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	
25.11.2019	PCB-No.: 1532.1	Revision : 001	Sheet 1 of 22

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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	---

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Z1
PHYTEC
Logo
DMC1 DMC2
DMC DMC
DMC DMC
Z2 Z4
Fiducial-Round Fiducial-Square
Z3 Z5
Fiducial-Round Fiducial-Square

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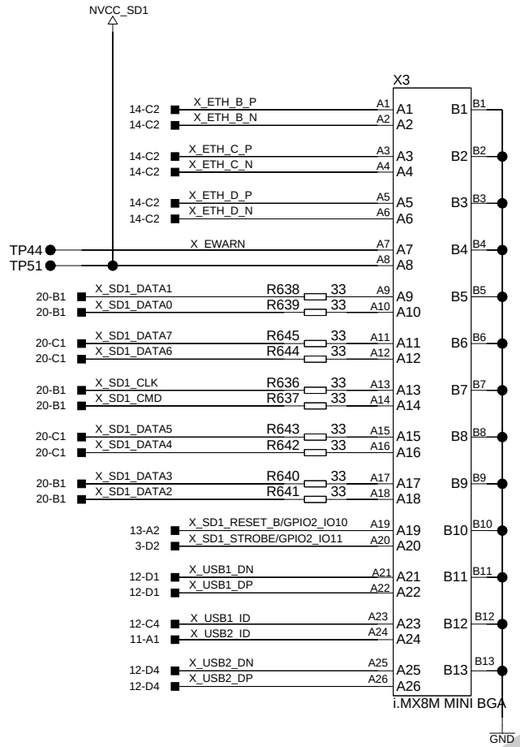
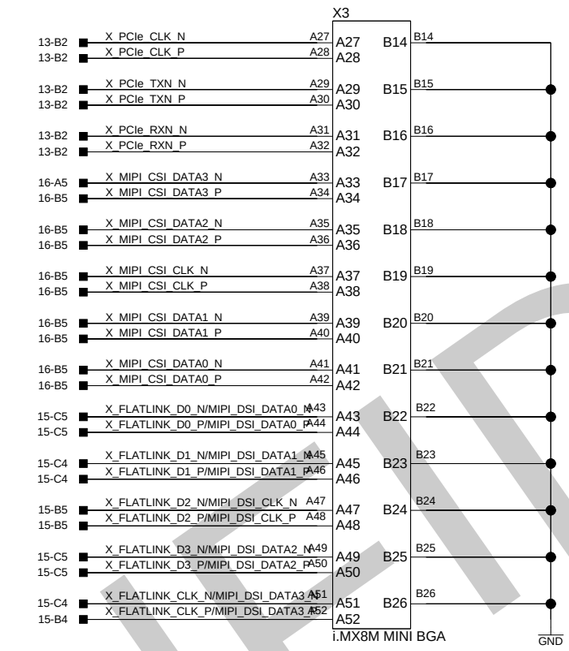
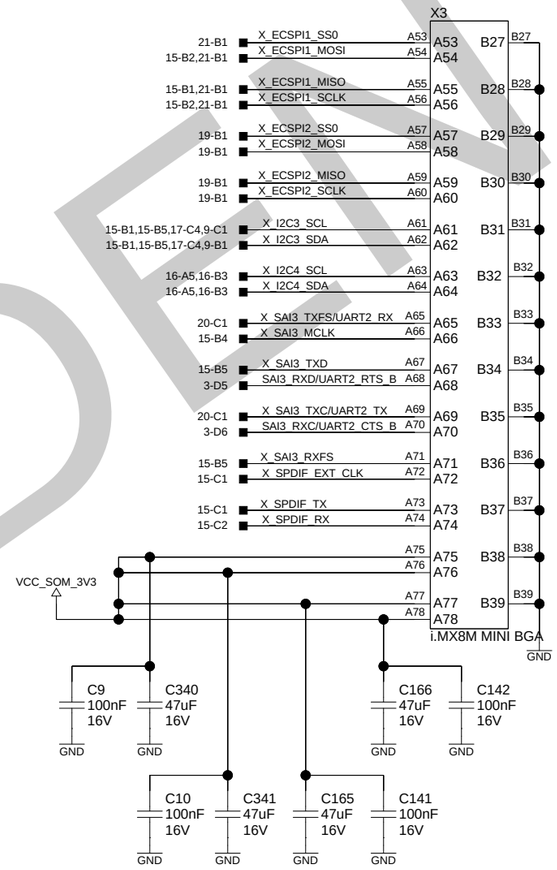
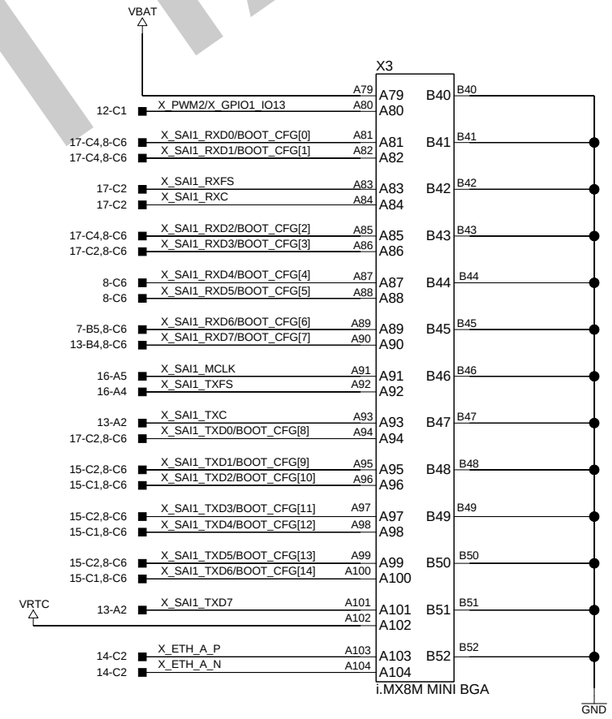
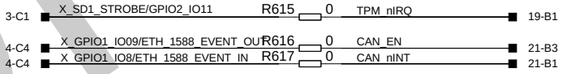
SOM Connector Page 1

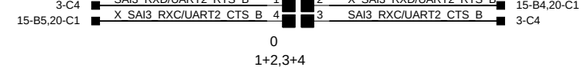


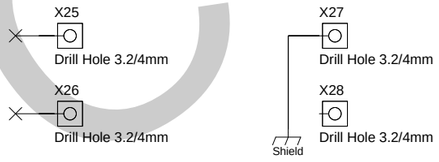












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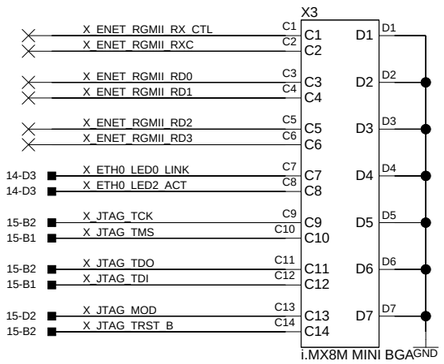
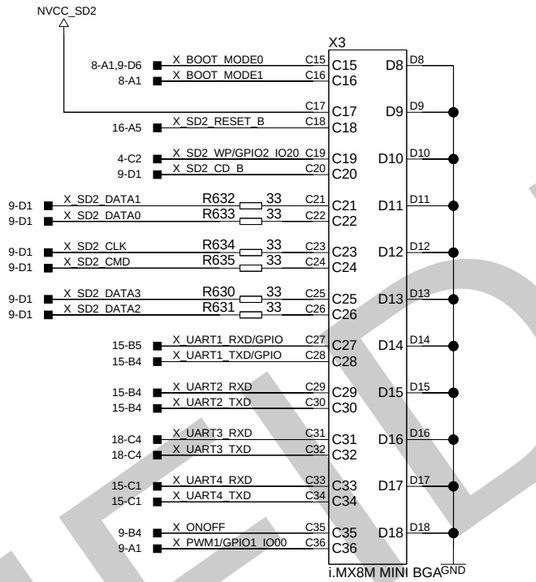
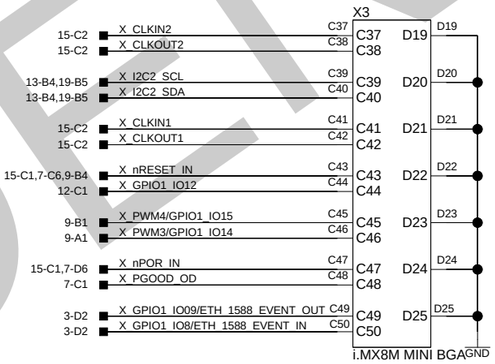
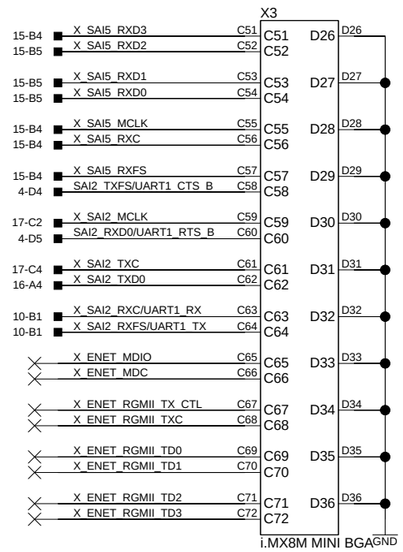
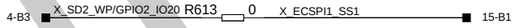
SOM Connector Page 2

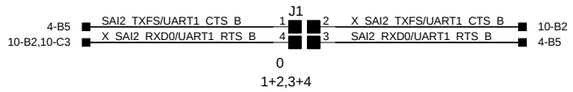












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SOM Connector Page 3

Factory use only

VDD_SNVS_0P8
NVCC_SNVS_1P8
VDD_1P2
VDDA_1V8
VDD_1V8
NVCC_DRAM_1P1V
VDD_SOC_VDDA_PHY_0P8
VDD_MIPI_0P9
VDD_VPU
VDD_GPU_DRAM
VDD_ARM
USB2_VBUS
USB1_VBUS
VDD_3V3_S

