

STM32U575I-EV

MB1550

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Legend

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

Text to be added to silkscreen.

Warning text.

Notes to generate the board layout.

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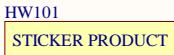
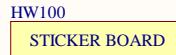
Netherlands acting for the purpose of this Agreement through its Swiss branch 39, Chemin du

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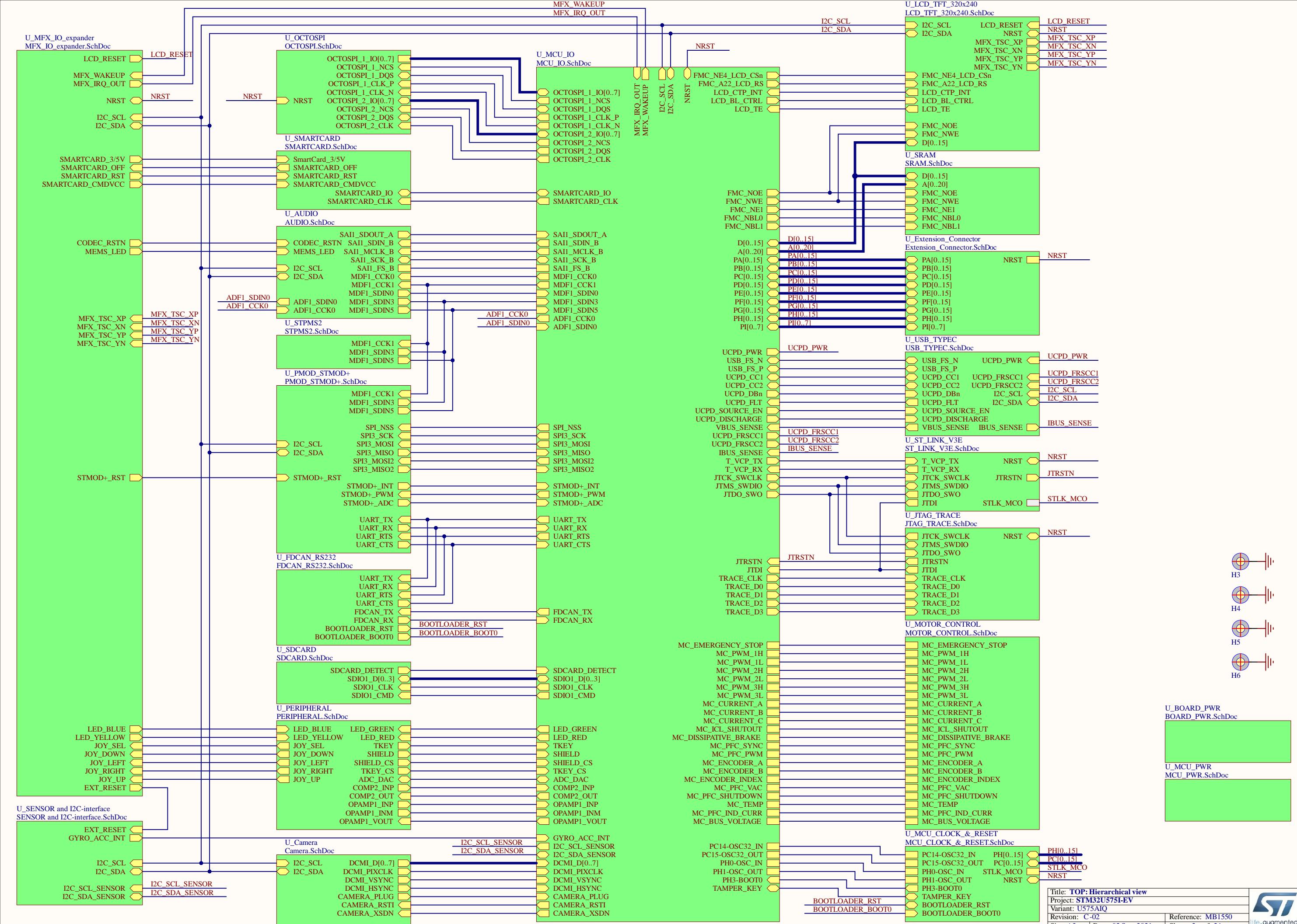
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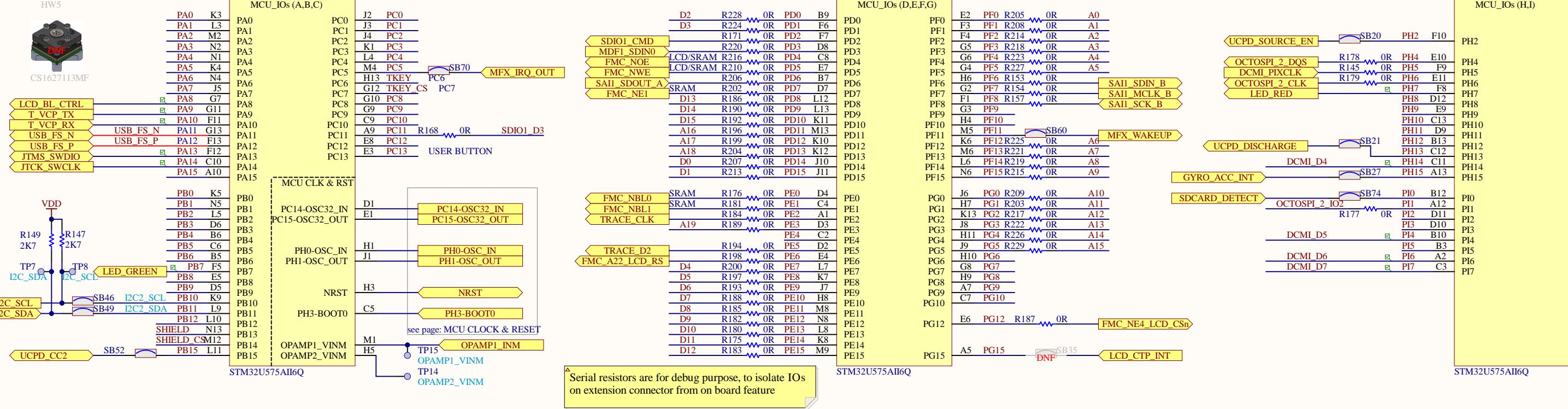
U_MB1550_TOP
MB1550_TOP.SchDoc



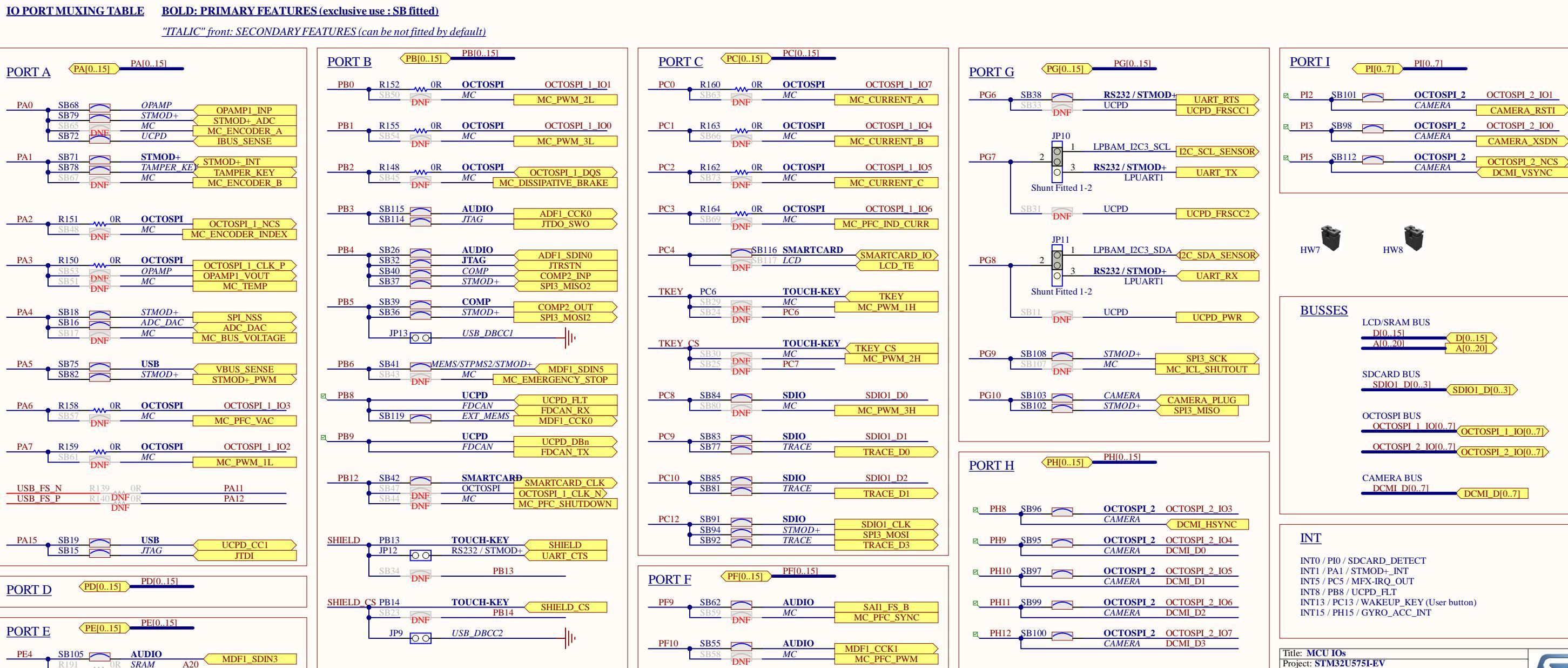
Title: Project overview	ST life.augmented
Project: STM32U575I-EV	
Variant: U575AIQ	
Revision: C-02	
Reference: MB1550	
Size: A4	Date: 02 Sept 2021
Sheet: 1 of 24	



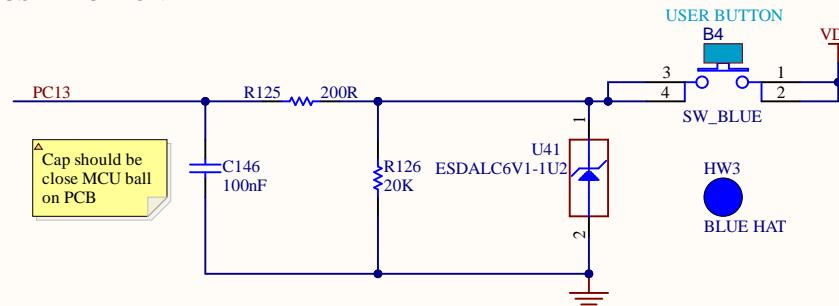
STM32 MCU IOs



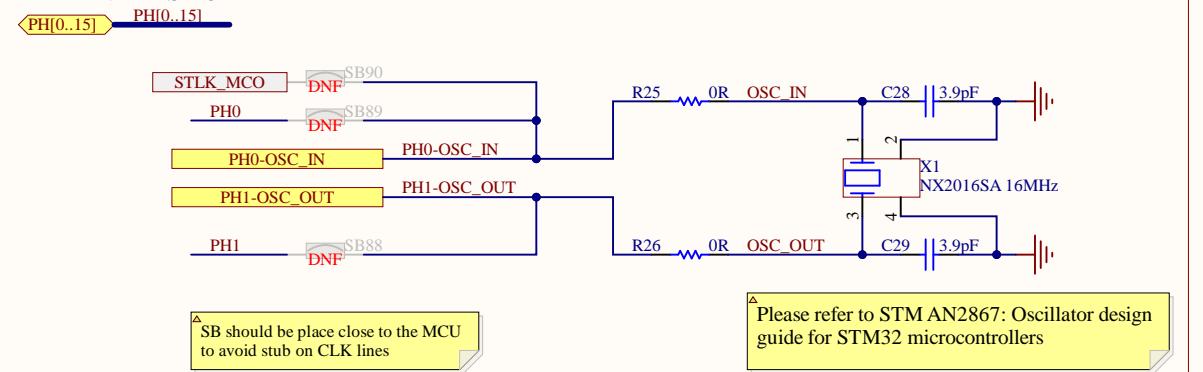
IO PORT MUXING TABLE



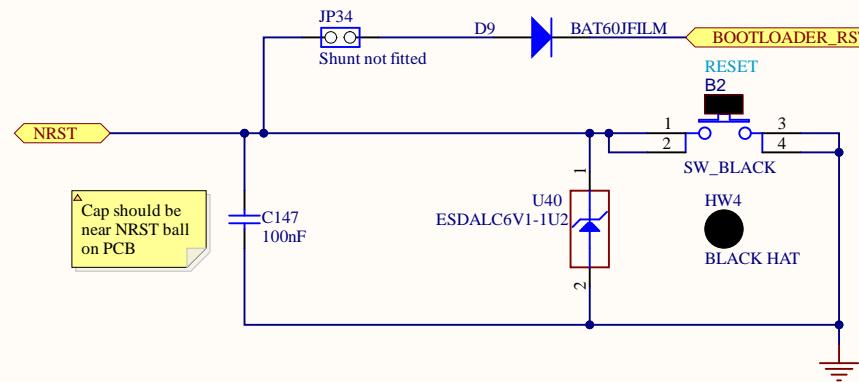
USER BUTTON



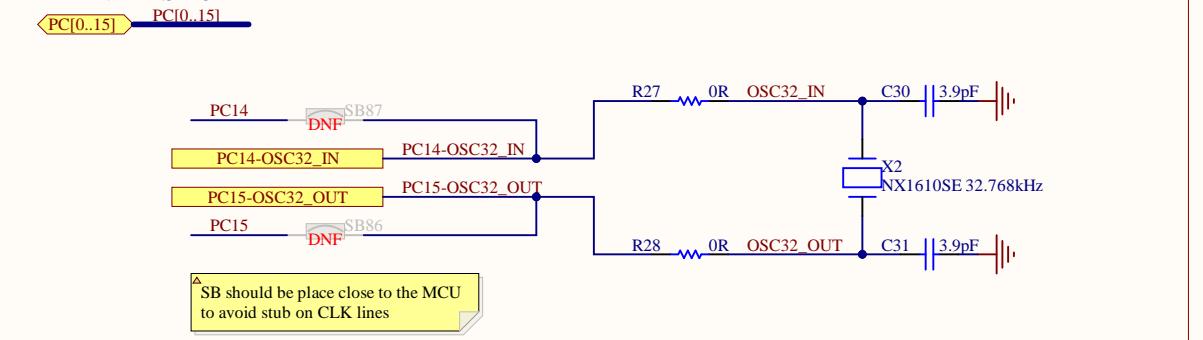
EXTERNAL HSE CLK



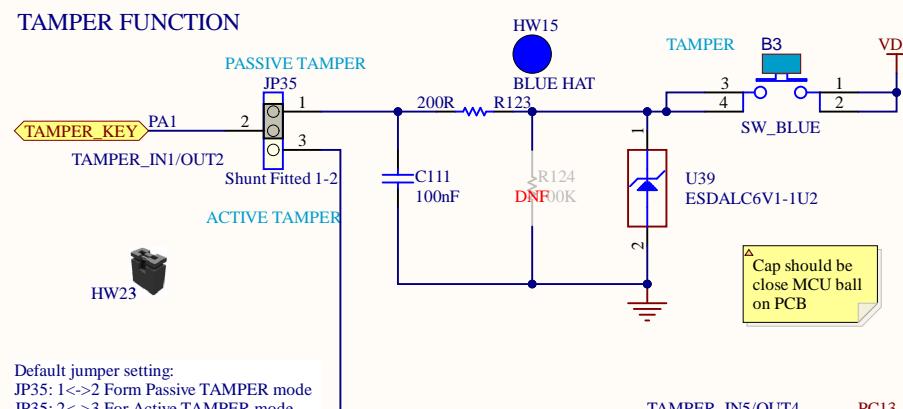
RESET FUNCTION



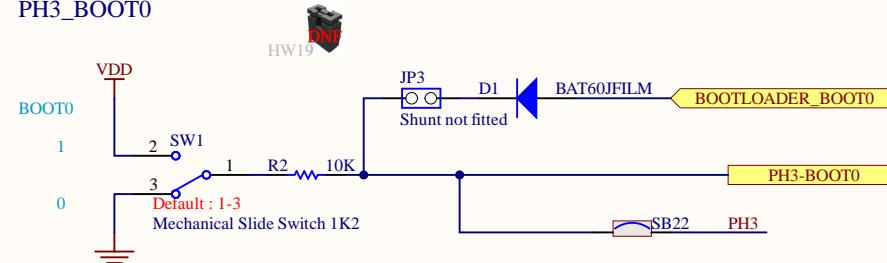
EXTERNAL LSE CLK



TAMPER FUNCTION



PH3_BOOT0



LIMITATIONS : See User Manual for more detail about muxing.

