

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, A. Merrath	
09.07.2021	PCB-No.: 1532.2	Revision : 001	Sheet 1 of 21

Overview

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Page	Content
1	Title
2	Overview
3	SOM Connector1
4	SOM Connector2
5	SOM Connector3
6	Power1
7	Power2
8	Switches, Sequencing
9	Bootmode MINI
10	Bootmode NANO
11	Buttons, RGB LED, SD-Card
12	RS232; RS485
13	USB-HUB
14	USB
15	miniPCle Connector, ENET Connector
16	Expansion and Audio/Video-Connector
17	MIPI Camera Connector, Voice Array
18	Debug UART/USB
19	TPM, WLAN
20	CAN
21	Capacitors

I.MX 8M Mini		I.MX 8M Nano
ON: Alternate-BOOT OFF: Default-BOOT	S1-1	ON: BOOT_MODE[2] = 1 OFF: BOOT_MODE[2] = 0
ON: QSPI-BOOT OFF: SD-BOOT	S1-2	ON: BOOT_MODE[1] = 1 OFF: BOOT_MODE[1] = 0
ON: Serial Downloader OFF: Internal Boot	S1-3	ON: BOOT_MODE[0] = 1 OFF: BOOT_MODE[0] = 0
ON: UART1 RS485 OFF: UART1 RS232	S1-4	ON: UART1 RS485 OFF: UART1 RS232
Not Used	S1-5	ON: USB OTG Port OFF: USB HUB
ON: UART4 to X8 OFF: UART4 to FTDI	S1-6	ON: Baseboard Bootmode OFF: SOM Bootmode
RESET	S2	RESET
ON/OFF	S3	ON/OFF

Z1

PHYTEC

Logo

DMC1

DMC

DMC2

DMC

Z2

Fiducial-Round

Z4

Fiducial-Square

Z3

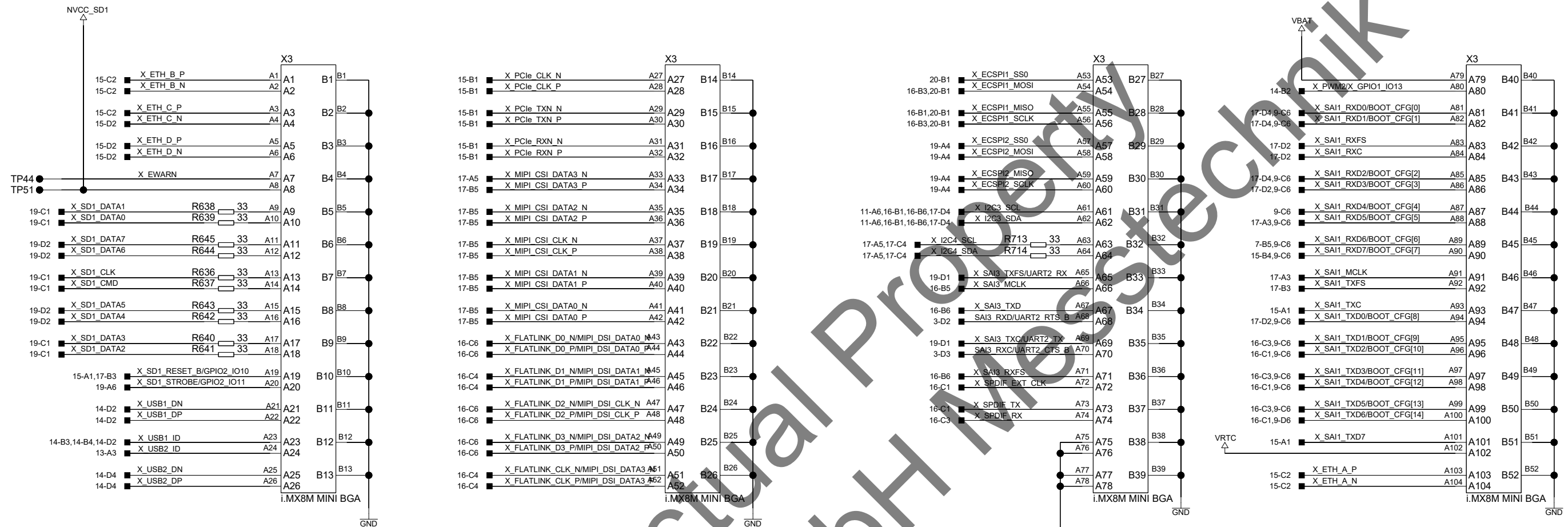
Fiducial-Round

Z5

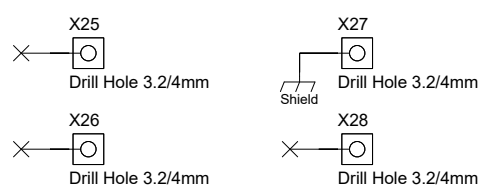
Fiducial-Square

SOM Connector Page 1

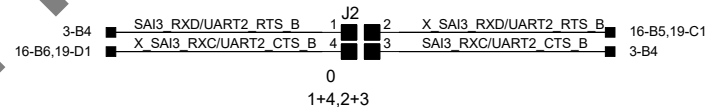
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Baseboard Mounting Holes



UART2 RTS/CTS Jumper



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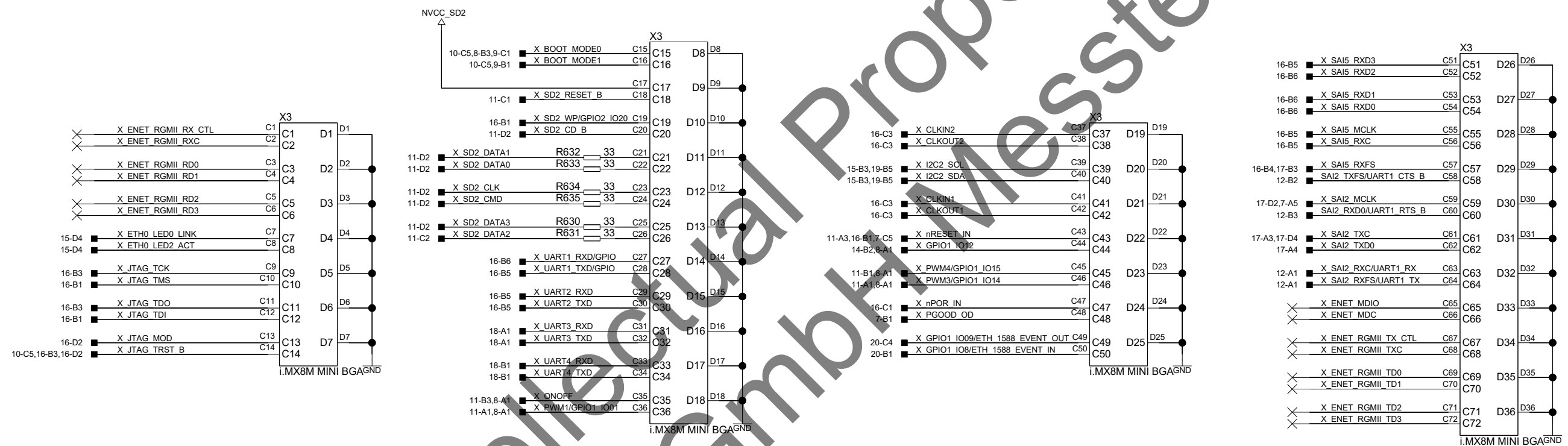
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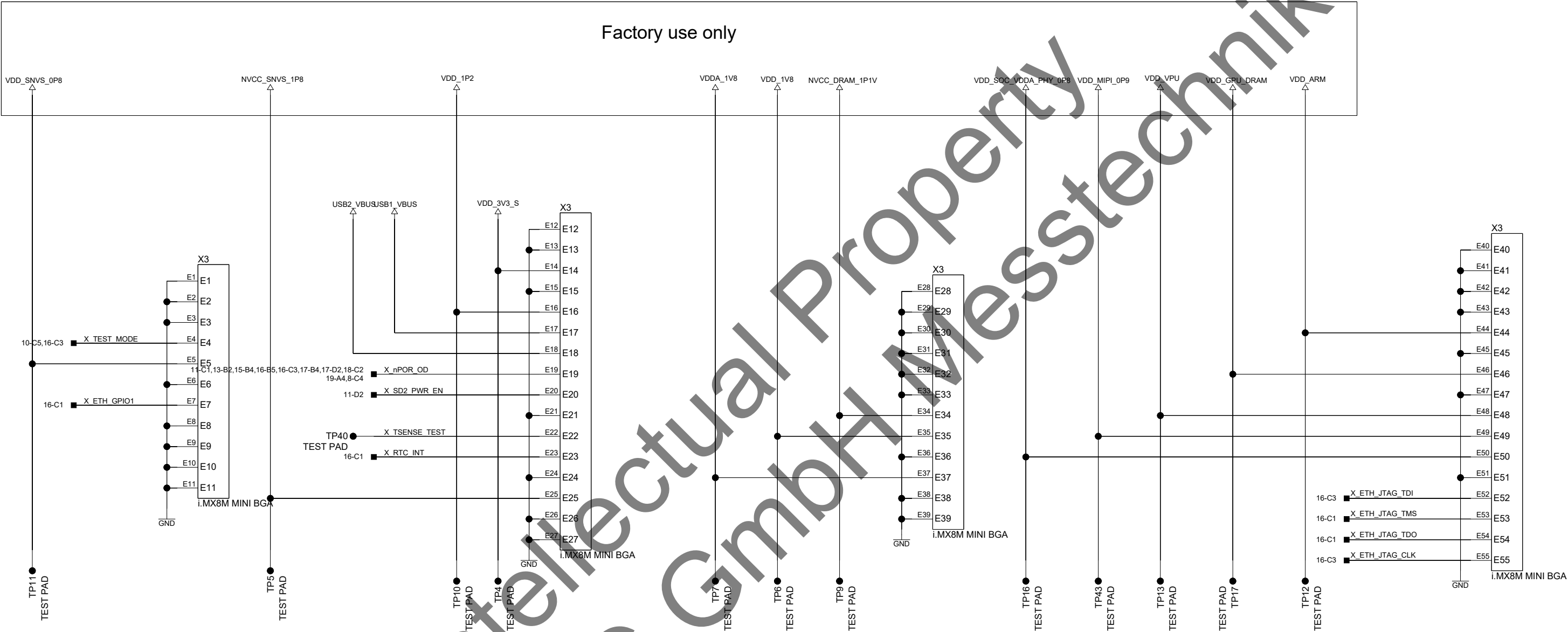
Sheet 3 of 21

SOM Connector Page 2

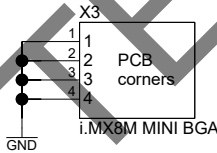
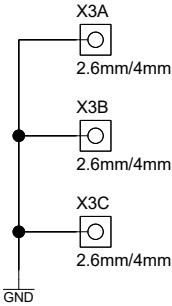
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Heatspreader Mounting



