

STM32U5A9NJH6Q Discovery

MB1829

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Legend

General comment such as function title, configuration, ...

Text to be added to silkscreen.

Warning text.

A

Notes to generate the board layout.

Open Platform License Agreement

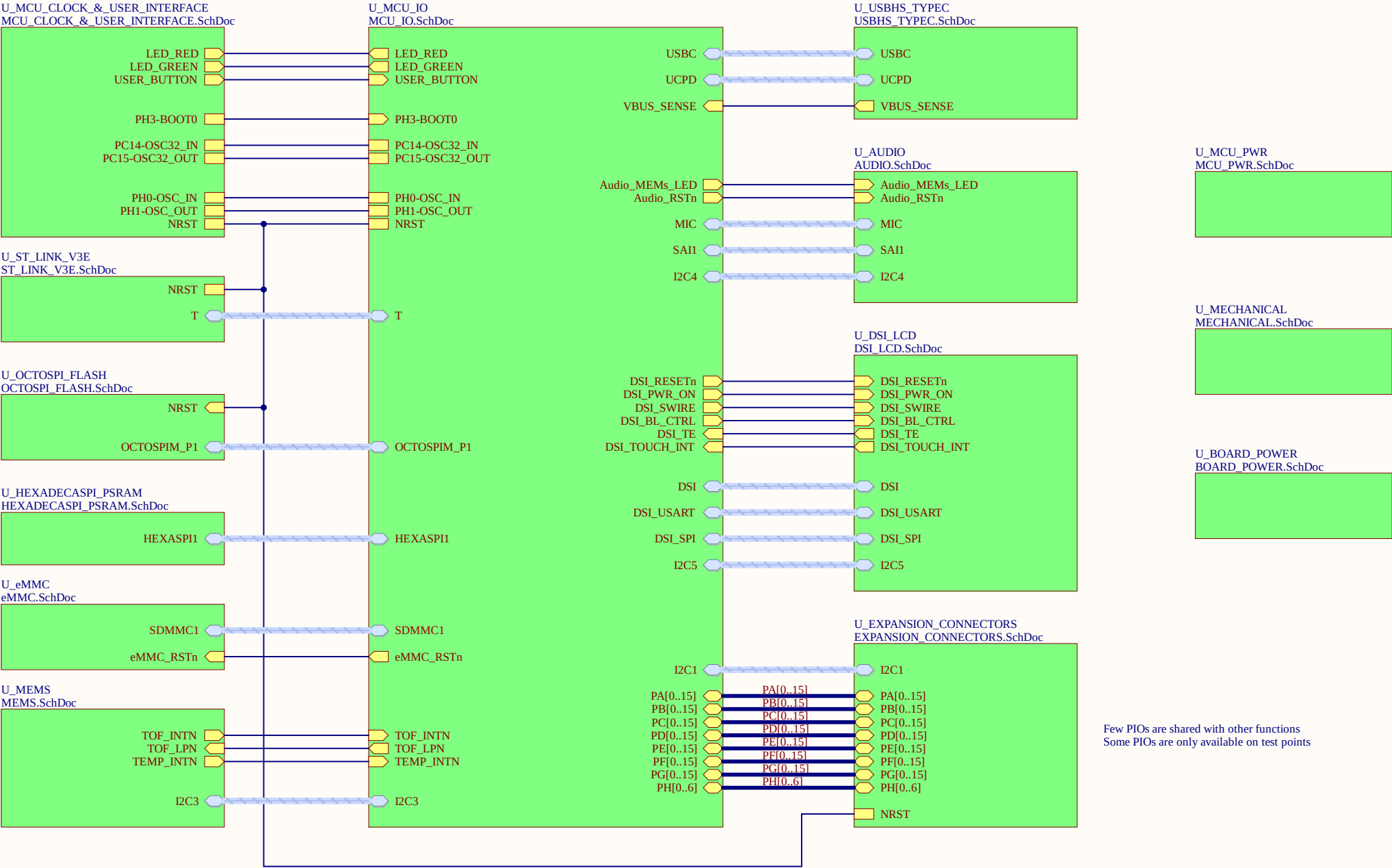
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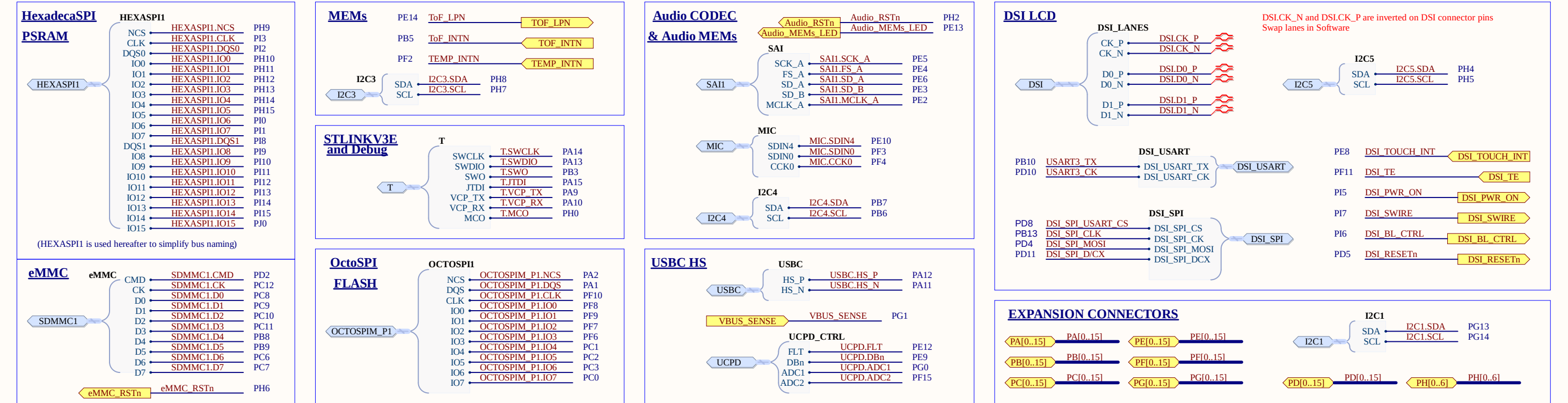
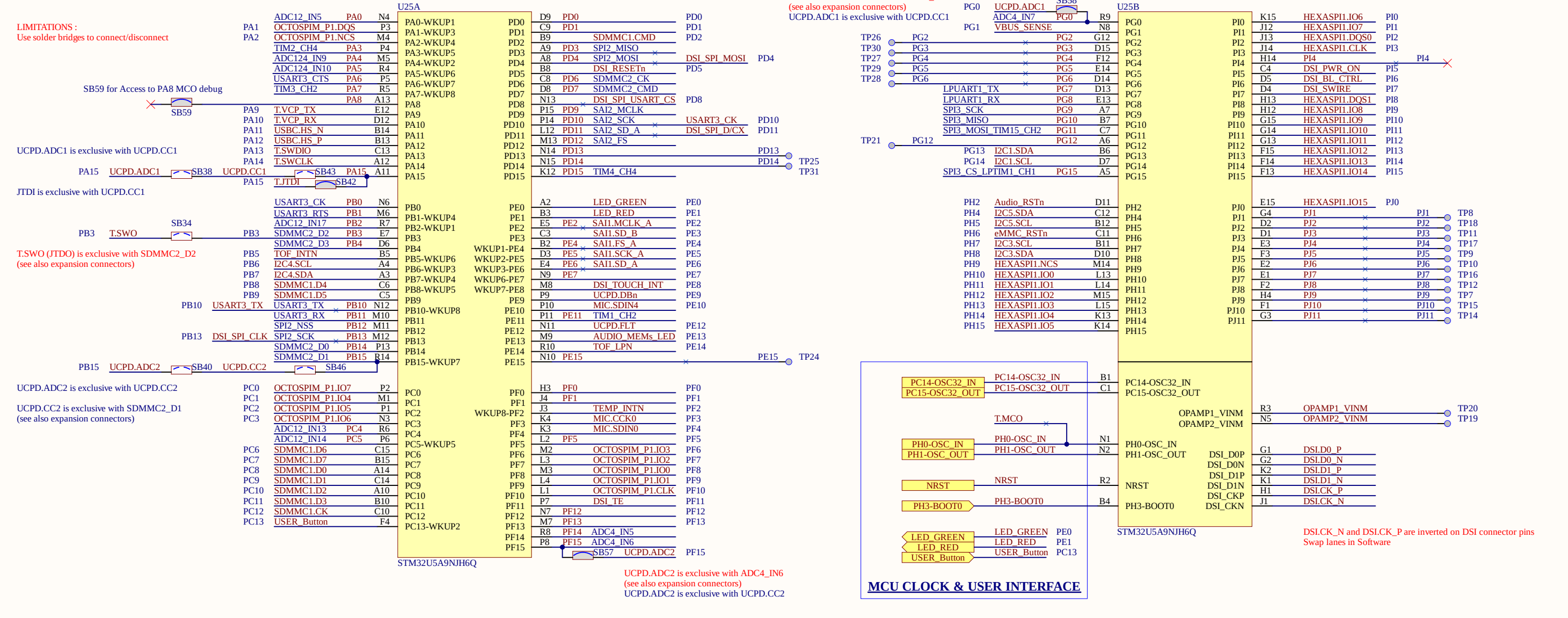
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U_MB1829_TOP
MB1829_TOP.SchDoc

