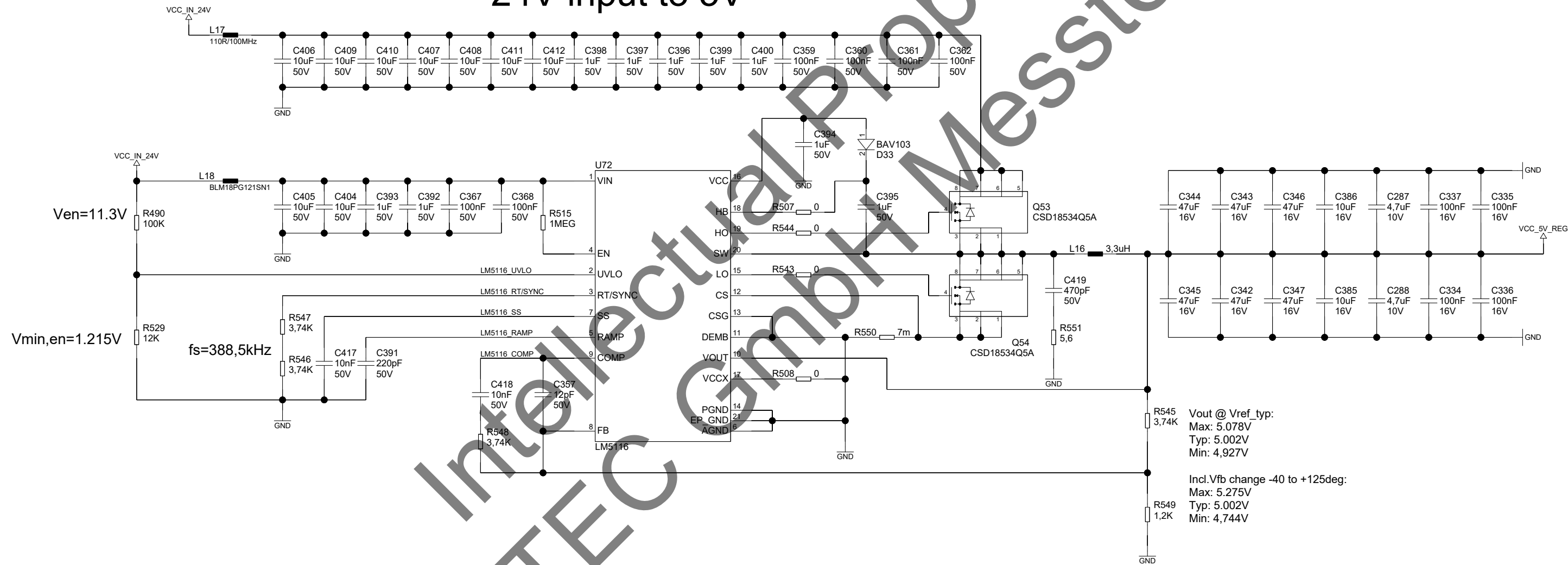
Power1

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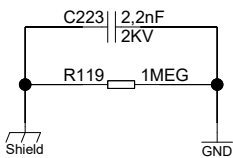
GND for Measurement



24V input to 5V



Shield



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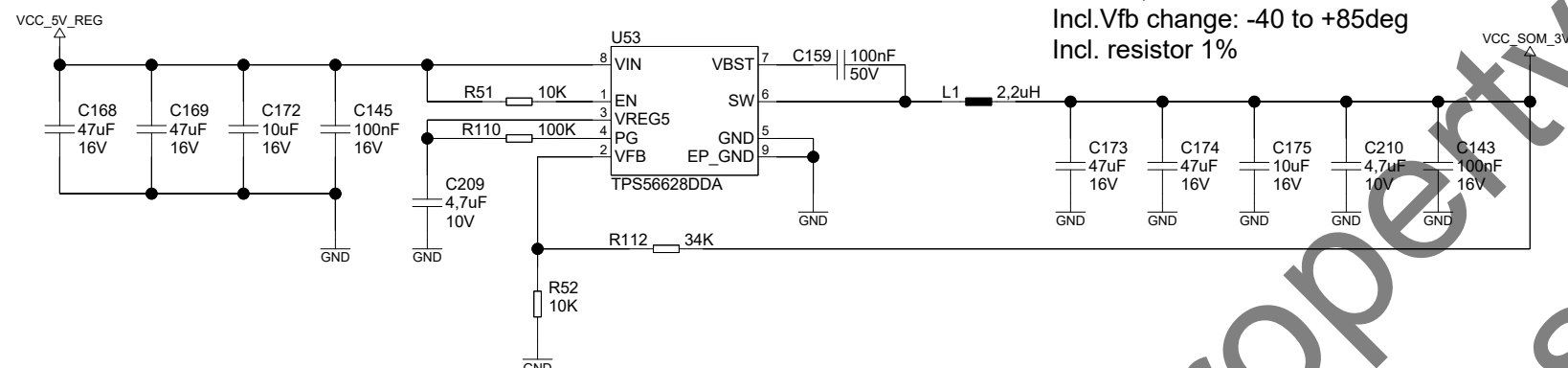
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Power2

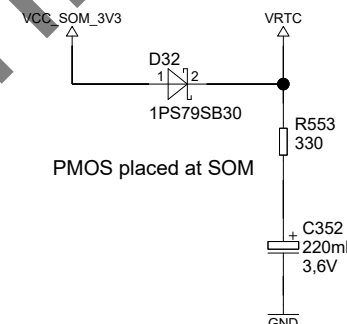
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3.3V / 6A