X3 — i.MX8M MINI BGA

E1	E1		
E2	E2		
E3	E3		
15-C2 X_TEST_MODE	E4		
11-B1,13-B4,15-A4,15-C2,17-C2,18-D5,19-B1,7-C6	E5		
E6	E6		
15-C1 X_ETH_GPIO1	E7		
E8	E8		
E9	E9		
E10	E10		
E11	E11		
GND			
E12	E12		
E13	E13		
E14	E14		
E15	E15		
E16	E16		
E17	E17		
E18	E18		
8-C1 X_nPOR_OD	E19		
9-C2 X_SD_PWR_EN	E20		
E21	E21		
TP40 TEST PAD X_TSENSE_TEST	E22		
15-C1 X_RTC_INT	E23		
E24	E24		
E25	E25		
E26	E26		
E27	E27		
GND			
E28	E28		
E29	E29		
E30	E30		
E31	E31		
E32	E32		
E33	E33		
E34	E34		
E35	E35		
E36	E36		
E37	E37		
E38	E38		
E39	E39		
GND			
E40	E40		
E41	E41		
E42	E42		
E43	E43		
E44	E44		
E45	E45		
E46	E46		
E47	E47		
E48	E48		
E49	E49		
E50	E50		
E51	E51		
15-C2 X_ETH_JTAG_TDI	E52		
15-C1 X_ETH_JTAG_TMS	E53		
15-C1 X_ETH_JTAG_TDO	E54		
15-C2 X_ETH_JTAG_CLK	E55		
GND			

TP11 TEST PAD
TP5 TEST PAD
TP10 TEST PAD
TP4 TEST PAD
TP7 TEST PAD
TP6 TEST PAD
TP9 TEST PAD
TP16 TEST PAD
TP43 TEST PAD
TP13 TEST PAD
TEST PAD TP17
TP12 TEST PAD

X3A 2.6mm/4mm
X3B 2.6mm/4mm
X3C 2.6mm/4mm

X3 — i.MX8M MINI BGA

1	1
2	2
3	3
4	4
GND	

PCB corners

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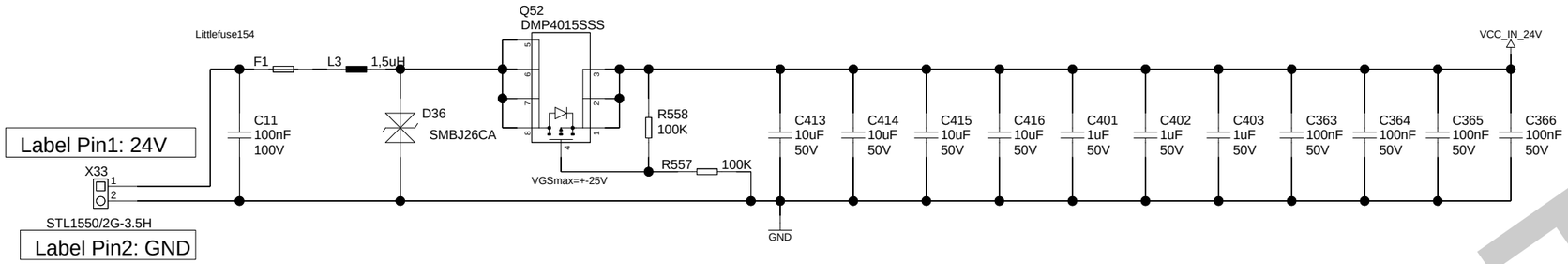
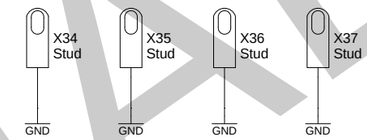
Power1

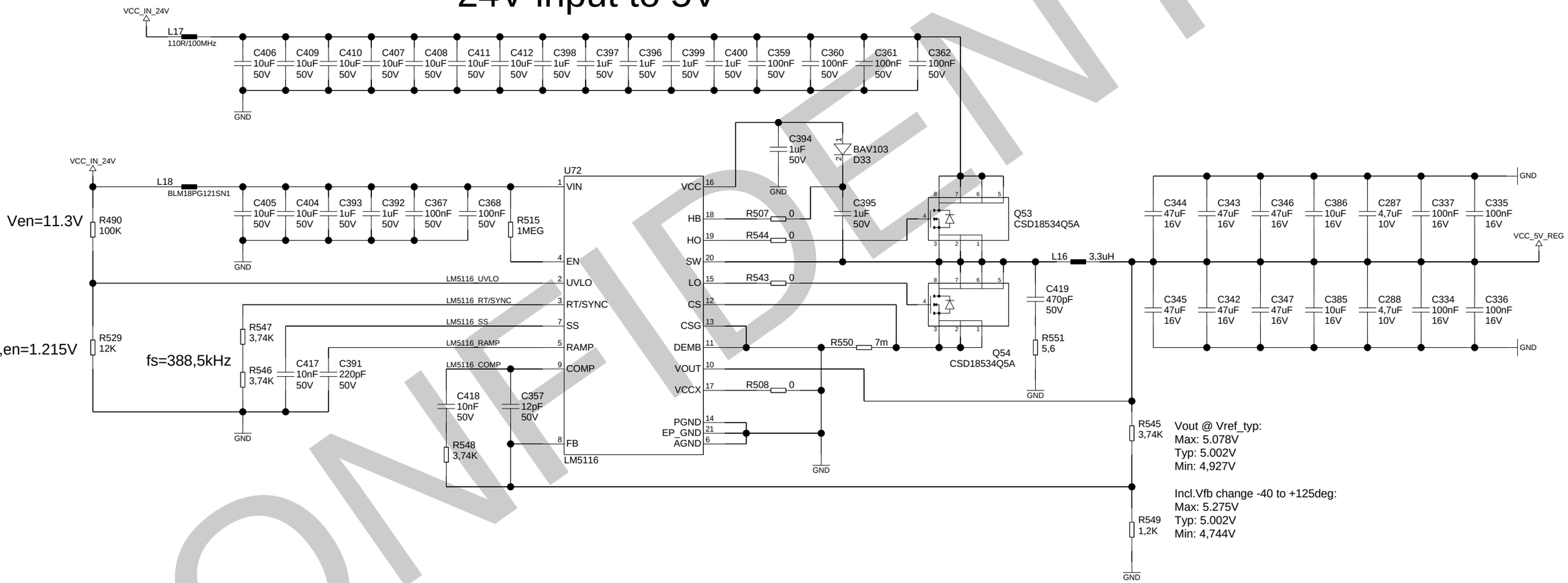
reverse polarity protection



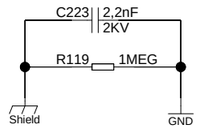
GND for Measurement



24V input to 5V



Shield



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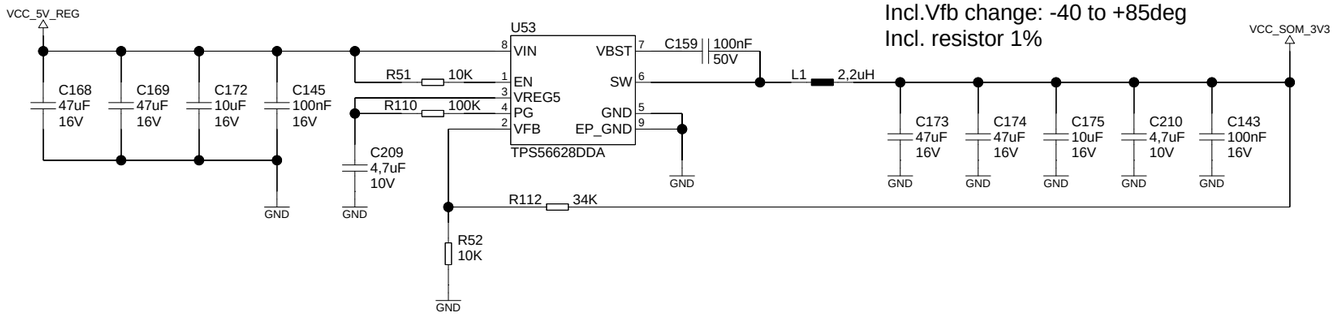
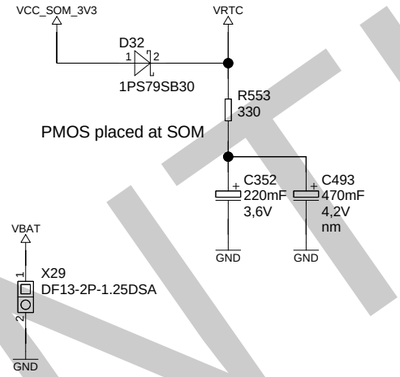
Power2

3.3V / 6A

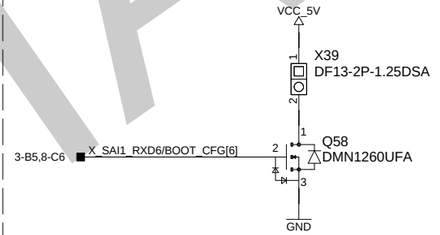
Vmin: 3,254V
Vtyp: 3,366V
Vmax:3,481V
Incl.Vfb change: -40 to +85deg
Incl. resistor 1%