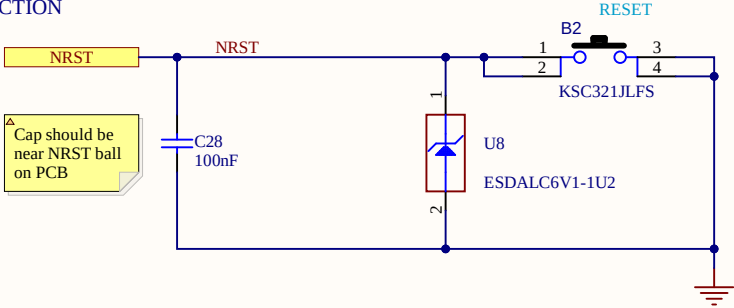




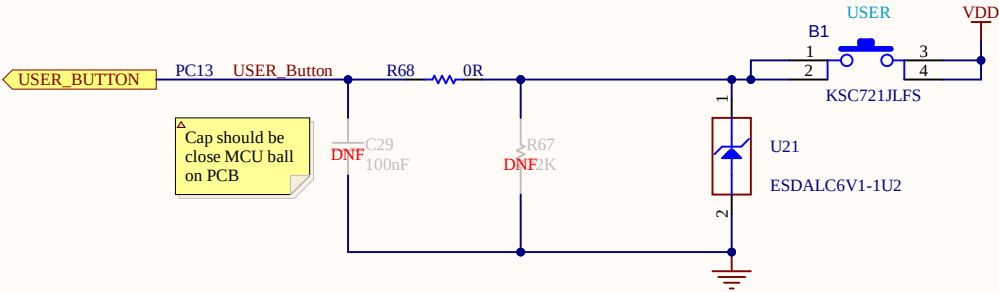
STM32 MCU I/Os



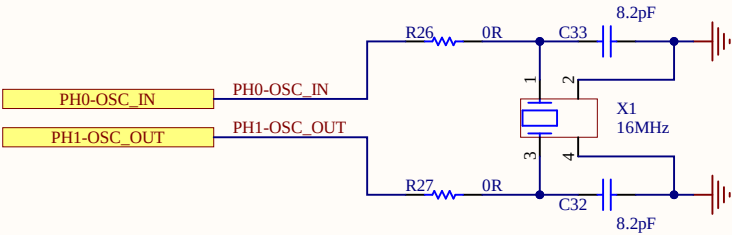
RESET FUNCTION



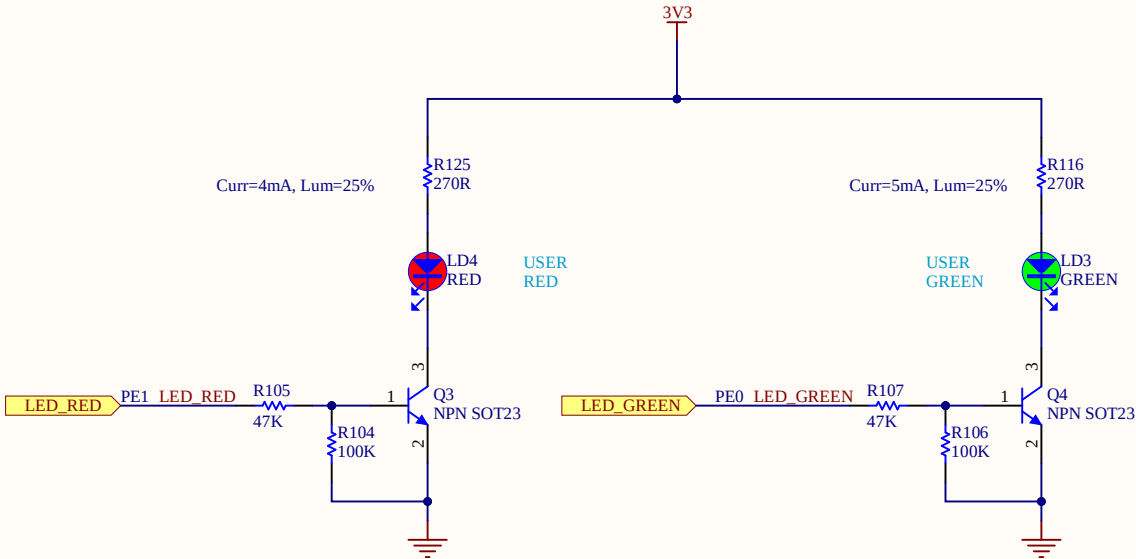
USER BUTTON



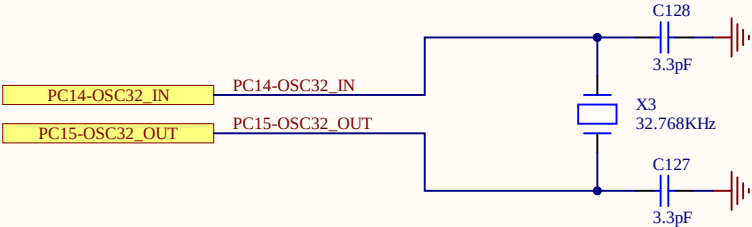
EXTERNAL HSE CLK



USER LEDs

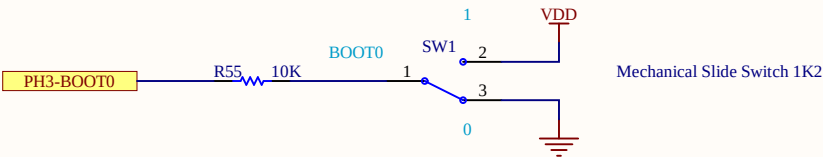


EXTERNAL LSE CLK



PH3_BOOT0

BOOT0 Low by default to boot from internal Flash

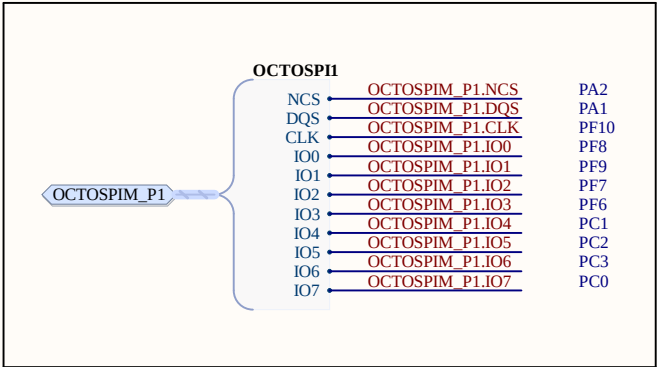


(The design supports a VDD_MCU at 1.8V only)



Operating range: 1V71<VDD<3V6
Operating range: 1V08<VDDIO2<3V6 (only for IO G[15:2], if independent from VDD).
Operating range: 1V62<VDDA<3V6 (VREFBUF not used)
Operating range: 1V62<VREFP<3V6 (external VREFP, VREFBUF not used)
Operating range: 3V <VDDUSB<3V6 (USB used)
Operating range: 1V65<VBAT<3V6
Operating range: 1V71<VDDDSI<3V6
Operating range: 1V71<VDDSMPS<3V6
Operating range: 1V<VDDI1USB and VDDI1DSI< 1V26, must be connected to VDDI1
Operating range: 0V81<VDDI1<1V27 (except STDBY/Shutdown : OFF)

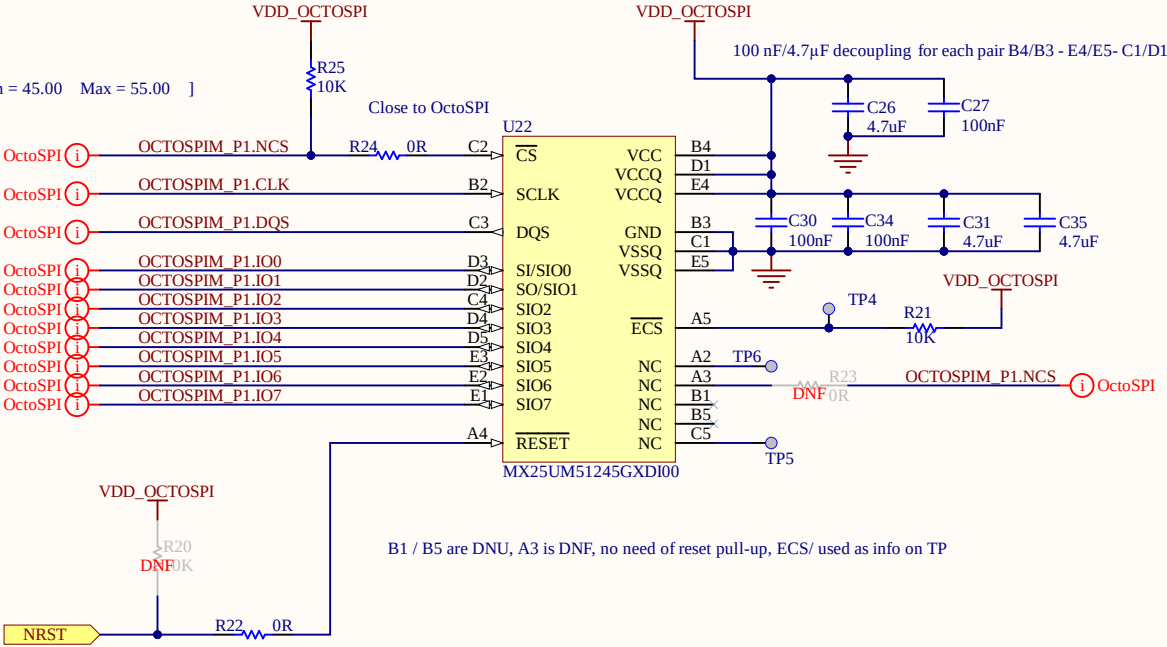
OctoSPI Flash Memory



▲ Length equalization (include BGA package length) :