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

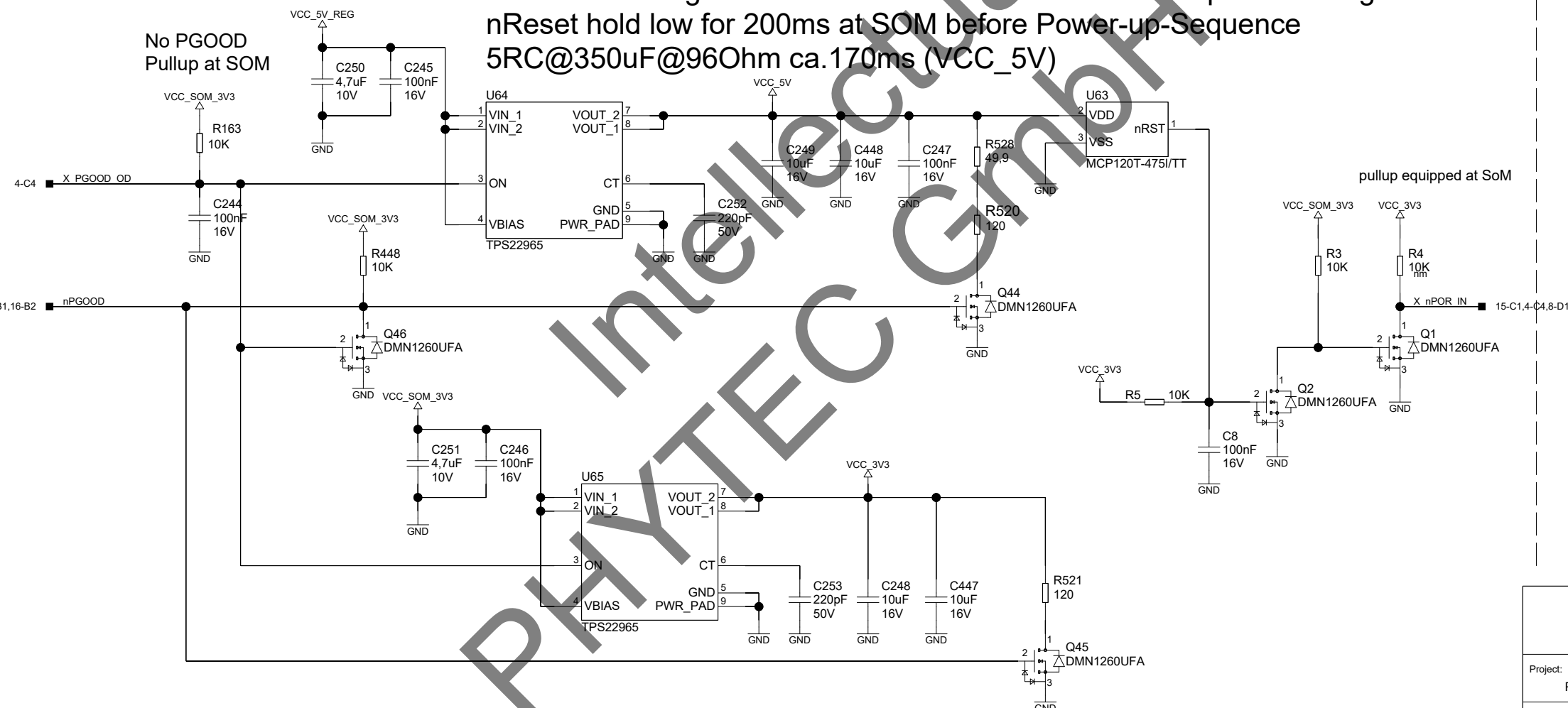


Gold CAP

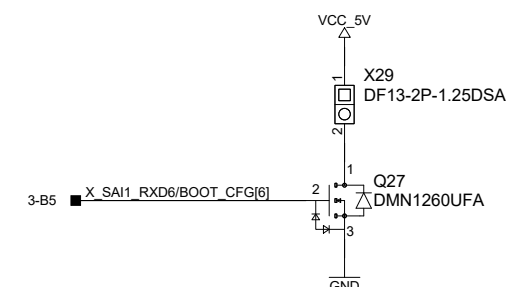


Enable board voltages

Internal discharge of TPS22965: 225Ohm and 170Ohm par. discharge
nReset hold low for 200ms at SOM before Power-up-Sequence
5RC@350uF@96Ohm ca.170ms (VCC_5V)



Fan



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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

Defaul 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

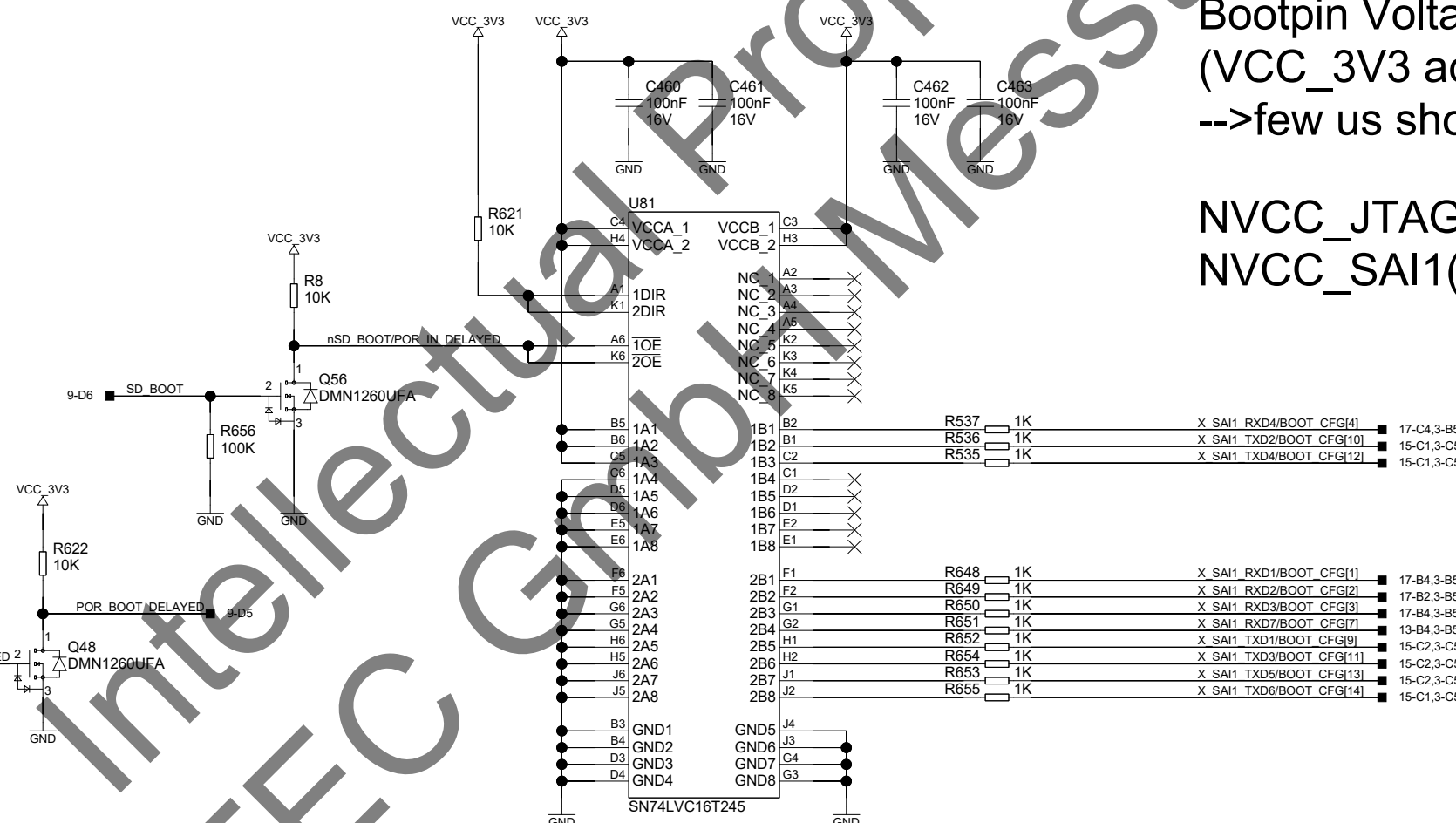
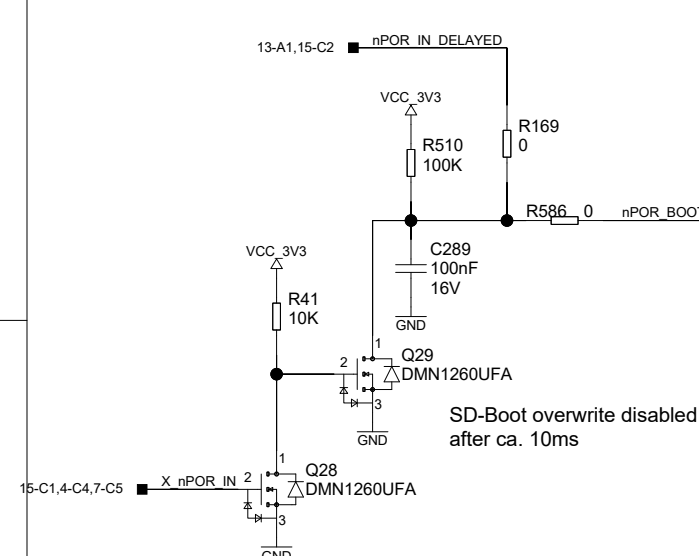
Infinite-Loop
001- SD
01- SDHC2
Power Cycle
Loopback CLK
Fast Boot
Reserved
Reserved
Bus Width 4-bit
000 Normal Speed/
SDR12
Reserved