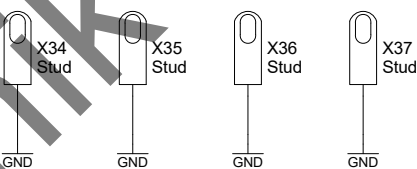
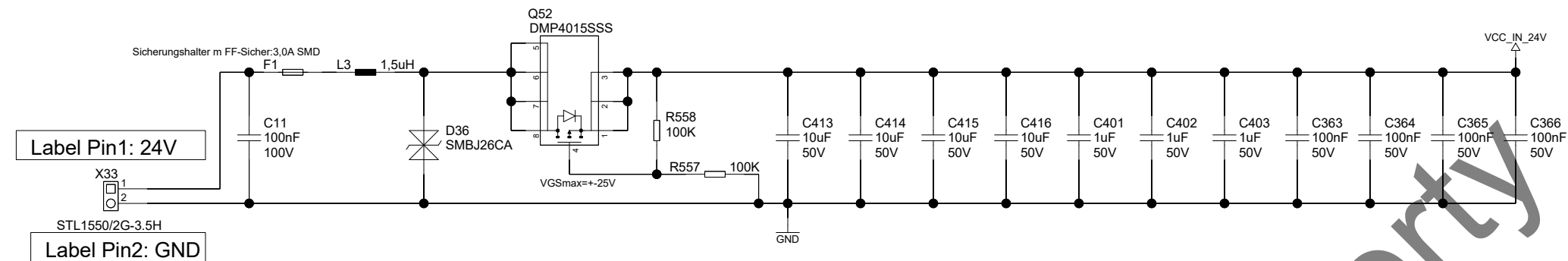
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09.07.2021	PCB-No.: 1532.2	Revision : 001	Sheet 5 of 21

Power1

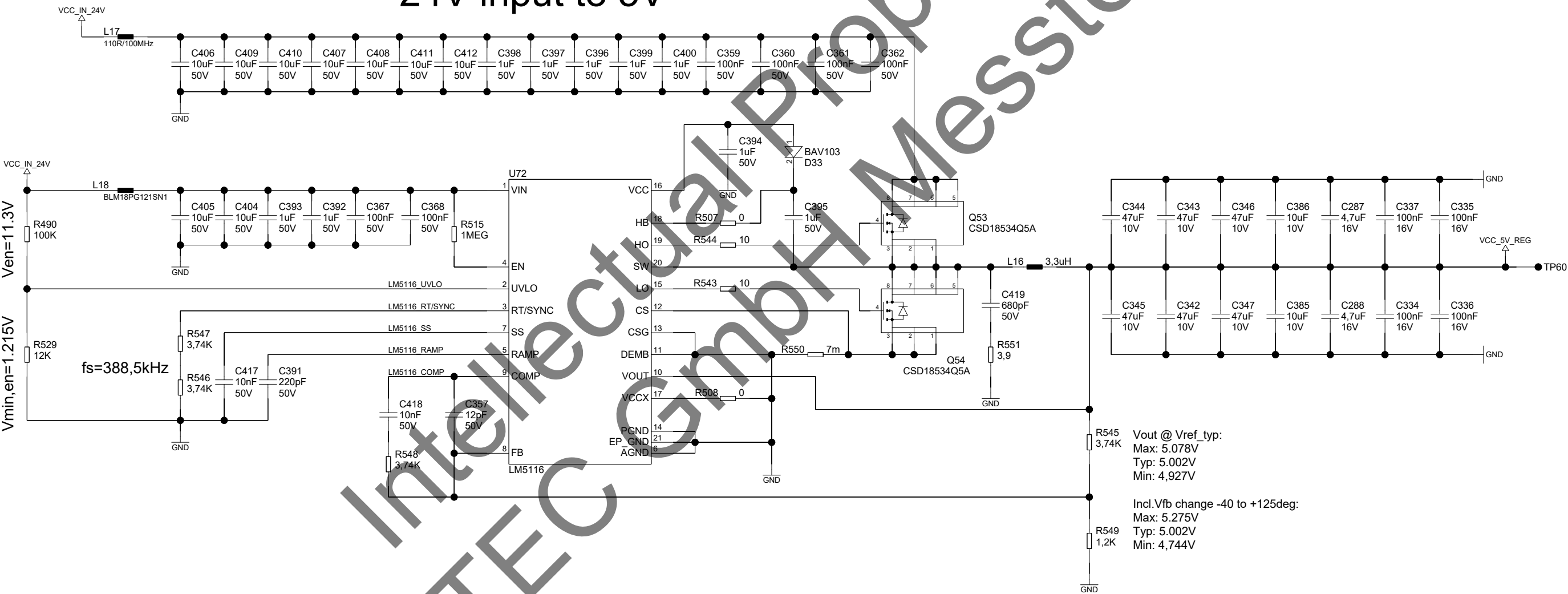
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GND for Measurement

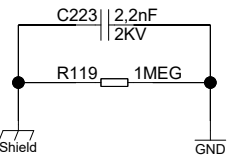
reverse polarity
protection



24V input to 5V



Shield



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Sheet 6 of 21

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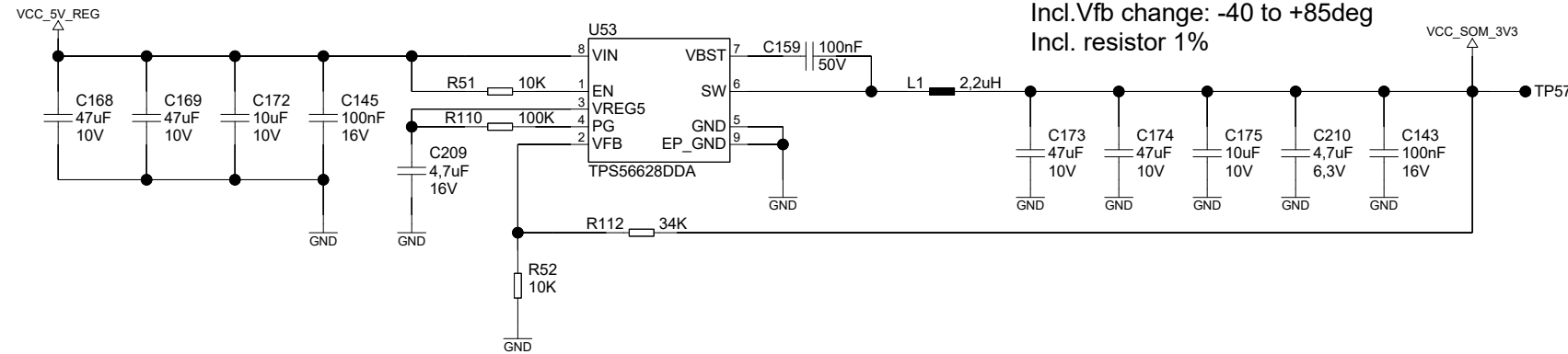
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Sheet 6 of 21