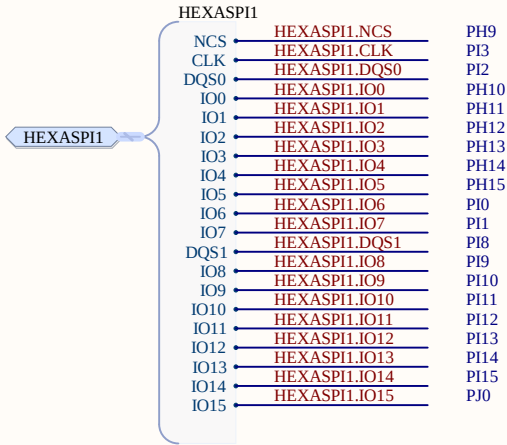
- DQS0 with IO0..7 (Byte0) , and CLK , all in 50 mils
- NCS length can be in the range of up to CLK length +/- 750 mils

OCTOSPI Impedance Constraint [Min = 45.00 Max = 55.00]

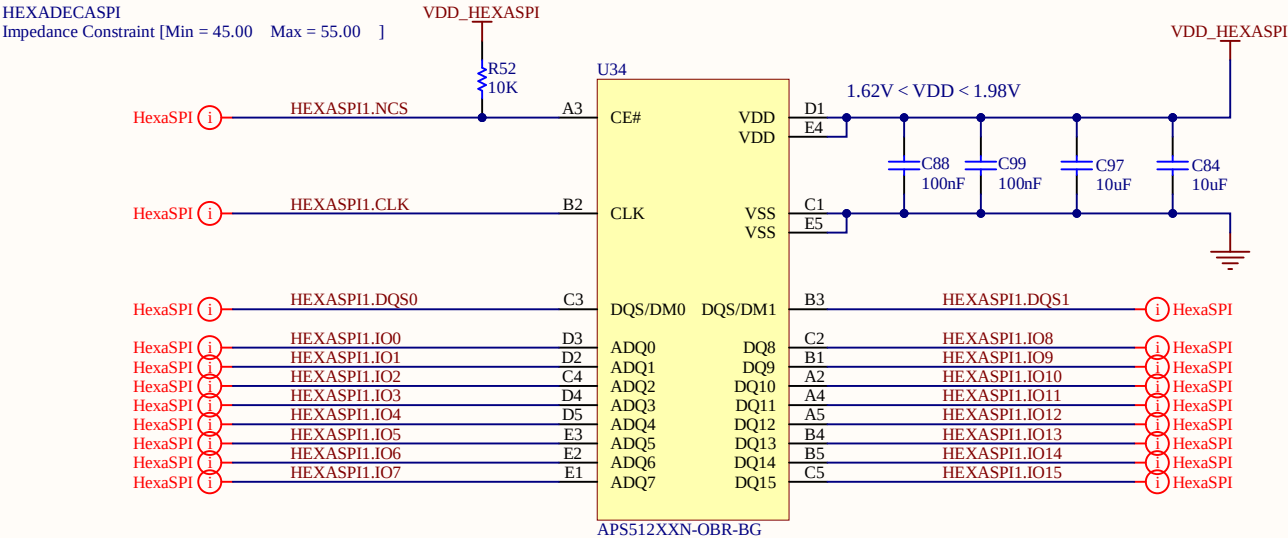
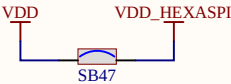


HexadecaSPI PSRAM Memory

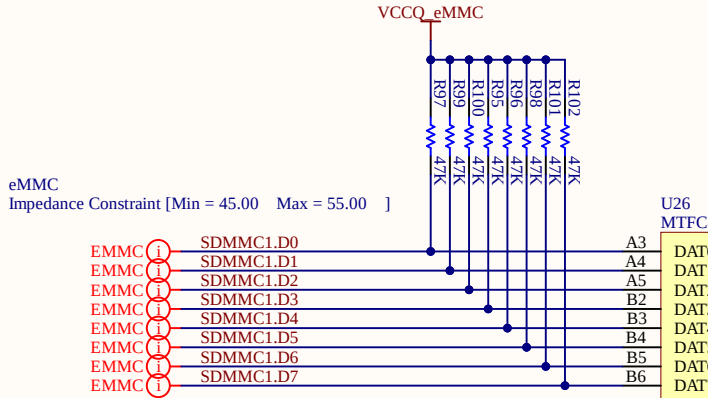
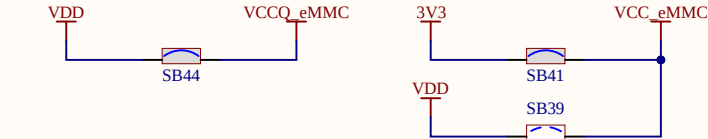
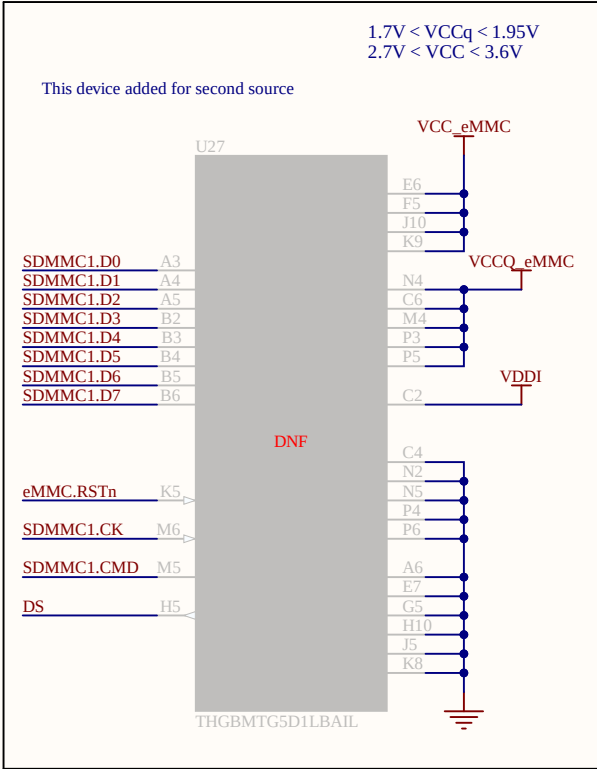
HexadecaSPI1 (HEXASPI1 is used hereafter to simplify bus naming)



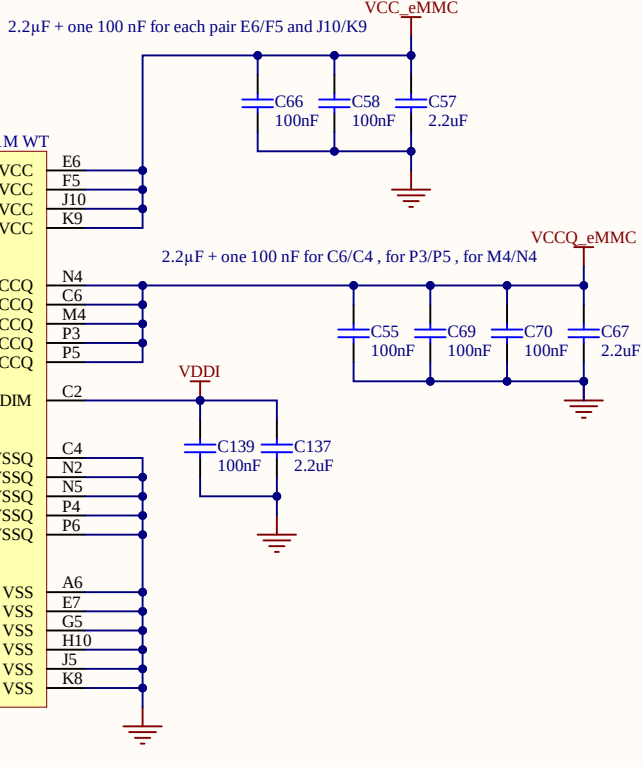
- Match length (including BGA package length)
- DQS0 with IO0..7 (Byte0), all in 50 mils,
 - DQS1 with IO8..15 (Byte1), all in 50 mils,
 - CLK is 100 mils from any signal of Byte0 or Byte1
 - NCS can be CLK +/- 700 mils