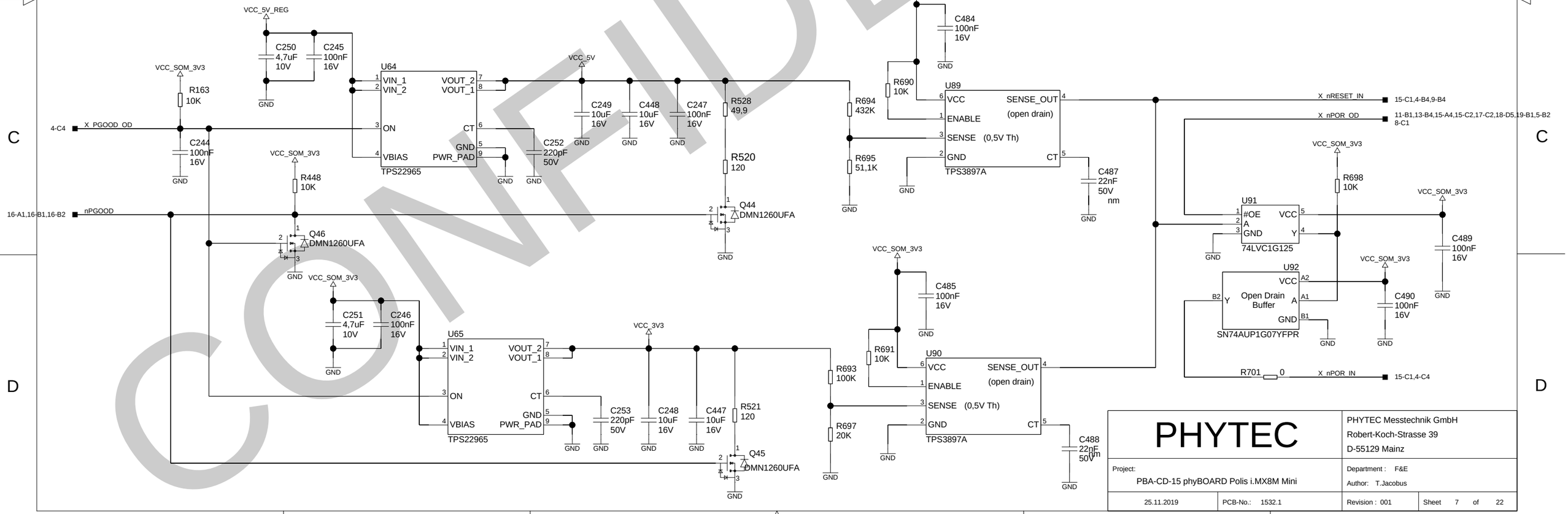
Gold CAP



Fan



Enable board voltages



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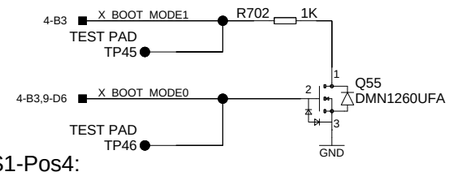
Bootmode Configuration

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

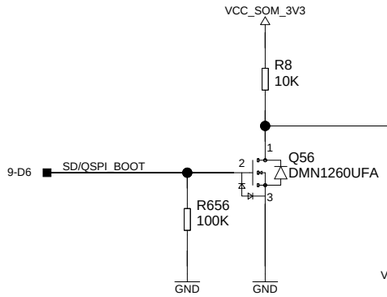
Resistors for [10] placed at SOM

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



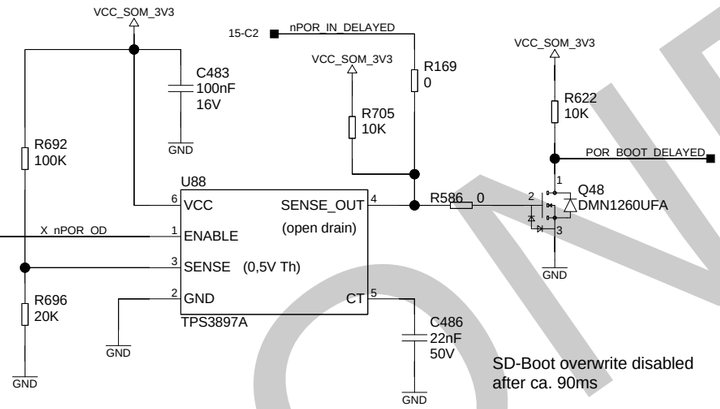
S1-Pos4:
select between Internal-Boot and Serial Downloader
OFF: Serial Downloader
ON: Internal Boot

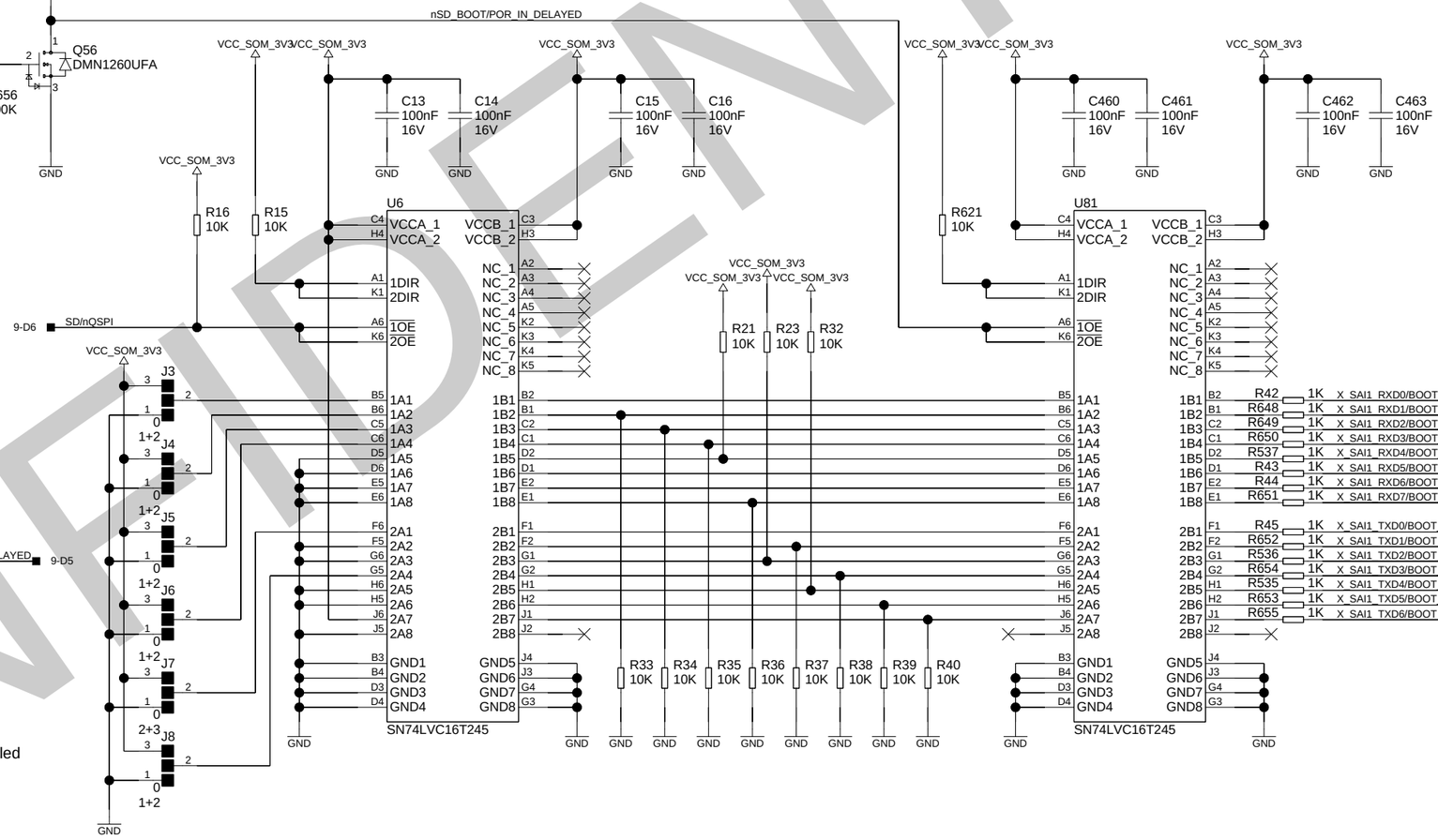


Alternate Boot

S1-Pos1:
ON = Alternate Boot
OFF = eMMC

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





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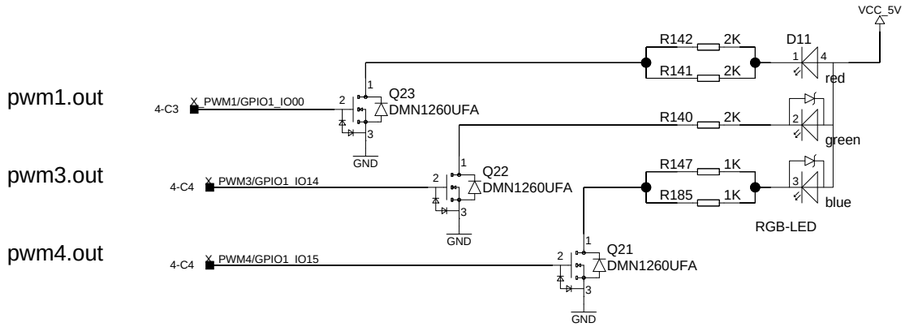
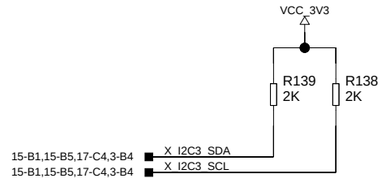
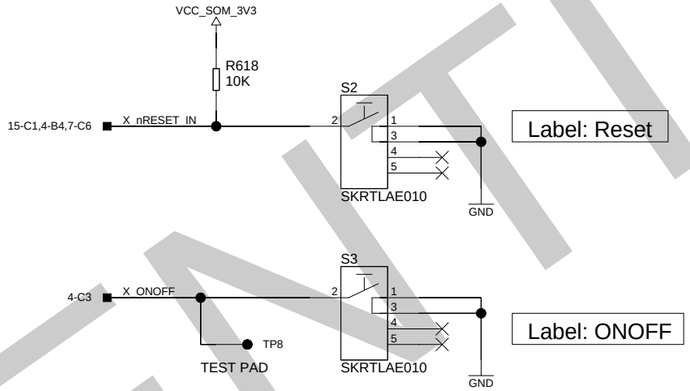
RGB LED