TAMPER on PA1 exclusive with PMOD/STMOD+ INT

Title: **MCU CLOCK & RESET**

Project: **STM32U575I-EV**

Variant: **U575AIQ**

Revision: **C-02**

Reference: **MB1550**

Size: **A4**

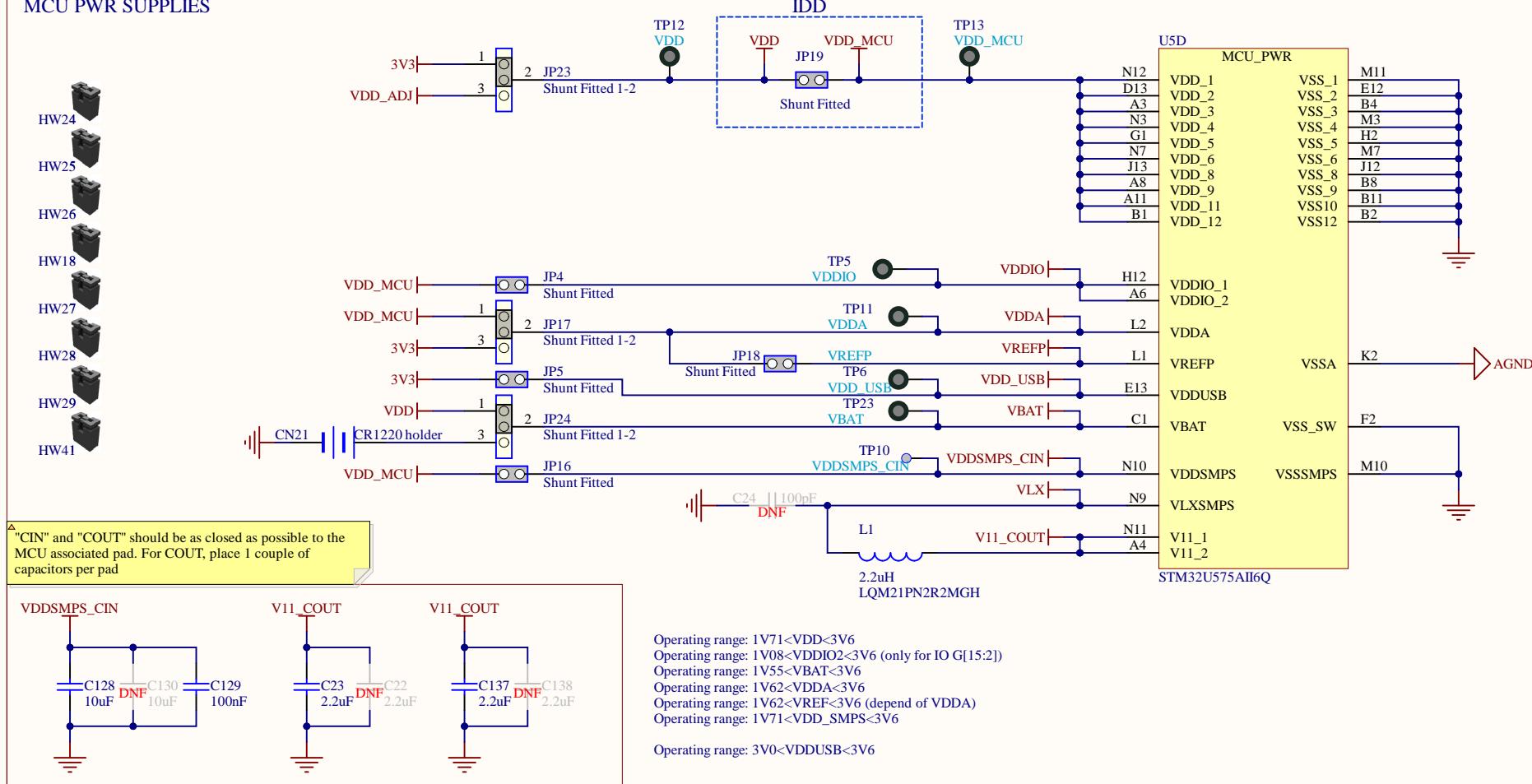
Date: **02 Sept 2021**

Sheet: **4 of 24**



life.augmented

MCU PWR SUPPLIES



MCU DECAPS
Ceramic capacitor (Low ESR, ESR<1ohm)



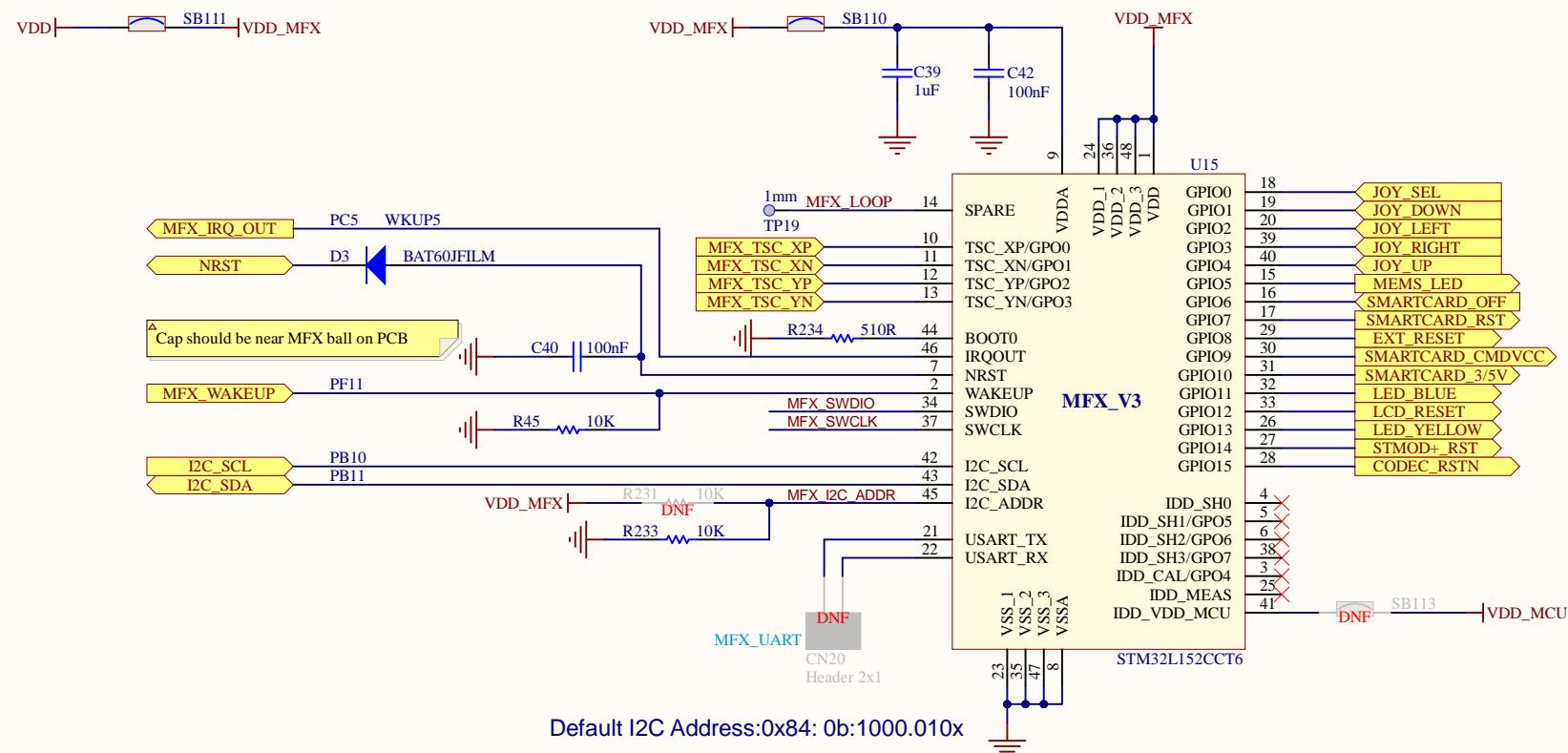
SB76 → AGND

Title: MCU PWR	
Project:	STM32U575I-EV
Variant:	U575AIQ
Revision:	C-02
Size: A4	Date: 02 Sept 2021
Reference: MB1550	
Sheet: 5 of 24	

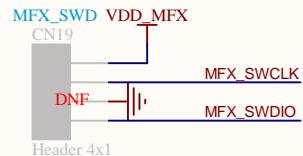


MFX I/O EXPANDER

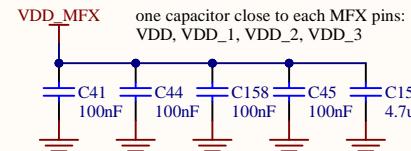
Operating range: 1.65<VDD<3.6V



MFX DEBUG SWD INTERFACE



MFX DECAPS



LIMITATIONS : See User Manual for more detail about muxing.

NO LIMITATION

Title: MFX IO EXPANDER		
Project: STM32U575I-EV		
Variant: U575AIQ		
Revision: C-02	Reference: MB1550	
Size: A4	Date: 02 Sept 2021	Sheet: 6 of 24



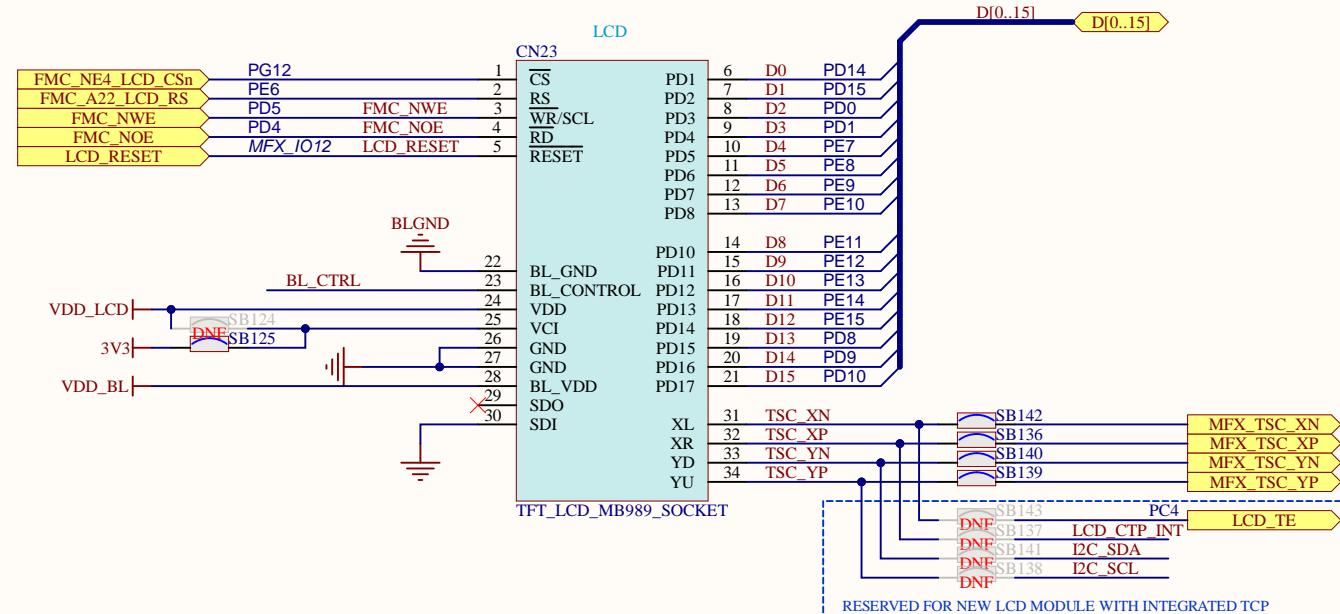
life...augmented

TFT LCD SOCKET CONNECTOR

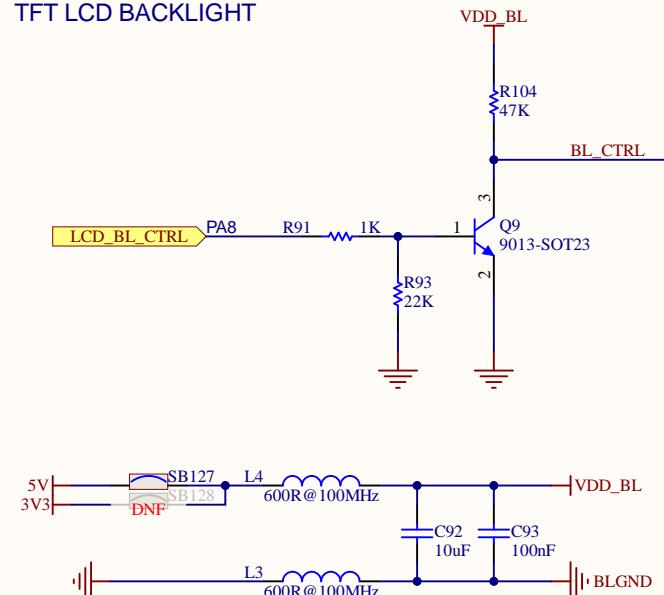
Operating range: 2.5<VCI<3.3V

Operating range: 1.65<VDD<3.3V

VDD — SB123 — VDD_LCD

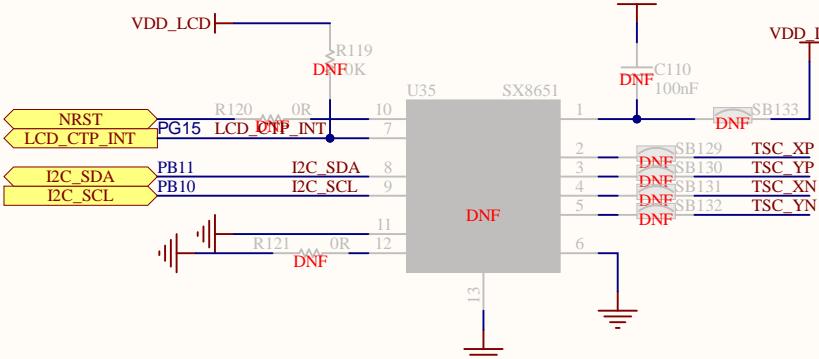


TFT LCD BACKLIGHT



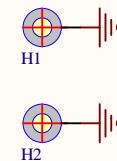
TOUCH PANEL SEMTECH

Operating range: 1.65<VDD<3.7V



Default I2C Address:0x90: 0b:1001.000x

LCD MECHANICAL PARTS



LIMITATIONS: See User Manual for more detail about muxing.
LCD_TE exclusive with SMARTCARD_UART_RX

Title: LCD TFT 320x240

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02

Reference: MB1550

Size: A4

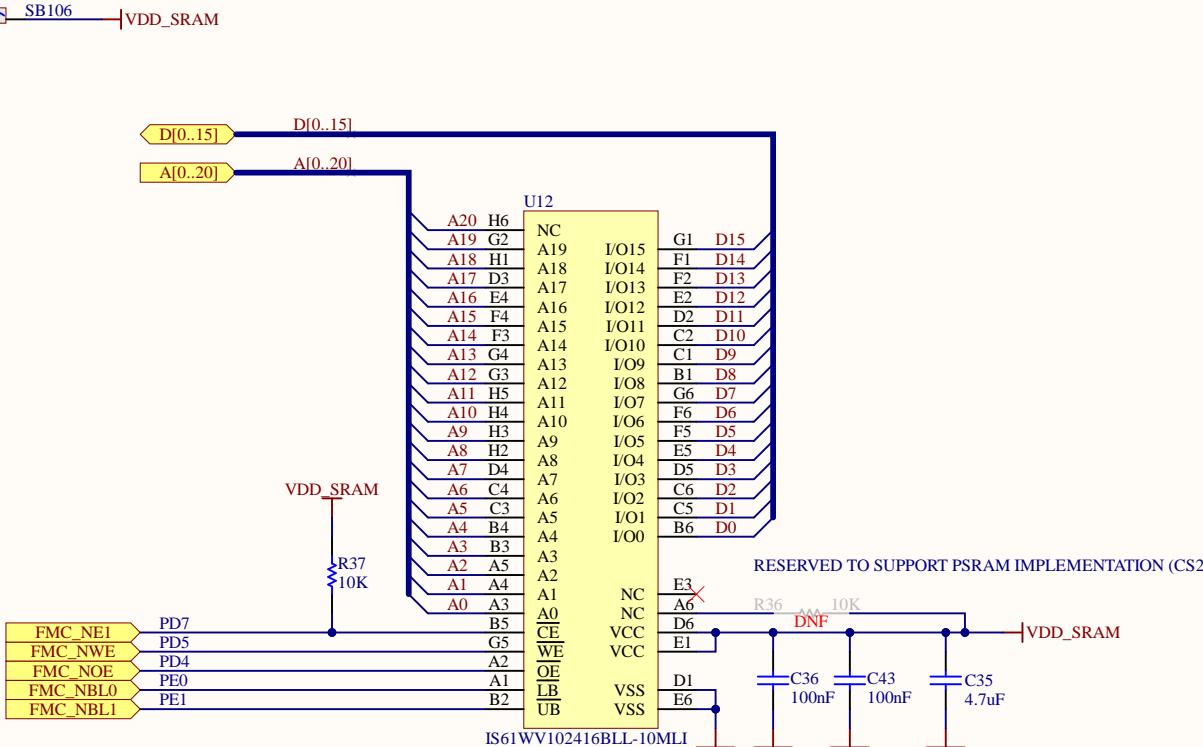
Date: 02 Sept 2021

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SRAM

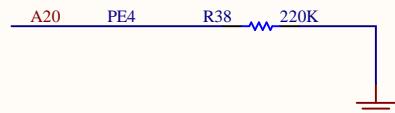
Operating range: 2.4<VDD<3.6V



Other memory compatible:
SRAM 512x16: IS61WV51216BLL-10MLI
PSRAM 512Kx16: IS66WV51216EBLL-55BLI

Default config = A0-A19

A20 = 0 by default (depend of the memory size)



▲ SRAM bus should be routed in 50 ohm +/- 15%

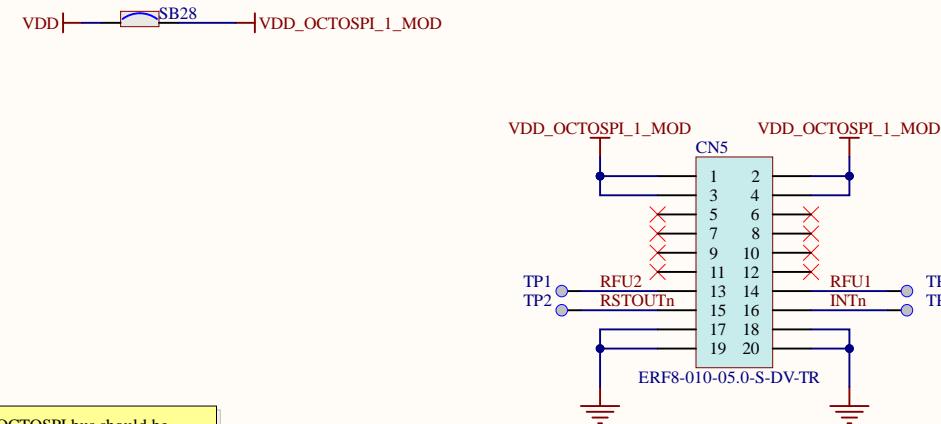
LIMITATIONS : See User Manual for more detail about muxing.