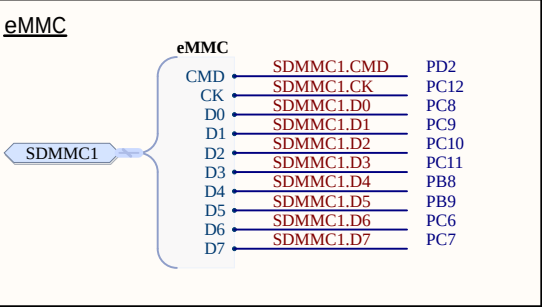
eMMC Memory



1.65V < VCCq < 1.95V
2.7V < VCC < 3.6V



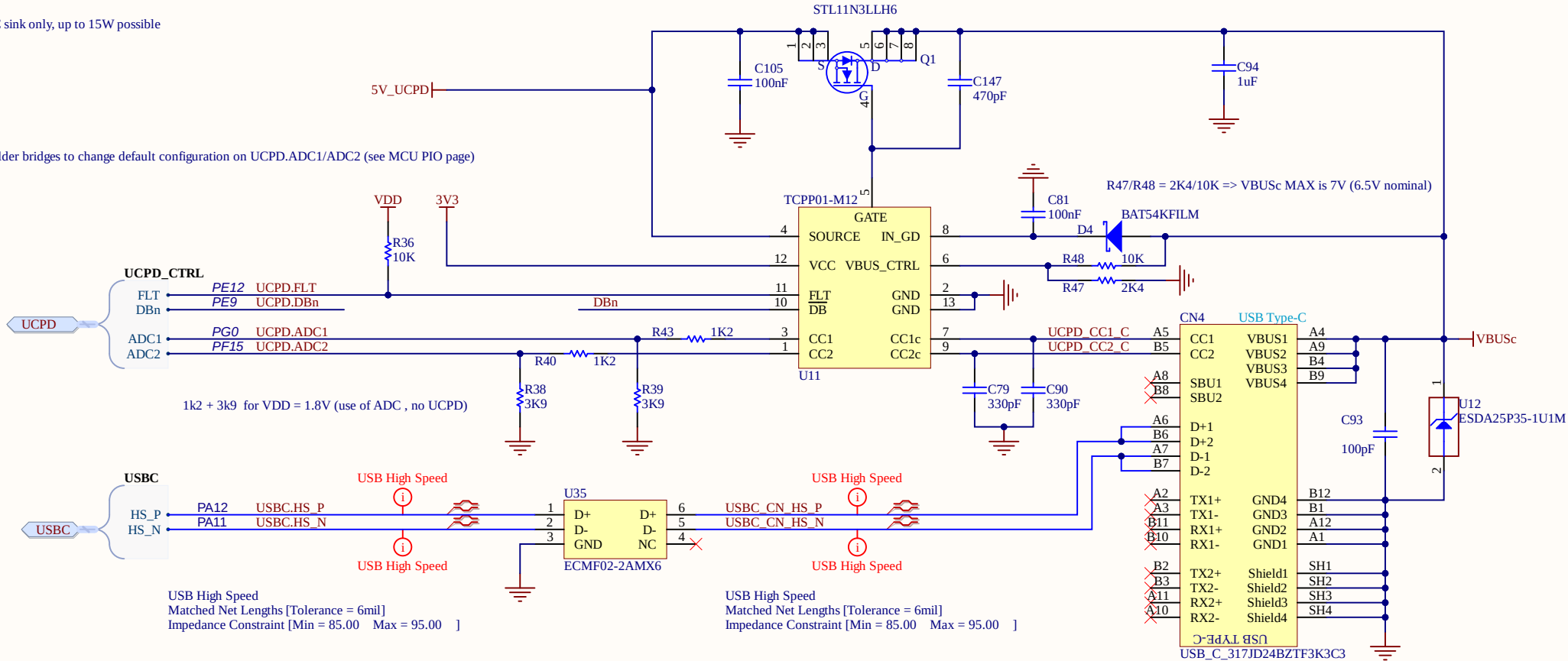
Match length (including BGA package length) :
- D0-D7 (Byte0) , CK, CMD all in 50 mils



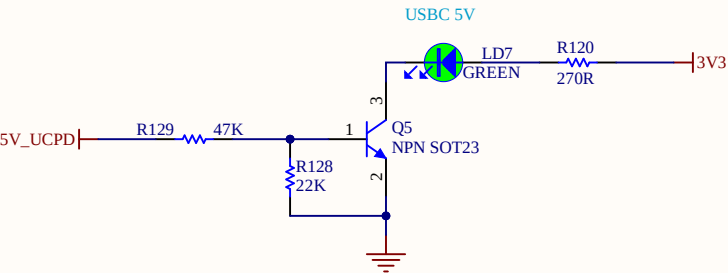
USBHS_TYPE_C CONNECTOR

USB-C sink only, up to 15W possible

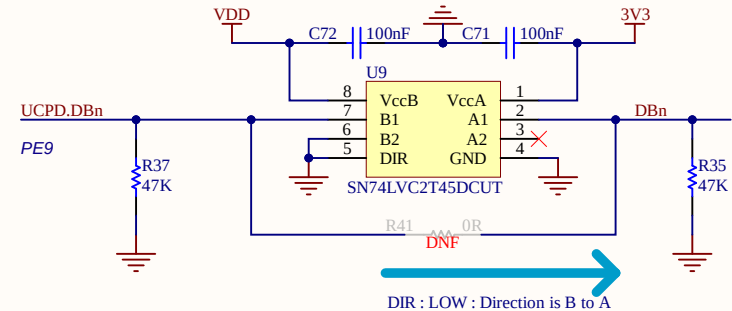
Use solder bridges to change default configuration on UCPD,ADC1/ADC2 (see MCU PIO page)