RESET has to be hold low until
Bootpin Voltage is OK.
(VCC_3V3 active +Delay)
-->few us should be save

NVCC_JTAG (BootMODE) and
NVCC_SAI1(Bootconfig) is 3V3

SD Boot

S1-Pos1:
ON = SD Boot
OFF = eMMC



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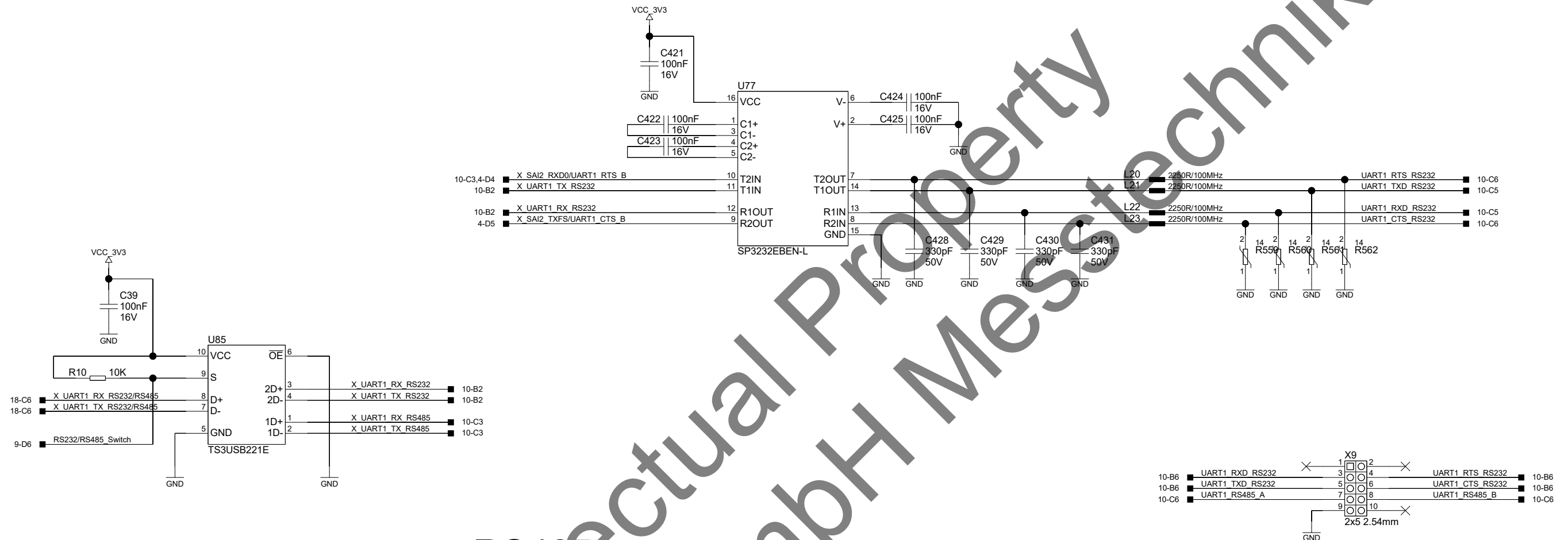
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UART Multiplexer

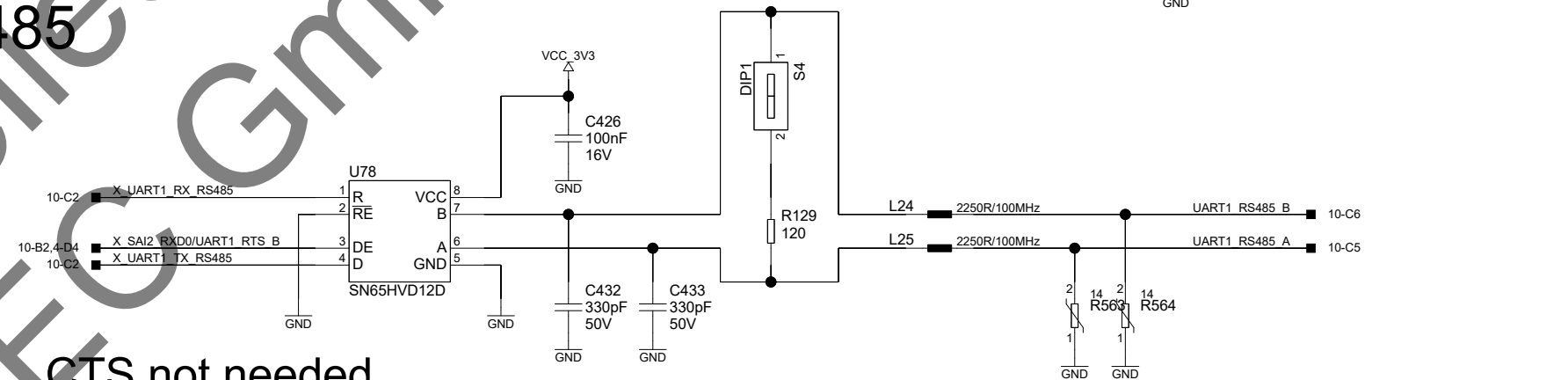
RS232

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RS485

CTS not needed



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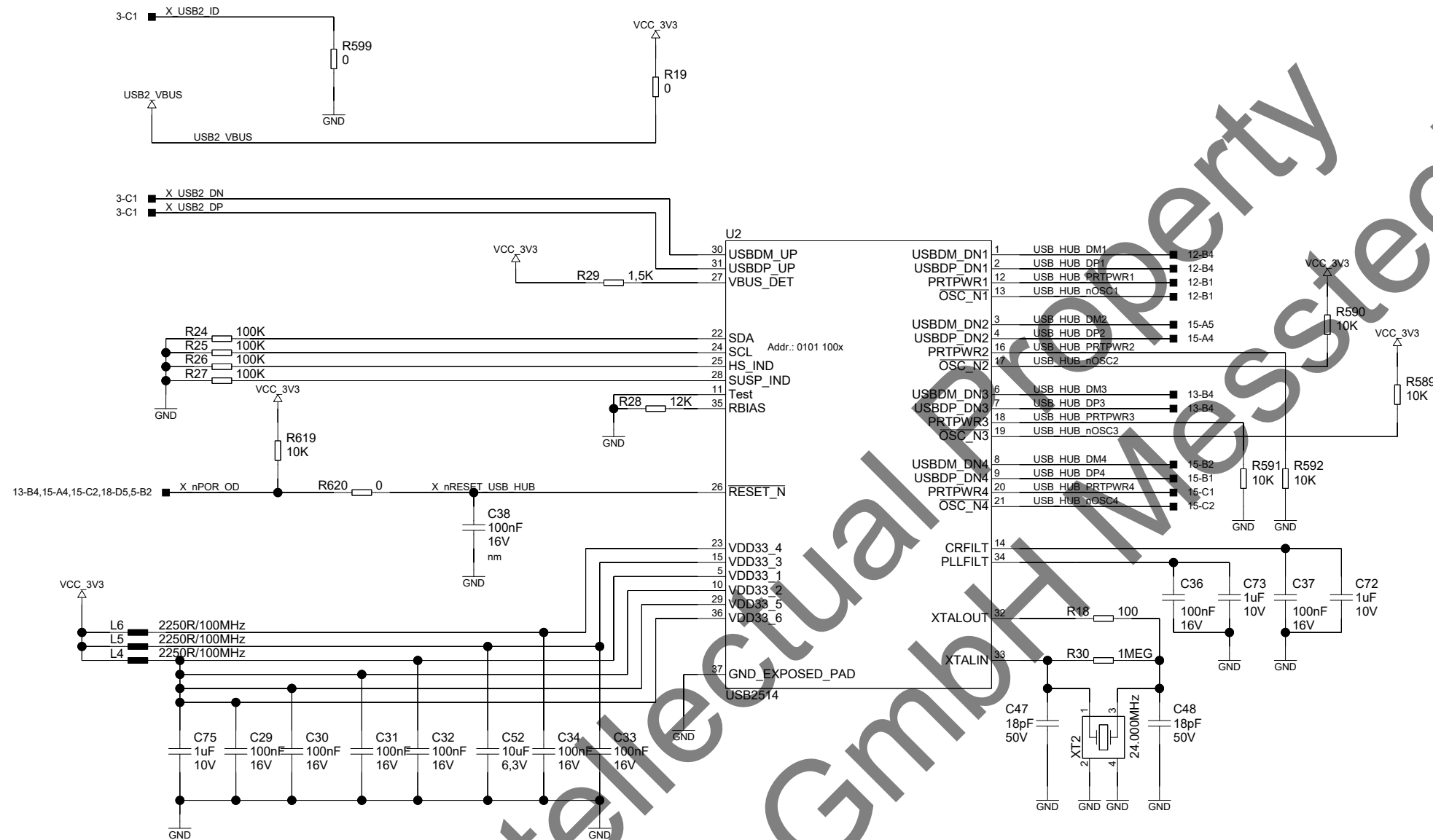
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USB-HUB