Memory size limited to max 32Mbits by design

Title: SRAM	ST life.augmented
Project: STM32U575I-EV	
Variant: U575AIQ	
Revision: C-02	
Reference: MB1550	
Size: A4	Date: 02 Sept 2021
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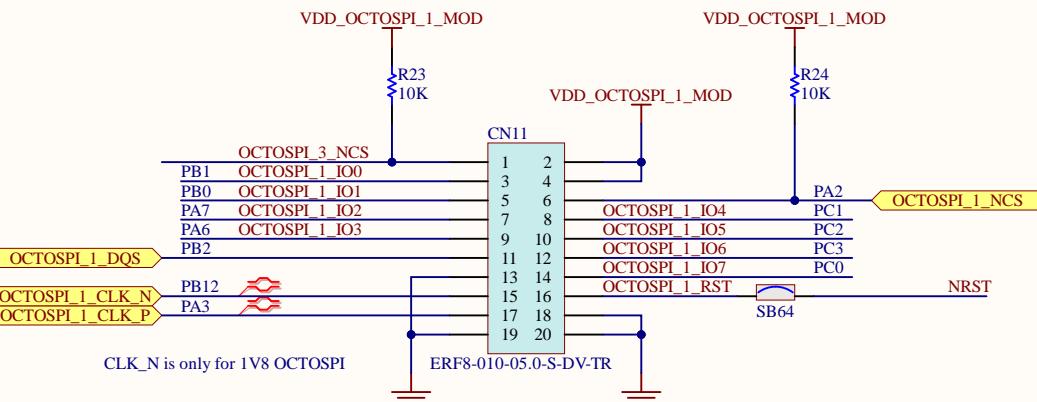
OCTOSPI_1 (MB1242 Module connector)

Operating range: 1.6<VDD<3.6V



OCTOSPI bus should be routed in 50 ohm +/- 15%

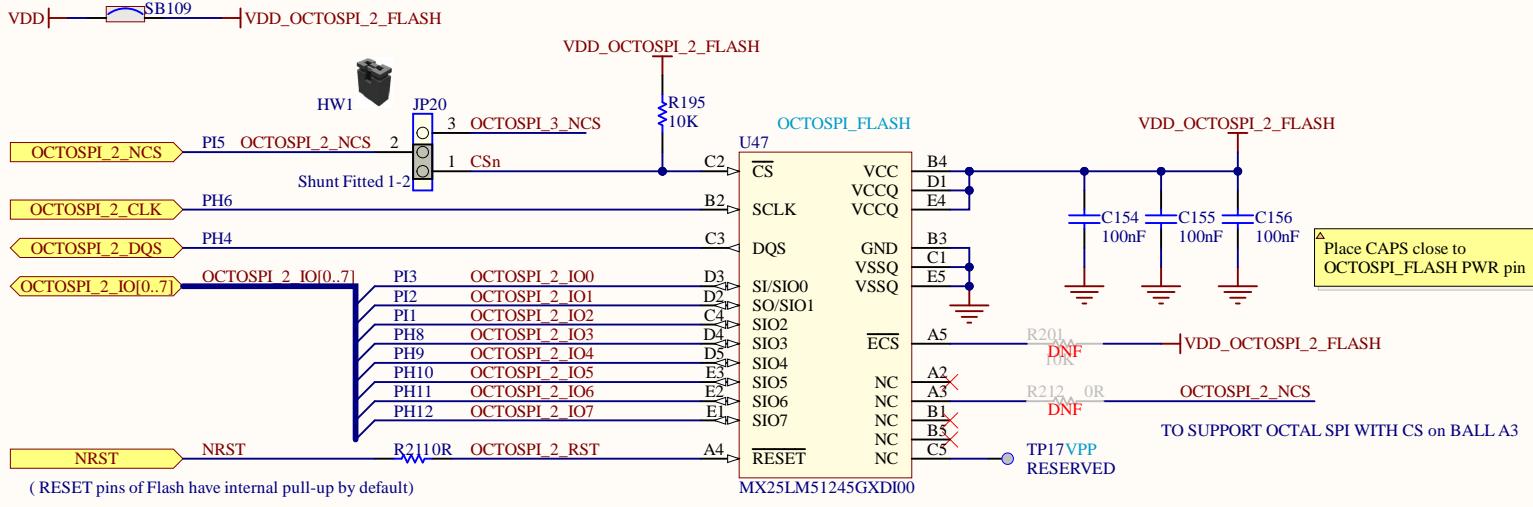
OCTOSPI_1_IO[0..7] OCTOSPI_1_IO[0..7]



CLK_N is only for 1V8 OCTOSPI

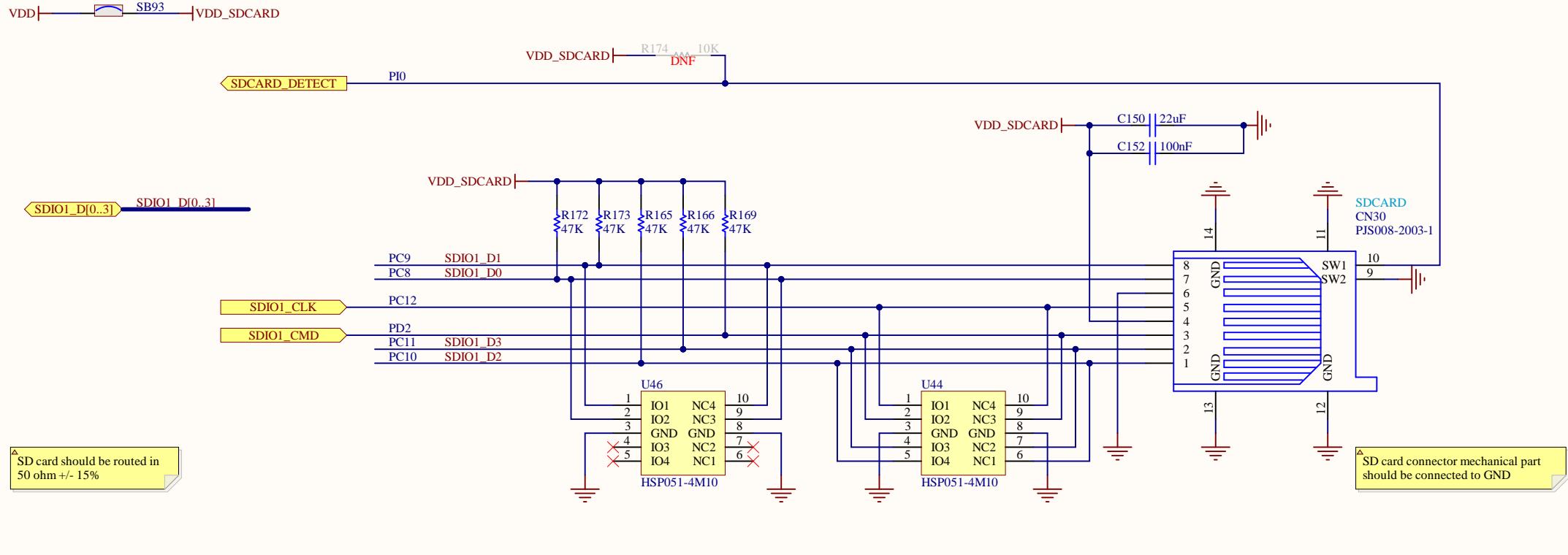
OCTOSPI_2 FLASH

Operating range: 2.7<VDD<3.6V



SD CARD

Operating range: 2.7<VDD<3.6V



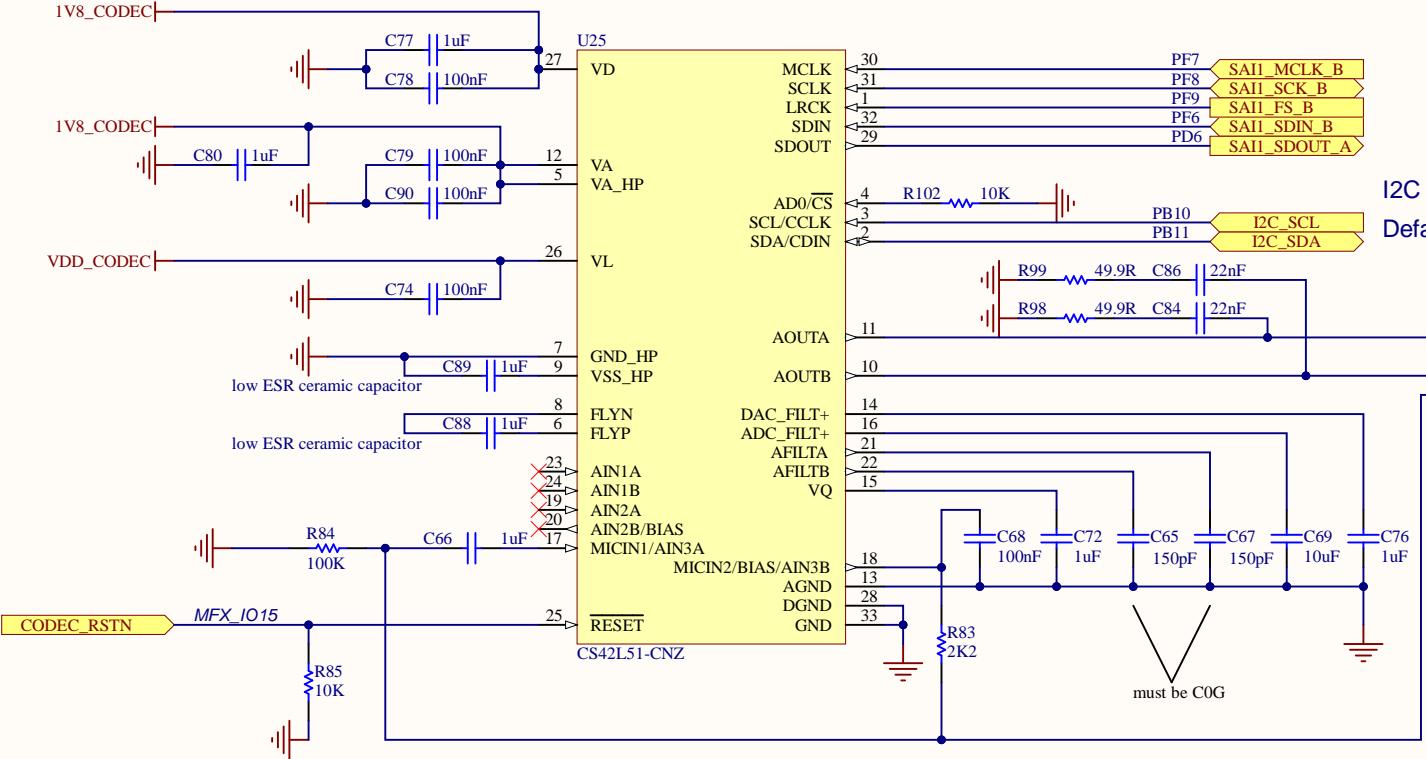
LIMITATIONS: See User Manual for more detail about muxing.

SDIO_CLK/D1/D2 exclusive with TRACE_D0/D1/D3
SDIO_D0 exclusive with MC
SDIO_CLK exclusive with STMOD+

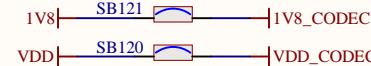
Title: SDCARD	
Project: STM32U575I-EV	
Variant: U575AIQ	
Revision: C-02	Reference: MB1550
Size: A4	Date: 02 Sept 2021
Sheet: 10 of 24	life.augmented



AUDIO CODEC

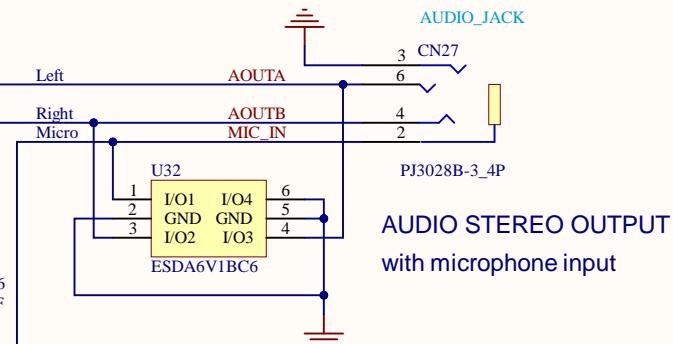


Operating range: $1.65 < VL < 3.47V$
Operating range: $1.65 < VA/VD < 2.63V$



I²C 100KHz SUPPORTED

Default I2C Address:0x94: 0b:1001.010x

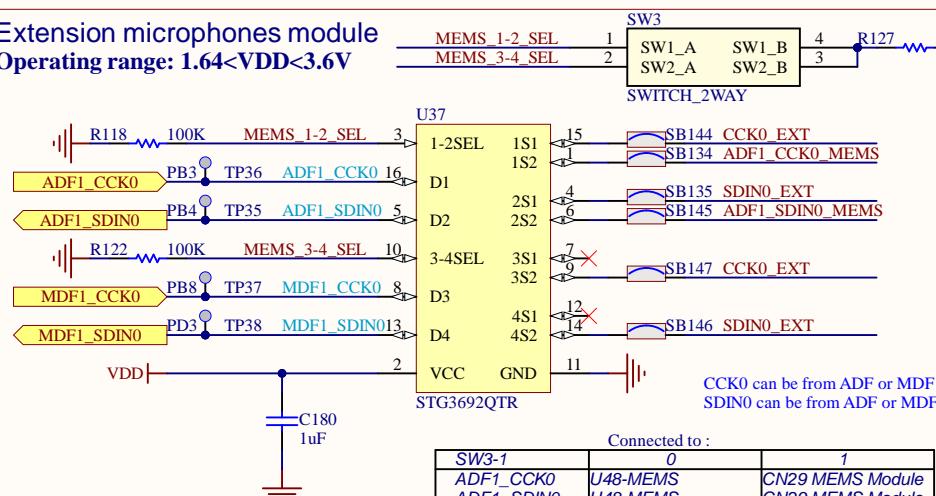


LIMITATIONS : See User Manual for more detail about muxing.

SAI_FS_B exclusive with MC

Extension microphones module

Operating range: 1.64<VDD<3.6V

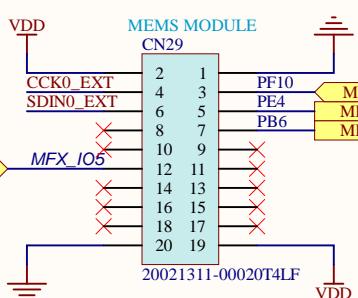


CCK0 can be from ADF or MDF
SDIN0 can be from ADF or MDF

Connected to :		
SW3-1	0	1
ADF1_CCK0	U48-MEMS	CN29 MEMS Module
ADF1_SDIN0	U48-MEMS	CN29 MEMS Module
SW3-2	0	1
MDF1_CCK0	CN29 MEMS Module	NC
MDF1_SDIN0	CN29 MEMS Module	NC

SEL₁ = 0 : Dx connected to xS2

SEL = 0 : Dx connected to xS2



Receptacle connector pin 1 connected to header connector pin 2

LIMITATIONS : See User Manual for more detail about muxing.