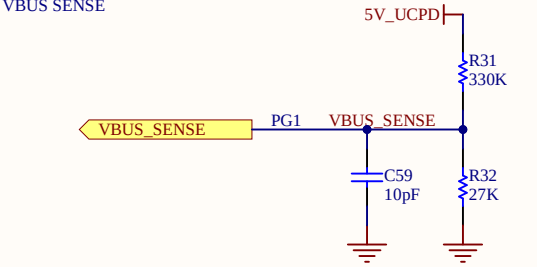
5V_USB_LED



UCPD.DBn Level shifter



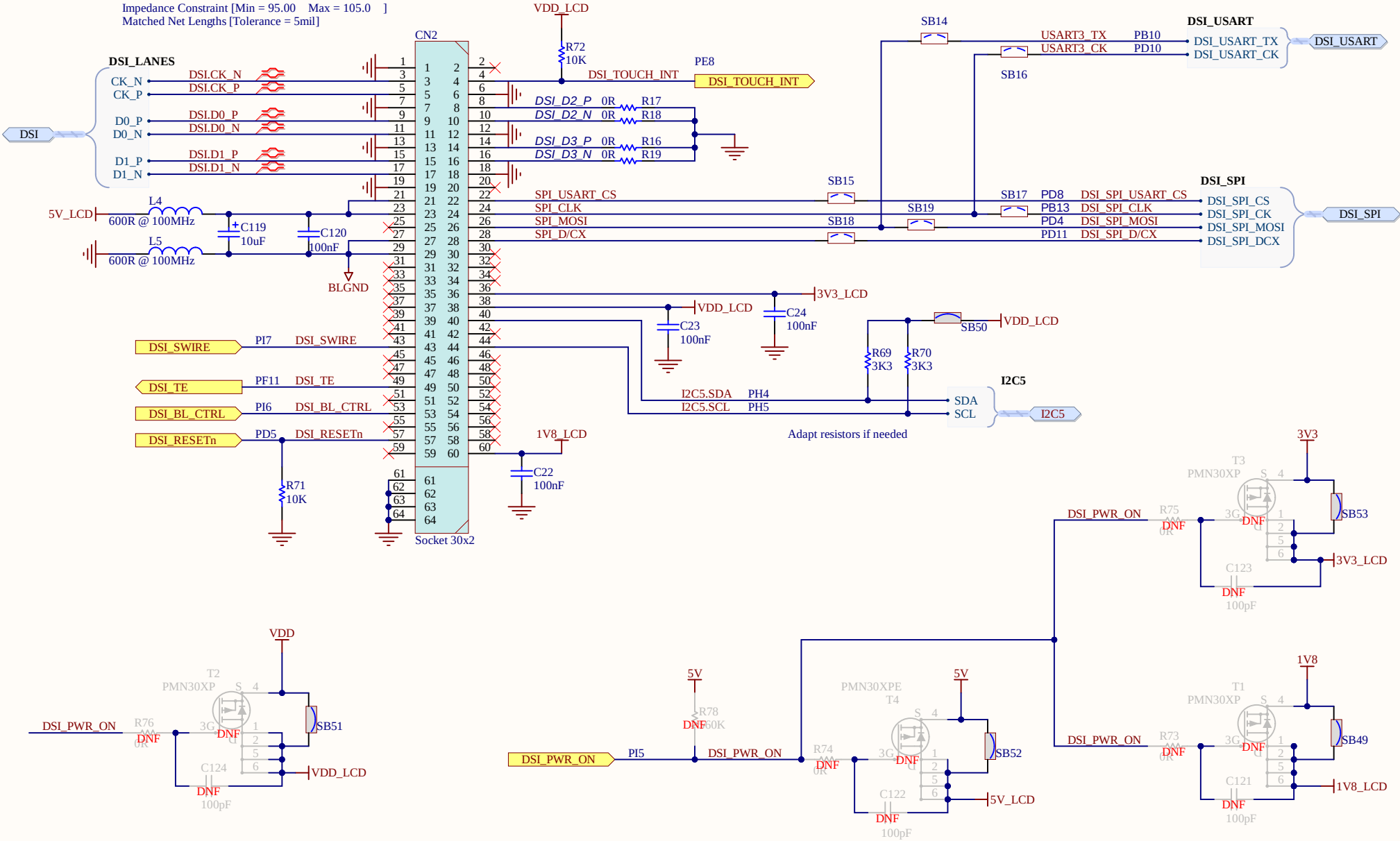
VBUS SENSE



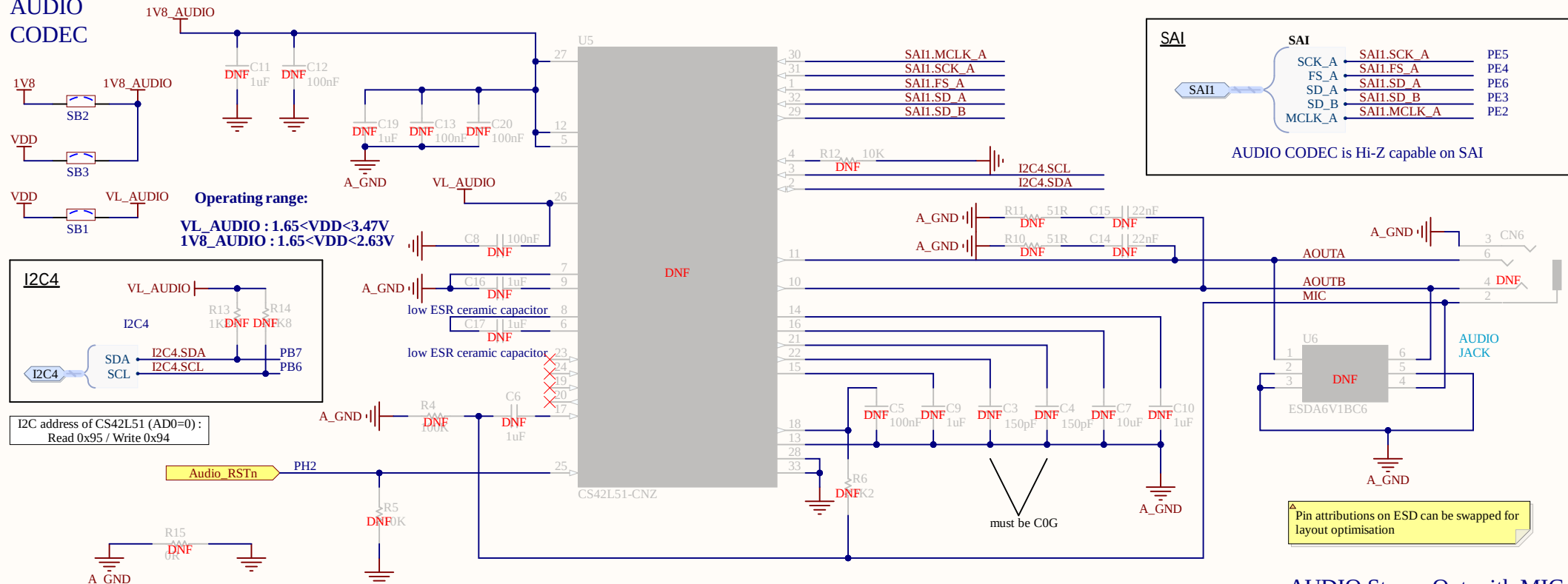
DSI LCD

DSI.CK_N and DSI.CK_P are inverted on DSI connector pins : swap lanes in Software

Impedance Constraint [Min = 95.00 Max = 105.0]
Matched Net Lengths [Tolerance = 5mil]

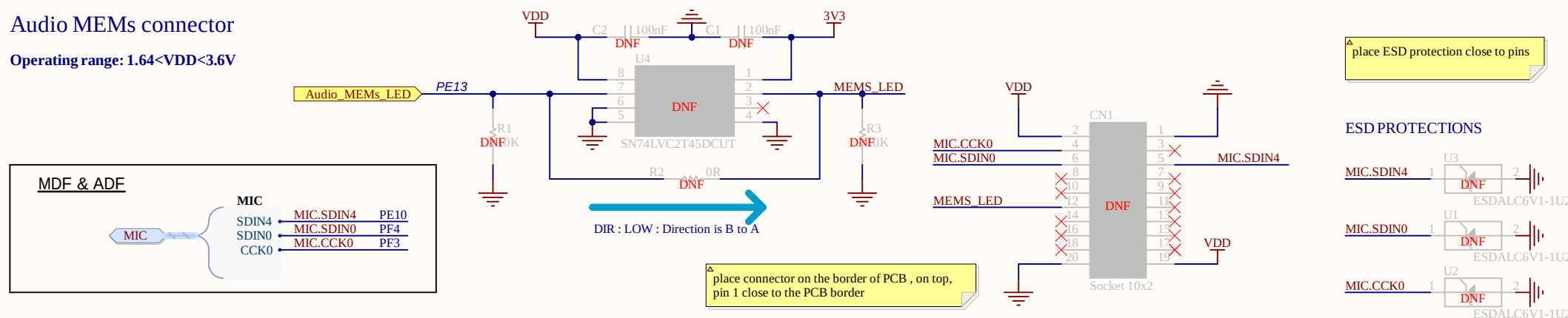


AUDIO CODEC



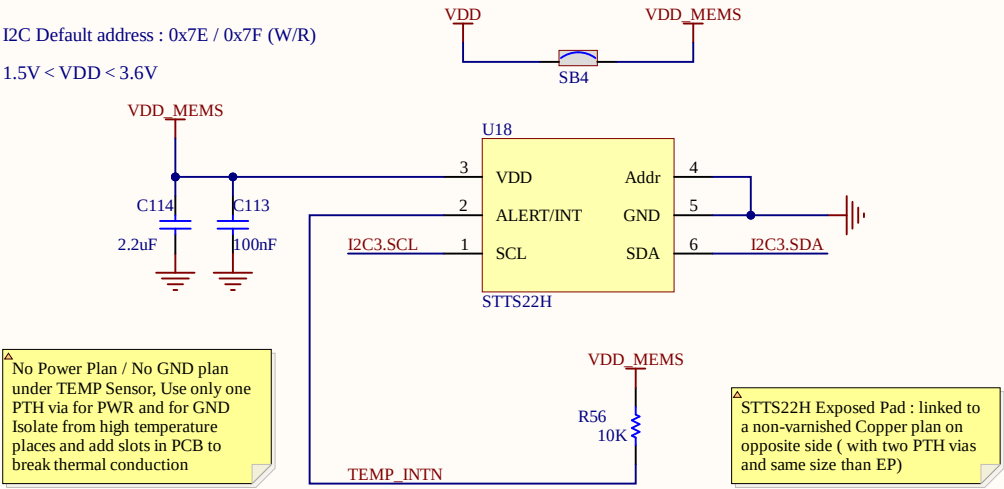
Audio MEMs connector

Operating range: $1.64 < V_{DD} < 3.6V$

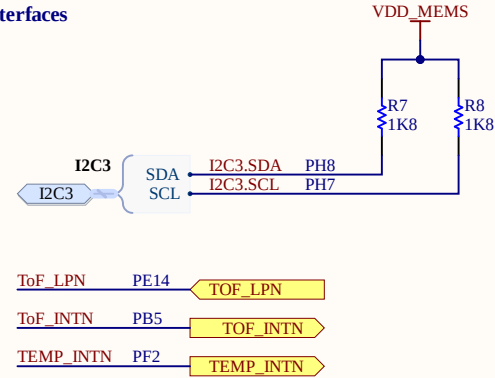


TEMPERATURE SENSOR

I2C Default address : 0x7E / 0x7F (W/R)
1.5V < VDD < 3.6V

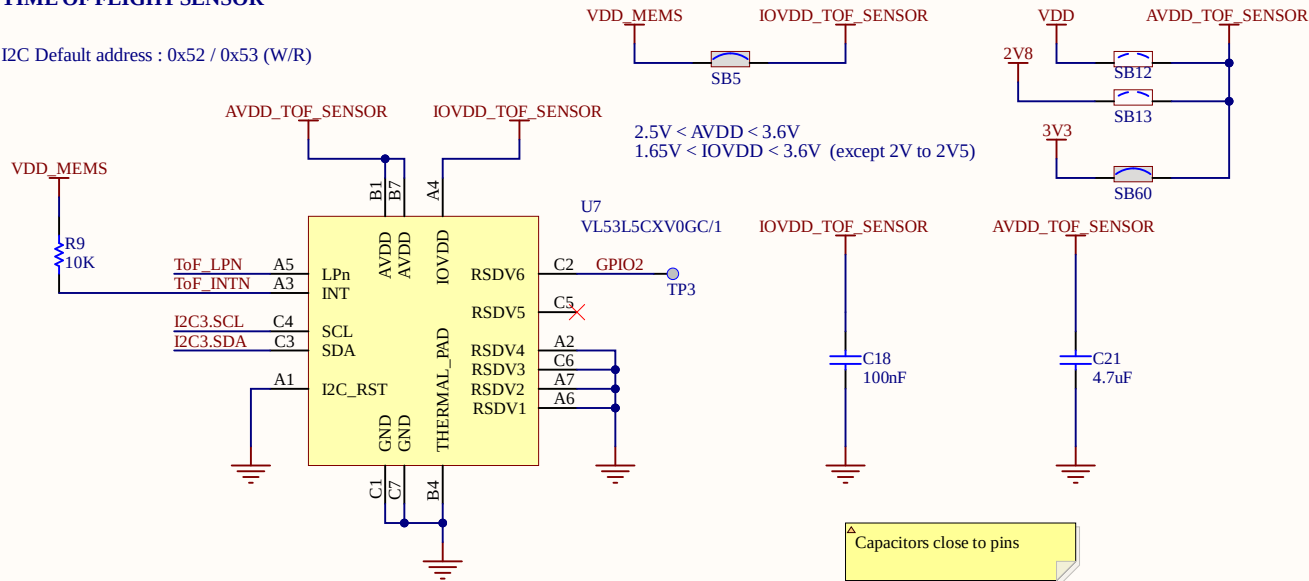


Interfaces



TIME OF FLIGHT SENSOR

I2C Default address : 0x52 / 0x53 (W/R)



EXPANSION CONNECTORS

EXPANSION CONNECTORS, MCU INTERFACES

The diagram illustrates various expansion connectors and their MCU interfaces. On the left, a vertical list of connectors is shown, each with a yellow label box and a blue line representing the connector pins. The connectors are: PA[0..15], PB[0..15], PC[0..15], PD[0..15], PE[0..15], PH[0..6], NRST, PF[0..15], and PG[0..15]. To the right, a text box states: "Only part of these PIOs are available on expansion connectors". Below this, the I2C1 interface is detailed. It shows a blue box labeled "I2C1" connected to a larger blue box labeled "I2C1". The "I2C1" box has two pins: "SDA" and "SCL". The "I2C1" box has two pins: "PG13" and "PG14". The "I2C1" box has two pins: "I2C1.SDA" and "I2C1.SCL".