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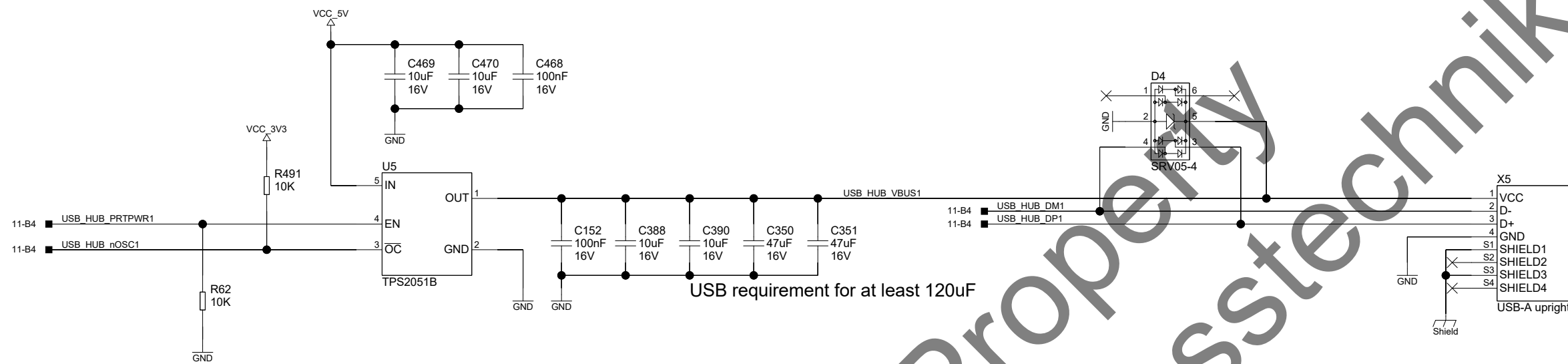
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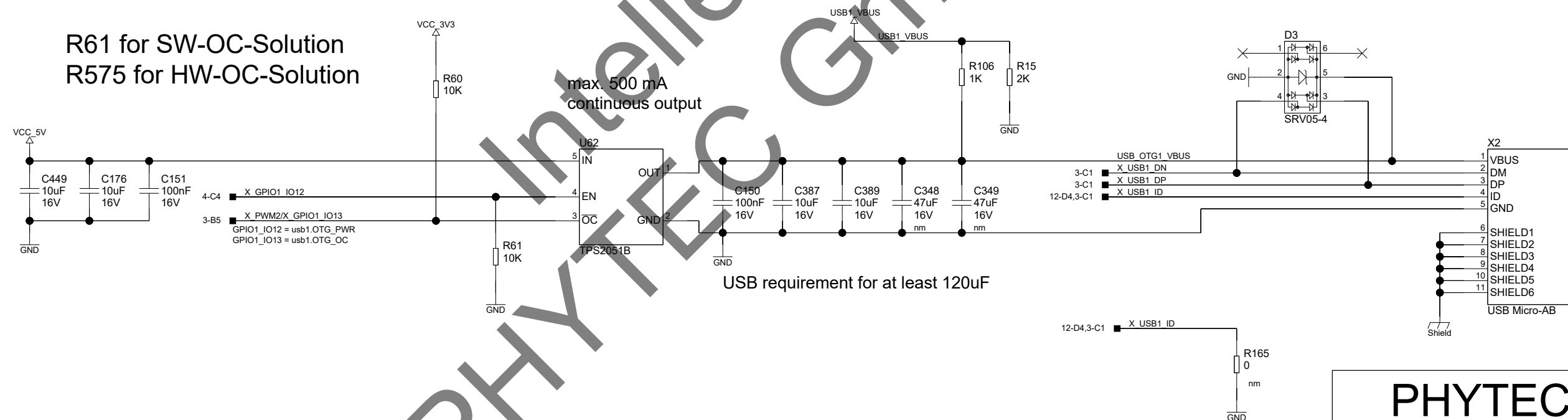
USB-A



USB OTG

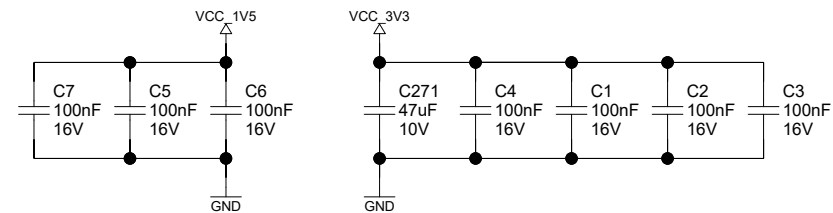
USB OTG1 useable for serial downloader

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



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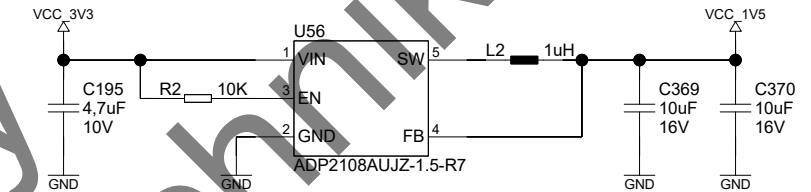
miniPCle