Power2

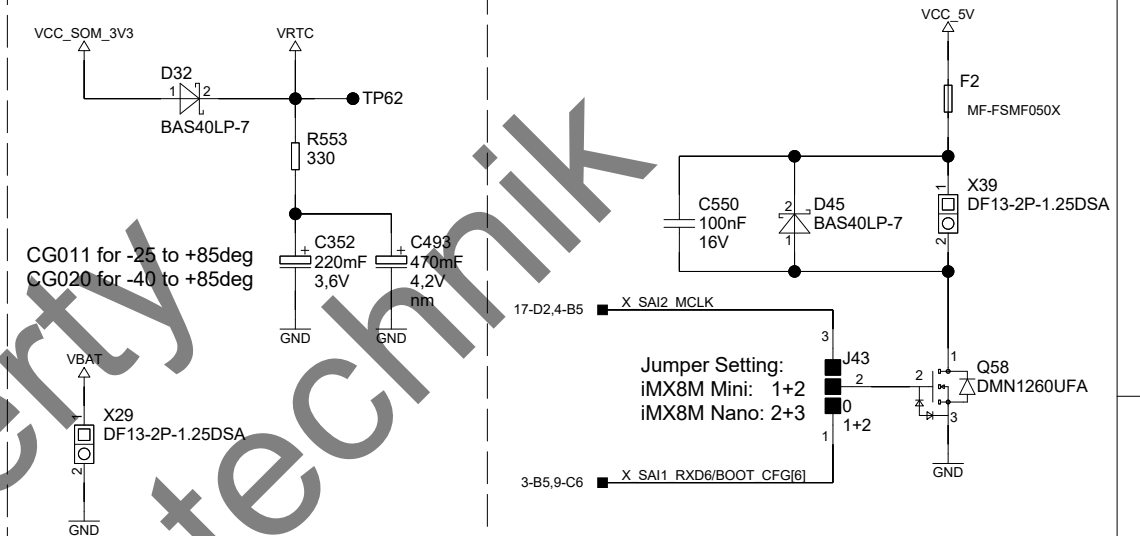
3.3V / 6A

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

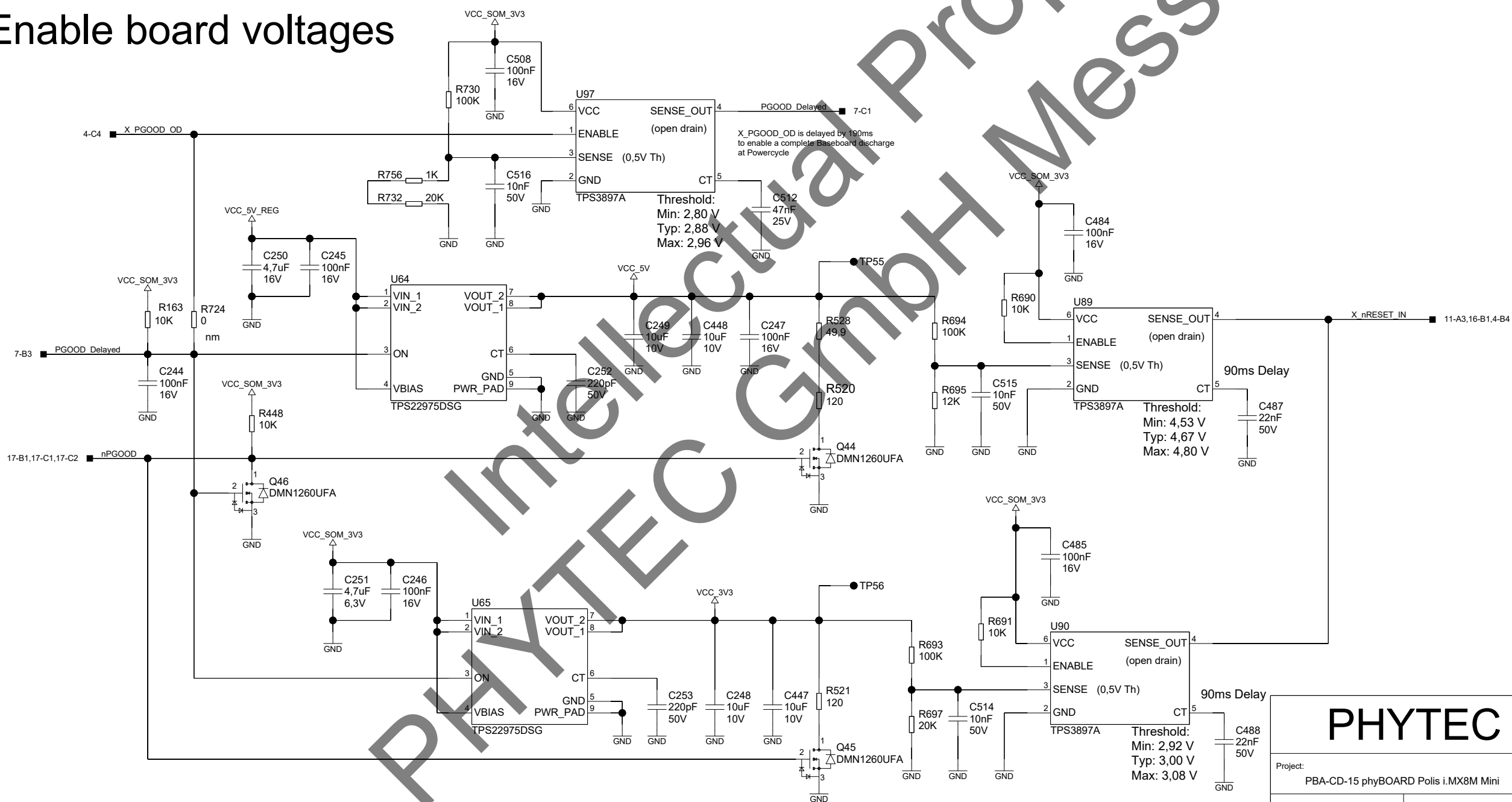


Gold CAP Fan

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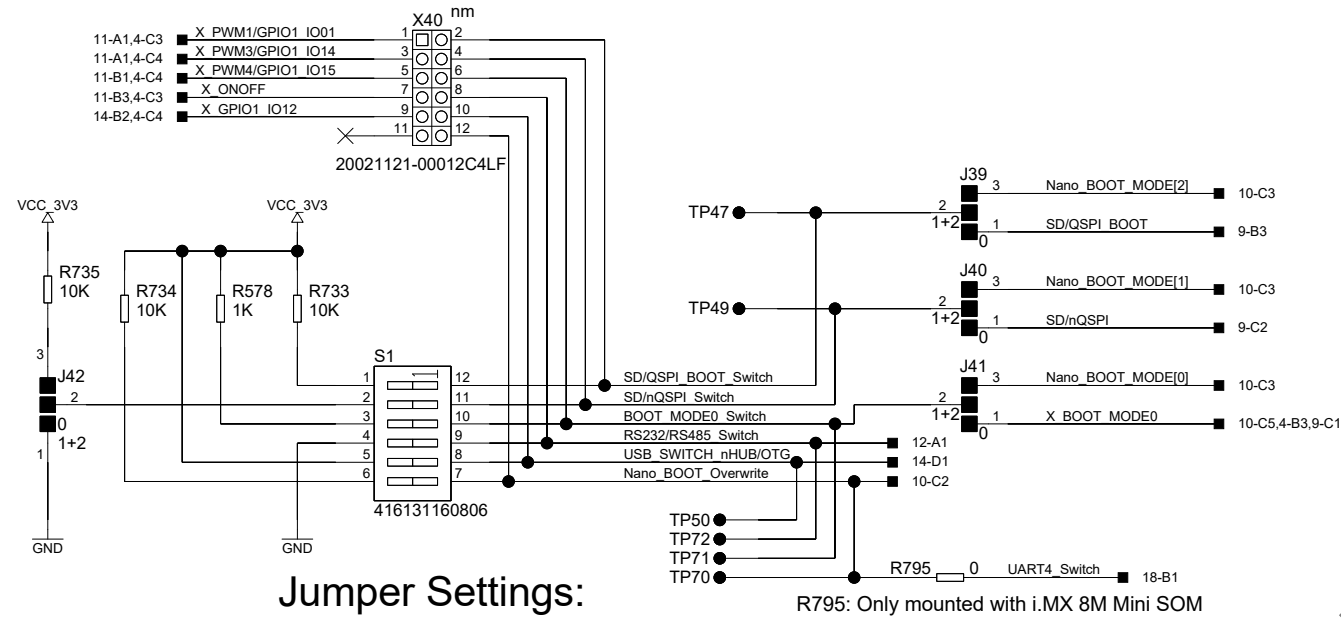
Enable board voltages



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09.07.2021	PCB-No.: 1532.2	Revision : 001	Sheet 7 of 21

Dip-Switch

X40 not mounted
Pads for factory use only

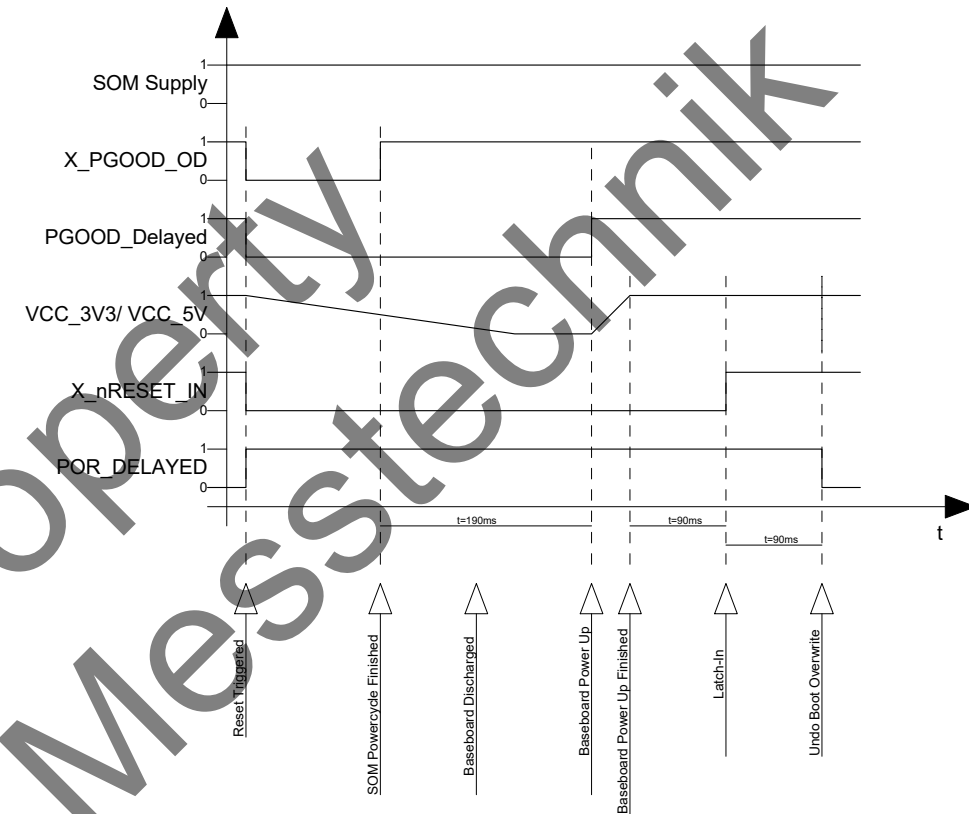


Jumper Settings:
iMX8M Mini: 1+2
iMX8M Nano: 2+3

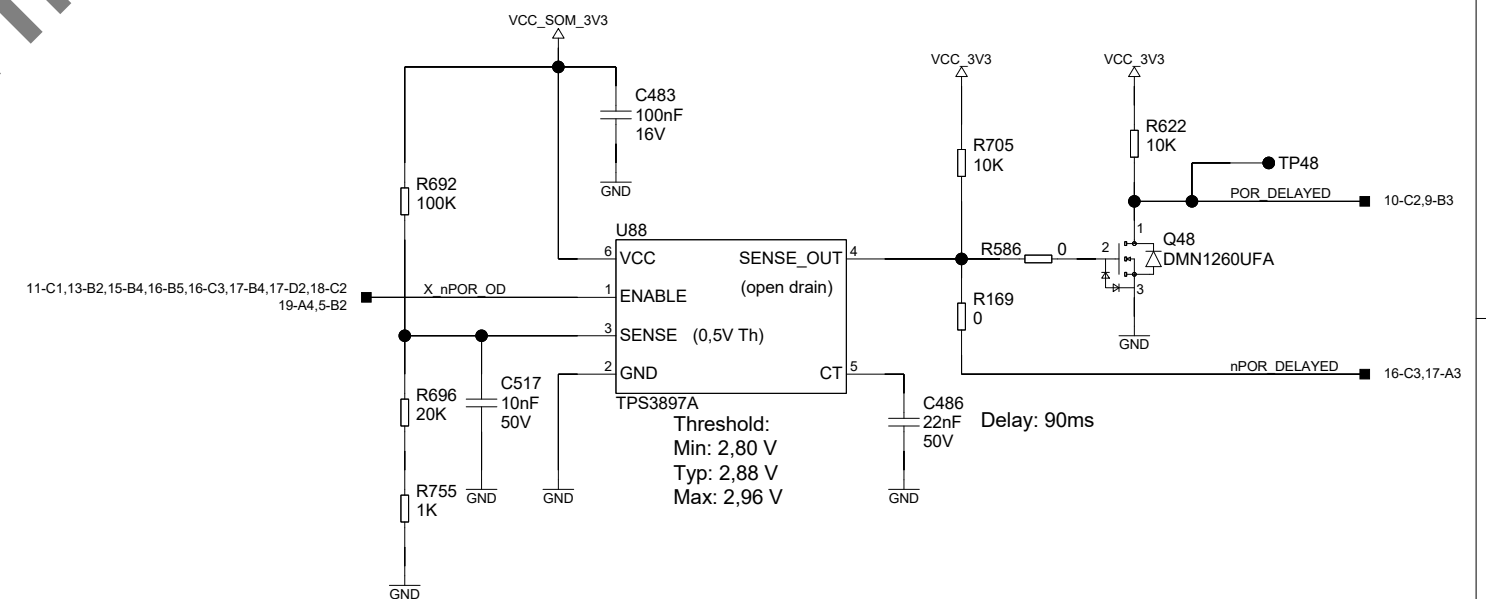
I.MX 8M Mini		I.MX 8M Nano
ON: Alternate-BOOT OFF: Default-BOOT	S1-1	ON: BOOT_MODE[2] = 1 OFF: BOOT_MODE[2] = 0
ON: QSPI-BOOT OFF: SD-BOOT	S1-2	ON: BOOT_MODE[1] = 1 OFF: BOOT_MODE[1] = 0
ON: Serial Downloader OFF: Internal Boot	S1-3	ON: BOOT_MODE[0] = 1 OFF: BOOT_MODE[0] = 0
ON: UART1 RS485 OFF: UART1 RS232	S1-4	ON: UART1 RS485 OFF: UART1 RS232
Not Used	S1-5	ON: USB OTG Port OFF: USB HUB
ON: UART4 connected to Expansion Connector OFF: UART4 connected to FTDI	S1-6	ON: Baseboard Bootmode OFF: SOM Default Bootmode

Sequencing Details

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POR Delay [90ms]



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09.07.2021

PCB-No.: 1532.2

Revision: 001

Sheet 8 of 21

Bootmode Configuration for i.MX 8M Mini

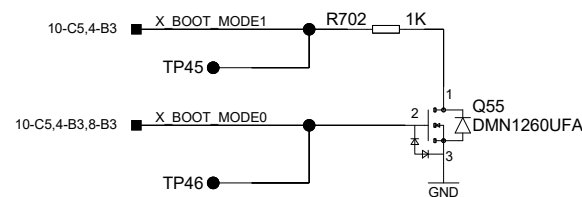
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BOOT_CFG	[14]	[13]	[12]	[11]	[10]	[9]	[8]	[7]	[6]	[5]	[4]	[3]	[2]	[1]	[0]
Default/ eMMC	0	1	0	1	0	1	0	0	1	0	1	0	1	1	0
Overwrite/ SD-Card	0	0	1	0	1	0	x	0	x	x	1	0	0	0	x
Overwrite/ QSPI	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Jumper QSPI				J8			J7					J6	J5	J4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