I2C3

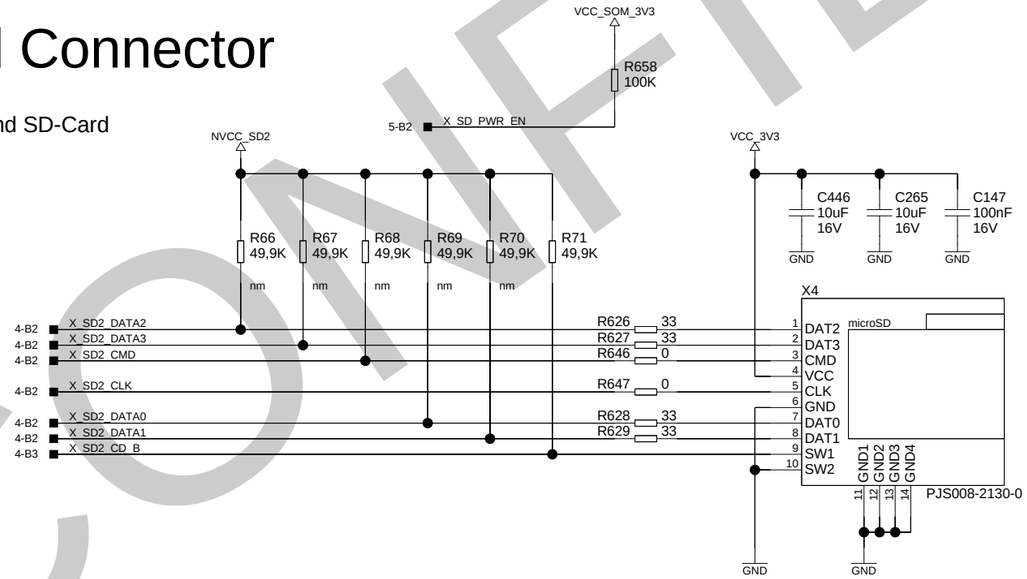


Reset Button/ ONOFF Button



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

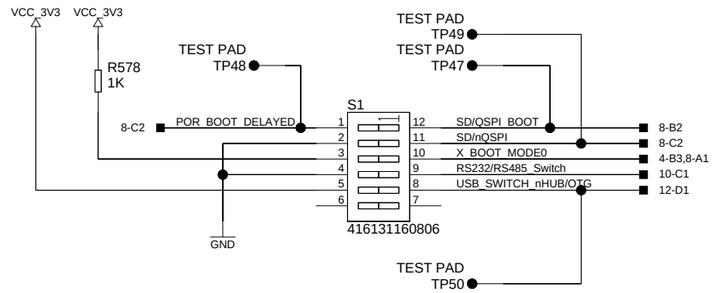
Label Pos2:
Pad11 (ON): QSPI-BOOT
Pad2 (OFF): SD-BOOT

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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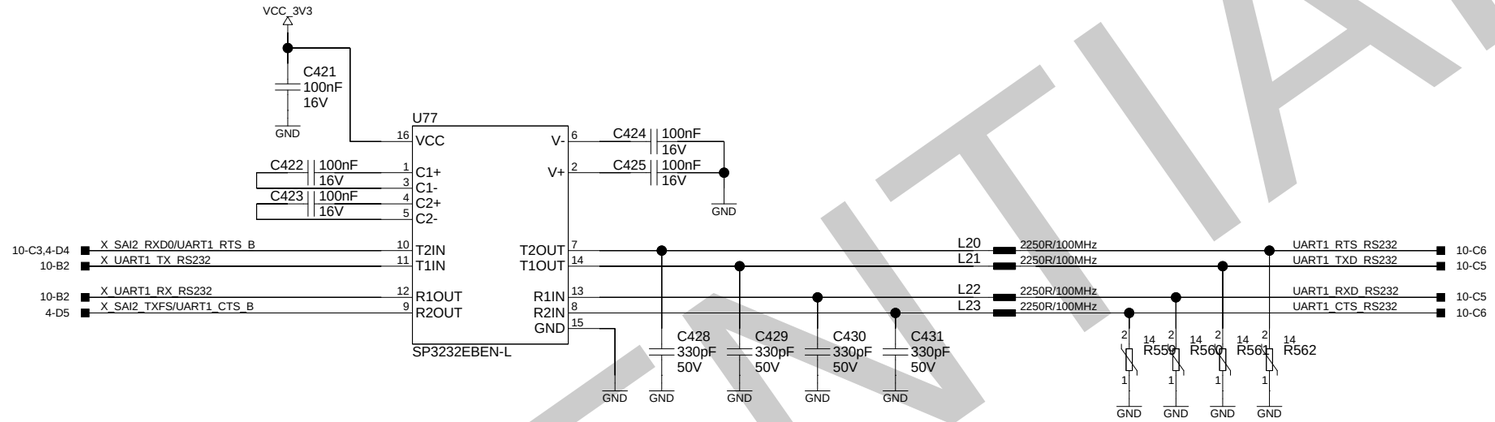
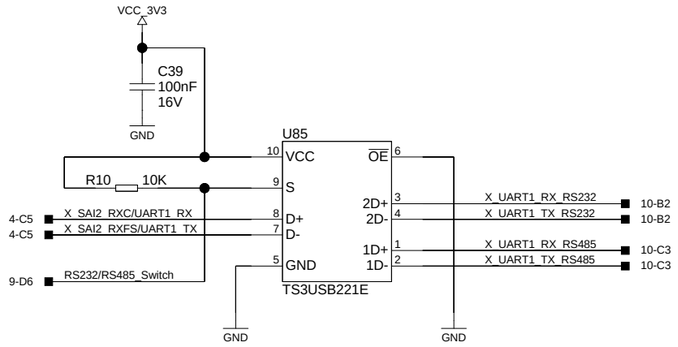
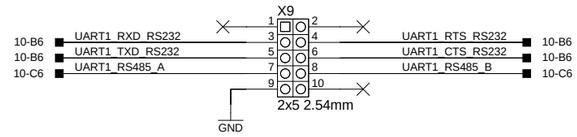
UART Multiplexer