MDF1_CCK1 shared between EXT-MEMS, STPMS2, STMOD+
MDF1_CCK1 exclusive with MC

MDF1_SDIN3 shared between EXT-MEMS, STPMS2, STMOD+

ADF1_CCK0 shared between EXT-MEMS and INT-MEMS

ADF1_CCK0 exclusive with JTAG-JTDO

ADF1_SDIN0 exclusive with JTAG-NJTRST, COMP2 and STMOD1
MDF1_SDIN5_1 – LEXT MEMS, STM4S2, STMOD1

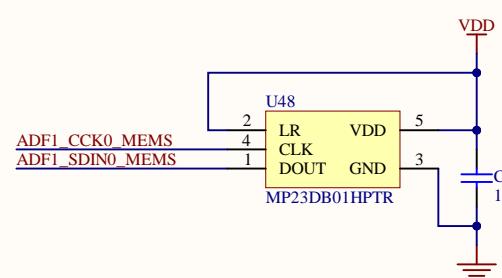
MDF1_SDIN5 shared EXT-MEMS, STPMs2, STMOD+
MDE1_SDIN5 exclusive with MC

MDF1_SDINS exclusive with MC
MDF1_CCK0 exclusive with UCPD, FDCAN

MBT_F_CCR0 exclusive with UCFD, FDCAN

MEMS

Operating range: $1.64 \leq V_{DD} \leq 3.6\text{ V}$



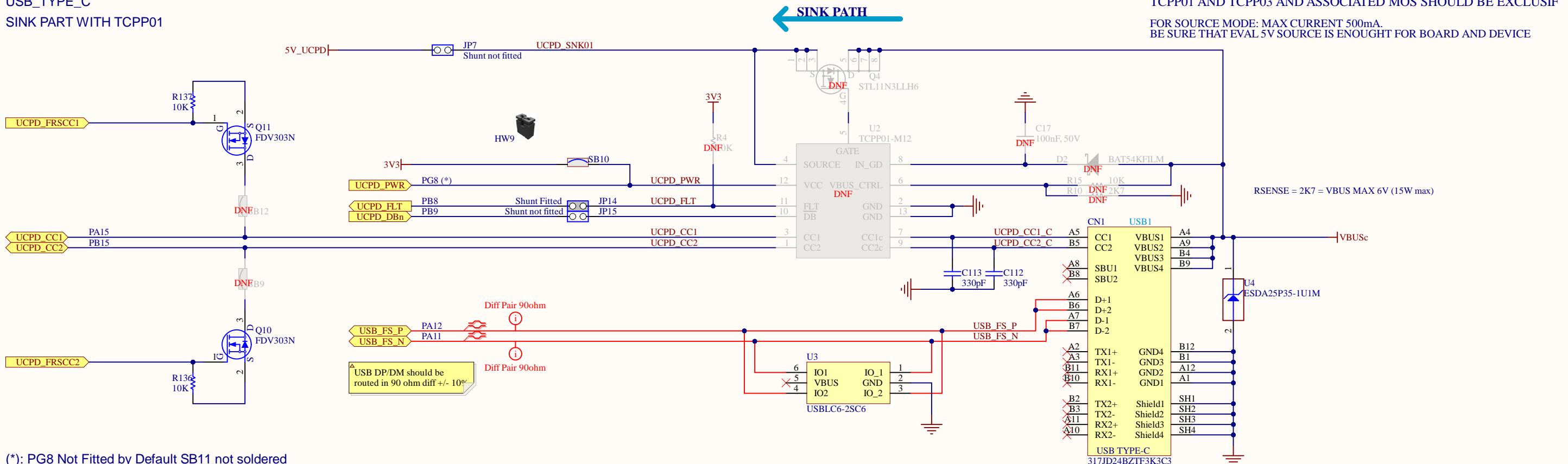
Title: AUDIO		
Project: STM32U575I-EV		
Variant: U575AIQ		
Revision: C-02	Reference: MB1550	
Size: A4	Date: 02 Sept 2021	Sheet: 11 of 24



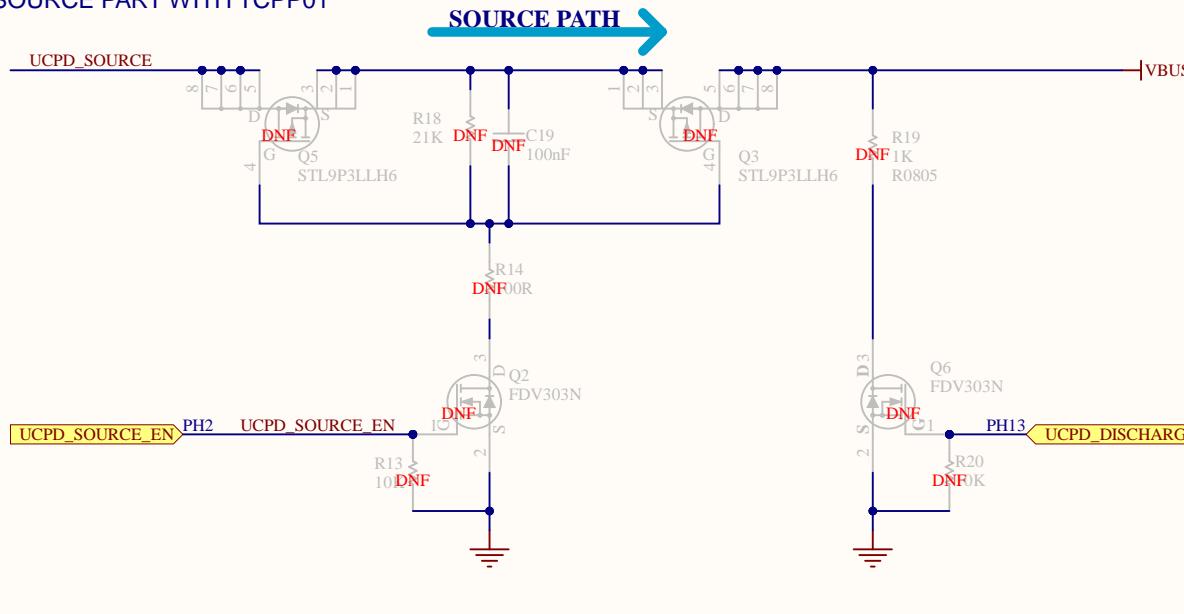
life.au

USB_TYPE_C

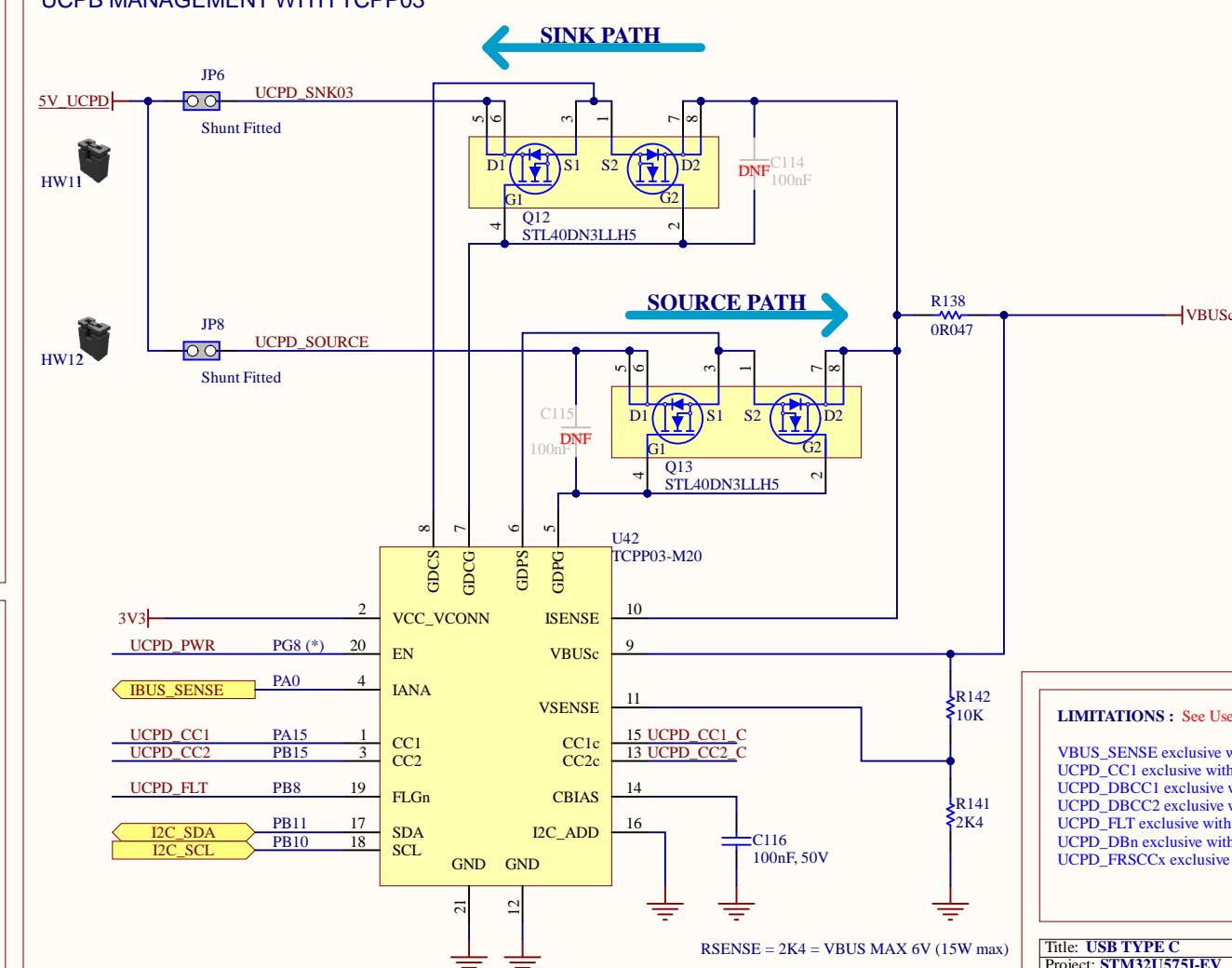
SINK PART WITH TCPP01



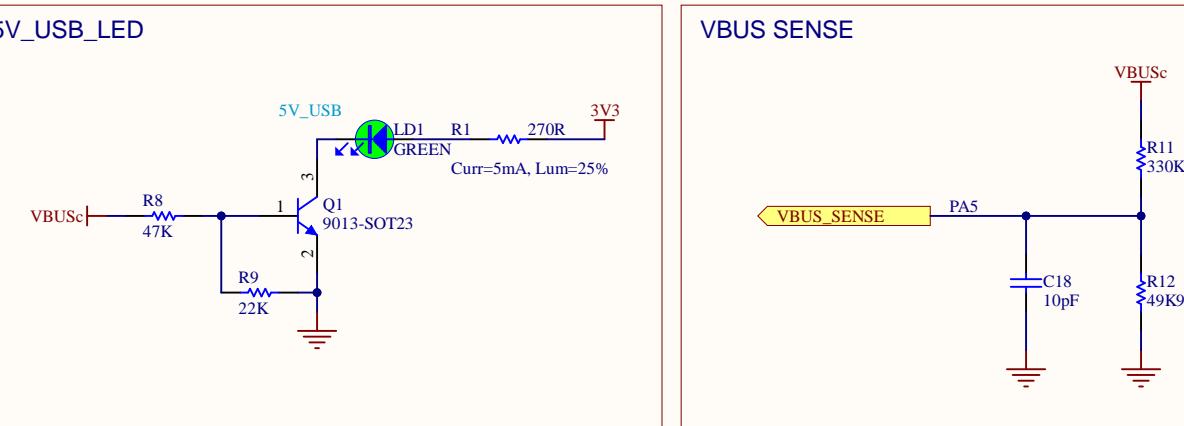
SOURCE PART WITH TCPP01



UCPB MANAGEMENT WITH TCPP03



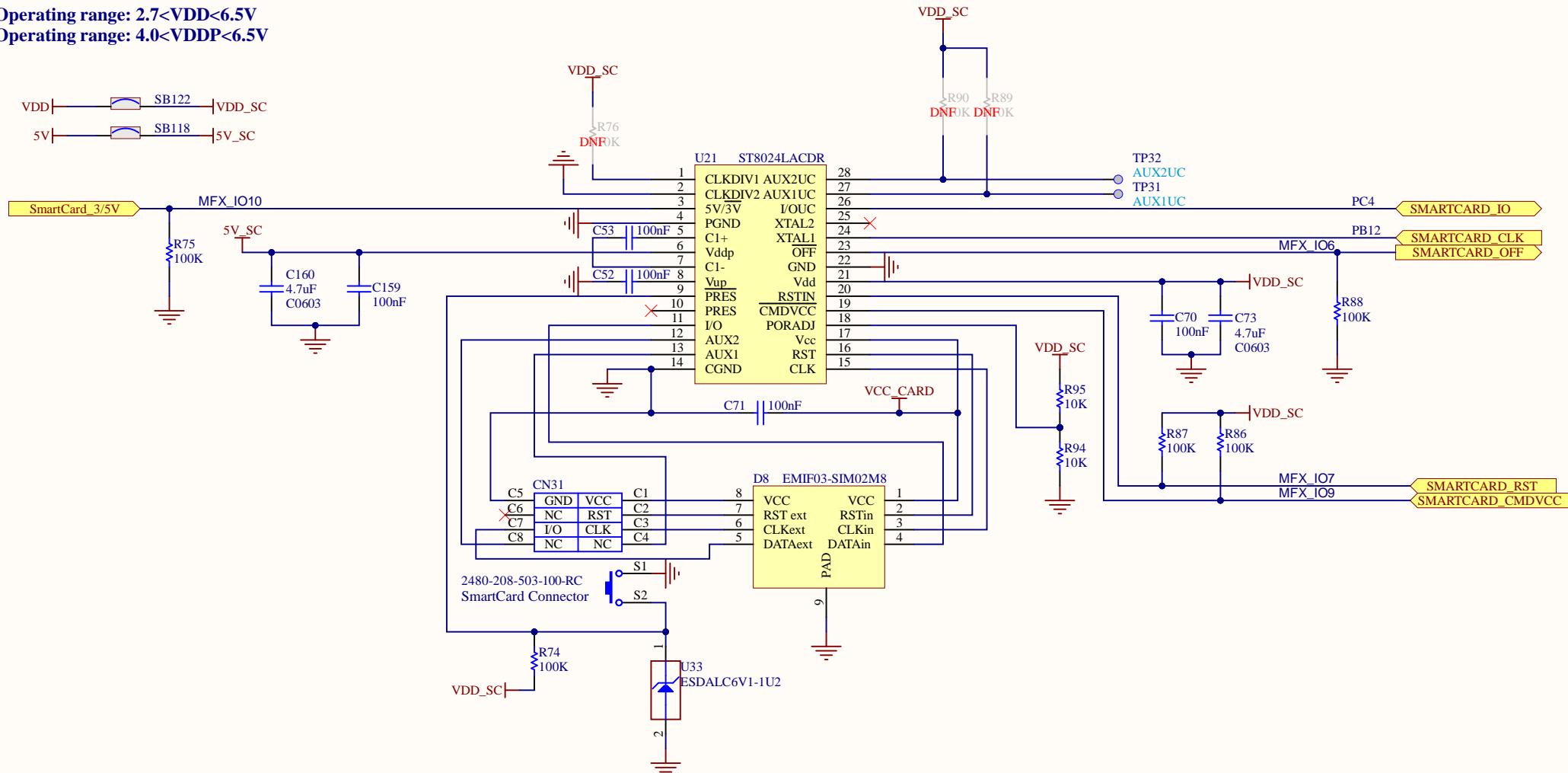
5V_USB_LED



SmartCard

Operating range: $2.7 < VDD < 6.5V$

Operating range: $4.0 < VDDP < 6.5V$



LIMITATIONS: See User Manual for more detail about muxing.

SMARTCARD_UART_RX exclusive with LCD_TE
SMARTCARD_CLK exclusive with MC

Title: SMARTCARD

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02

Size: A4

Date: 02 Sept 2021

Reference: MB1550



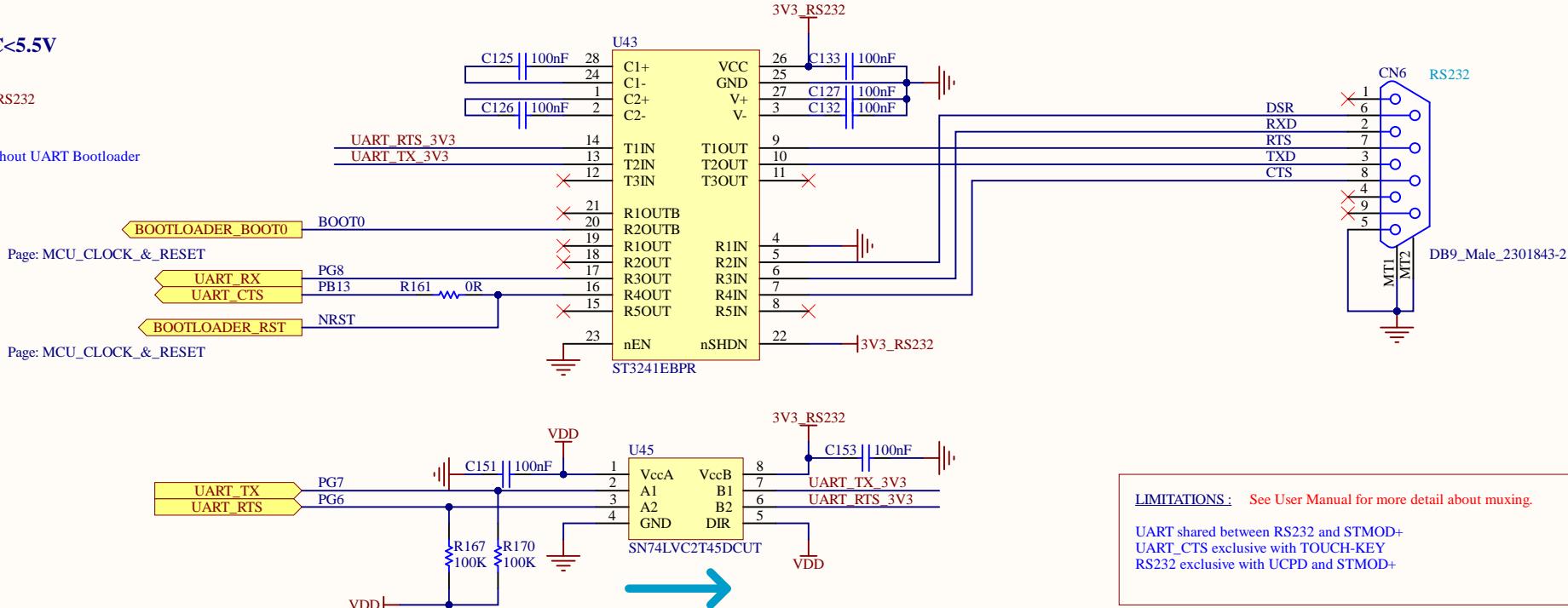
life.augmented

RS232 (USART1)