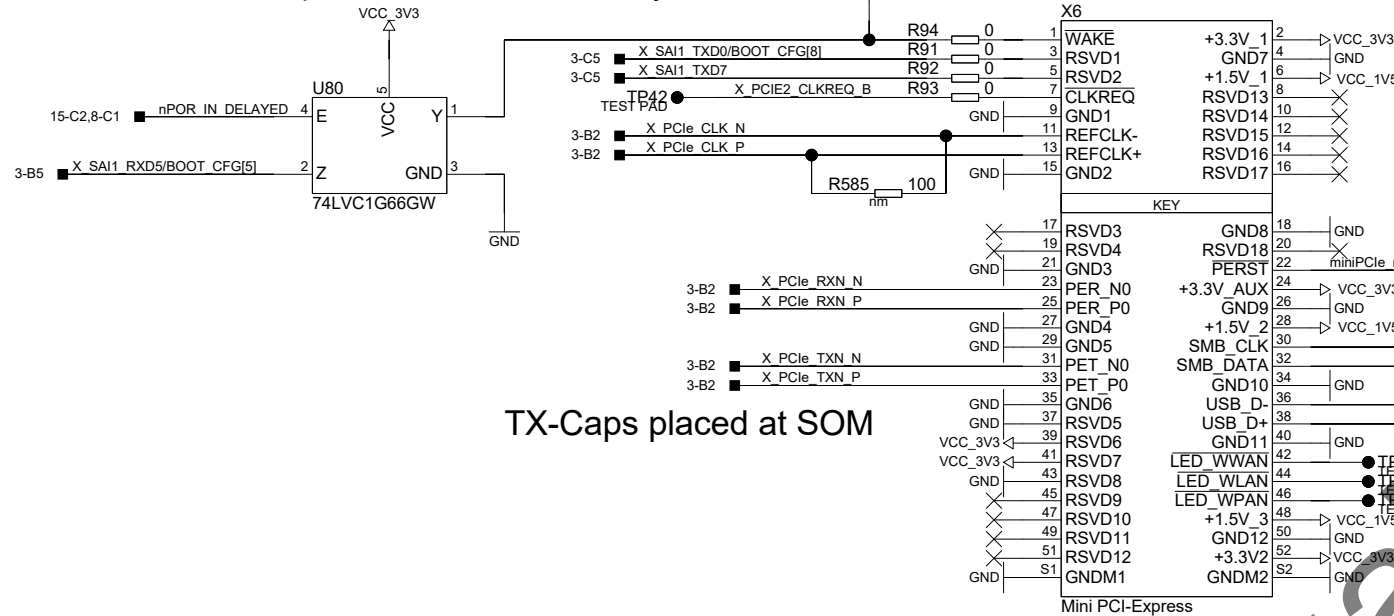
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miniPCle/Exp. 1V5 Supply