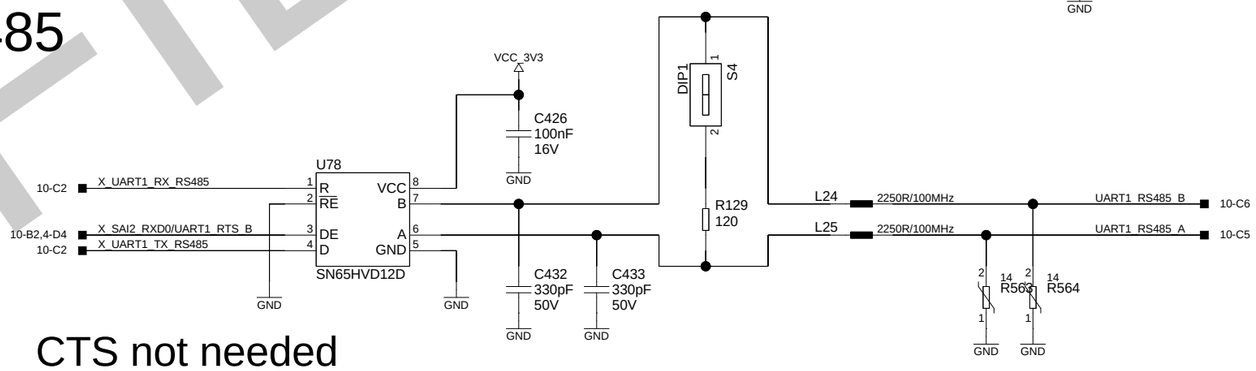
RS232







RS485



CTS not needed

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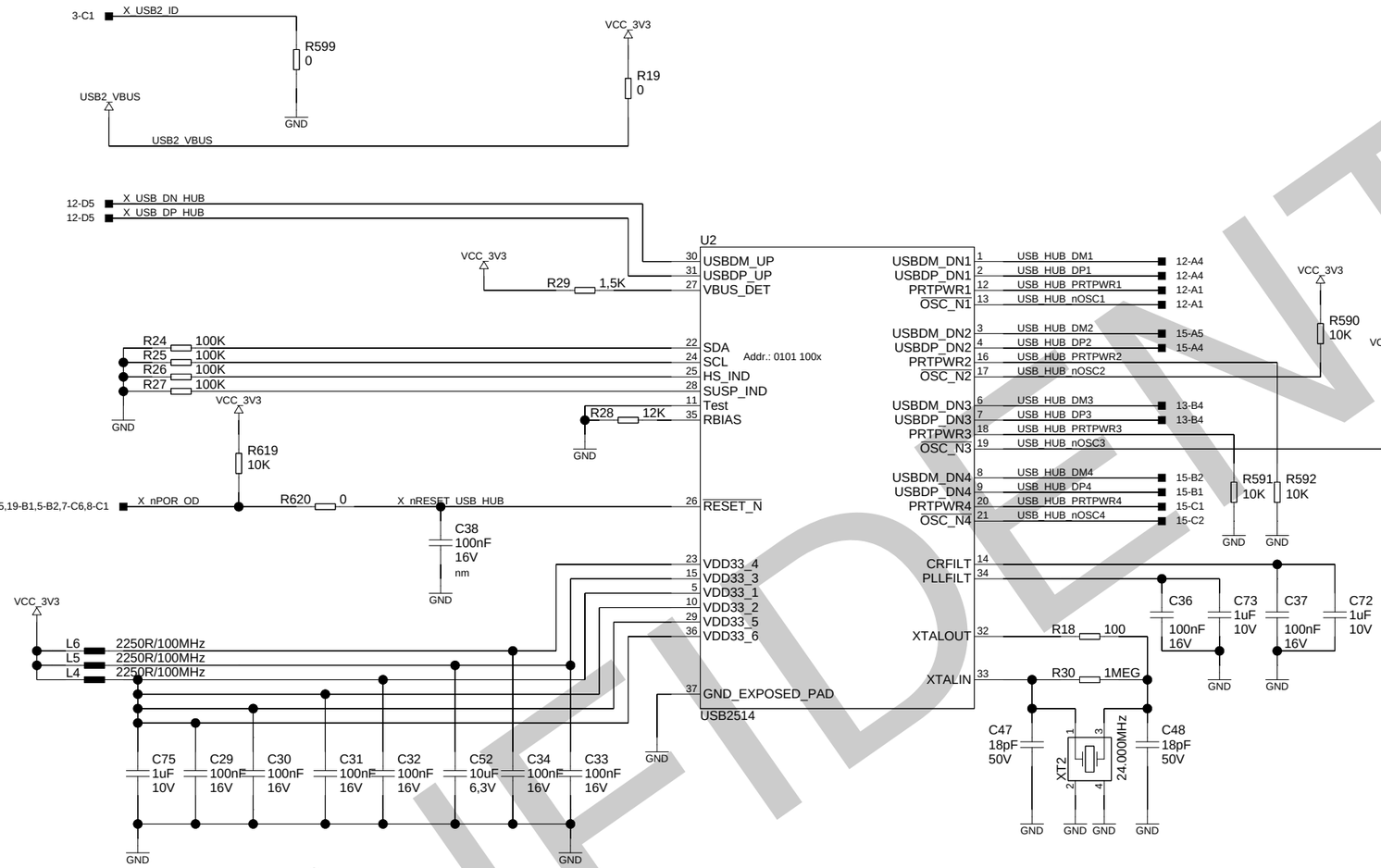
USB-HUB



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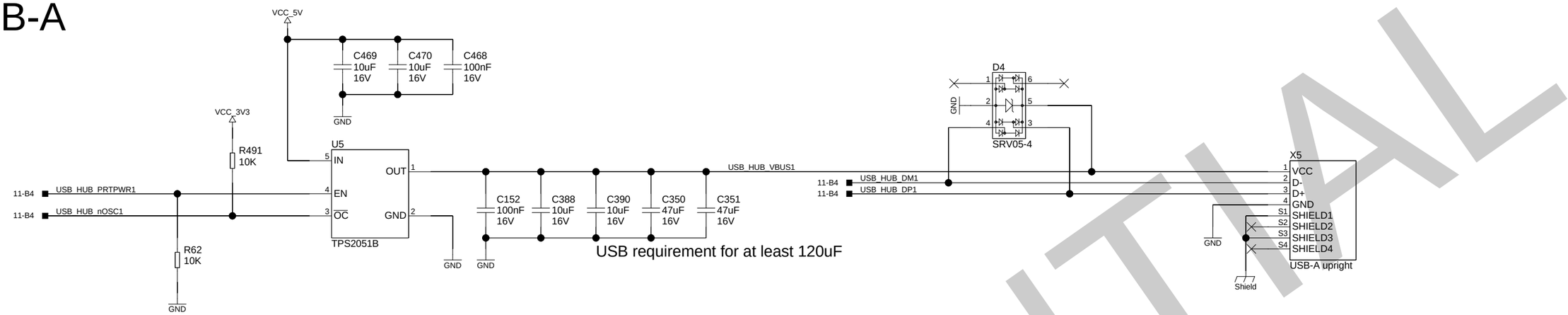
USB-A

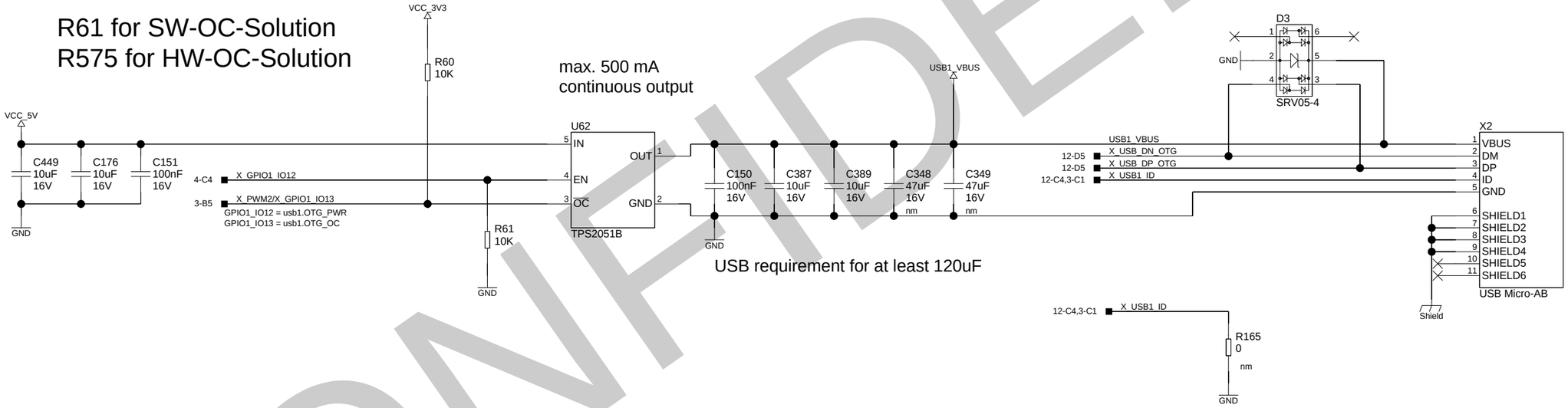


USB OTG

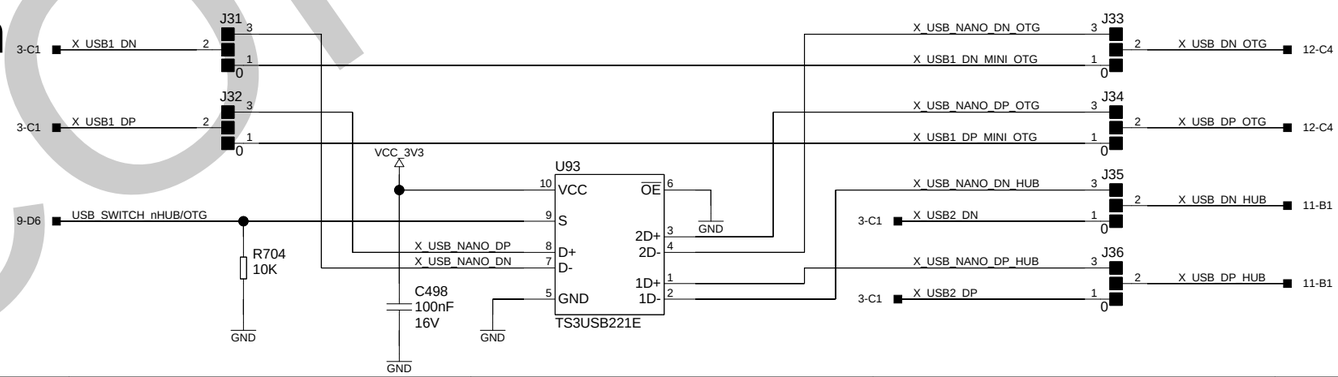
USB OTG1 useable for serial downloader

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

max. 500 mA
continuous output



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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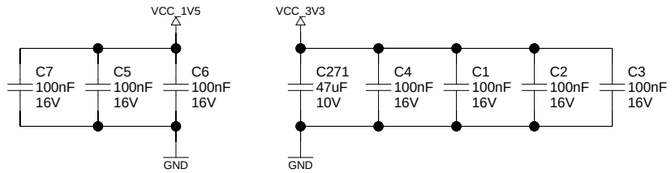
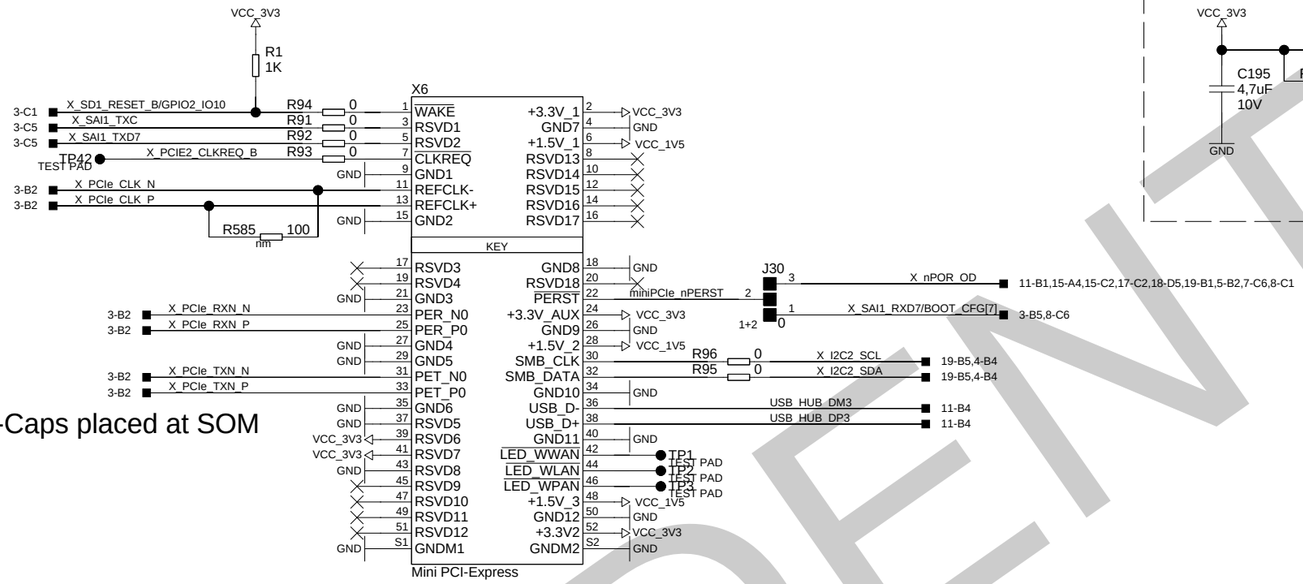
miniPCIe