These Parts are only mounted with a i.MX 8M Mini SOM

Boot-Type

S1-4:
OFF: Serial Downloader
ON: Internal Boot

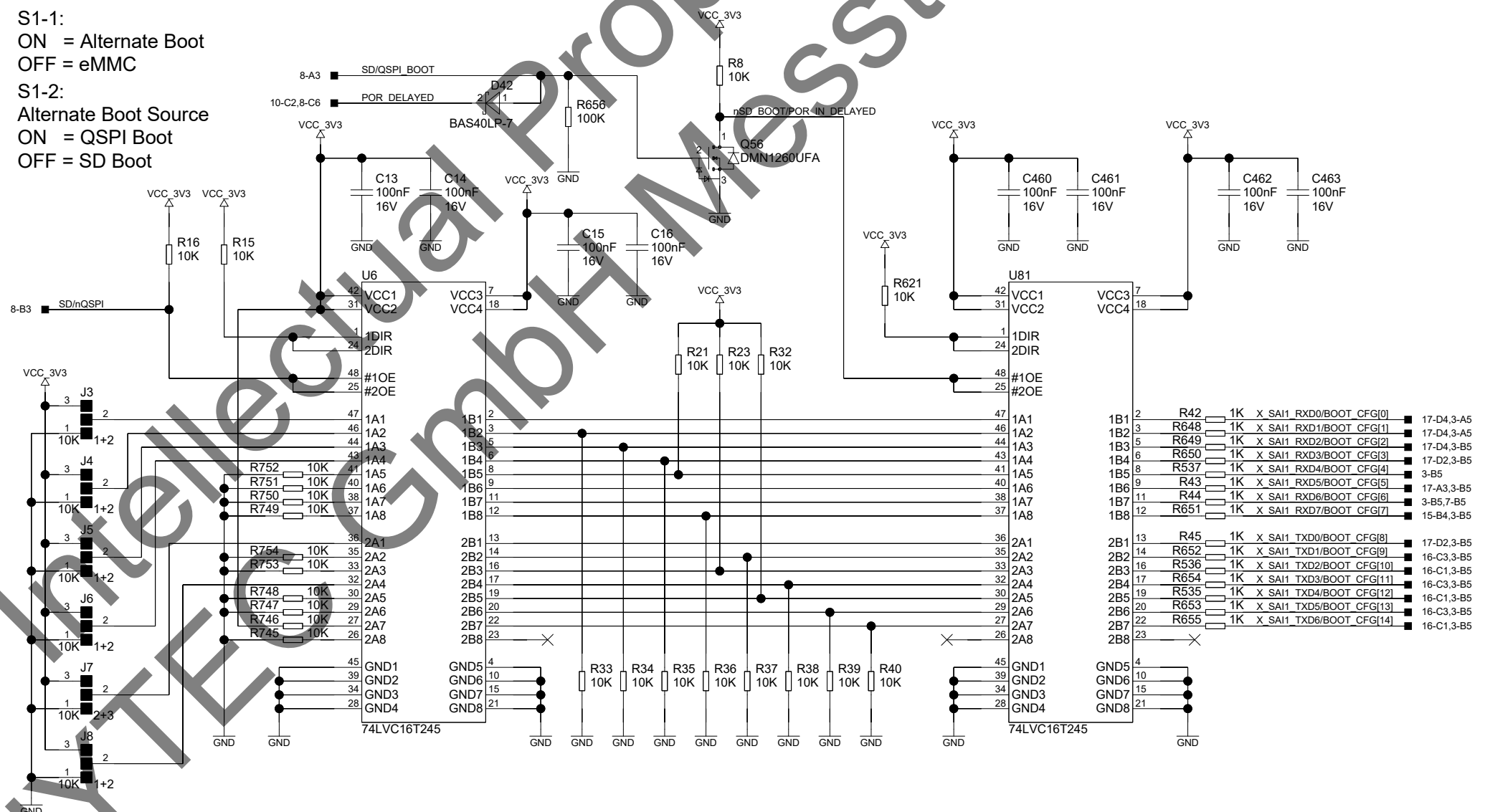


BOOT_MODE[1:0]	BOOT TYPE
00	Boot from fuses
01	Serial Downloader
10	Internal Boot (GPIO overwrite)
11	Reserved

SOM Default: Internal Boot [10]

Boot-Source

S1-1:
ON = Alternate Boot
OFF = eMMC
S1-2:
Alternate Boot Source
ON = QSPI Boot
OFF = SD Boot



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PCB-No.: 1532.2

Revision: 001

Sheet 9 of 21

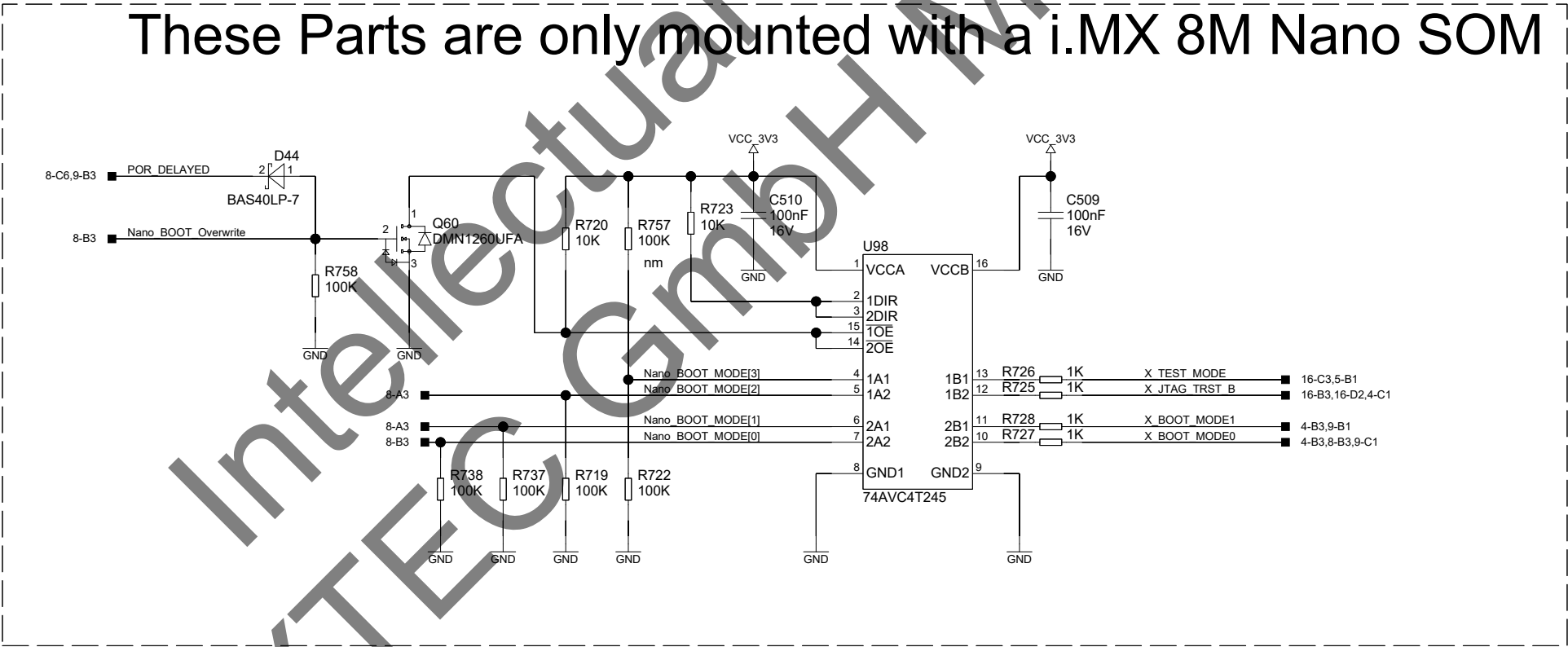
Bootmode Configuration for i.MX 8M Nano

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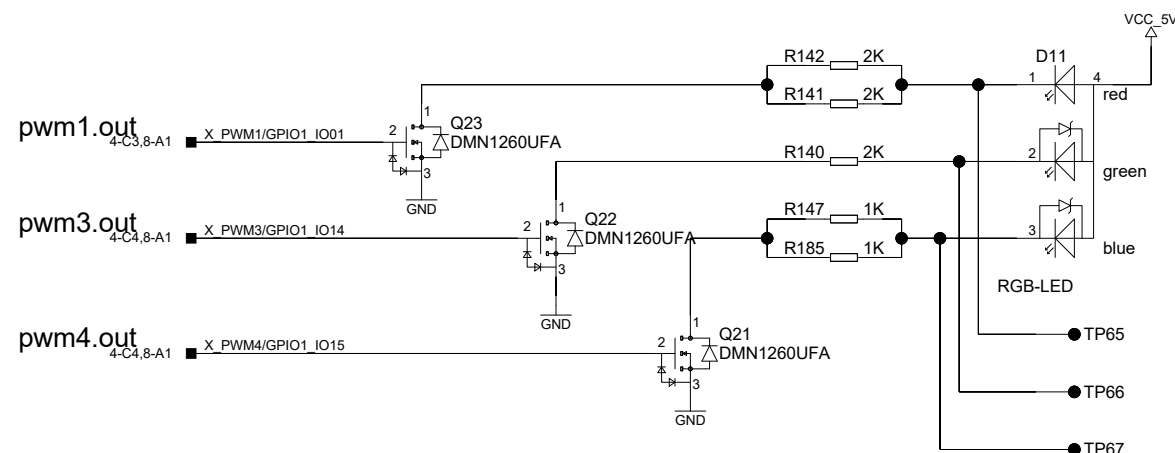
Switch-Setting ON = 1 OFF = 0 →			S1-1	S1-2	S1-3
Bootmode Options i.MX 8M Nano		X_TEST_MODE	X_JTAG_TRST_B	X_BOOT_MODE1	X_BOOT_MODE0
Boot-Source	MODE [Nr.] →	[3]	[2]	[1]	[0]
Fuses		0	0	0	0
USB Serial Download		0	0	0	1
USDHC3 (eMMC)		0	0	1	0
USDHC2 (SD)		0	0	1	1
FlexSPI 3B Read		0	1	1	0

Bootmode setting via S1
S1-6 = "ON": Baseboard Bootmode
S1-6 = "OFF": SOM Default Bootmode

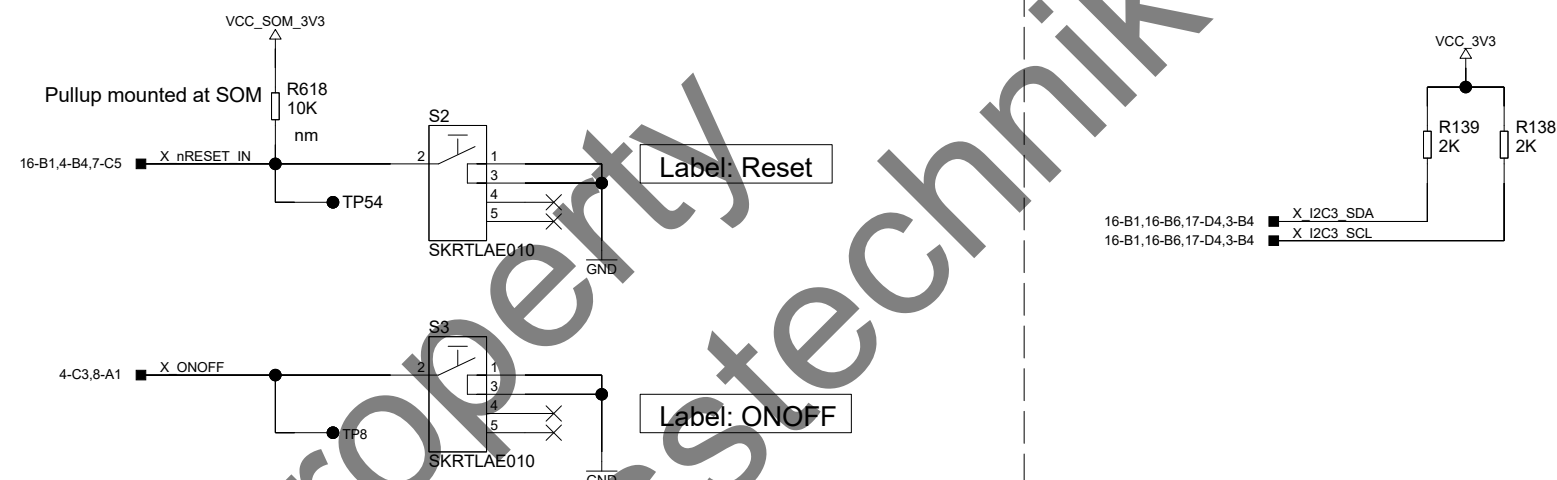
These Parts are only mounted with a i.MX 8M Nano SOM