PA[0..15]

PB[0..15]

PC[0..15]

PD[0..15]

PE[0..15]

PH[0..6]

NRST

PF[0..15]

PG[0..15]

Only part of these PIOs are available on expansion connectors

I2C1

I2C1

SDA

SCL

PG13

PG14

I2C1.SDA

I2C1.SCL

EXPANSION CONNECTORS

EXPANSION CONNECTORS : VDD is 1.8V Default, VREFP / VDDA are 1.8V default

VDD/IREF domain is the digital power supply dedicated to peripherals

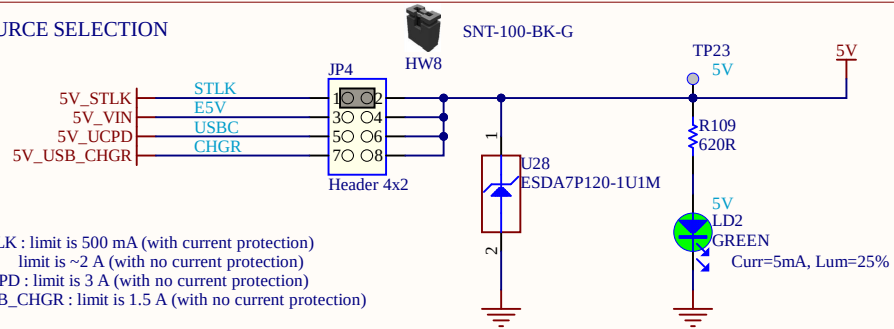
ADC inputs are referenced to VREFP (1.8V default)

LIMITATION :

ADC4_IN6 & ADC4_IN7 are exclusive with UCPD.ADC1/ADC2
Use solder bridges to connect/disconnect (on MCU page also)

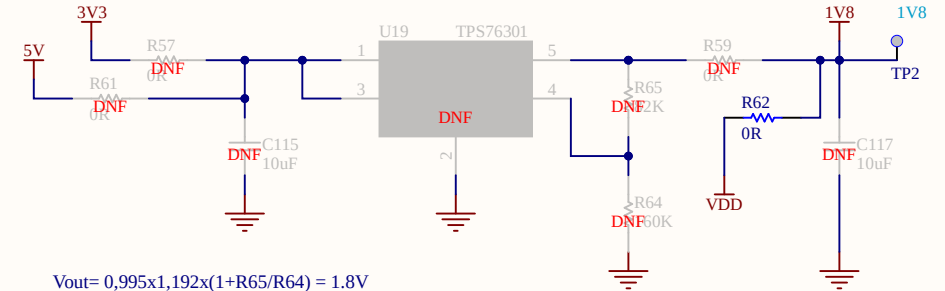
VDDA is used by COMP and OPAMP functions (multiplexed on many IOs)
ADC inputs are referenced to VREFP (1.8V default)

5V PWR SOURCE SELECTION



1V8 POWER SOURCE / 150mA

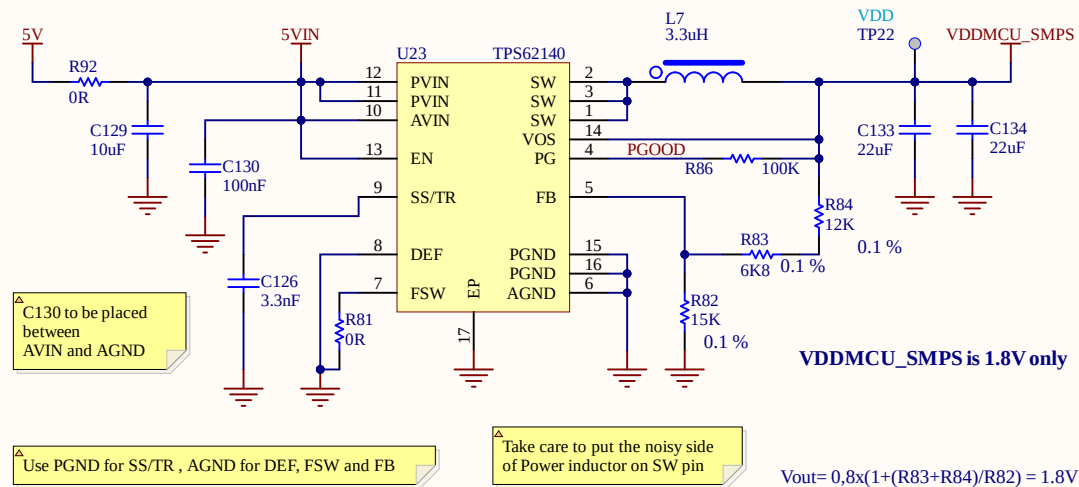
1V8 fixed LDO unused (AUDIO_CODEC, DSL_V3 connector and Expansion connectors)



VDD_MCU POWER SOURCE / 800mA

1.8V Default

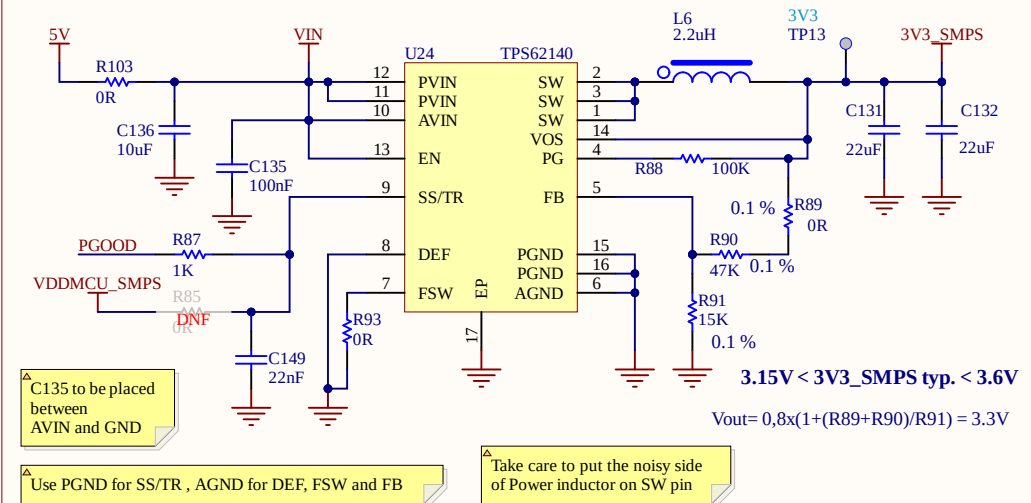
1.8V converter for MCU Power and Peripherals



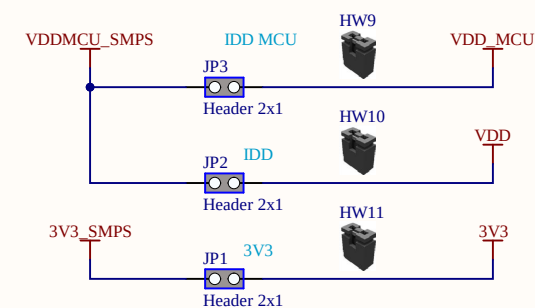
3V3 POWER SOURCE / 800 mA

3.3V Default

3.3V converter for MCU and Peripherals

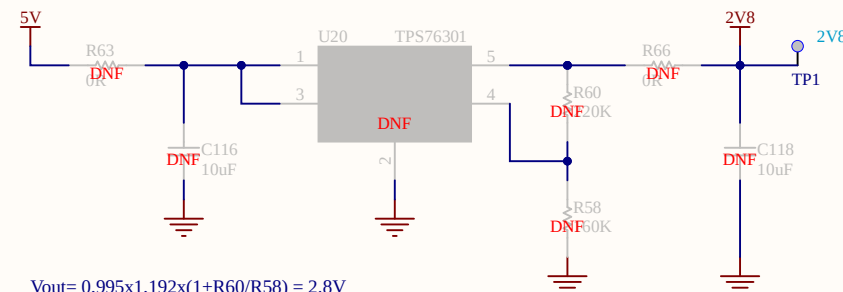


CURRENT MEASUREMENTS

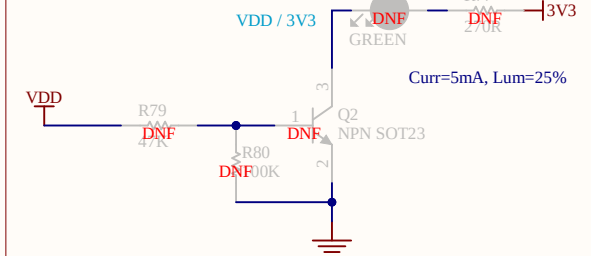


2V8 POWER SOURCE / 150mA

2V8 fixed LDO unused



MCU PWR LED (VDD and 3V3)