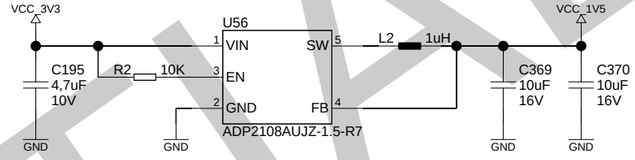




TX-Caps placed at SOM

miniPCIe/Exp. 1V5 Supply

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



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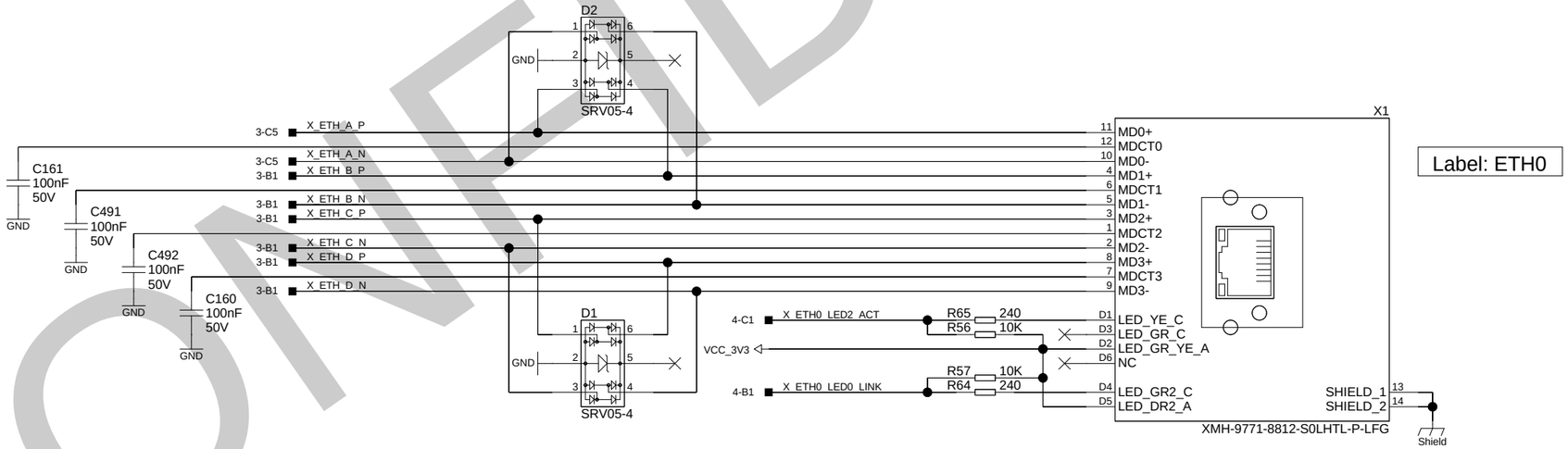
ENET Gbit-Connector



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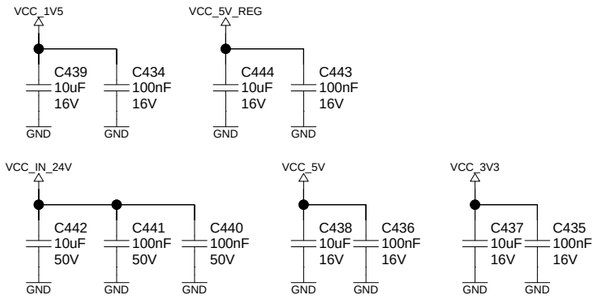
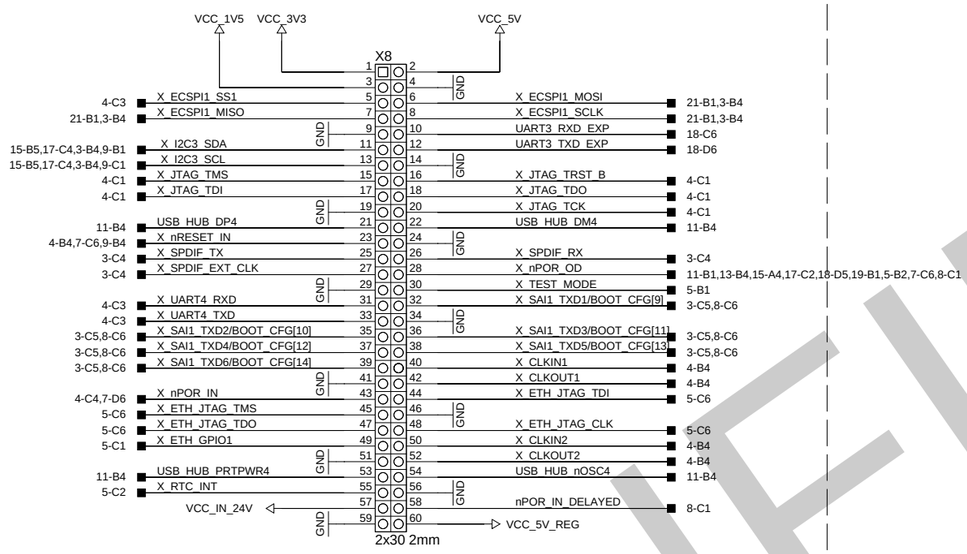
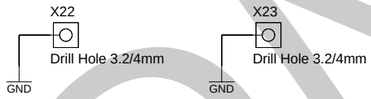
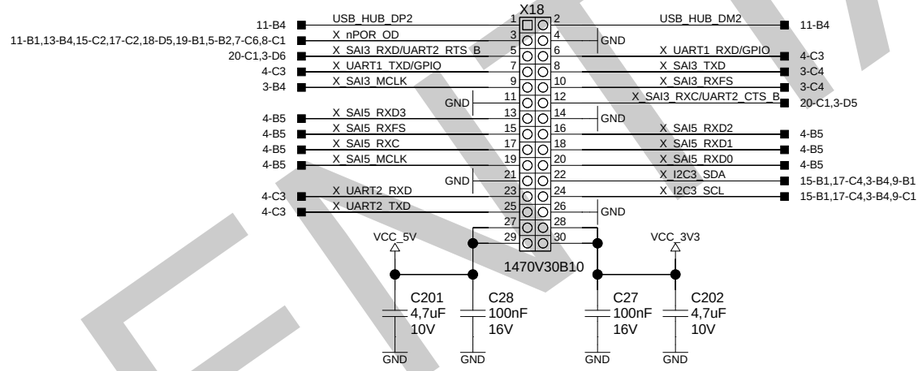
Expansion Connector

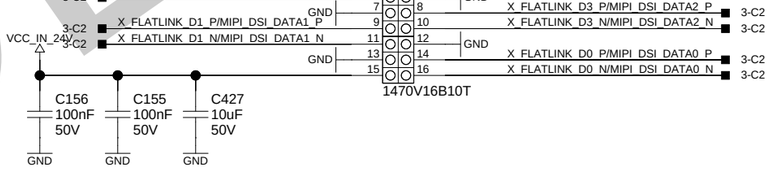


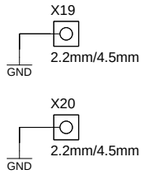


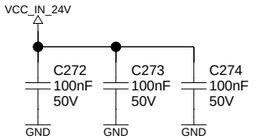


Audio/Video-Connector









place capacitors along the trace

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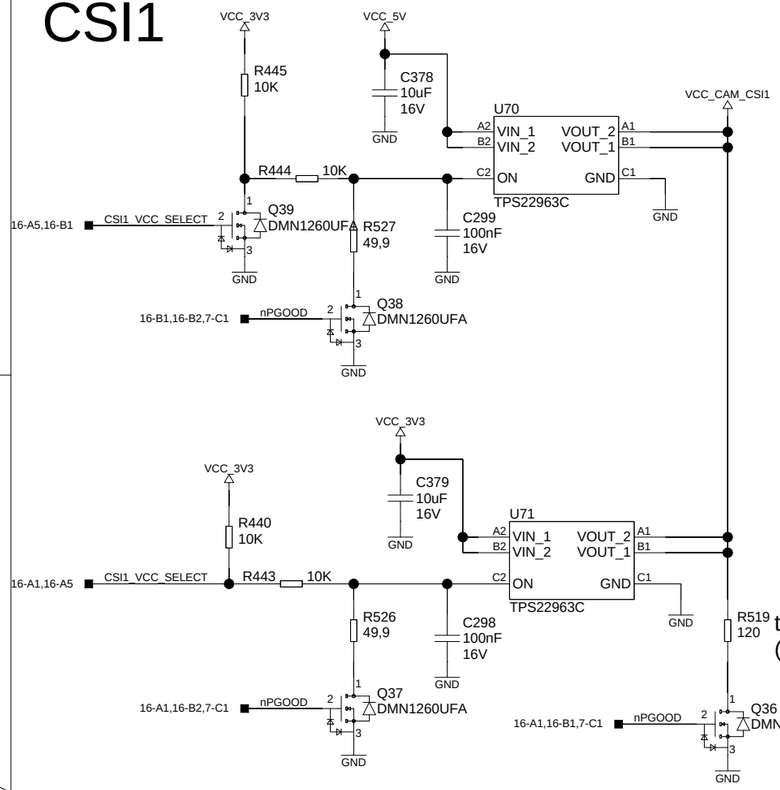
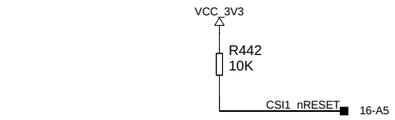
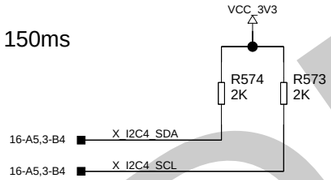
CSI1