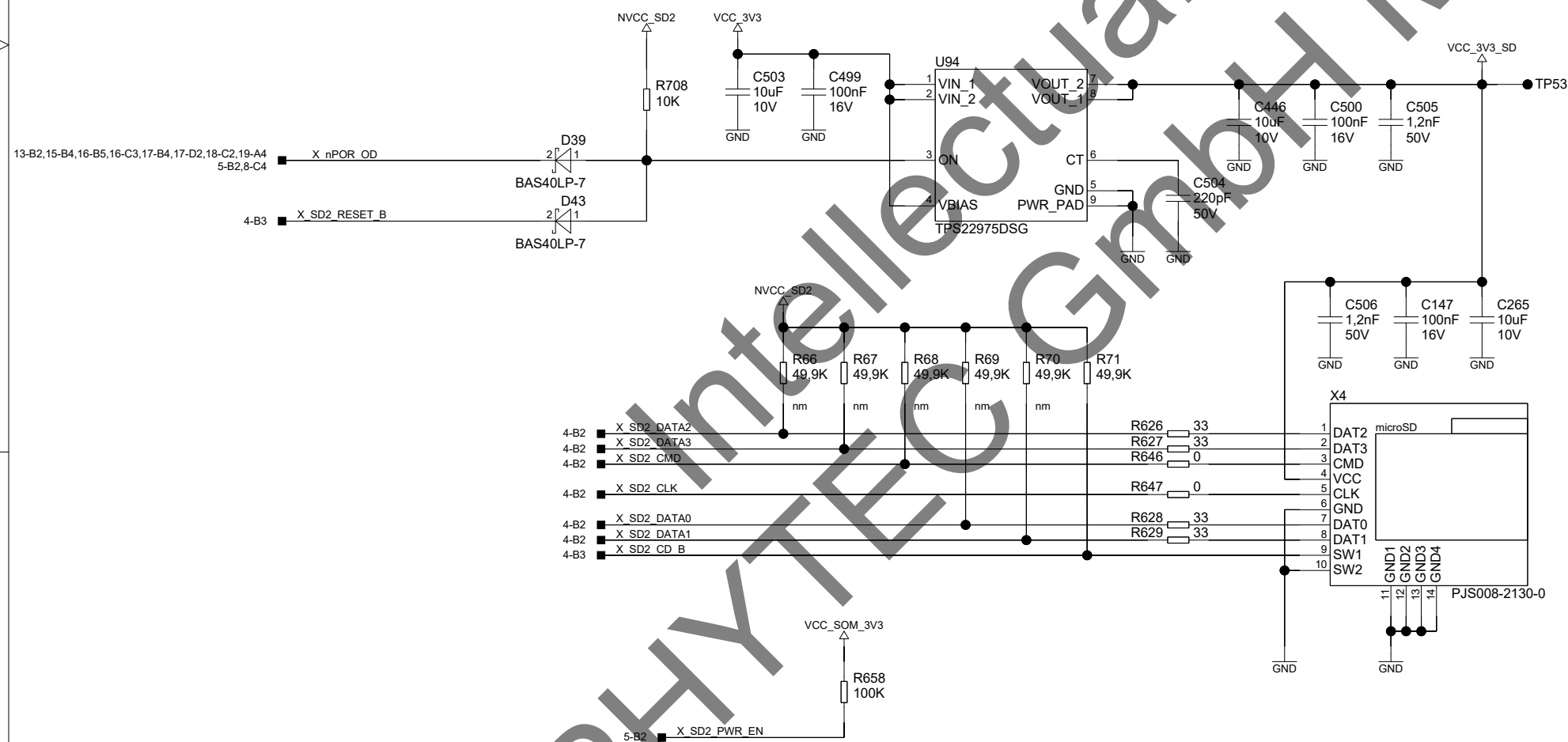
RGB LED



Reset Button ONOFF Button



uSD-Card Connector



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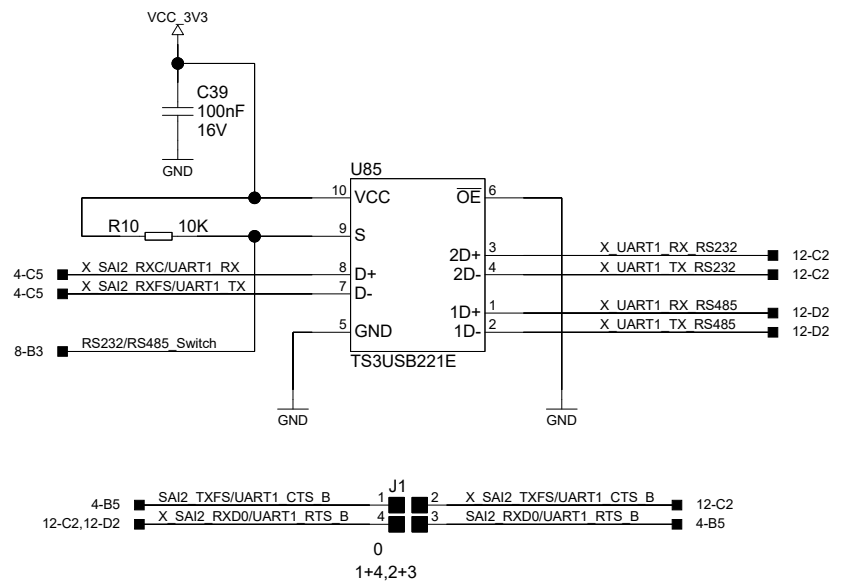
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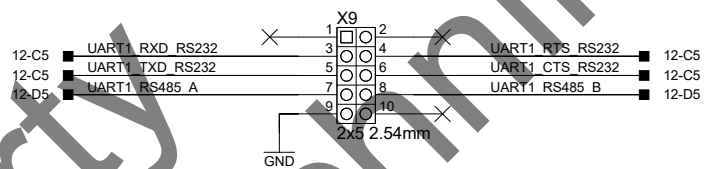
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Sheet 11 of 21