Operating range: 3V<VCC<5.5V

3V3 —> SB56 —> 3V3_RS232

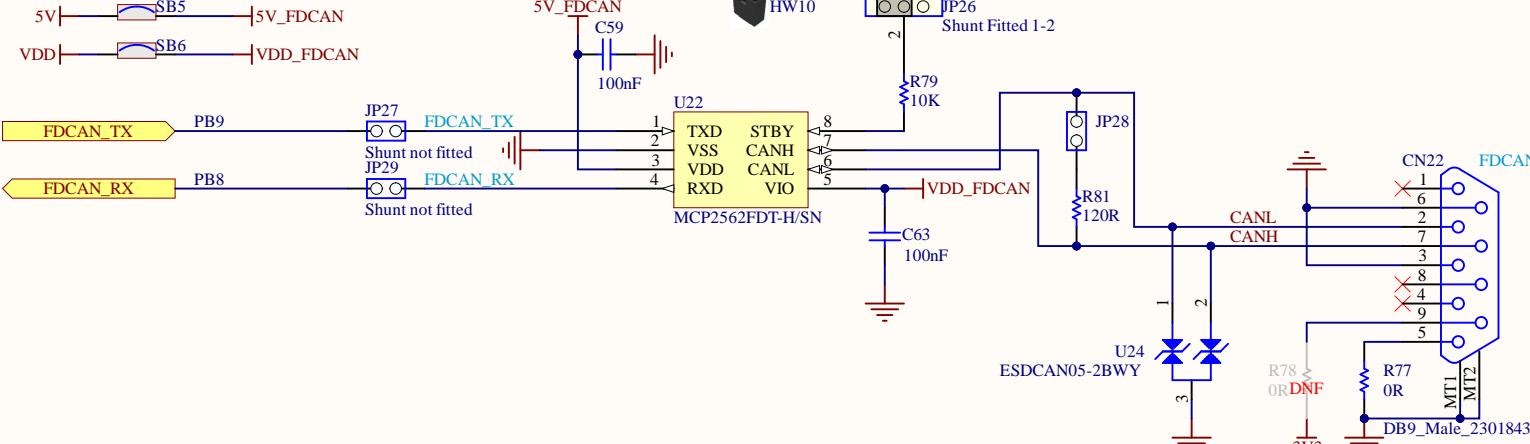
RS232 interface :
LPUART1 4wires RX/TX/RTS/CTS without UART Bootloader



CAN FD

Operating range: 4.5<VDD<5.5V

Operating range: 1.8<VIO<5.5V



Title: **FDCAN & RS232**

Project: **STM32U575I-EV**

Variant: **U575AIQ**

Revision: **C-02**

Size: **A4**

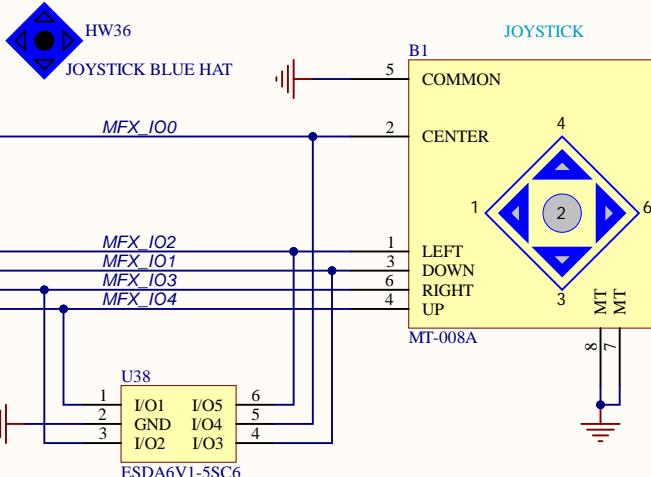
Date: **02 Sept 2021**

Reference: **MB1550**

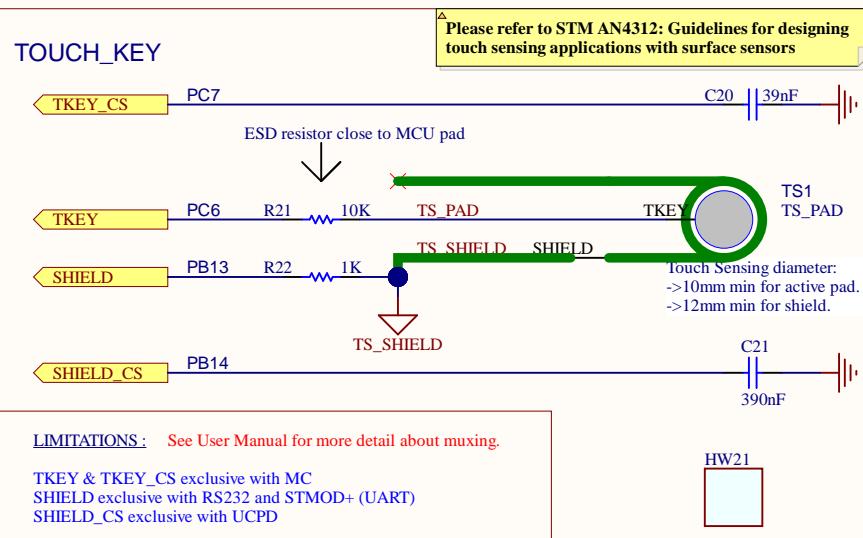


life.augmented

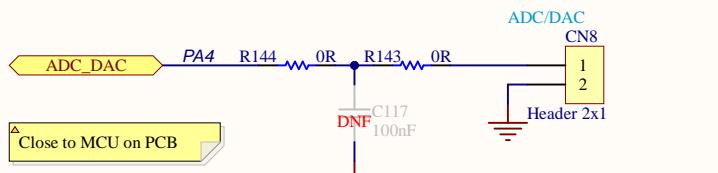
JOYSTICK



TOUCH_KEY

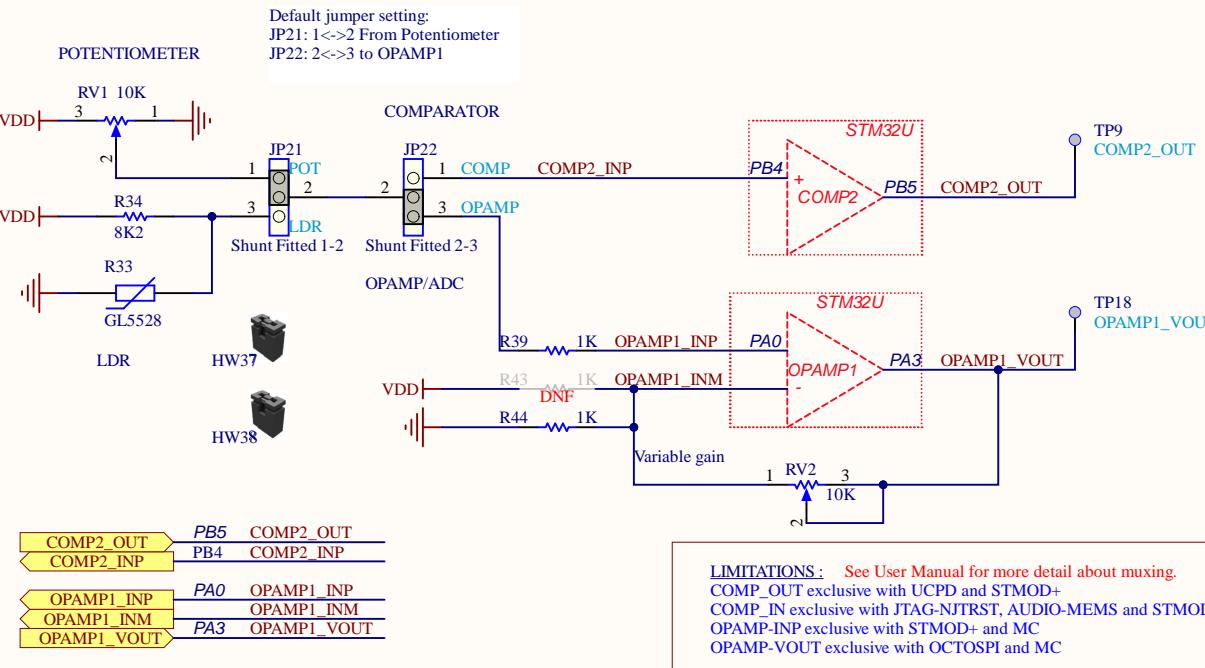


ADC / DAC CONNECTOR

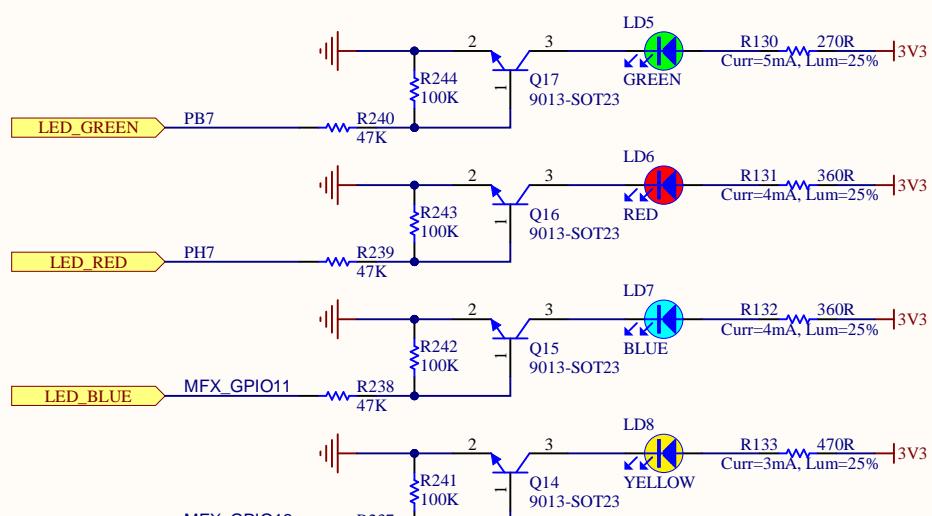


LIMITATIONS : See User Manual for more detail about muxing.
ADC-DAC exclusive with UCPD, STMOD+, MC

LDR / POTENTIOMETER



LEDs



Title: PERIPHERAL

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02

Reference: MB1550

Size: A4

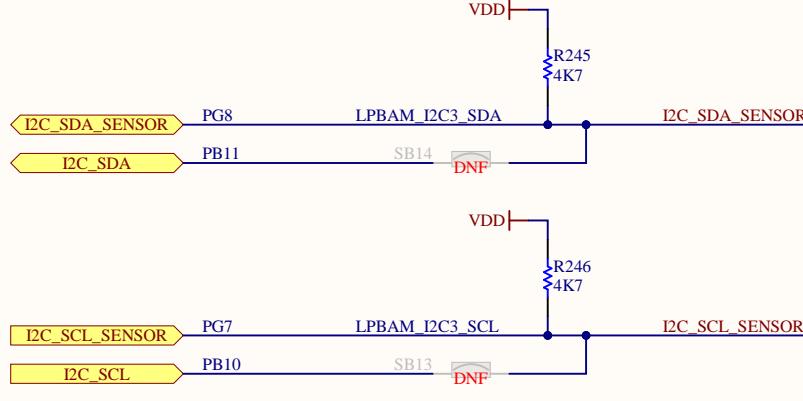
Date: 02 Sept 2021

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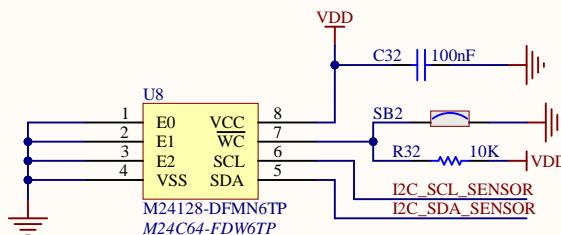
life.augmented

I2C SELECTION



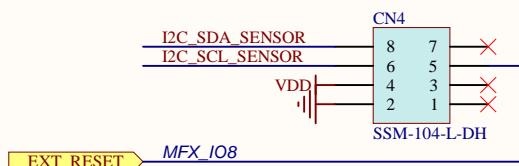
I2C EEPROM

Operating range: 1.7V < VCC < 5.5V



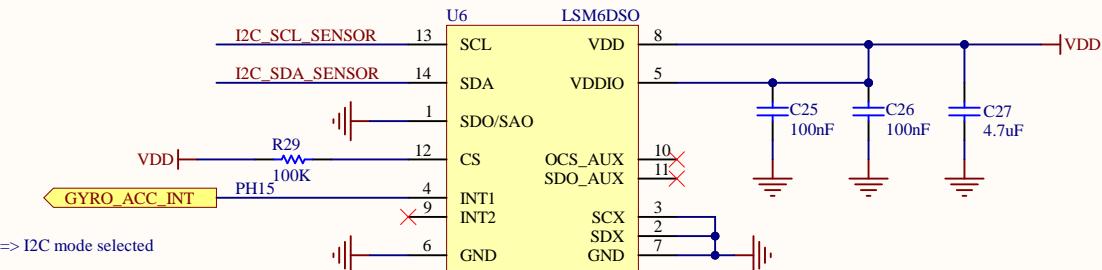
Default I2C Address: 0xA0: 0b:1010.000x

EXT_I2C



3D ACCELEROMETER and 3G GYROSCOPE SENSOR

Operating range: 1.71V < VCC < 3.6V



Default I2C Address: Read 0xD5 / Write 0xD4

LIMITATIONS : See User Manual for more detail about muxing.

NO LIMITATION

Title: SENSOR & I2C PERIPHERALS

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02 Reference: MB1550

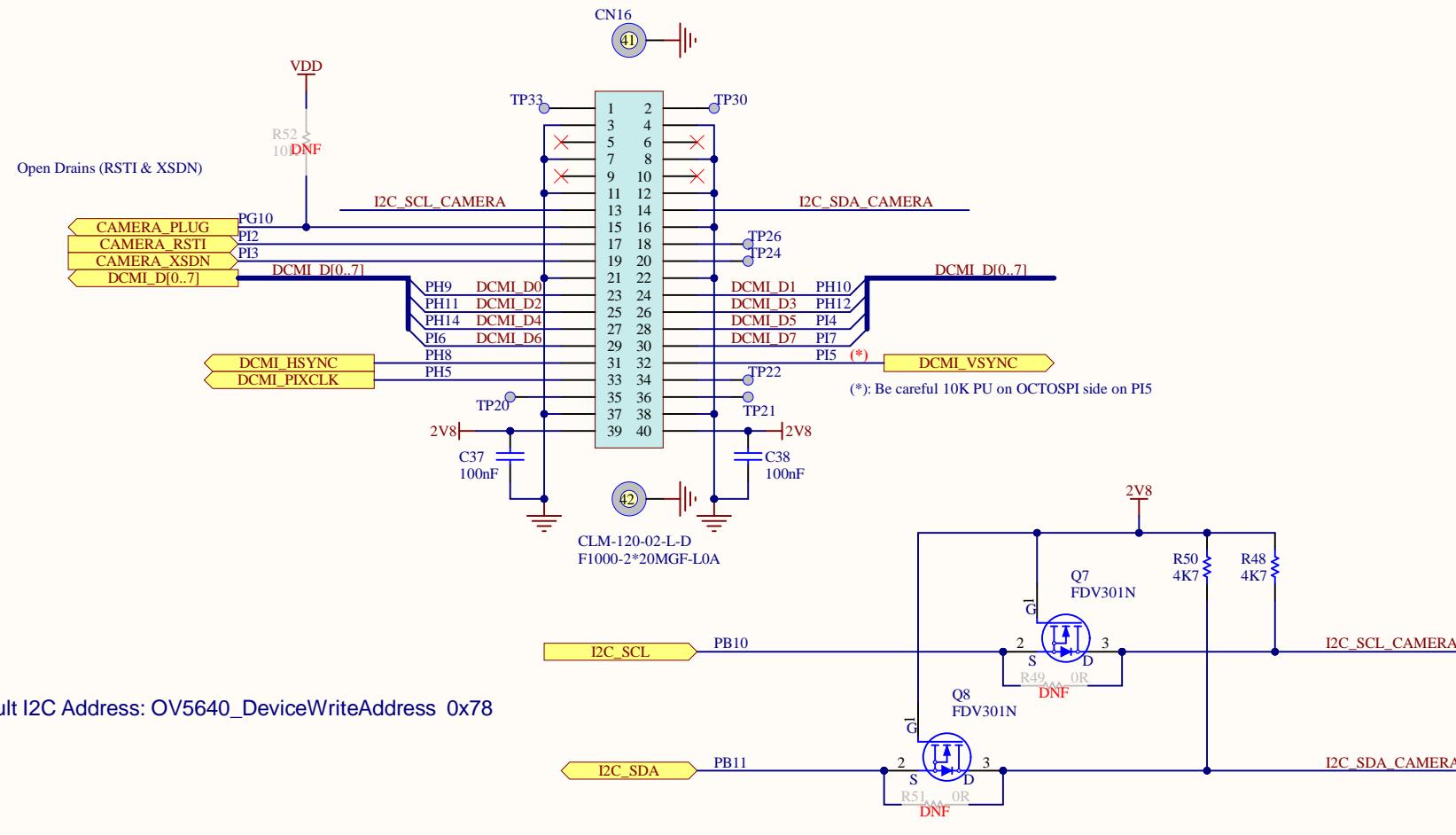
Size: A4 Date: 02 Sept 2021



life.augmented

CAMERA MODULE CONNECTOR

Operating range: 2.8<VDD<3.6V



Default I2C Address: OV5640_DeviceWriteAddress 0x78

I2C level Shifter for MCU @3V3 to Camera @2V8

LIMITATIONS : See User Manual for more detail about muxing.