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



nWAKE Open Drain active low driven by PCIe Card



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1

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3

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6

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A

B

C

D

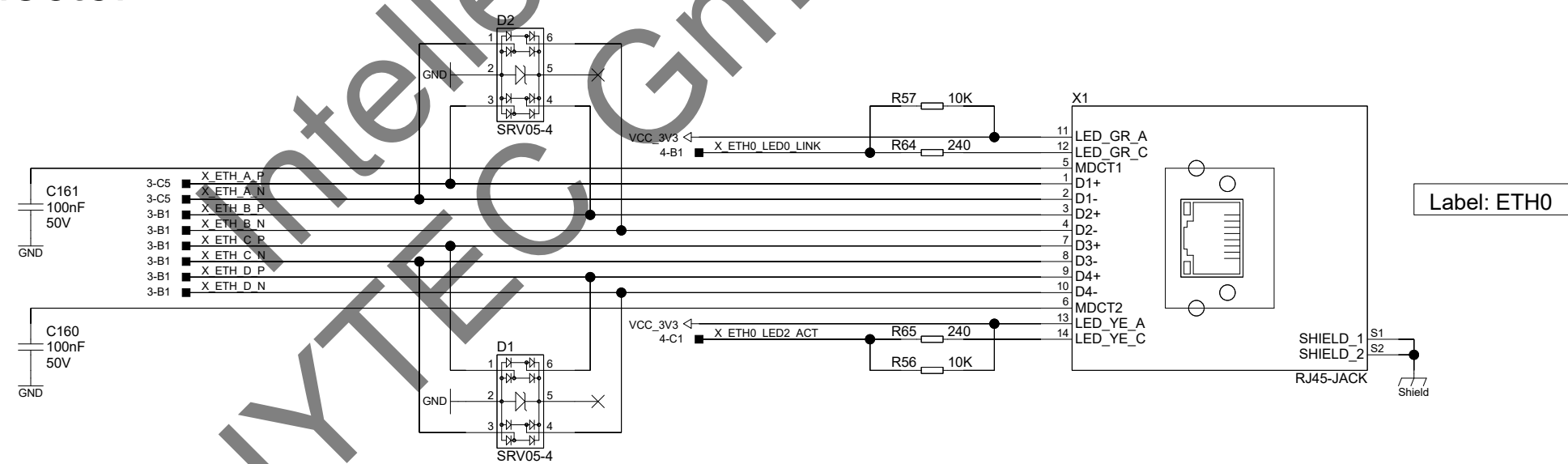
A

B

C

D

ENET Gbit-Connector



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1

2

3

4

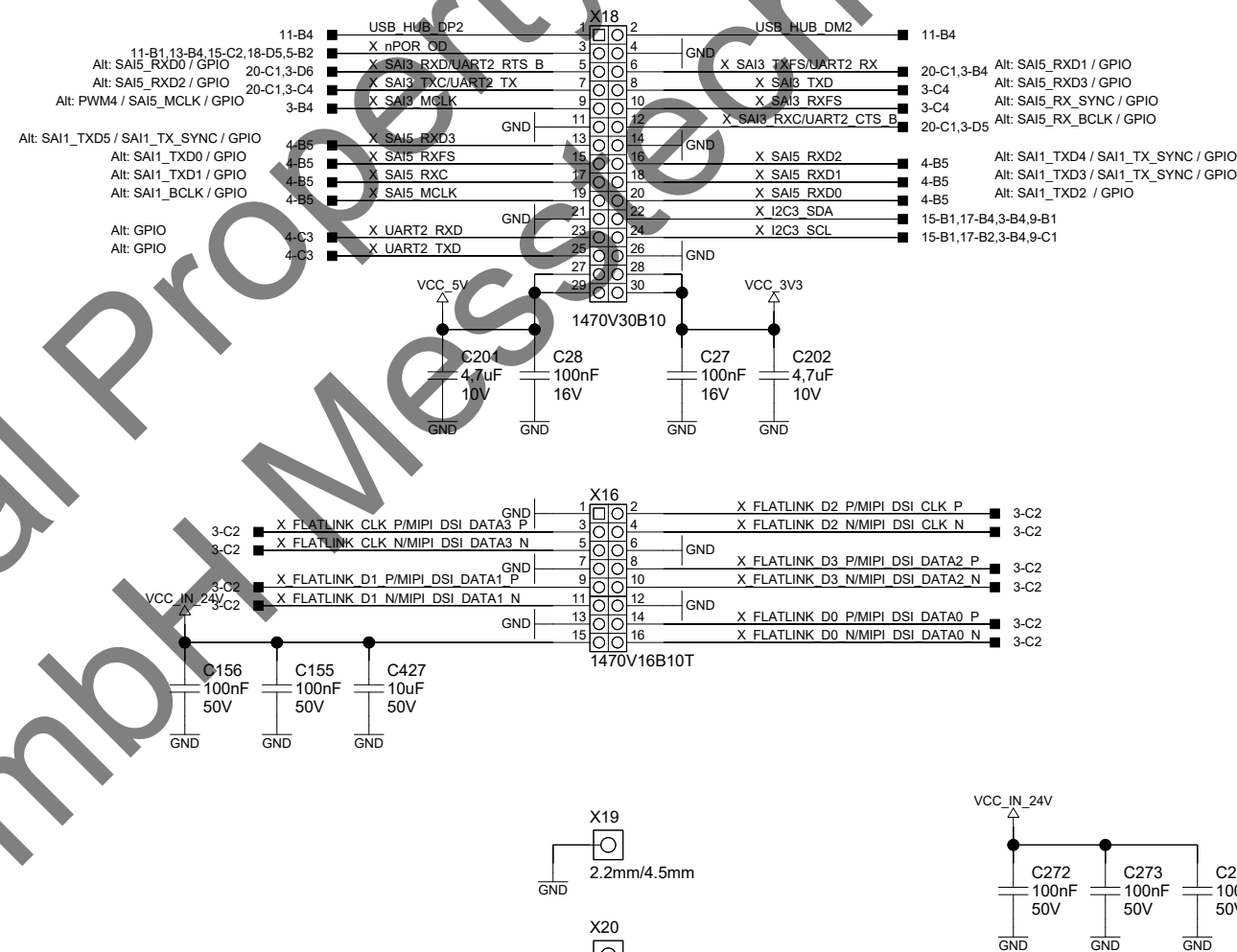
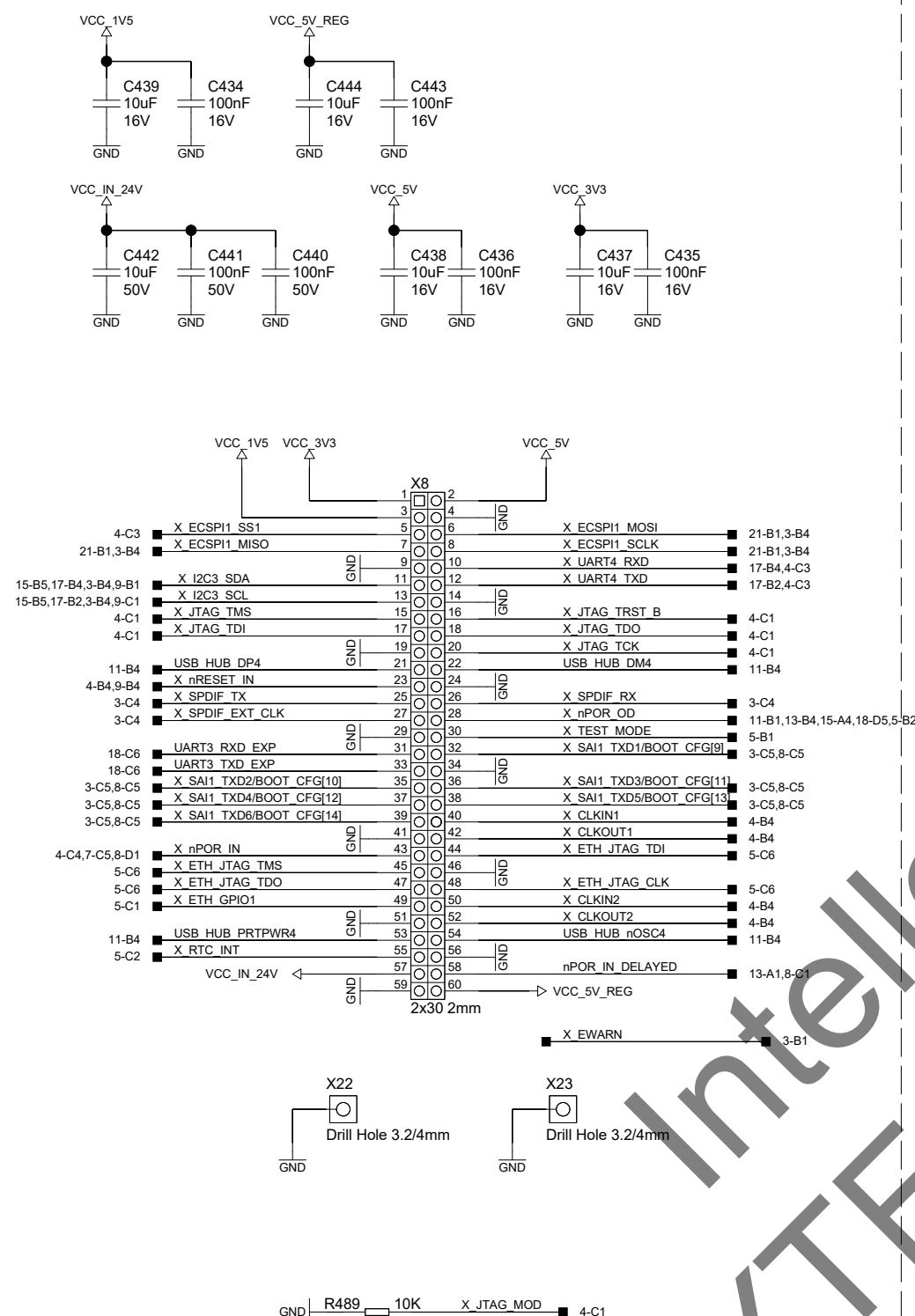
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6

Expansion Connector

Audio/Video-Connector

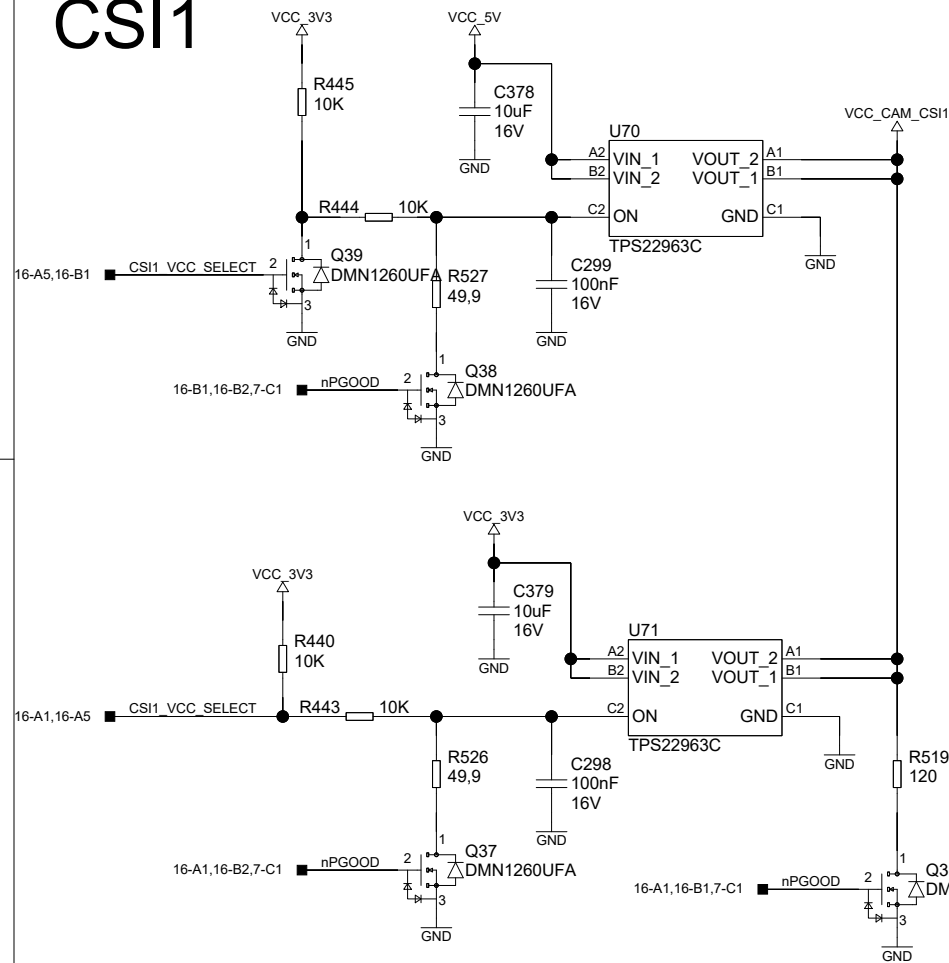
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place capacitors along the trace