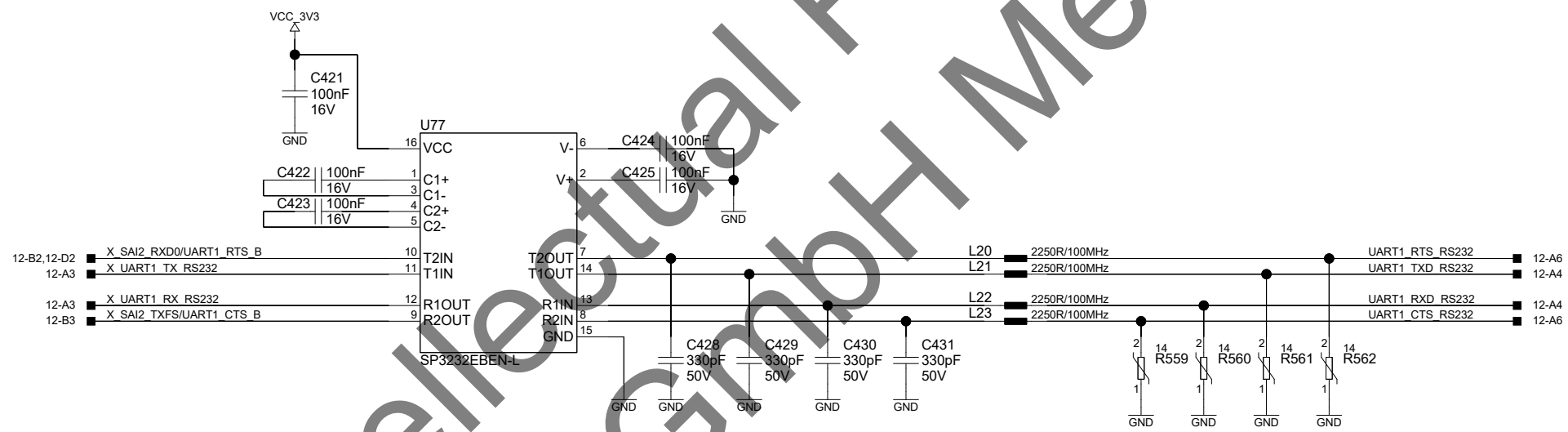
UART1 Multiplexer, RTS/CTS-Jumper



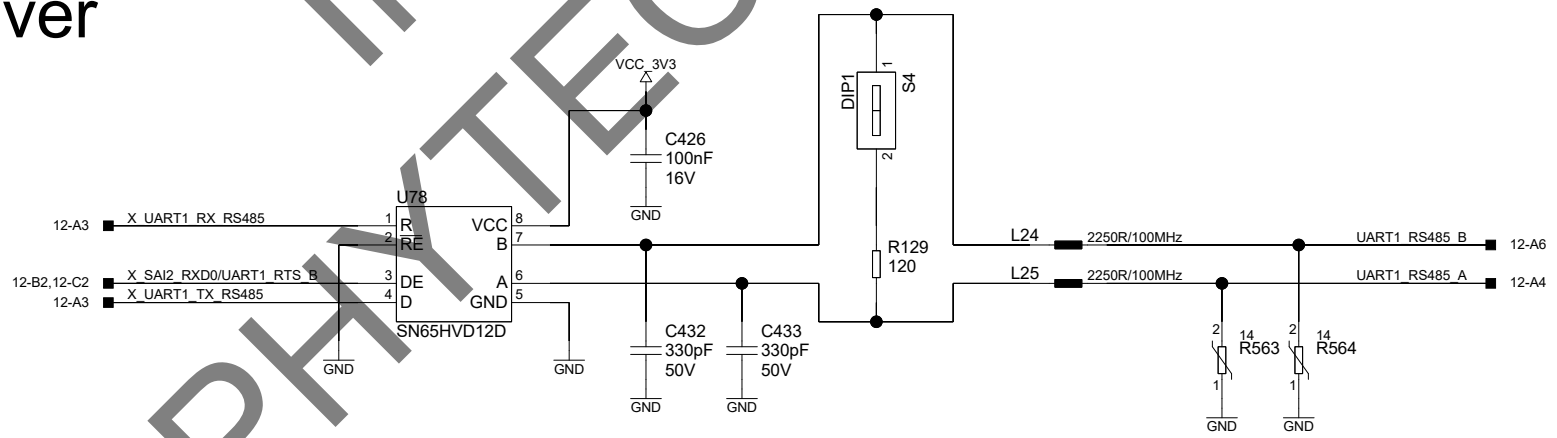
RS232/ RS485 Connector



RS232 Transceiver



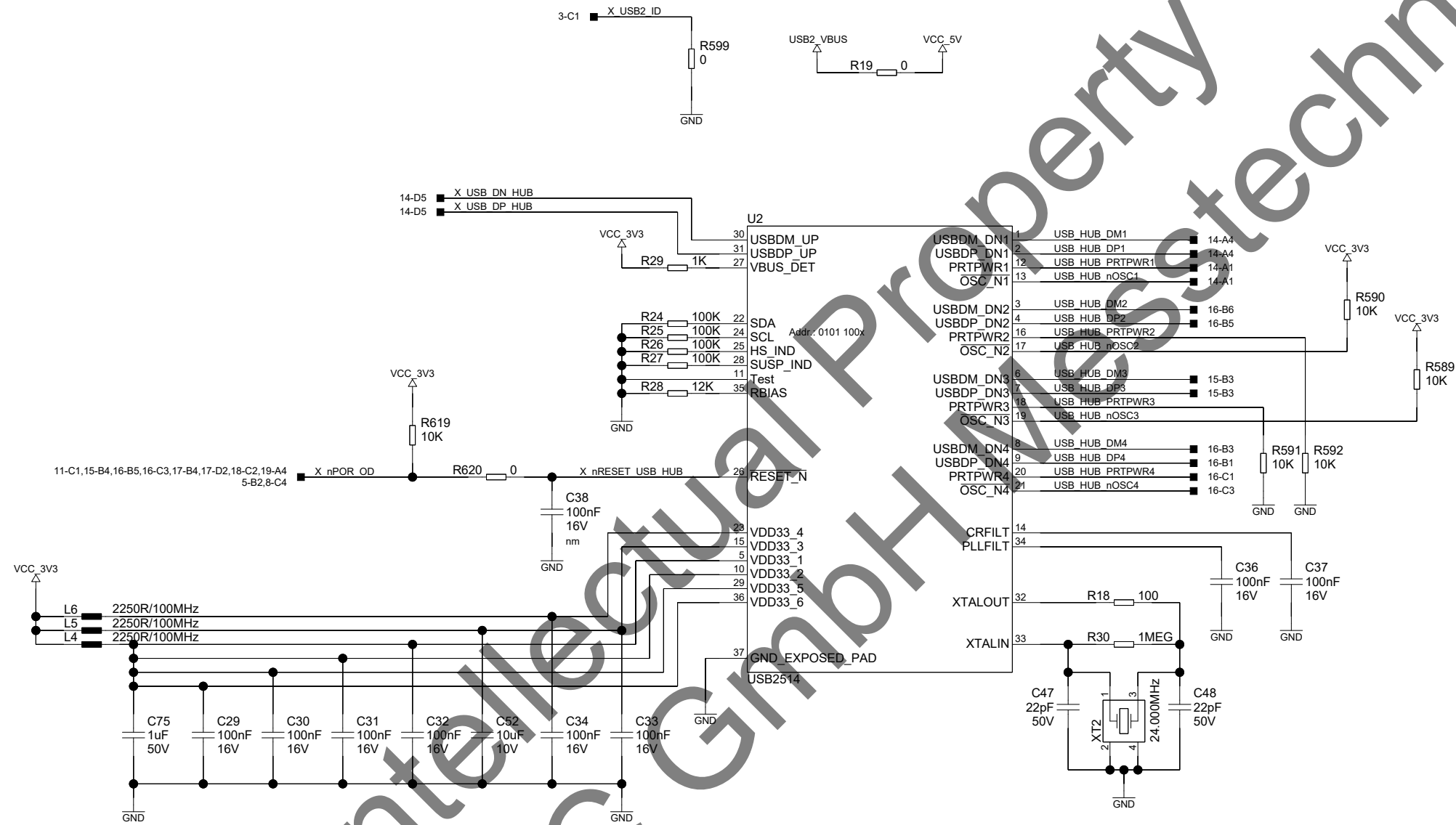
RS485 Transceiver



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USB-HUB

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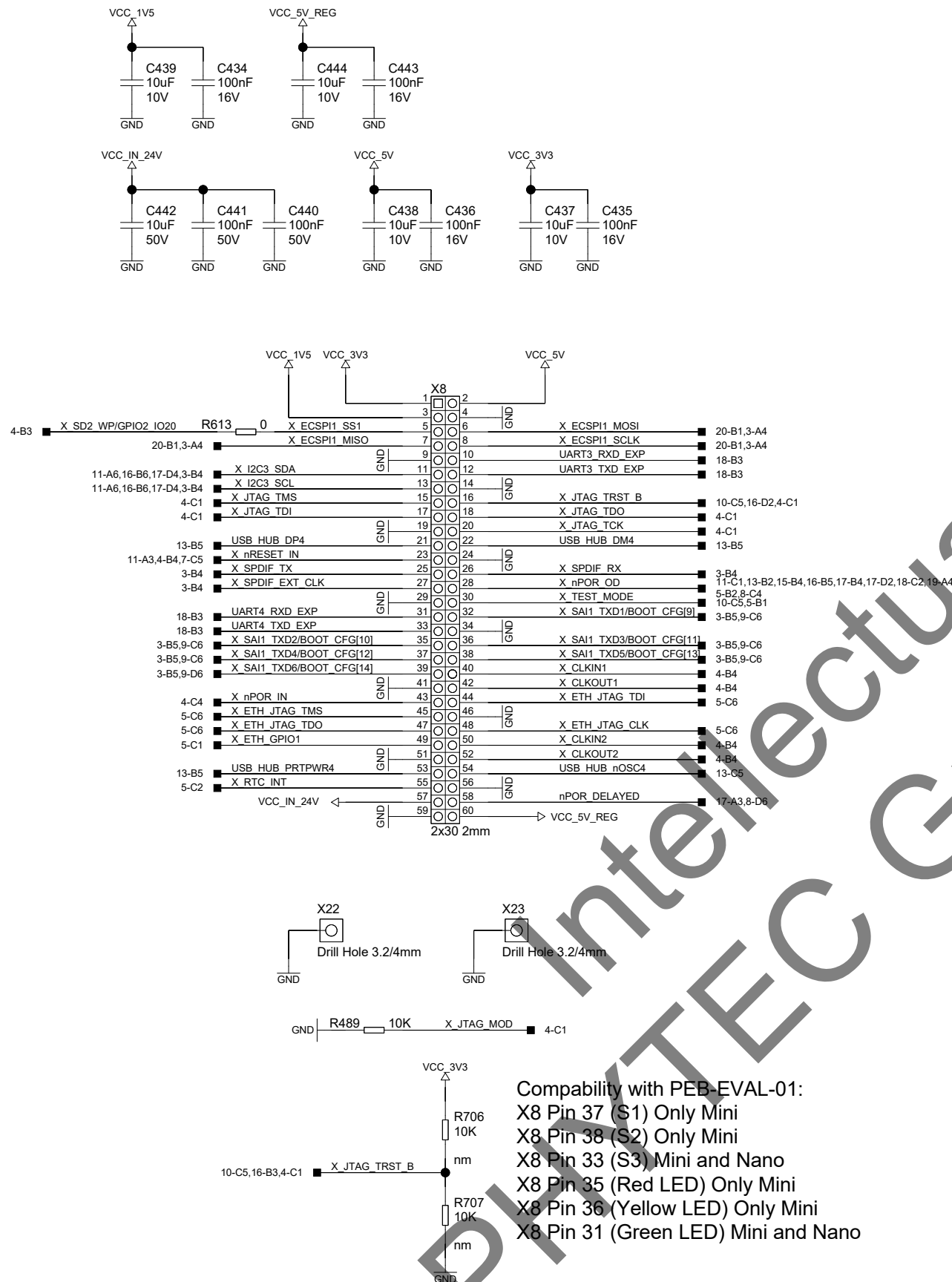
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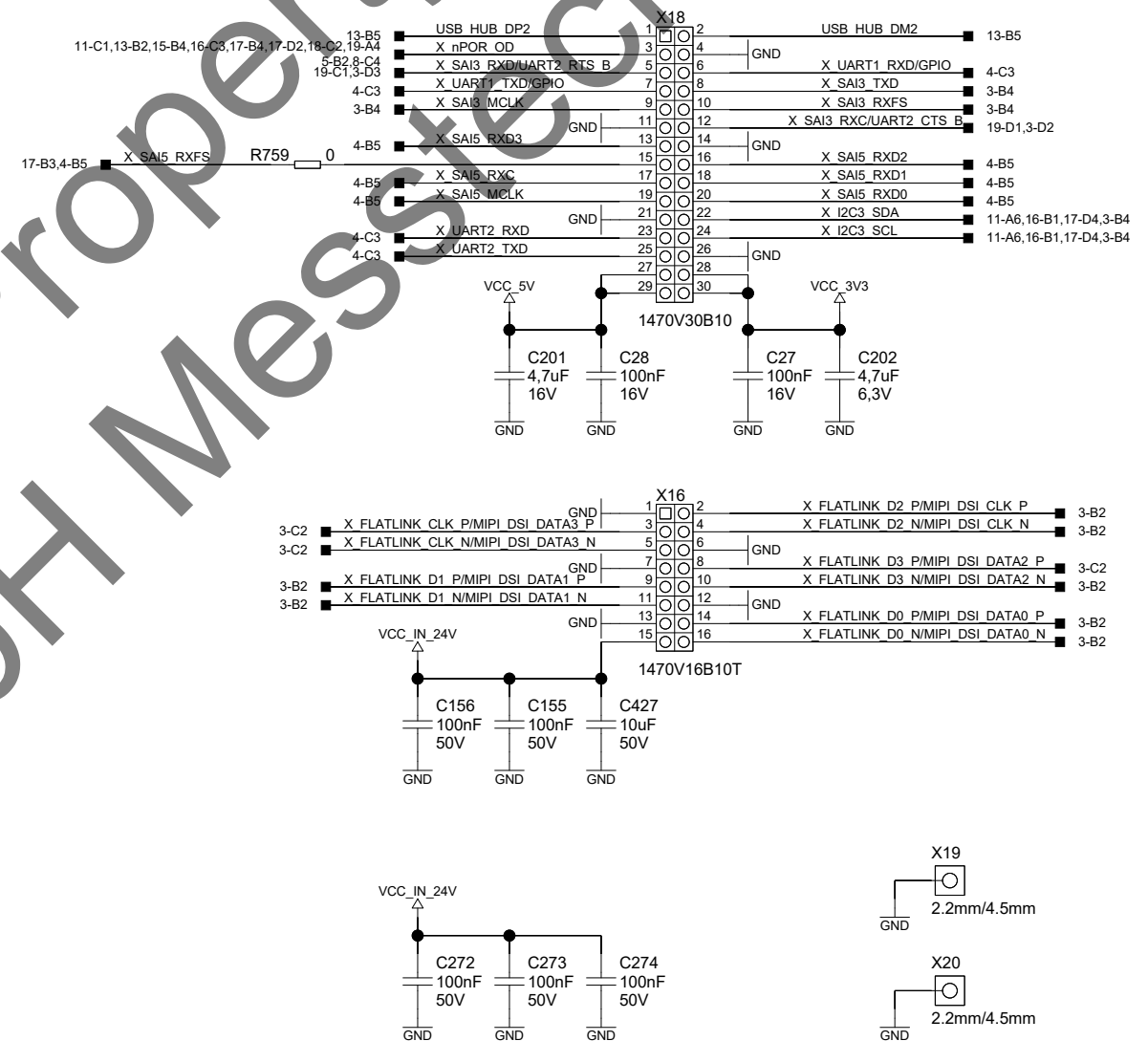
Sheet	13	of	21
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Expansion Connector