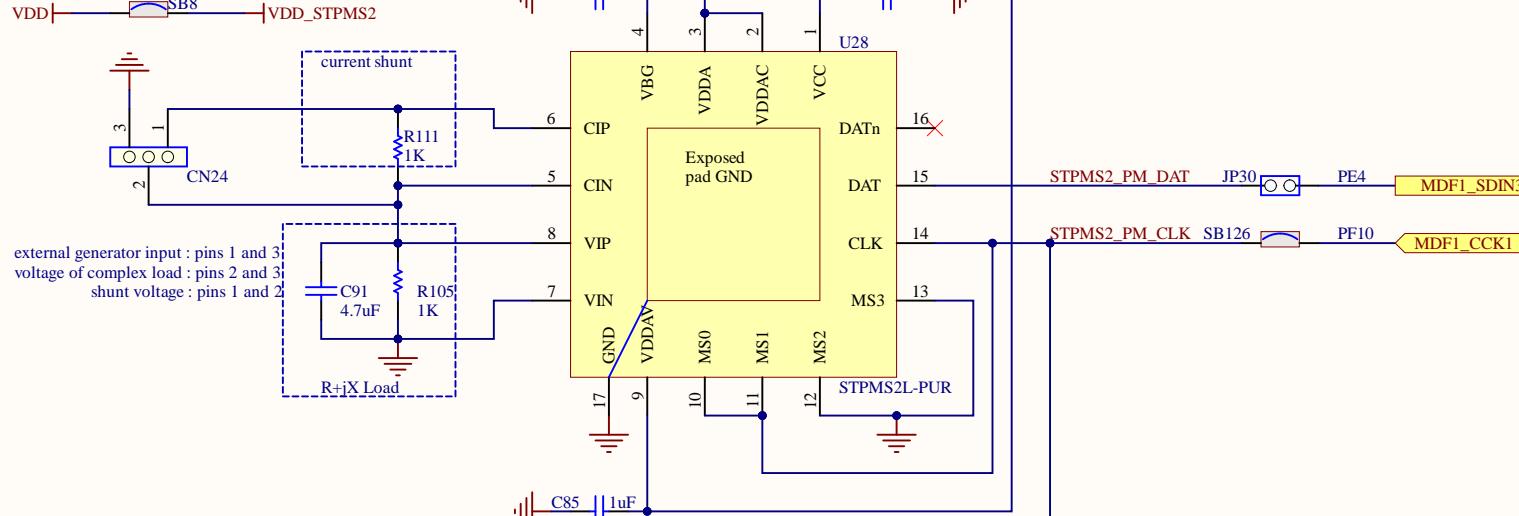
CAMERA interface exclusive with OCTOSPI SRAM

△ OCTOSPI bus should be routed in 50 ohm +/- 15%

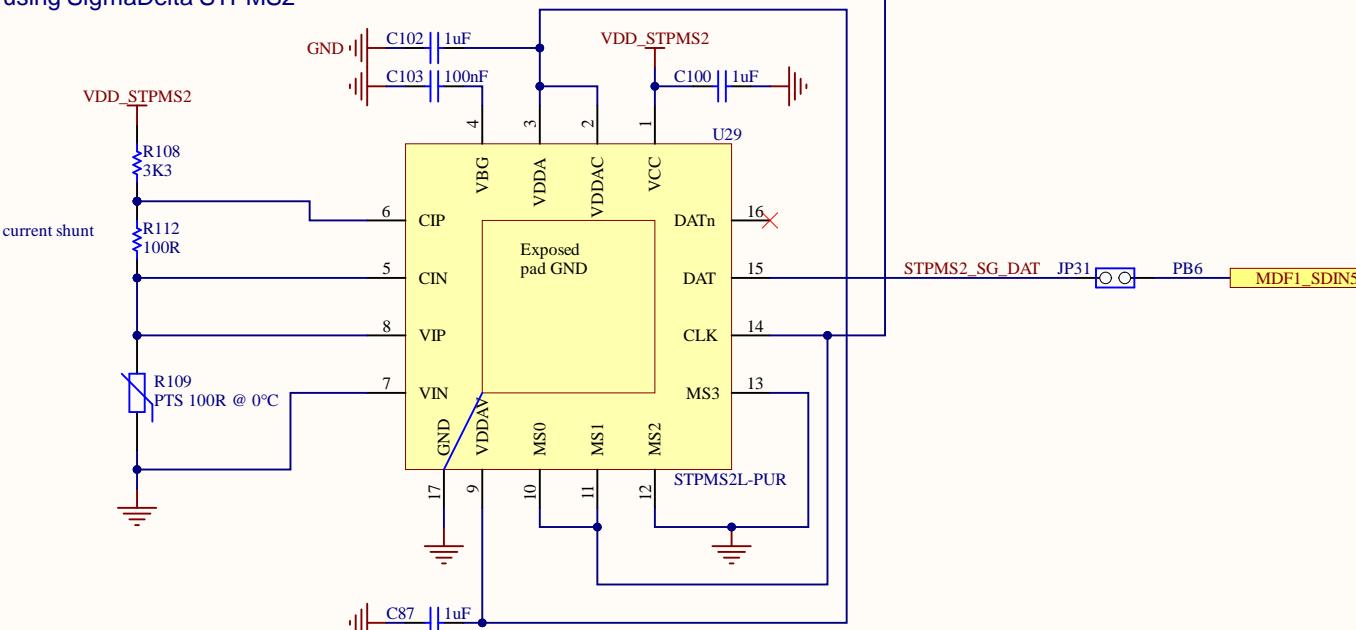
Title: CAMERA	Project: STM32U575I-EV	ST life.augmented
Variant: U575AIQ		
Revision: C-02	Reference: MB1550	
Size: A4	Date: 02 Sept 2021	
Sheet: 17 of 24		

STPM2 power metering

Operating range: 3.2<VDD<5.2V



Measurement using SigmaDelta STPM2

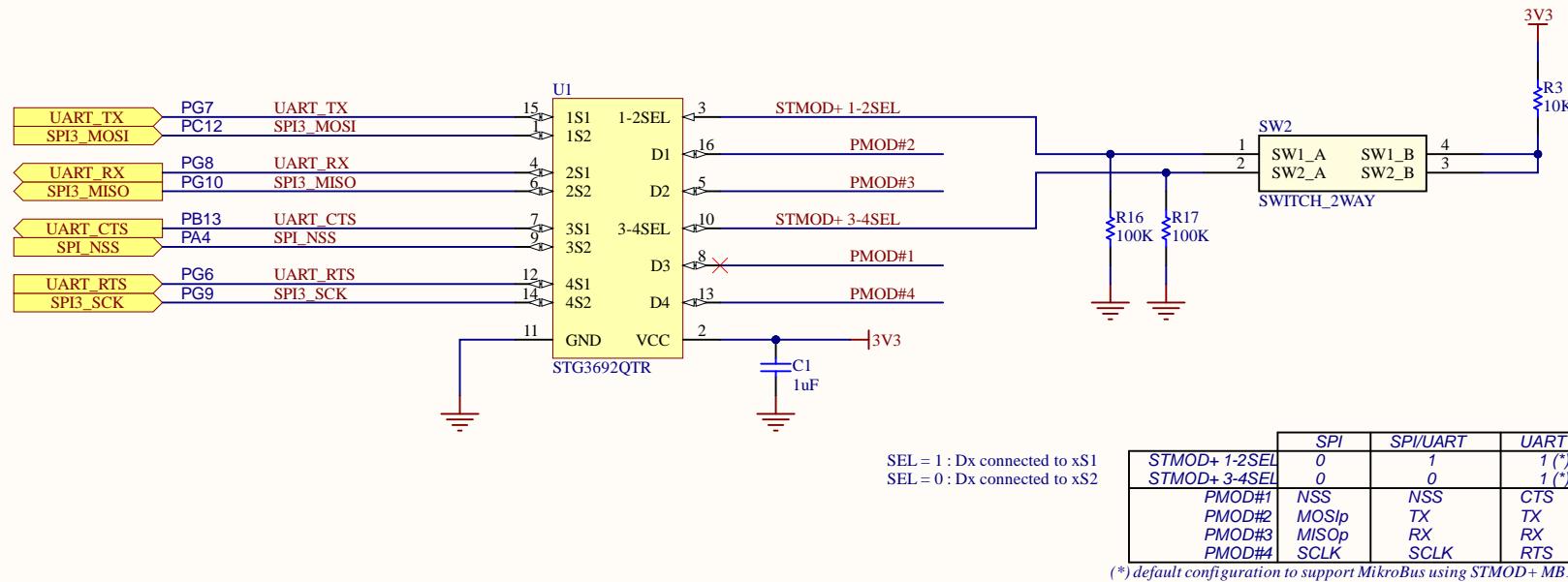


LIMITATIONS : See User Manual for more detail about muxing.

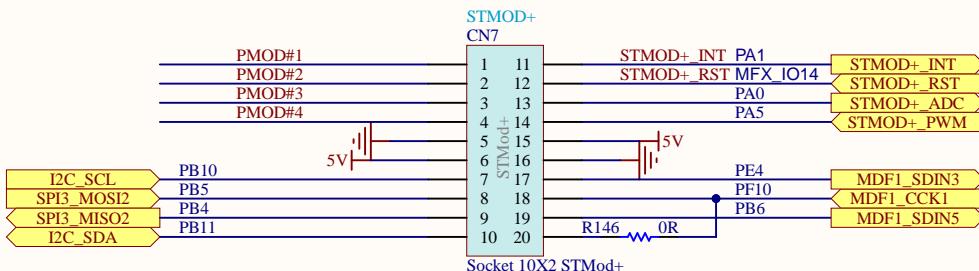
MDF1_SDIN3 shared between EXT-MEMS, STPM2, STMOD+
MDF1_CCK1 shared between EXT-MEMS, STPM2, STMOD+
MDF1_CCK1 exclusive with MC
MDF1_SDIN5 shared between EXT-MEMS, STPM2, STMOD+

Title: STPM2	
Project: STM32U575I-EV	
Variant: U575AIQ	
Revision: C-02	Reference: MB1550
Size: A4	Date: 02 Sept 2021
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PMOD / STMOD+ SWITCH



STMOD+



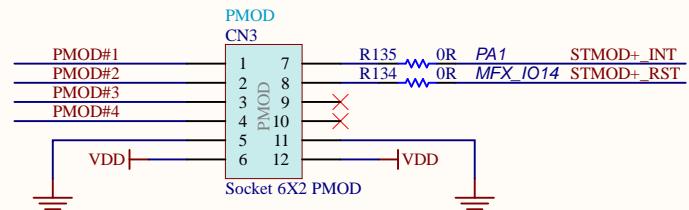
LIMITATIONS : See User Manual for more detail about muxing.

SPI exclusive with VBUS_SENSE, ADC/DAC, TRACE, SDMMC and MC
UART exclusive with TOUCH-KEY, RS232 interface and UCPD

SPI3-MOSI2 exclusive with COMP2 and UCPD
SPI3-MISO2 exclusive with int-MEMS, JTAG and COMP

INT shared between STMOD+ and PMOD
INT exclusive with TAMPER and MC
RST shared between STMOD+ and PMOD
STMOD+_ADC exclusive with OPAMP and MC
STMOD+_PWM exclusive with VBUS_SENSE
MDF1_CCK1 shared between EXT-MEMS, STPMS2, STMOD+
MDF1_CCK1 exclusive with MC
MDF1_SDIN3 shared between EXT-MEMS, STPMS2, STMOD+
MDF1_SDIN5 shared between EXT-MEMS, STPMS2, STMOD+
MDF1_SDIN5 exclusive with MC

PMOD



LIMITATIONS : See User Manual for more detail about muxing.

RST shared between STMOD+ and PMOD
INT shared between STMOD+ and PMOD
PMOD/STMOD+ INT exclusive with TAMPER and MC
SPI exclusive with VBUS_SENSE, ADC/DAC, TRACE, SDMMC and MC
PMOD/STMOD+ UART exclusive with TOUCH-KEY, RS232 interface and UCPD

Title: PMOD & STMOD+

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02

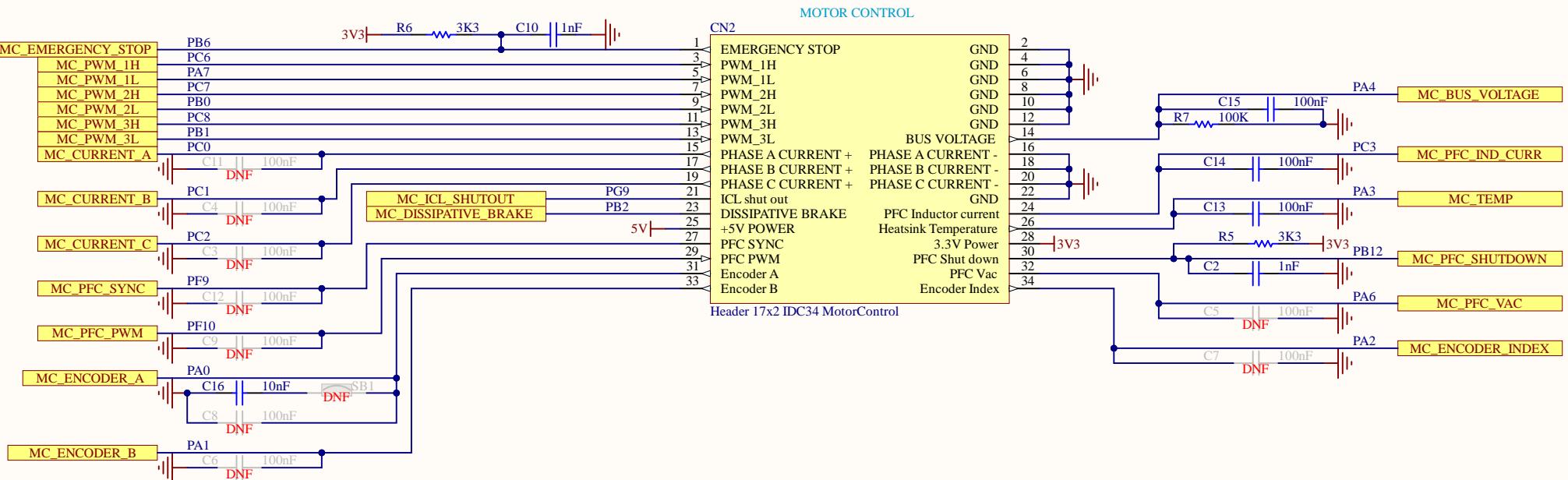
Reference: MB1550

Size: A4 Date: 02 Sept 2021



life.augmented

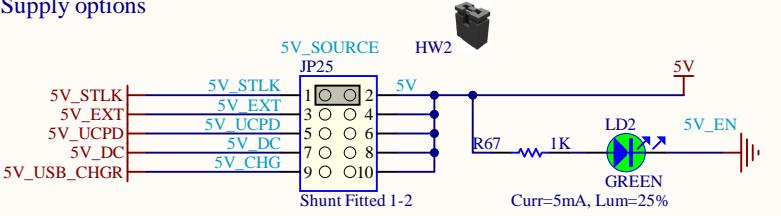
MOTOR CONTROL



LIMITATIONS : See User Manual for more detail about muxing.

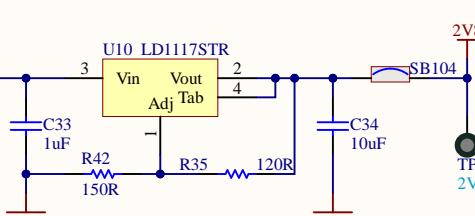
MotorControl exclusive with many functions.
See UM for MC IO configuration