Title: **BOARD Power**

Project: **STM32U5A9NJH6Q Discovery**

Variant: **U5A9NJQ**

Revision: **B-01**

Size: **A4**

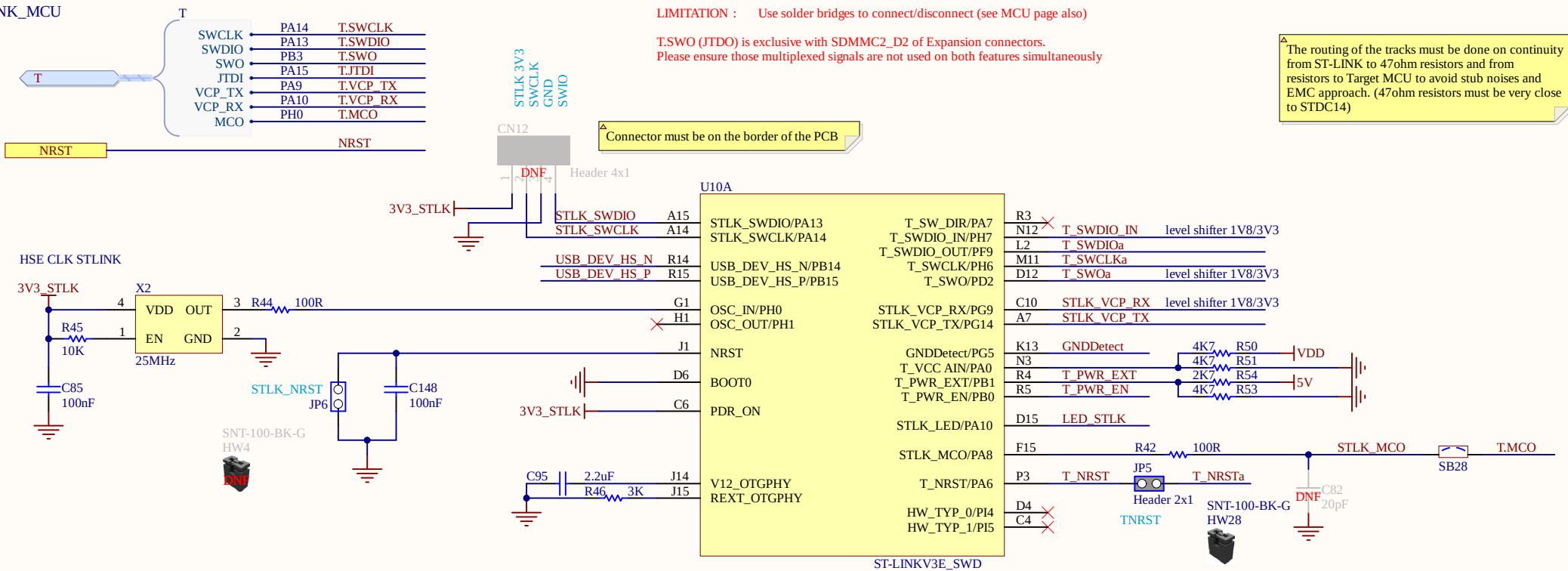
Date: **16-Feb-2023**

Reference: **MB1829**

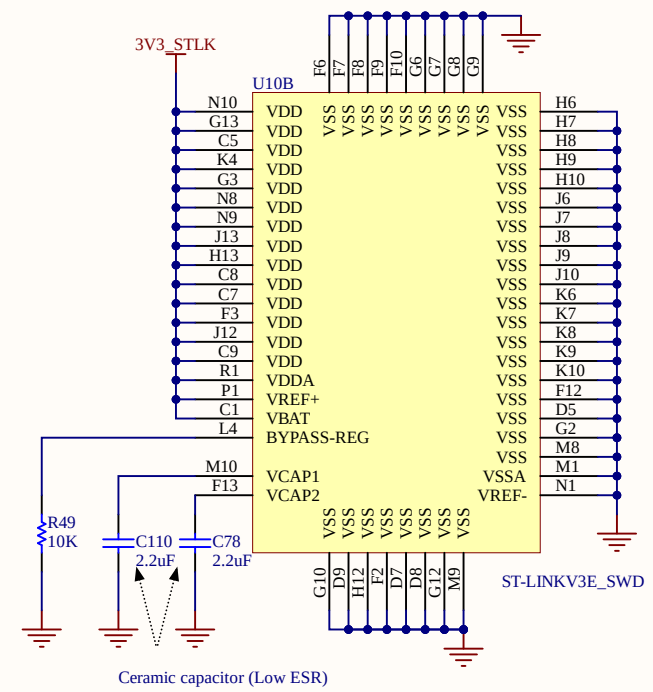
Sheet: **14 of 16**



STLINK_MCU



ST-LINK POWER

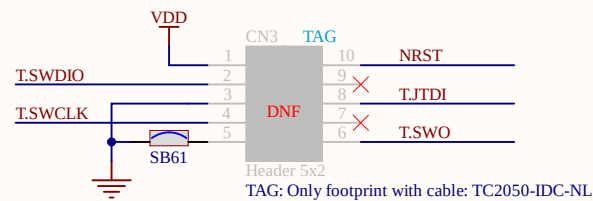


TAG CONNECTOR

Use SWD mode by default (JTAG 4 wire mode needs modification)

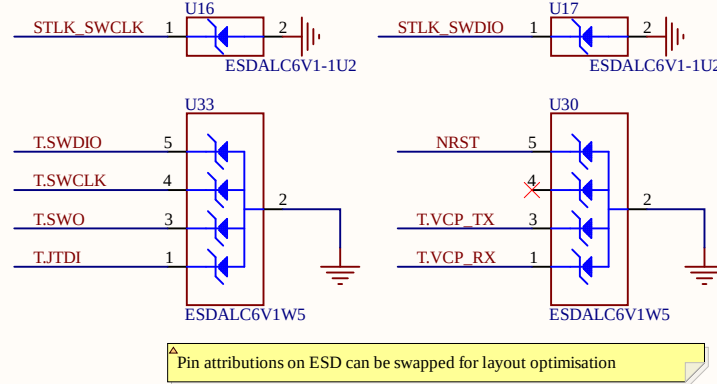
T.SWO (JTDO) is exclusive with SDMMC2_D2 of Expansion connectors
Use solder bridges to connect/disconnect (see MCU page also)

JTDI is exclusive with CC1 of USB Type-C UCPD

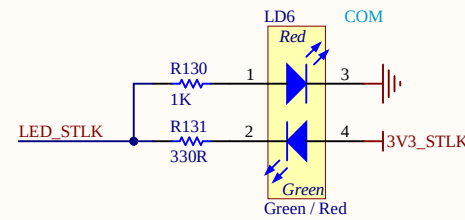


Remove the solder bridge if the debugger probe provides power supply on pin 5

ESD PROTECTIONS



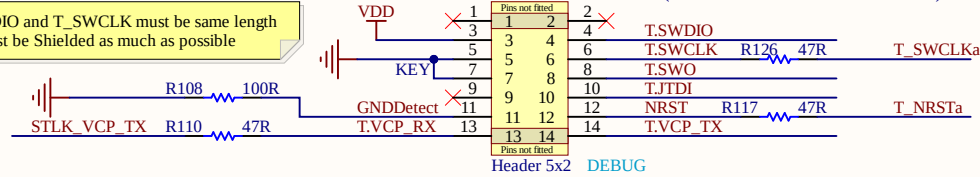
LED STLK



MIPI10 DEBUG

Use SWD mode by default
(JTAG 4 wire mode needs modification)

△ T_SWDIO and T_SWCLK must be same length and must be Shielded as much as possible

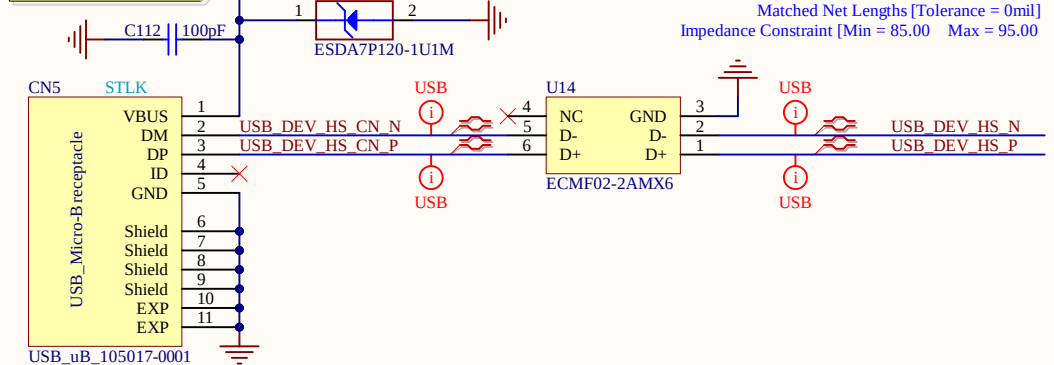


T.SWO (JTDO) is exclusive with SDMMC2_D2 of Expansion connectors
Use solder bridges to connect/disconnect (see MCU page also)

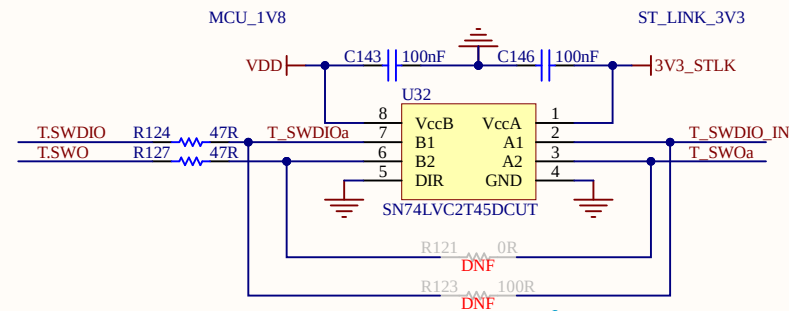
JTDI is exclusive with CC1 of USB Type-C UCPD

ST-LINK USB CONNECTOR

Capacitor close to pin 1

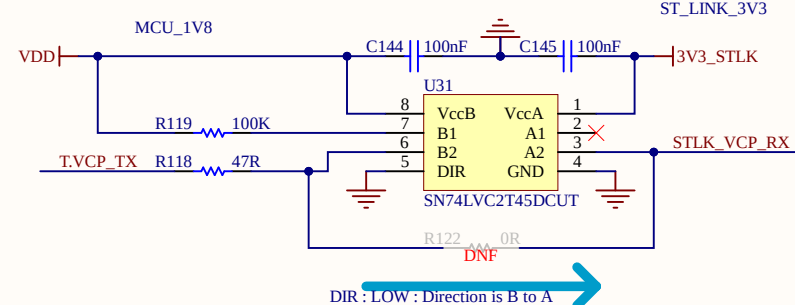


SW LEVEL SHIFTER FOR MCU_1V8

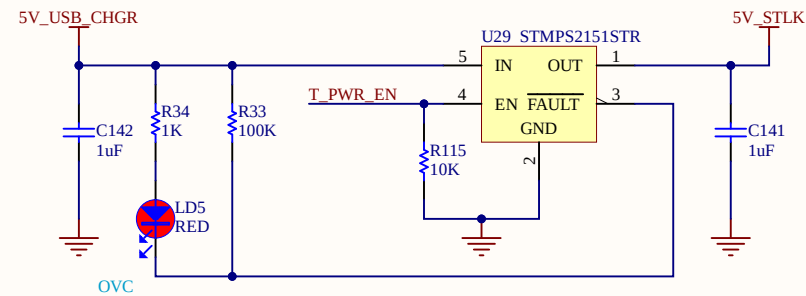


T.SWO (JTDO) is exclusive with SDMMC2_D2 of Expansion connectors

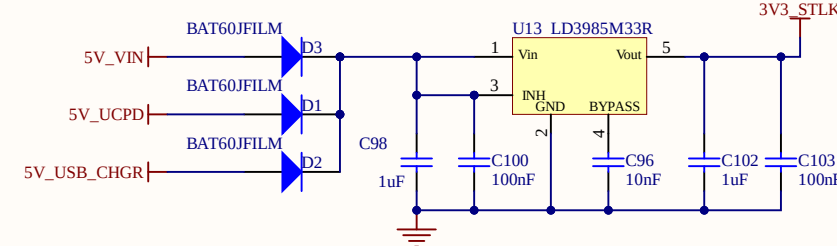
Use solder bridge to connect/disconnect
(see MCU page also)