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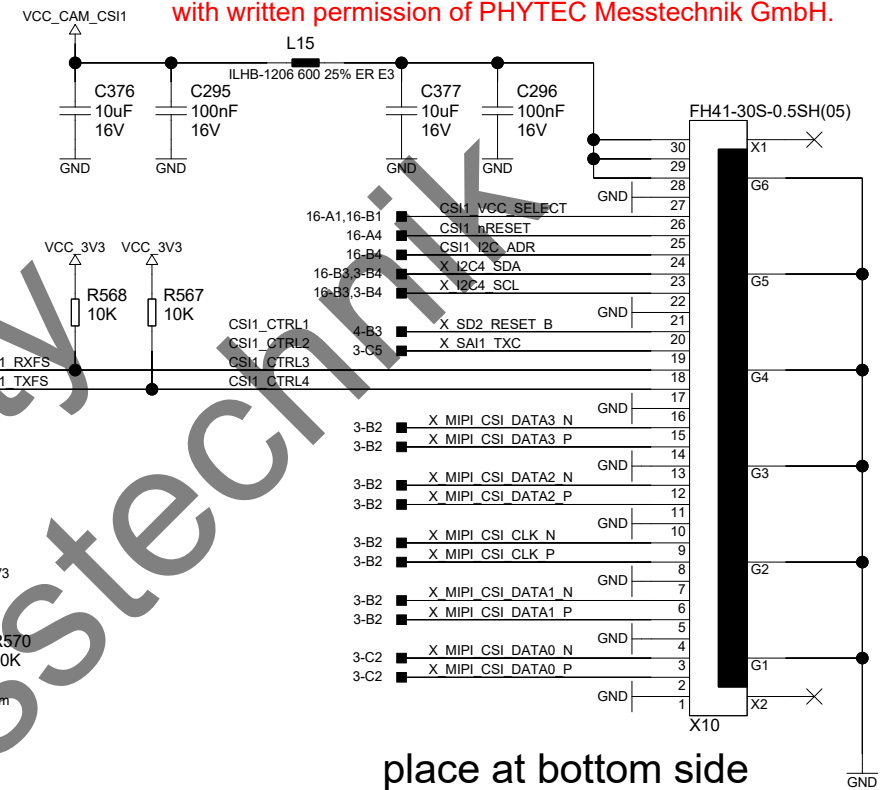
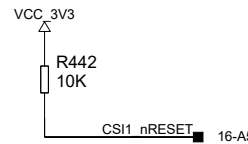
CSI1



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



place at bottom side

Label: CSI1

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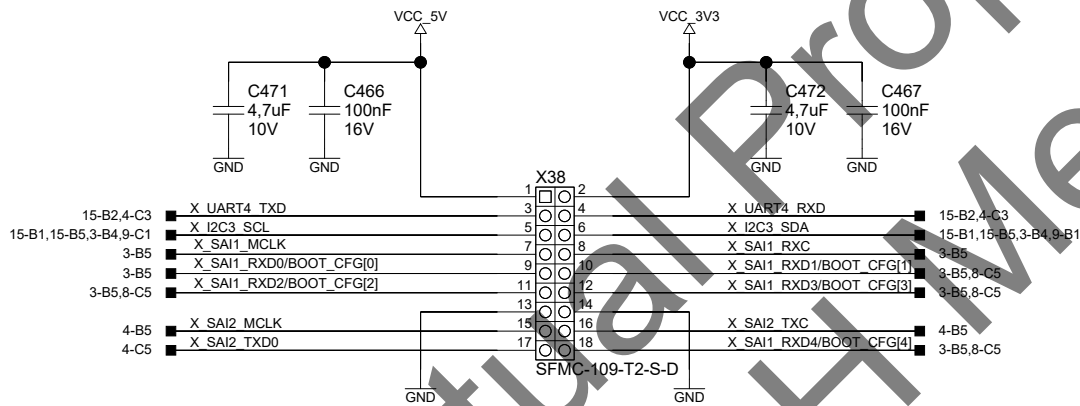
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VOICE ARRAY CONNECTOR

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Debug FTDI

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Label: Debug-USB

VCC_FTDI_3V3

Vmin: 3,141V
Vtyp: 3,313V
Vmax:3,488V
Incl.Vfb change: -40 to +125deg junction temp
Incl. resistor 1%

Label D34:
FTDI Enabled

UART Multiplexer

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

S1-Pos2:
select UART3 destination
ON: UART3 to EXP-Connector
OFF: UART3 to FTDI (only when X30 is plugged in)

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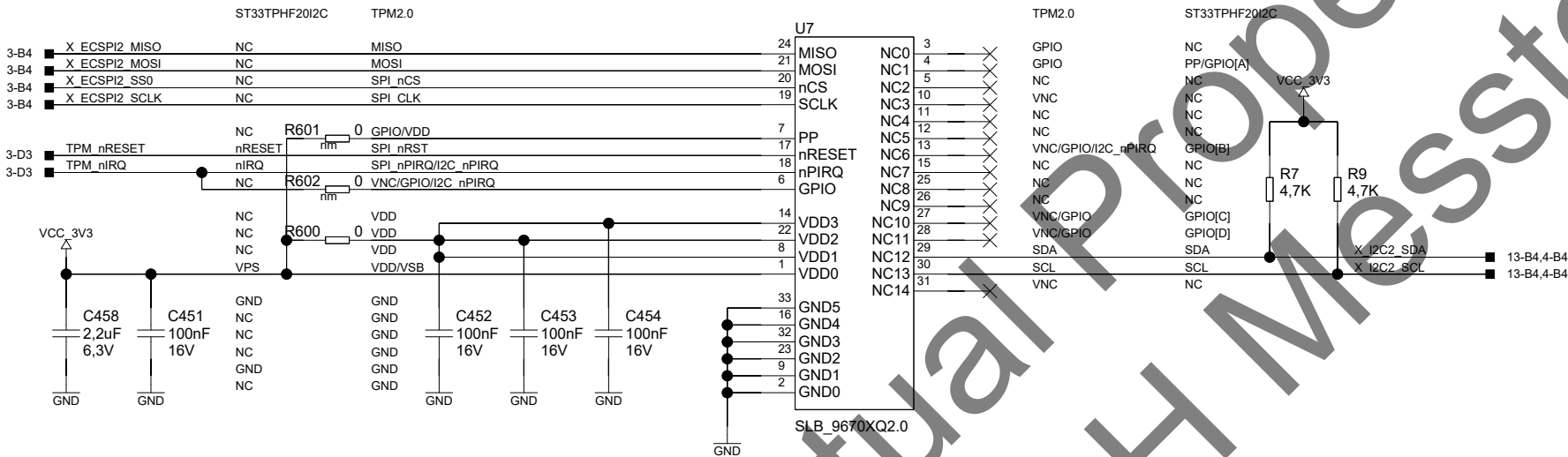
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TPM