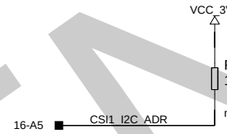


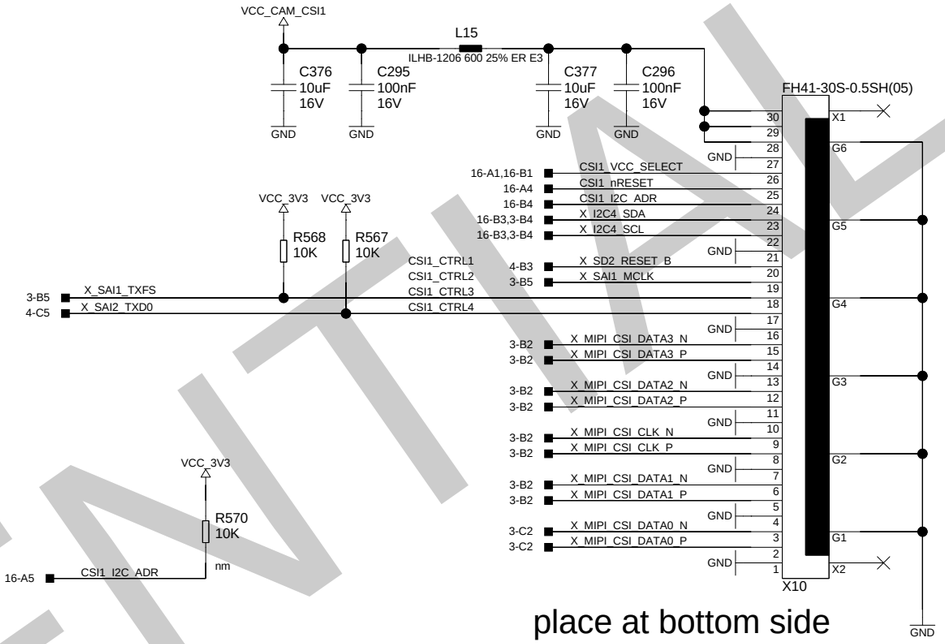
3V3:
Uc(0,026s) = 0,4V = Vth_min
Uc(0,072s) = 1,0V = Vth_max
5V:
Uc(0,016s) = 0,4V = Vth_min
Uc(0,044s) = 1,0V = Vth_max

t_discharge ca. 150ms
(250uF)









place at bottom side

Label: CSI1

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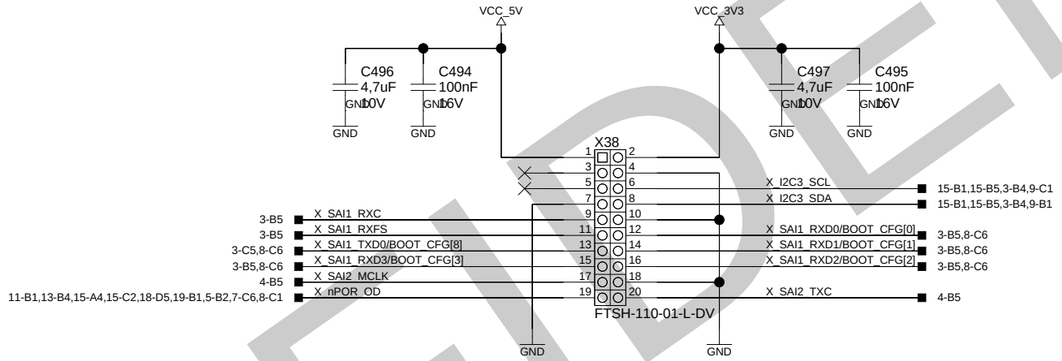
VOICE ARRAY CONNECTOR



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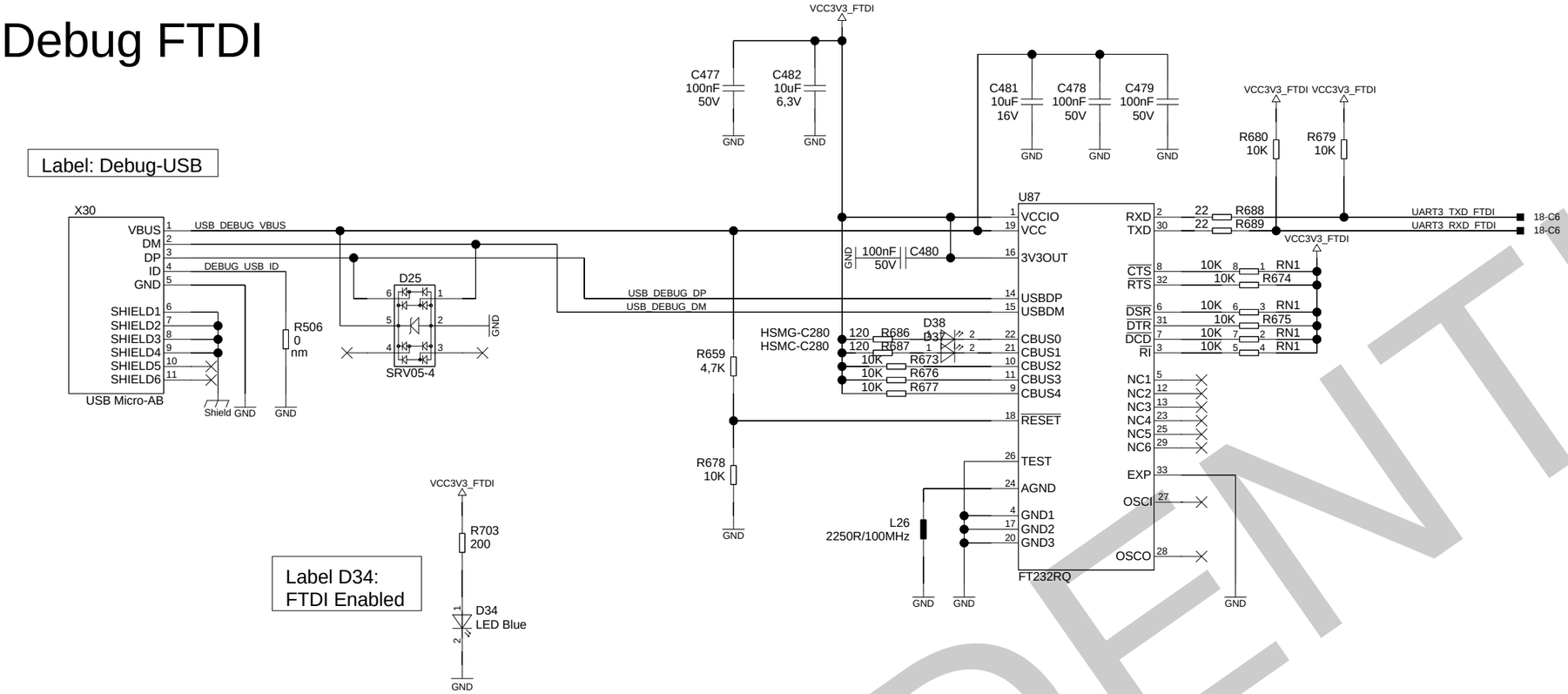
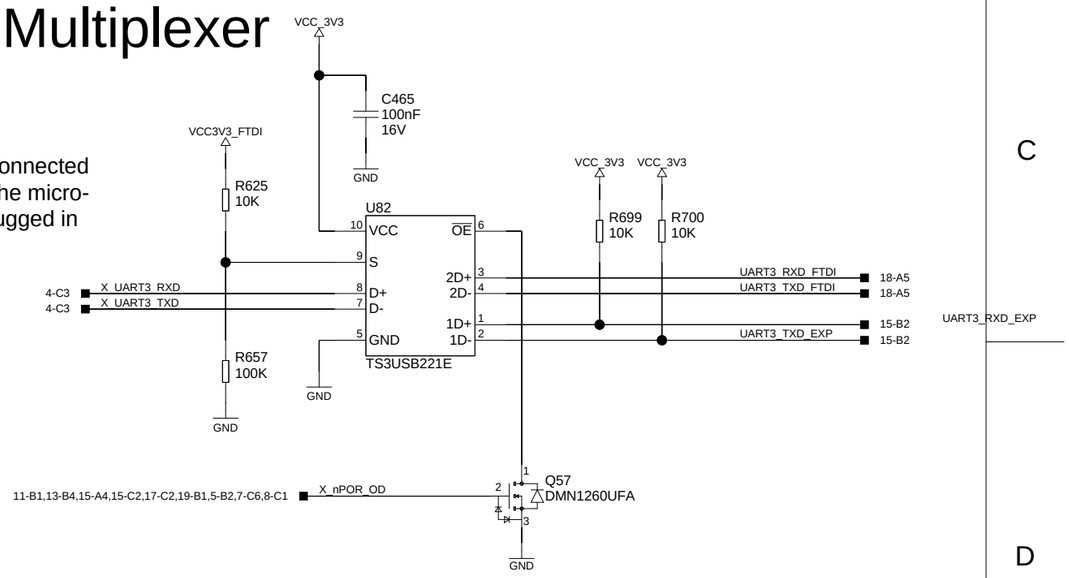
Debug FTDI