5V Power Supply options

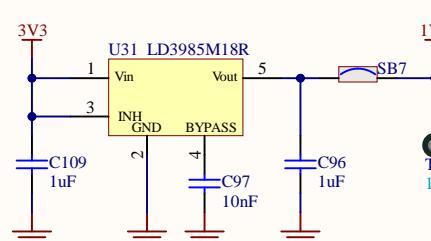


MAX CURRENT 500mA WHEN USING POWER INPUT 5V_STLK

2V8_LDO: CAMERA

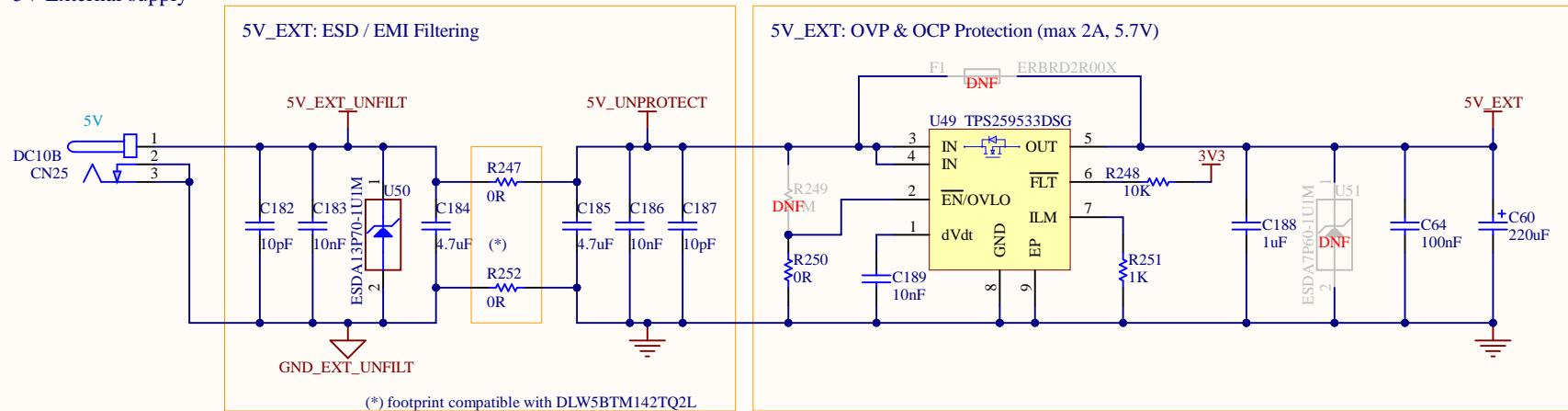


1V8_LDO: AUDIO_CODEC

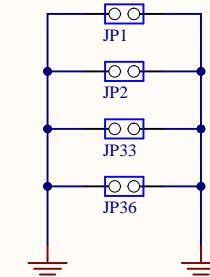


IV8 / 150mA

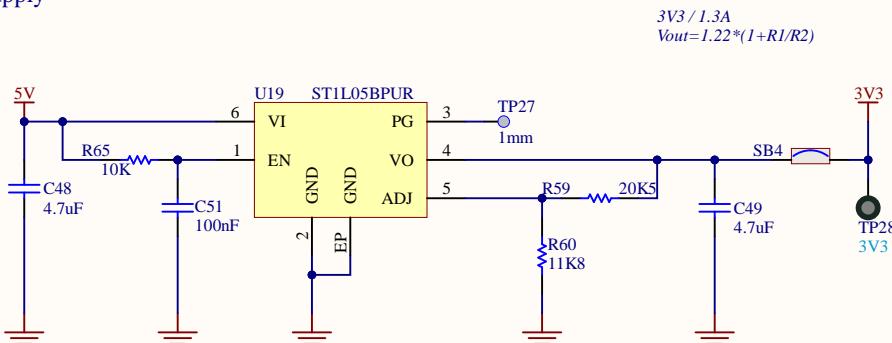
5V External supply



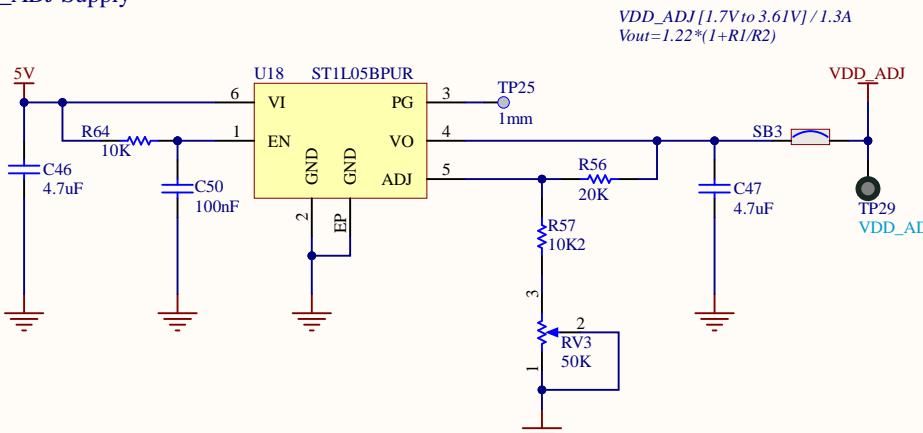
GND TEST POINT



3V3 Supply



VDD_ADJ Supply



VDD_ADJ [1.7V to 3.61V] / 1.3A
Vout=1.22*(I+R1/R2)

Title: BOARD PWR

Project: STM32U575I-EV

Variant: U575AIQ

Revision: C-02

Reference: MB1550

Size: A4

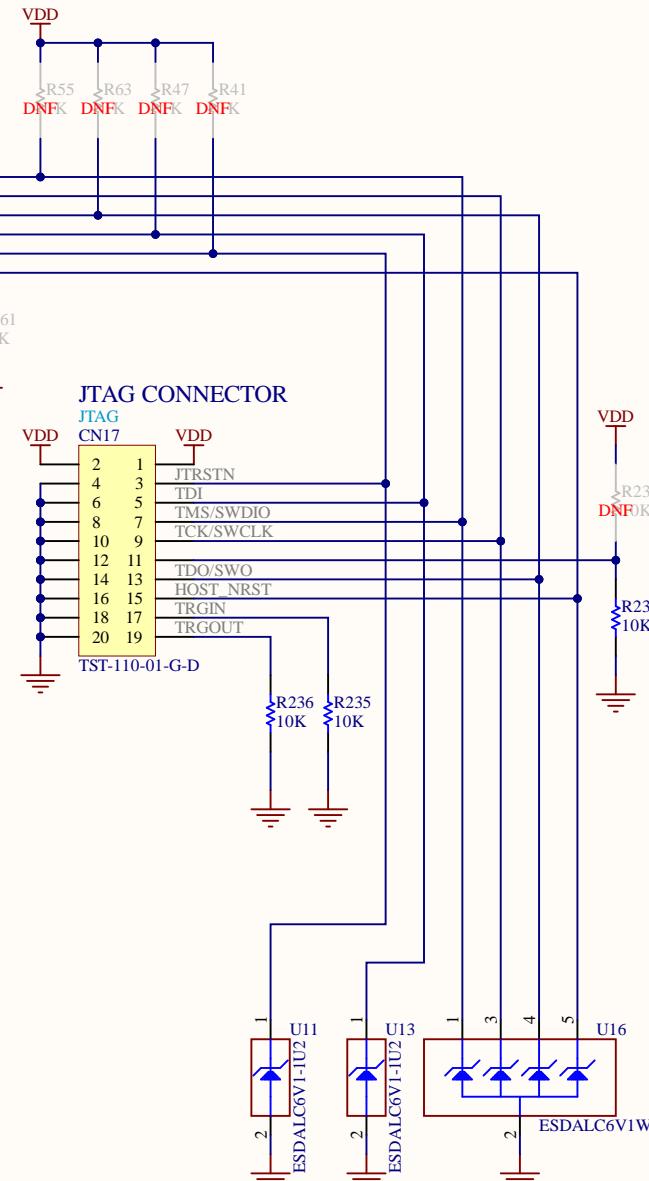
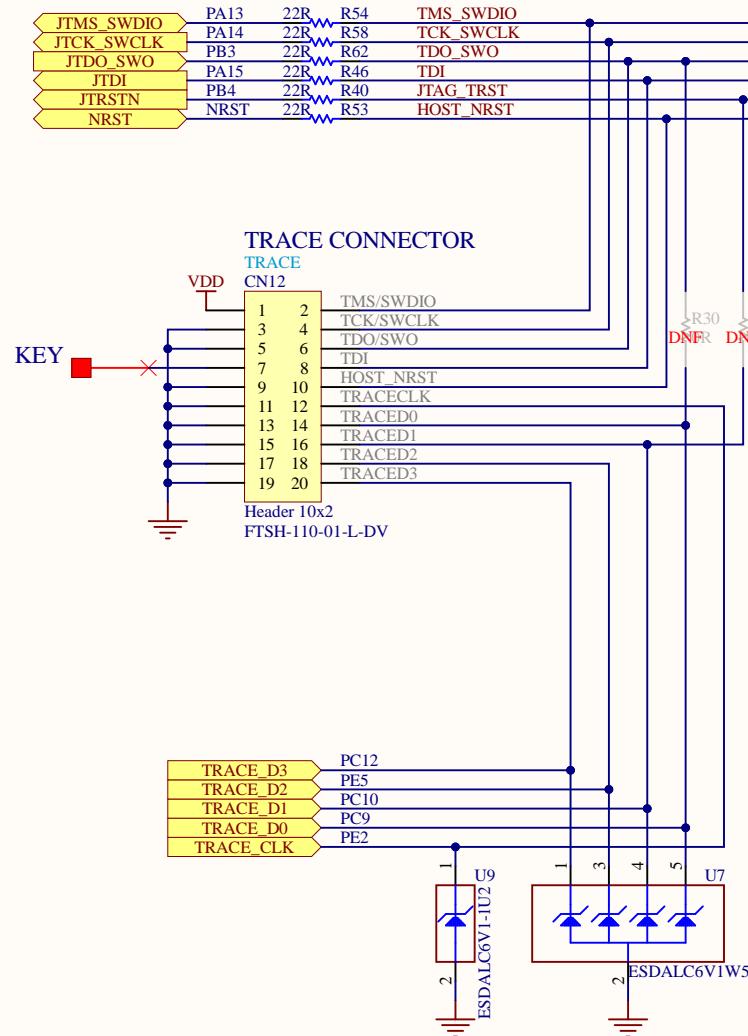
Date: 02 Sept 2021

Sheet: 21 of 24



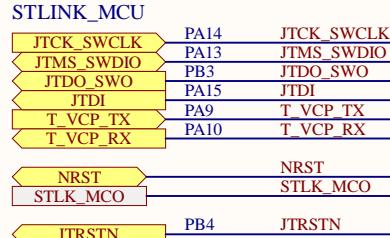
JTAG & TRACE

To disconnect JTAG connectors from target :
 - Remove 22R resistors



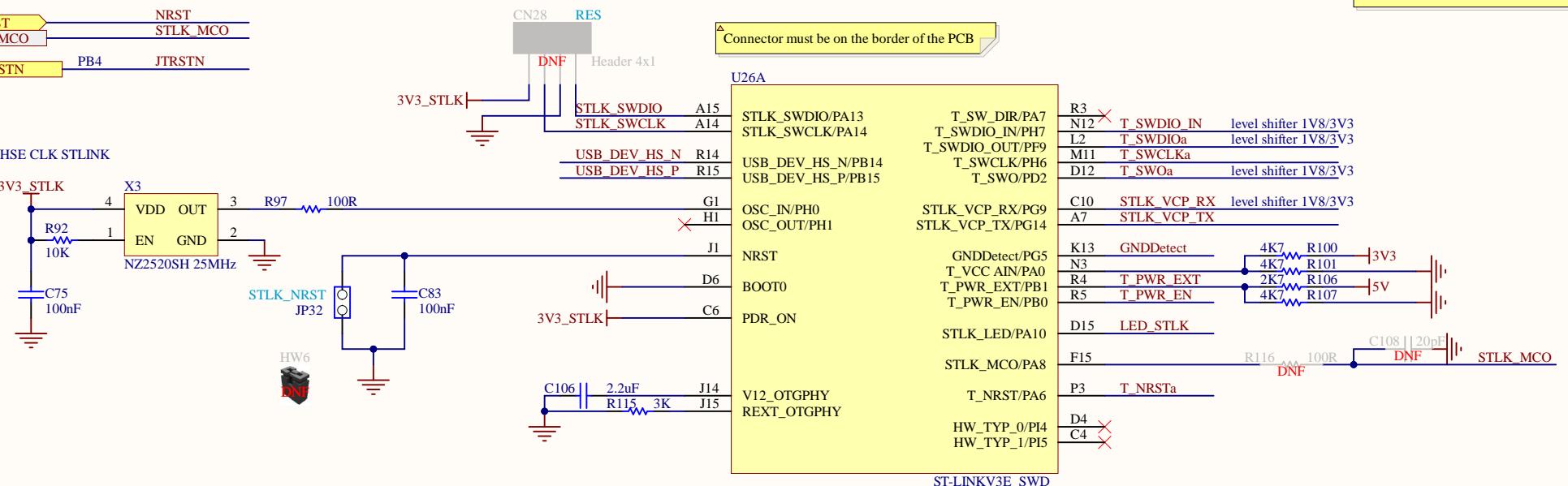
LIMITATIONS : See User Manual for more detail about muxing.

TRACE_D0/D1/D3 exclusive with SDIO_CK/D1/D2
 TRACE_D3 exclusive with STMOD+SPI
 JTAG_TDI exclusive with UCPD_CCI
 JTAG_JTDO exclusive with ADF1_CCK0
 JTAG_NJTRST exclusive with ADF1_SDIN0, COMP2 and STMOD+ SPI



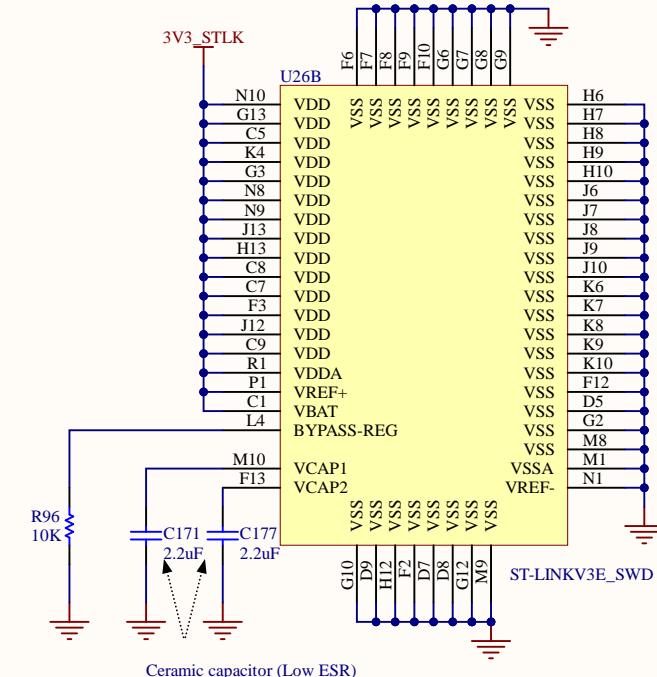
LIMITATION :

Some JTAG signals are multiplexed with UCPD: JTDI
In case JTDO is plugged, USB TYPE C connector should be disconnected.
User need to check that multiplexed signals are not used on both features simultaneously.

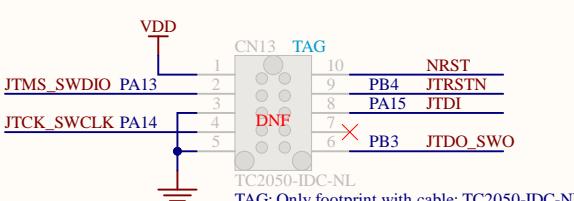


The routing of the tracks must be done on continuity from ST-LINK to 22ohm resistors and from resistors to Target MCU to avoid stub noises and EMC approach. (22ohm resistors must be very close to STDC14)