5V ST-LINK PROTECTION



ST-LINK POWER 3V3 / 150mA

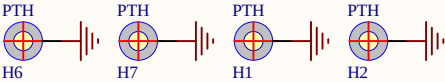


HW7
PCB
MBxxxxy

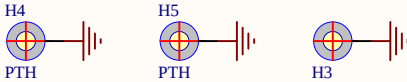
HW3
STICKER BOARD
Sticker board

HW1
STICKER PRODUCT
Sticker product

HW2
DNF
Sticker ES

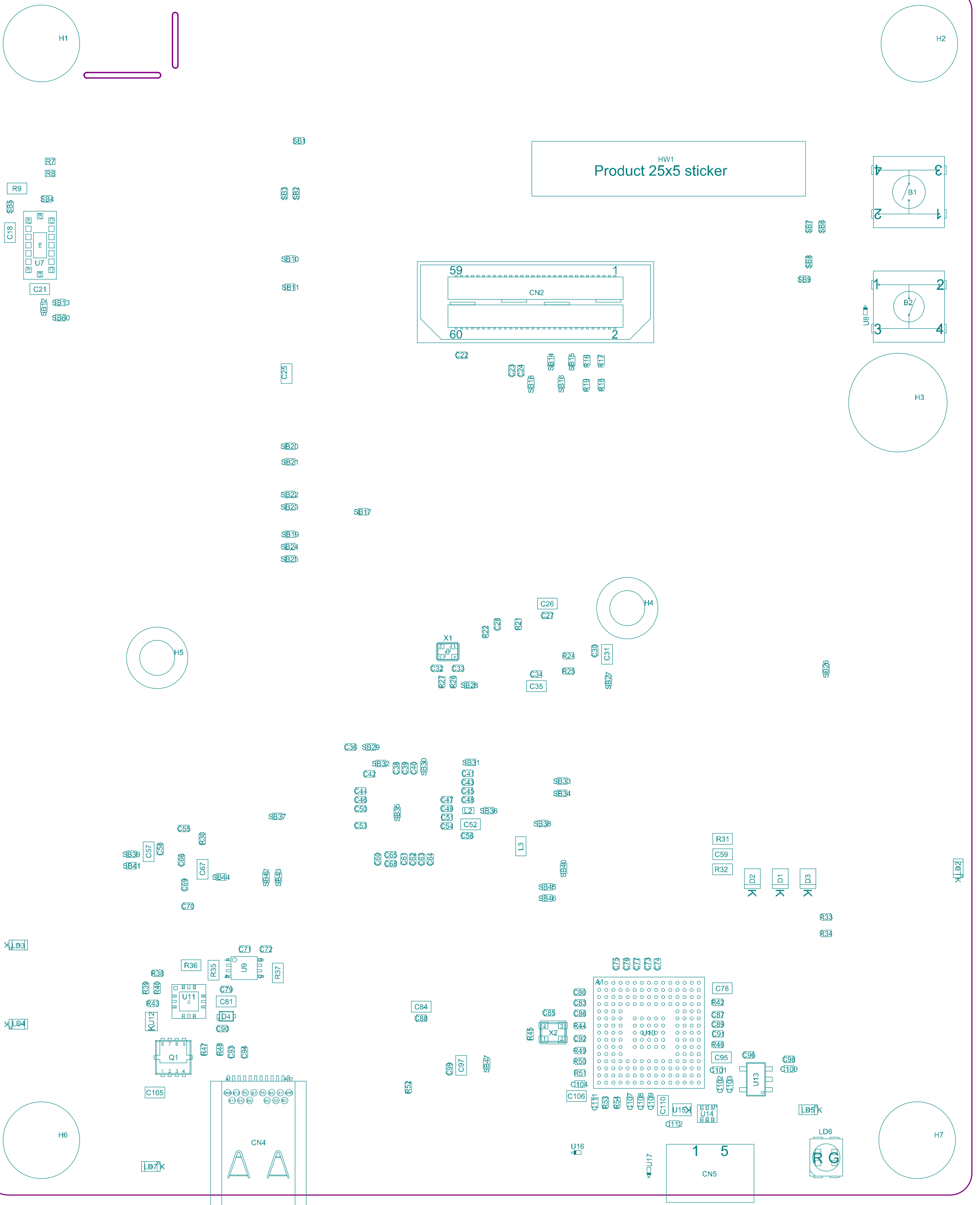


Parts for MB1829 corner holes



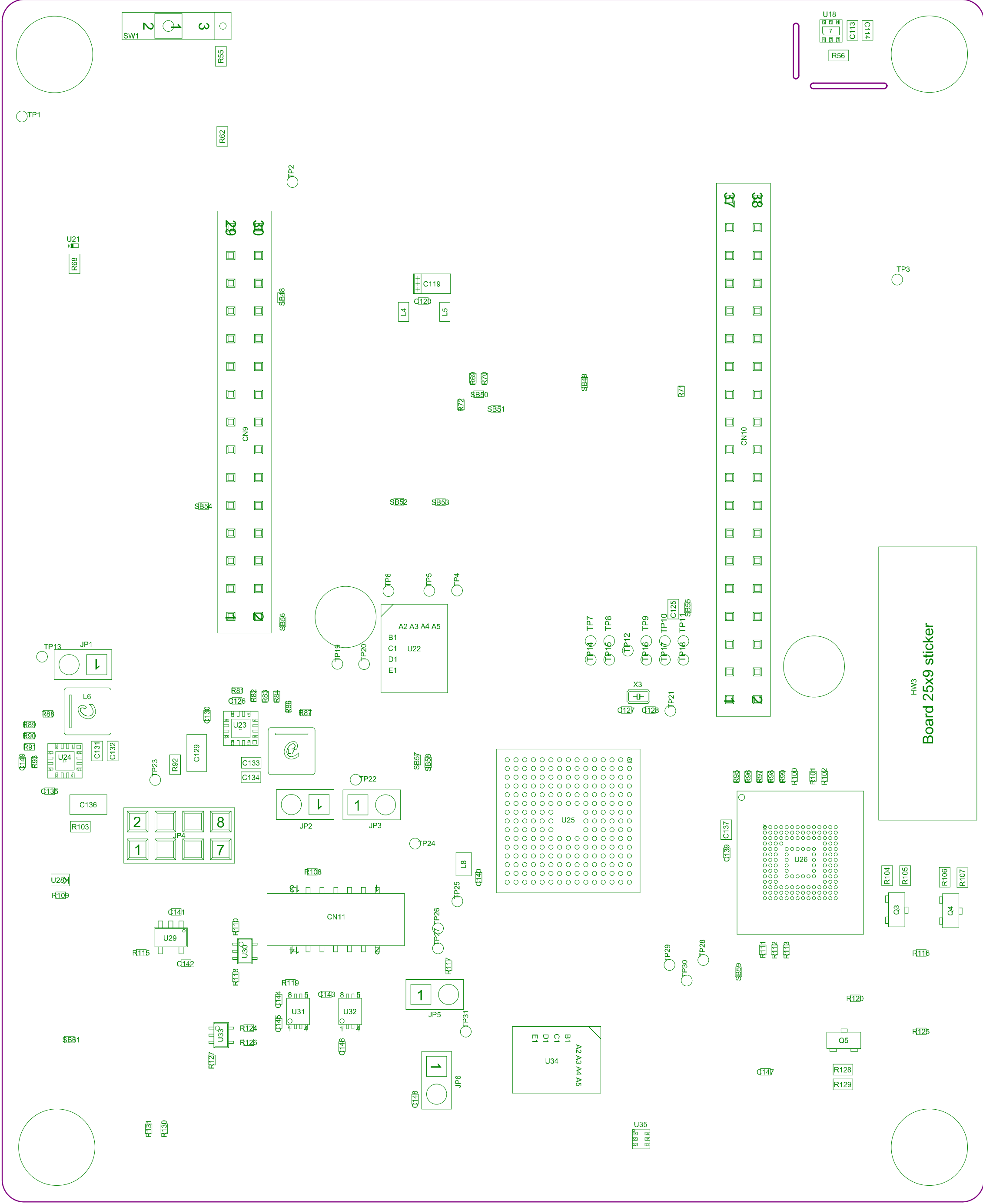
Parts for different daughter boards holes





Project: STM32U5A9NJH6Q Discovery	
Layer: M14-Top Assembly	Gerber: .GM14
Variant: U5A9NJQ	Ref: MB1829
Date: 16-Feb-2023	Rev: B





Project: STM32U5A9N Discovery

Layer: M15-Bottom Assembly

Variant: U5A9NJQ

Date: 16-Feb-2023

Gerber:.GM15

Ref: MB1829

Rev: B