UART Multiplexer



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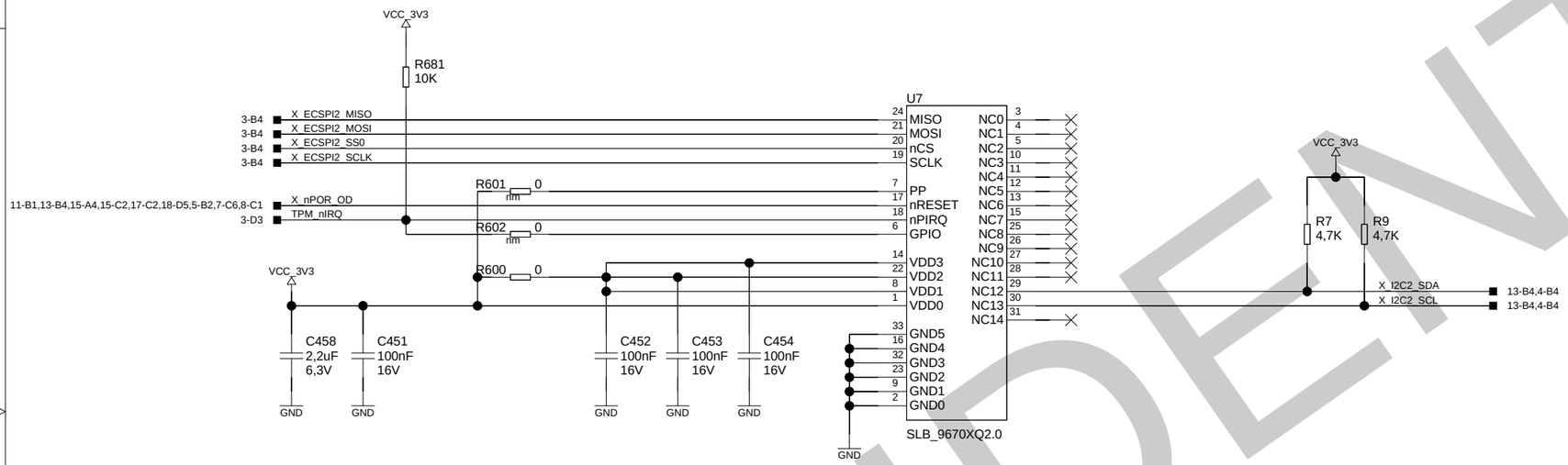
TPM



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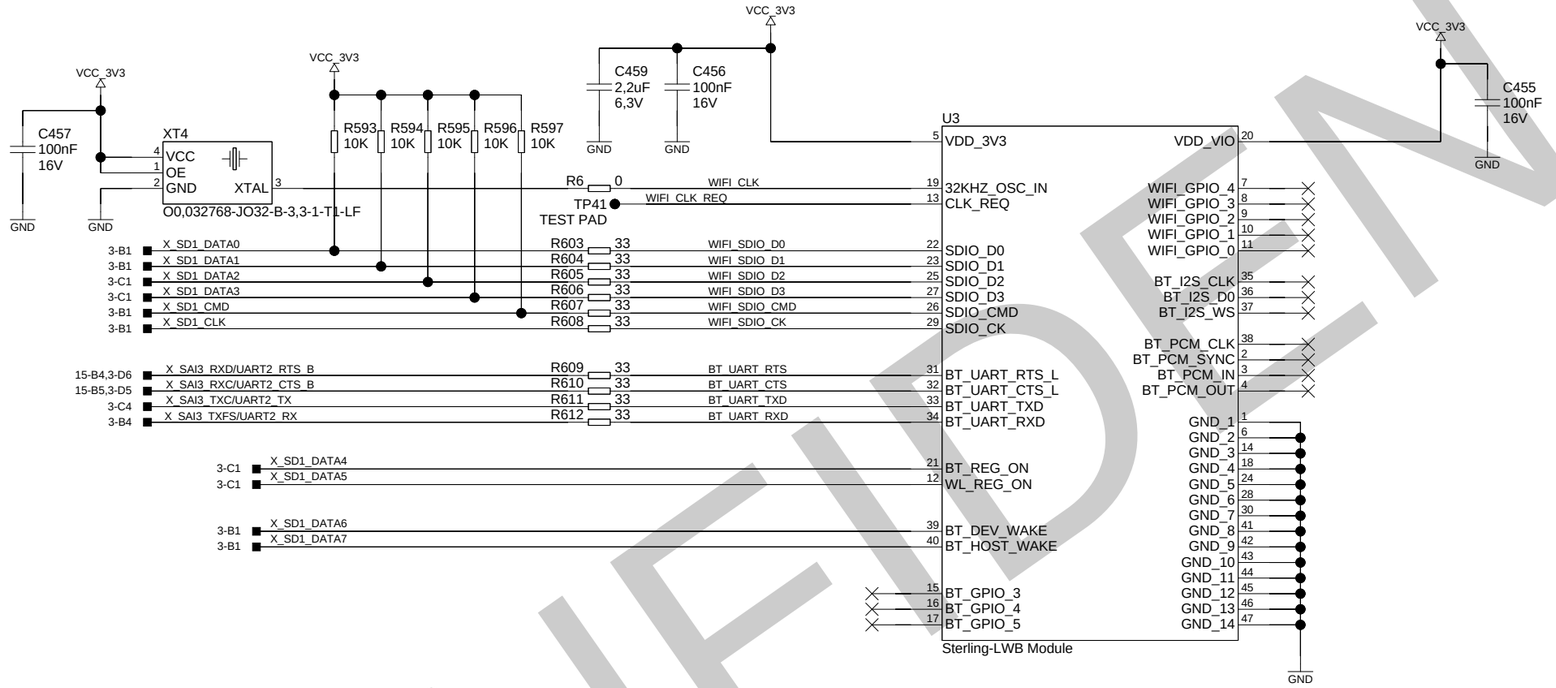
WLAN



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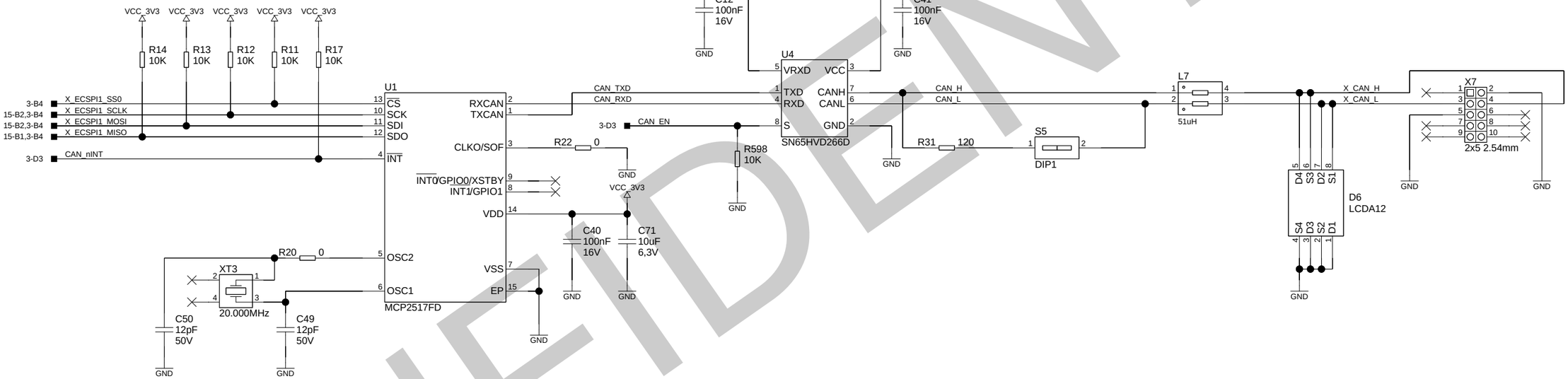
FD CAN



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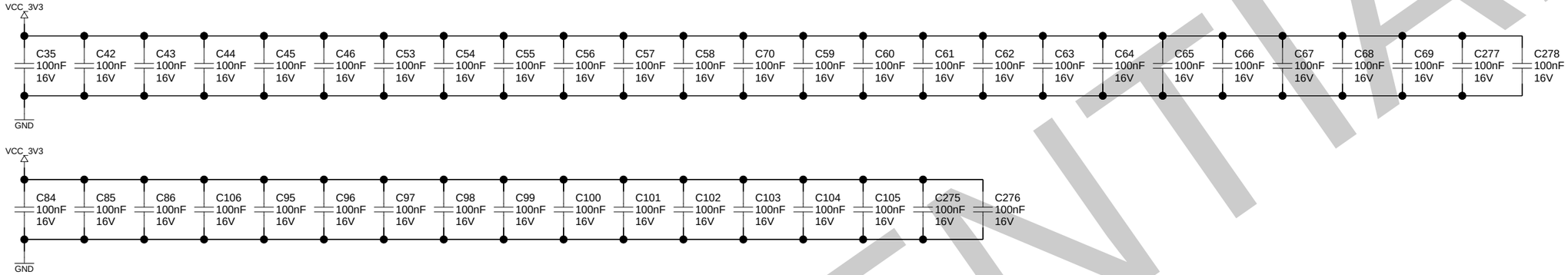
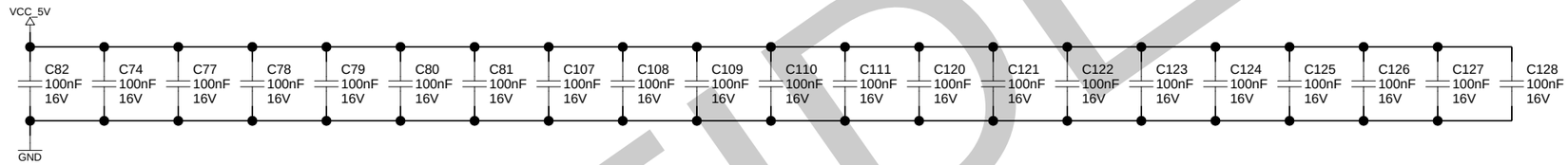
Capacitors





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