Audio/Video-Connector

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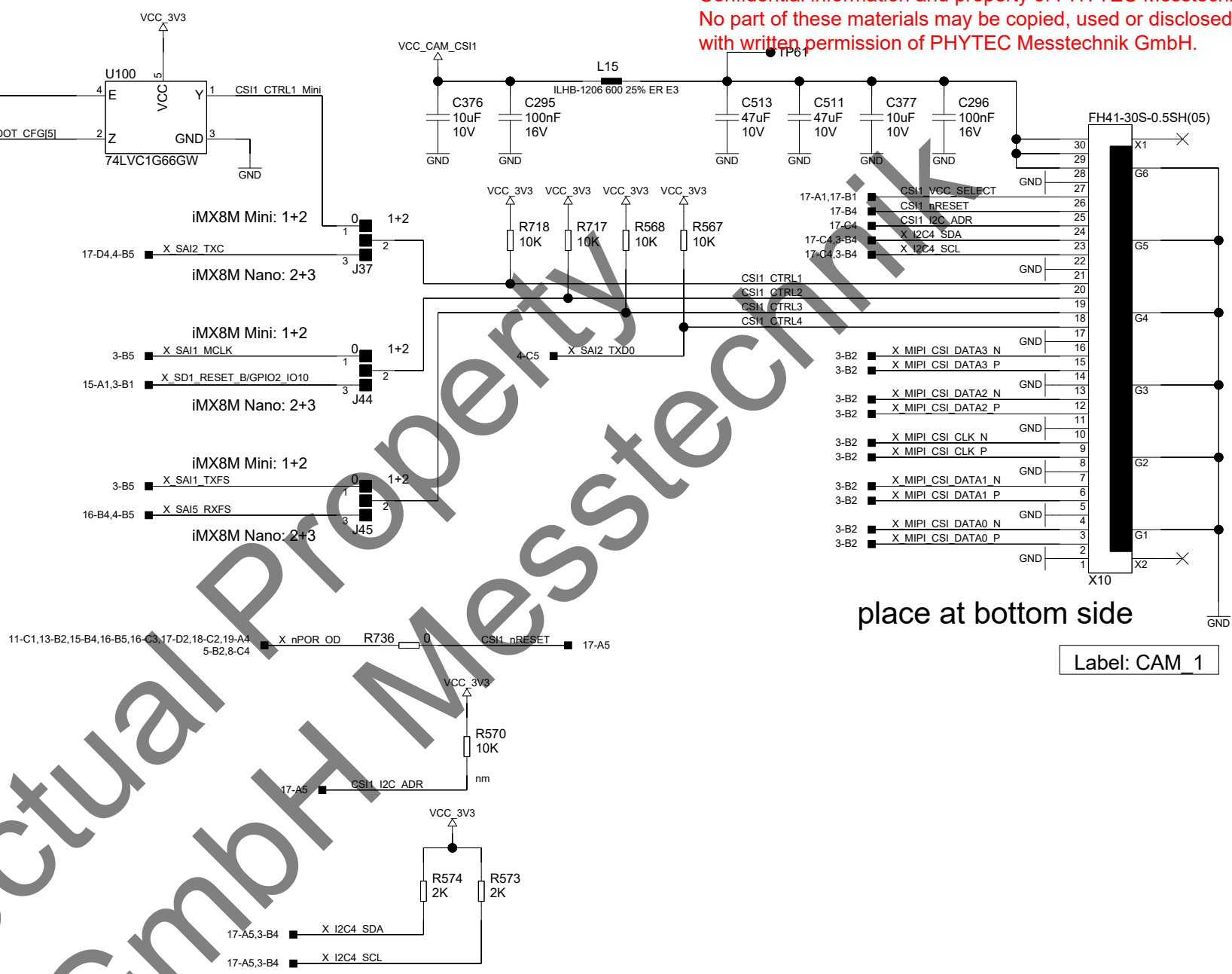
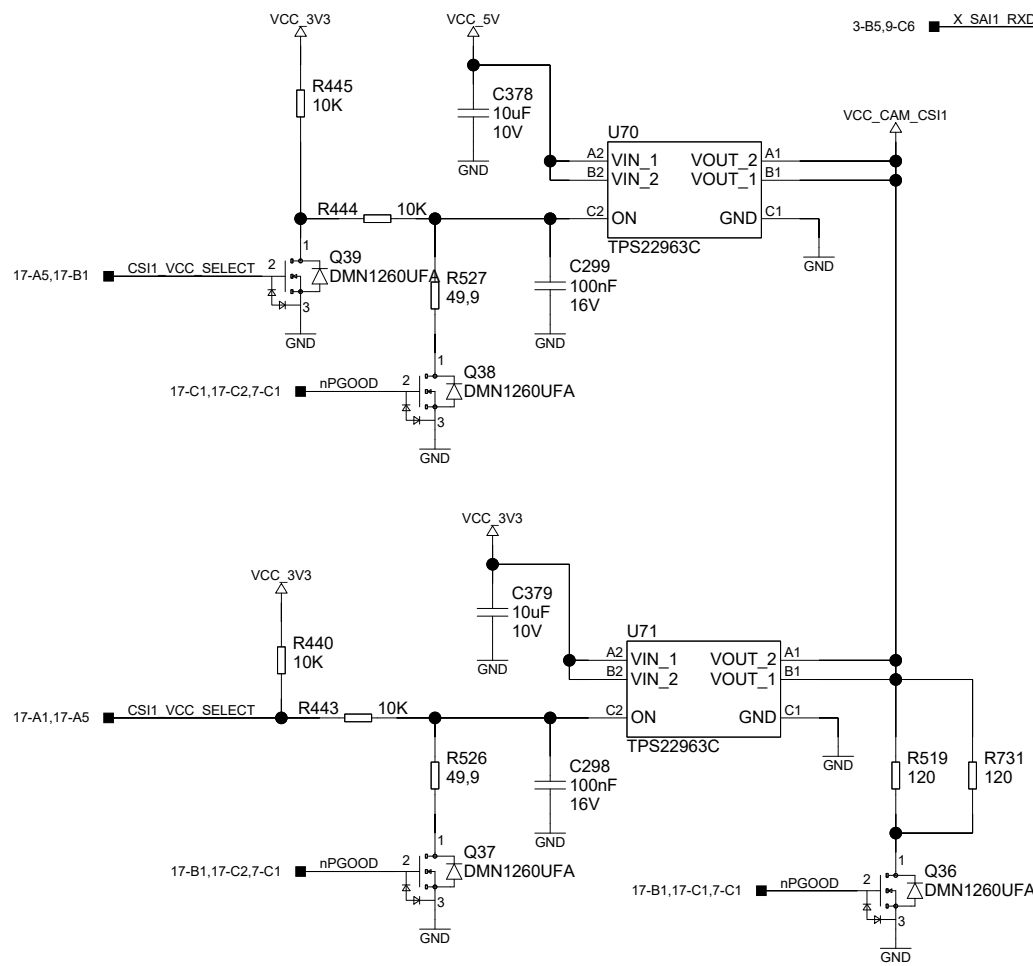


place capacitors along the trace

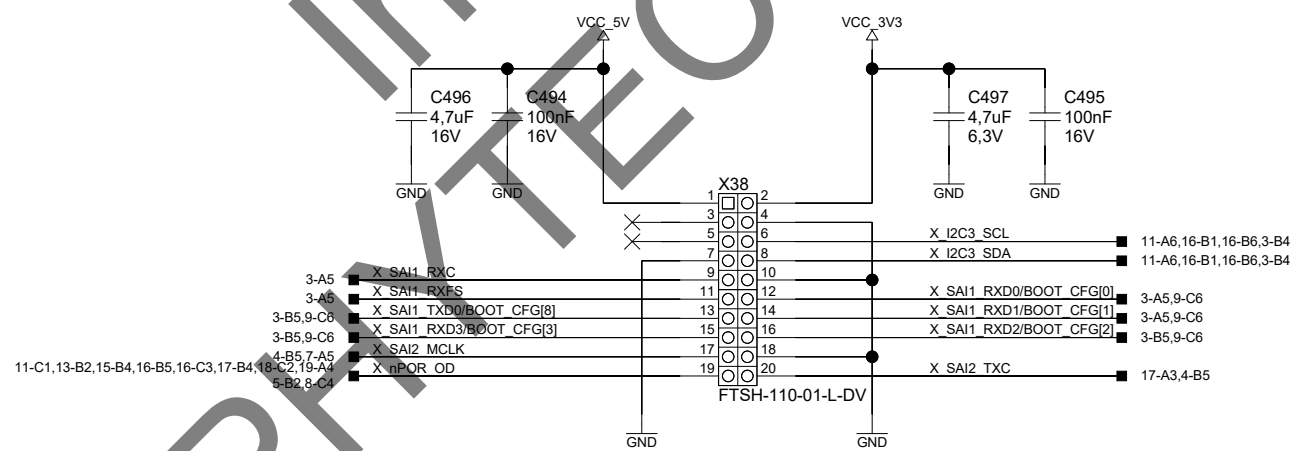
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CSI1/CAM1
phyCAM-M

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VOICE ARRAY CONNECTOR

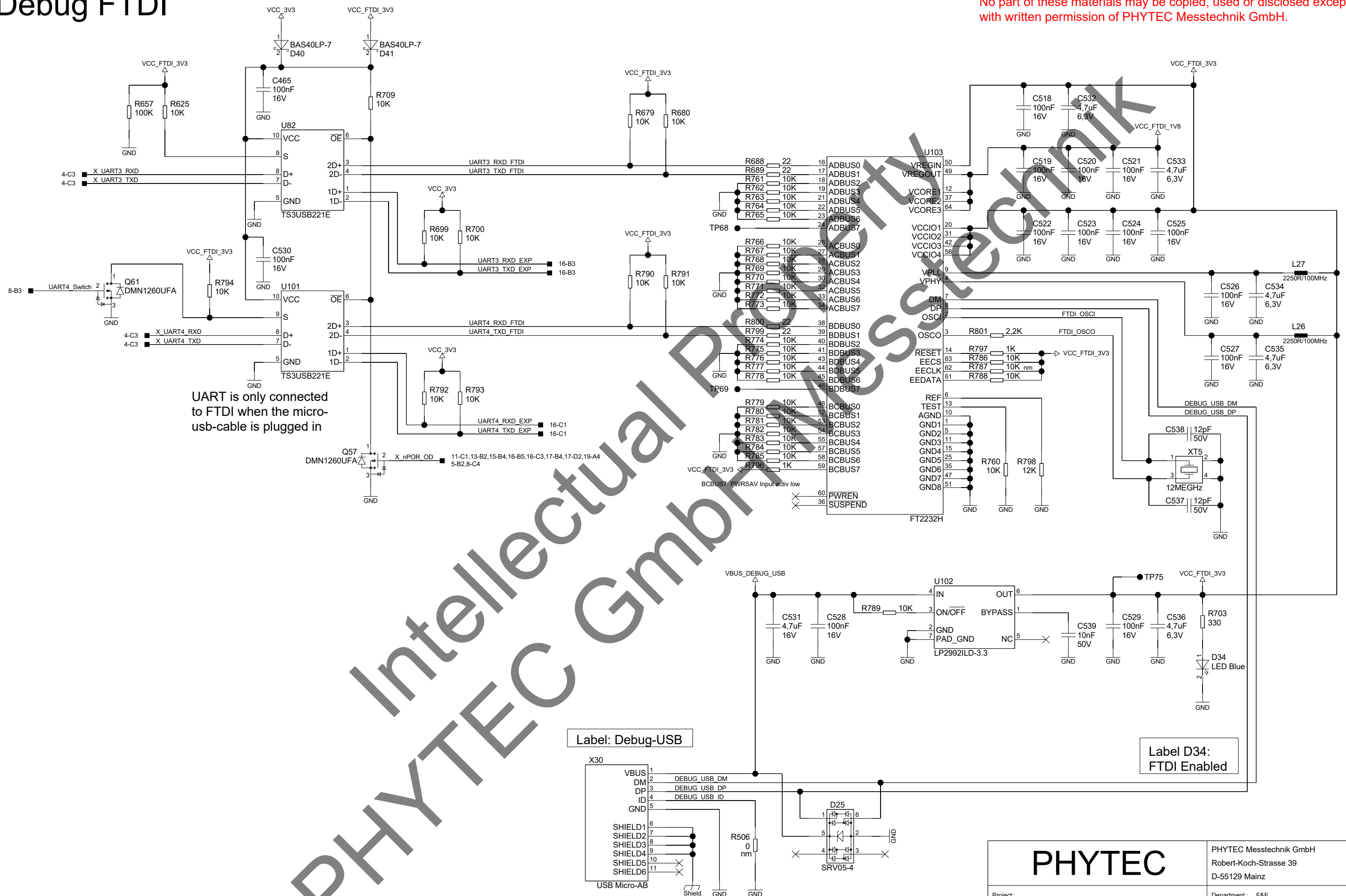


This Connector is only mounted with a i.MX 8M Mini SOM

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		Revision:	001
		Sheet	17 of 21