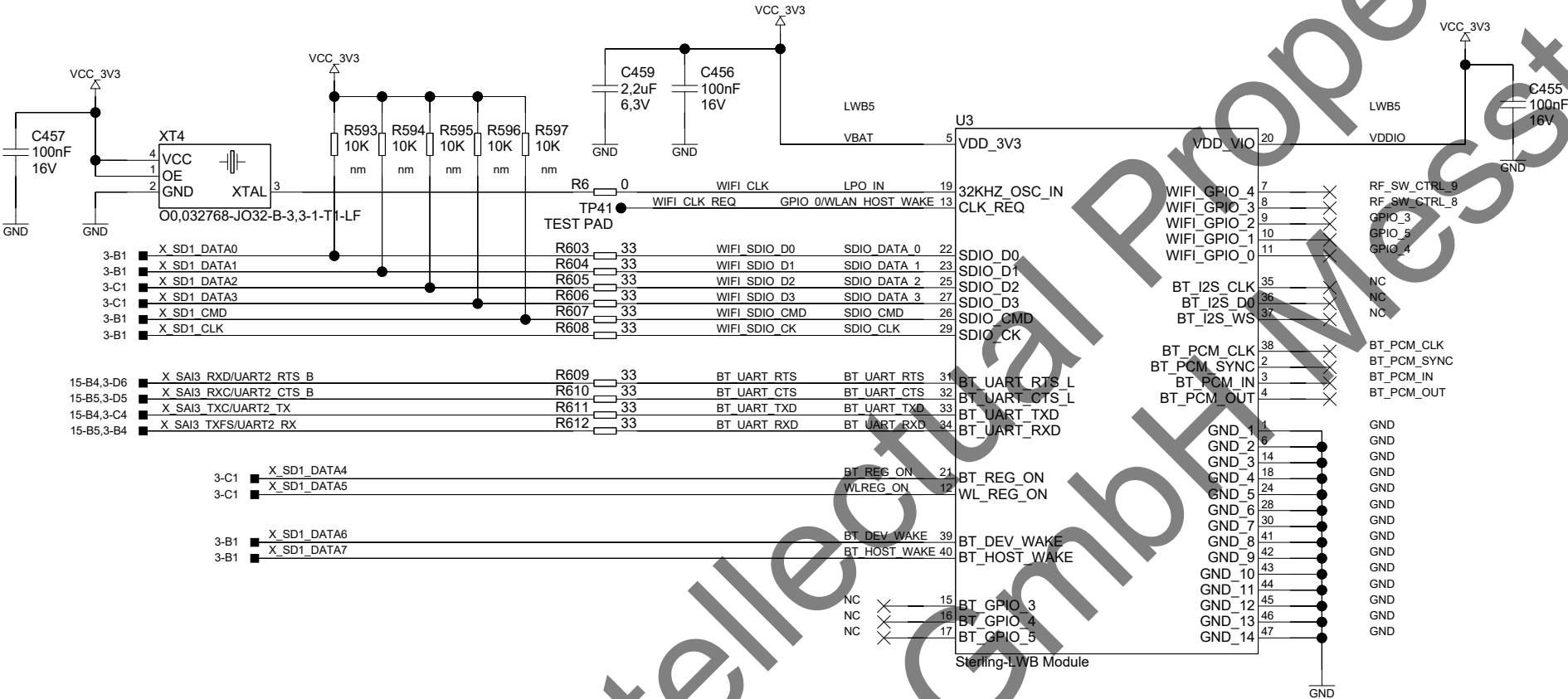
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WLAN

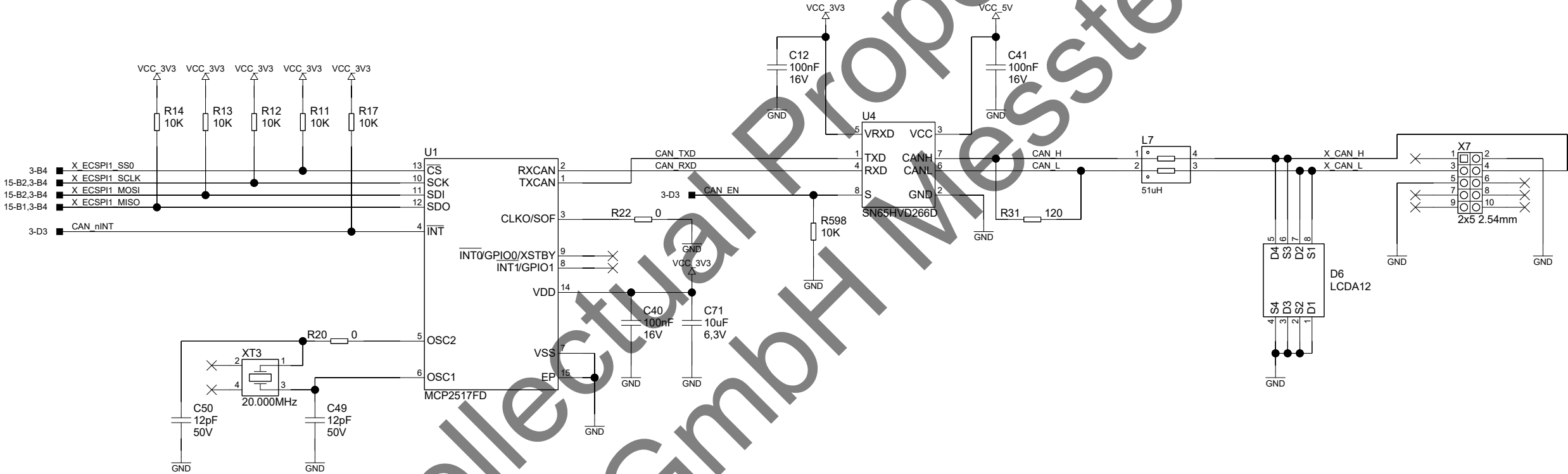
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FD CAN

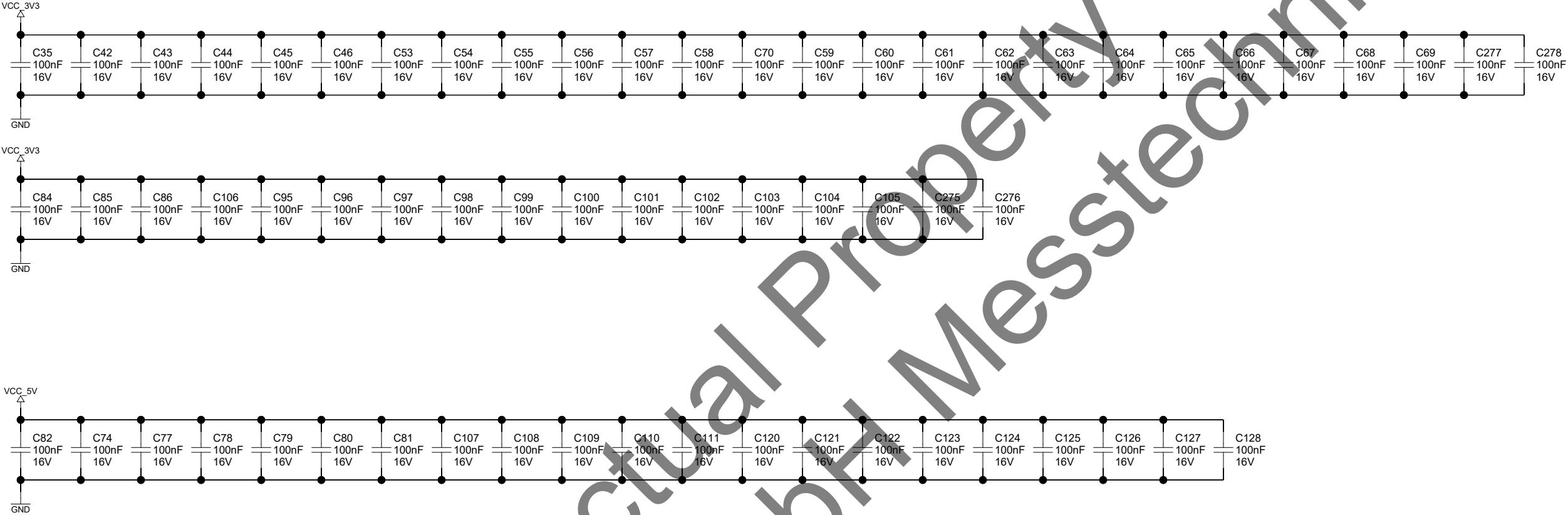
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