Debug FTDI

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Label: Debug-USB

Label D34:
FTDI Enabled

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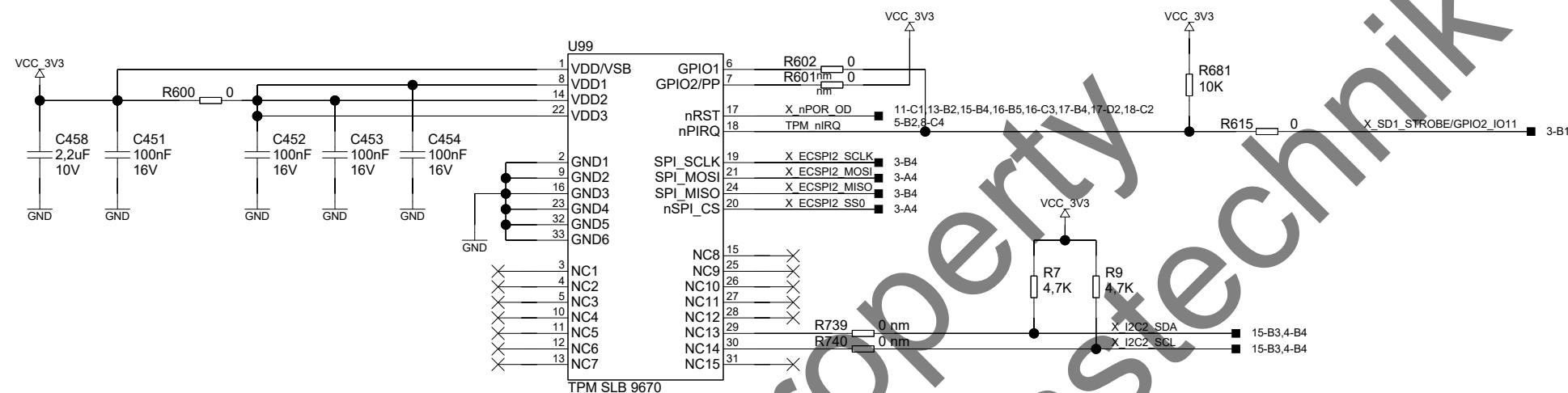
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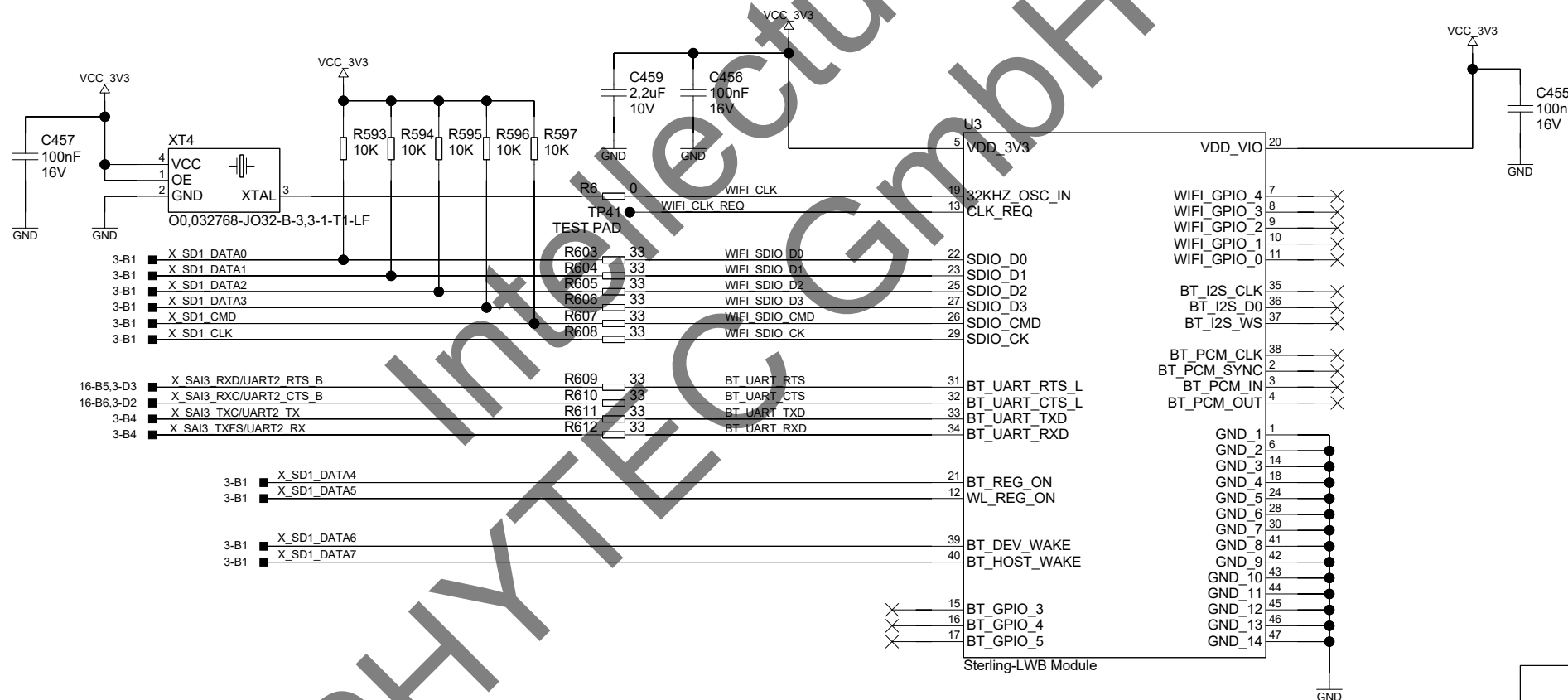
Sheet 18 of 21

TPM

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WLAN



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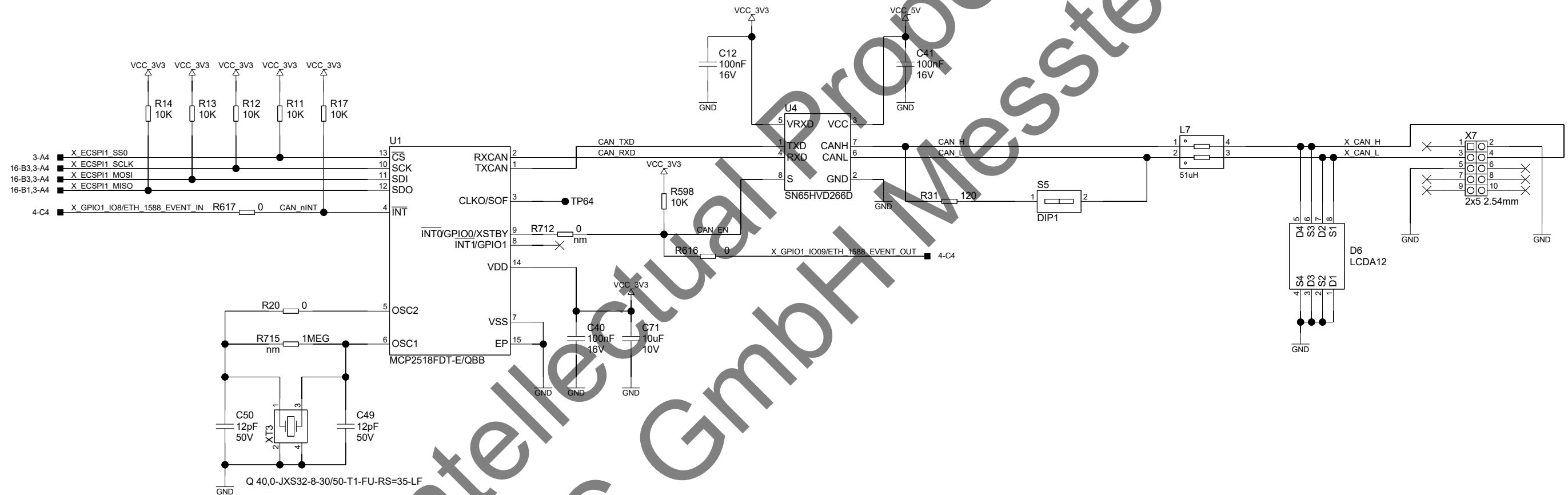
PCB-No.: 1532.2

Revision : 001

Sheet 19 of 21

CAN FD

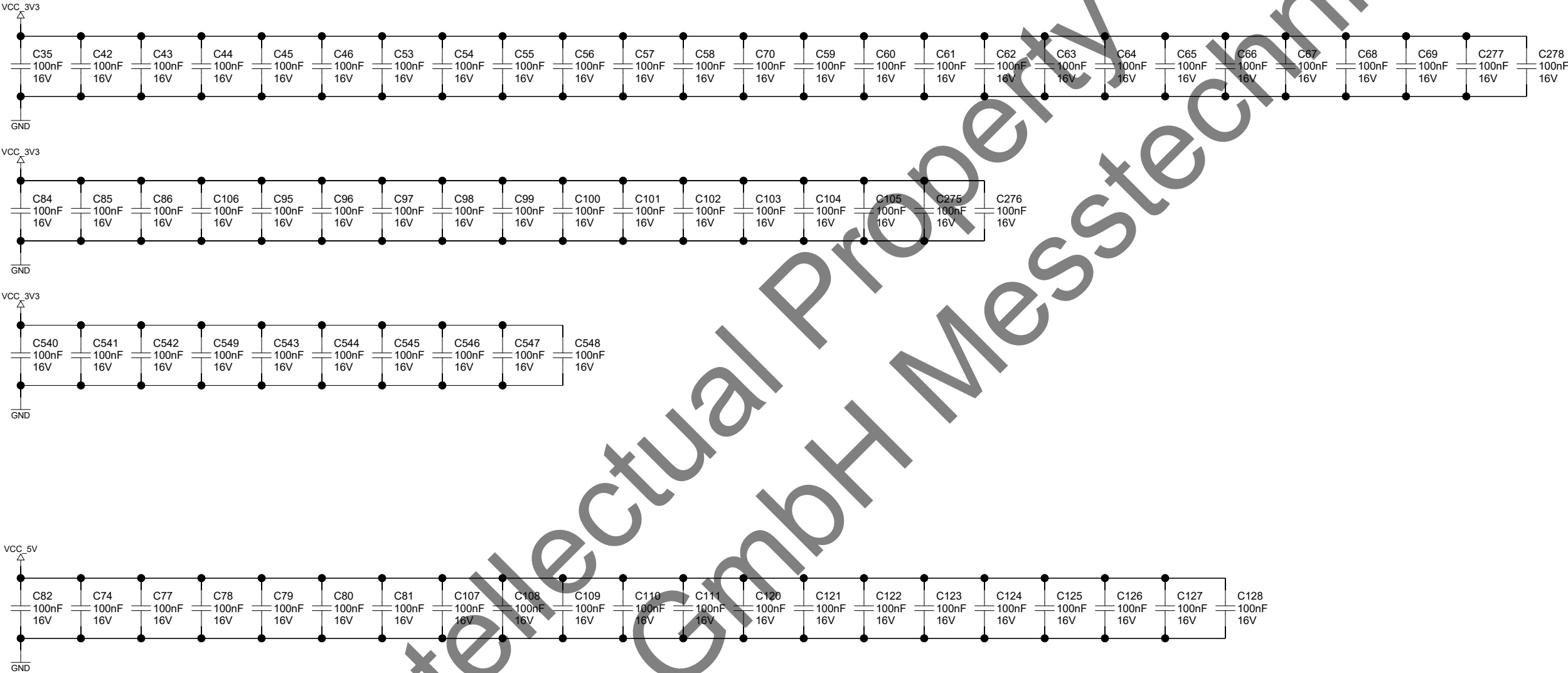
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Capacitors

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