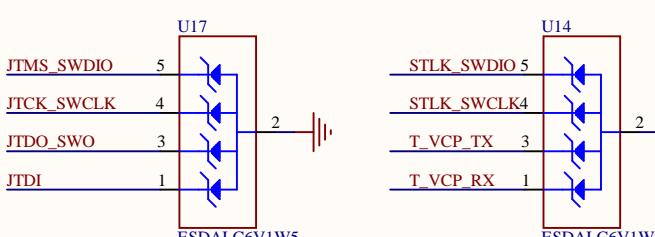
ST-LINK POWER



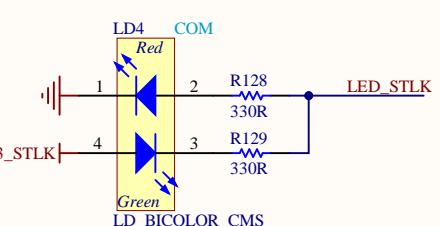
TAG CONNECTOR



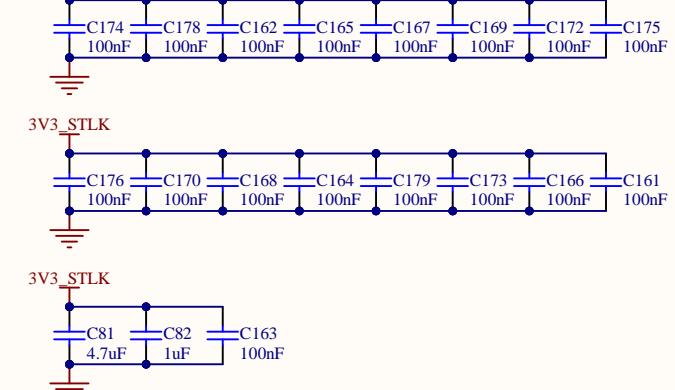
ESD PROTECTIONS



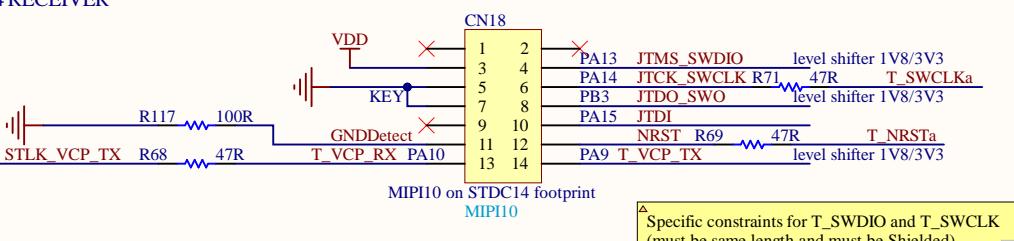
LED STLK



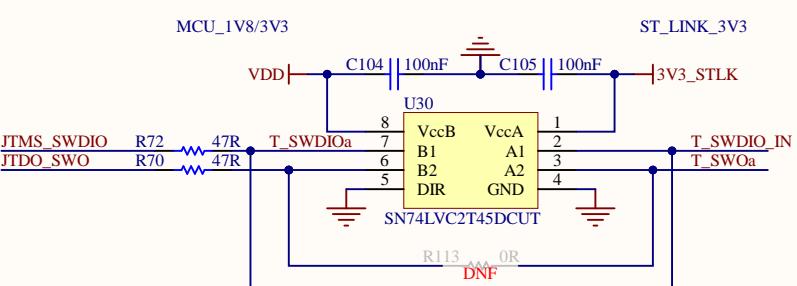
3V3_STLK



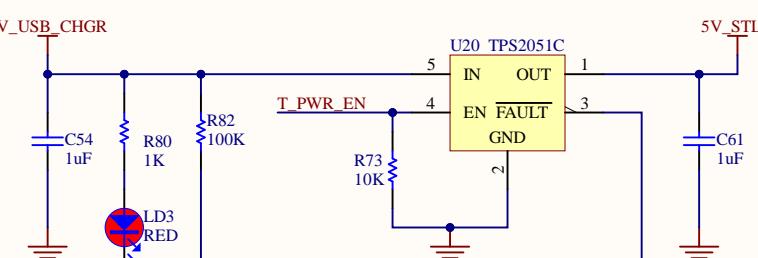
STDC14 RECEIVER



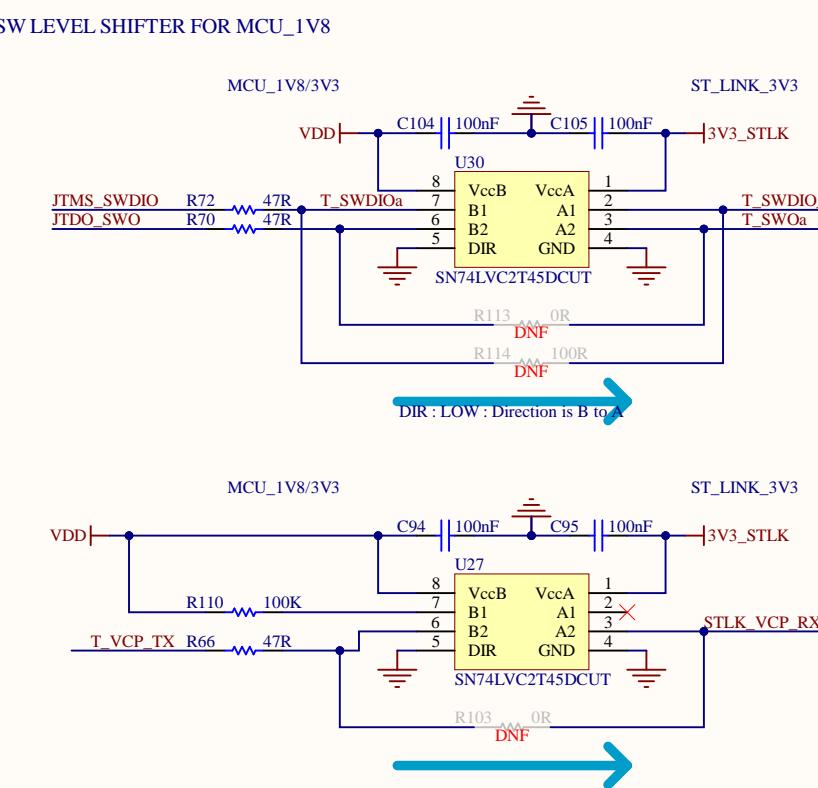
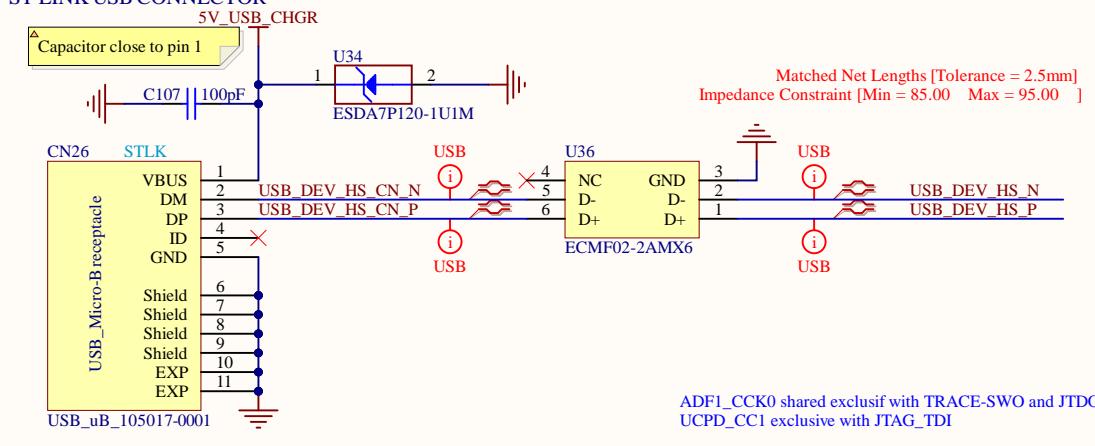
SW LEVEL SHIFTER FOR MCU_1V8



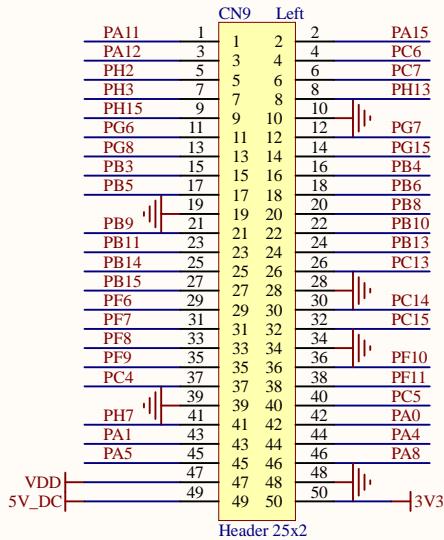
5V ST-LINK PROTECTION



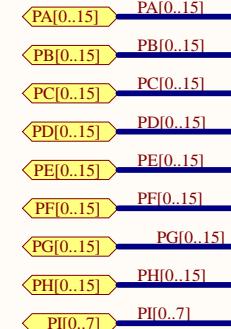
ST-LINK USB CONNECTOR



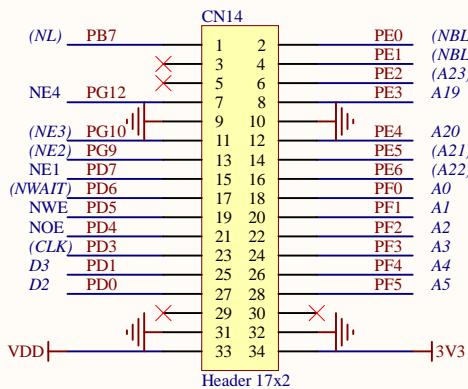
Placed close to MCU



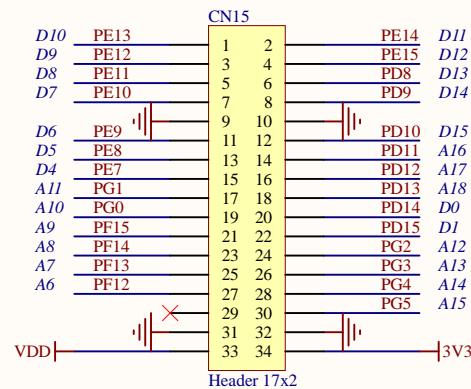
Placed close to MCU

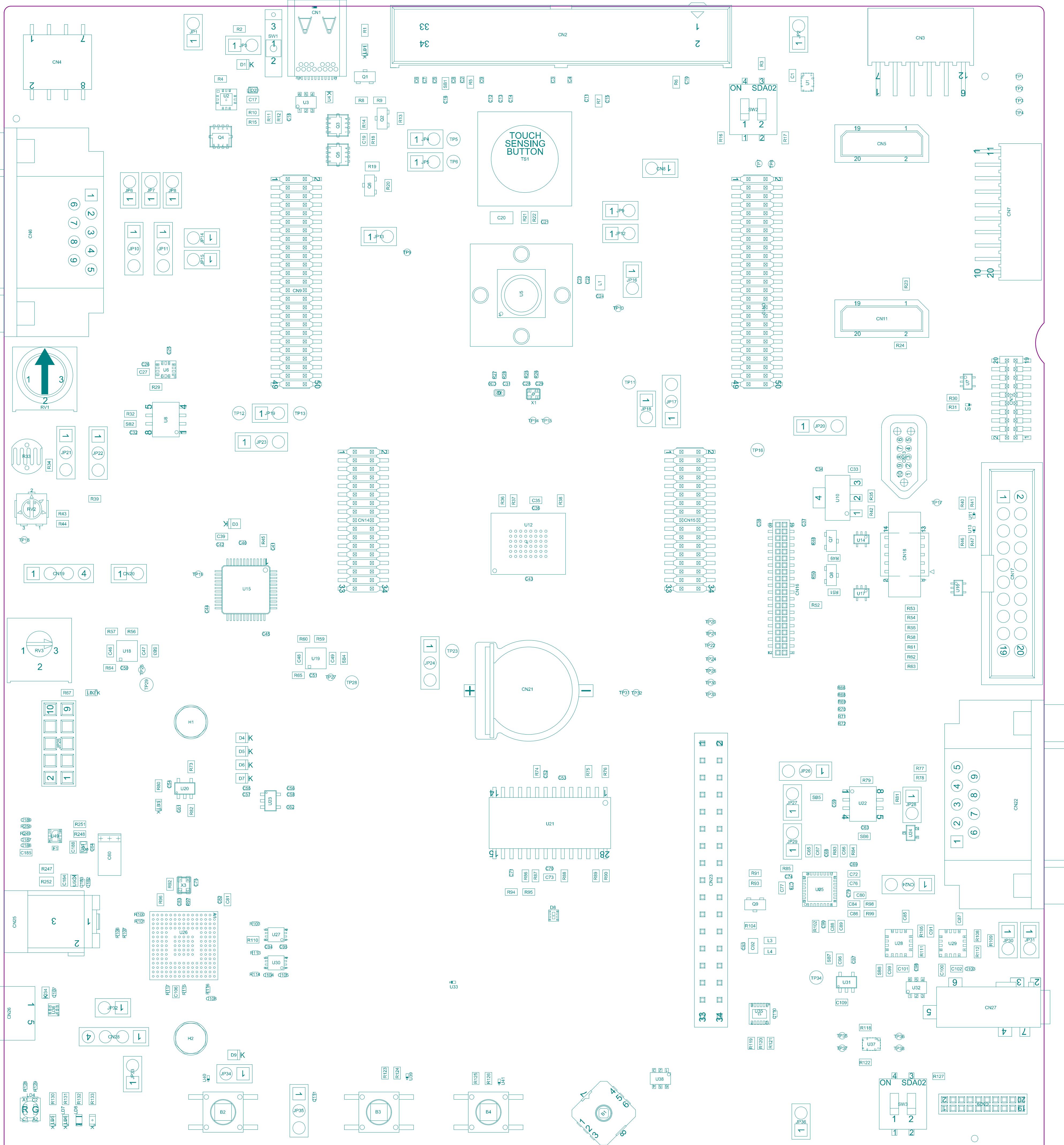


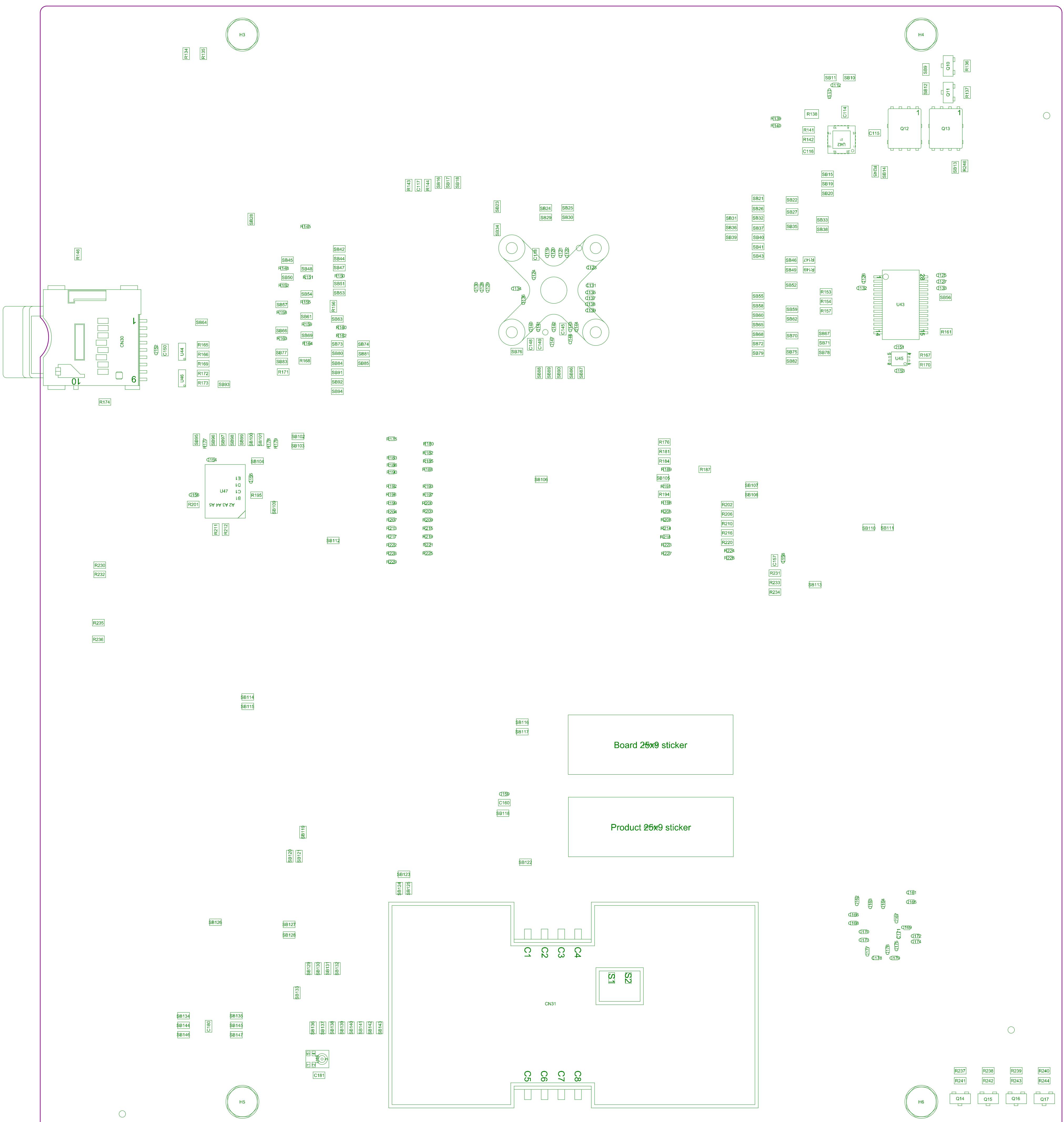
Placed close to memory



Placed close to memory







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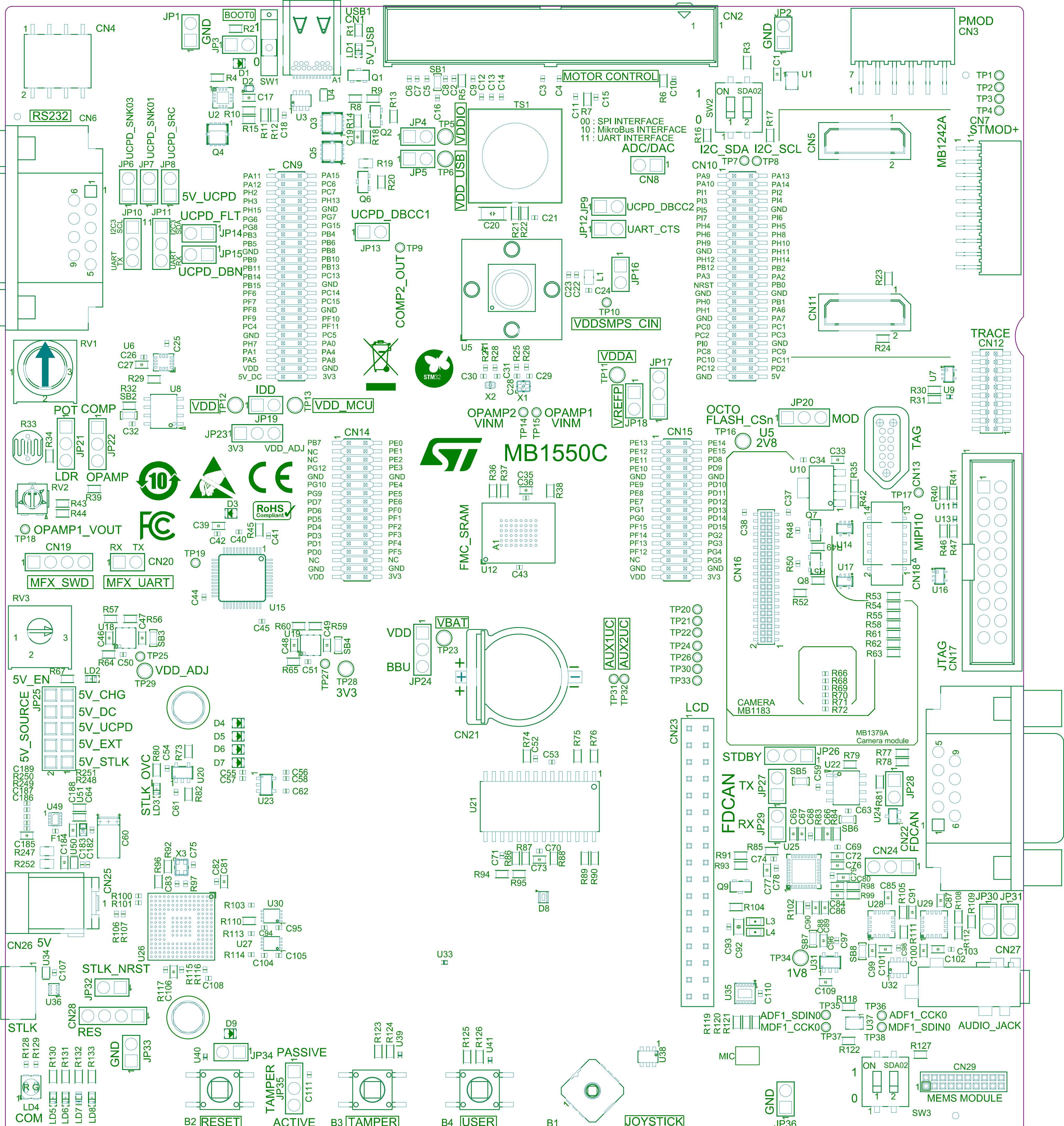
Project: STM320575I-EV

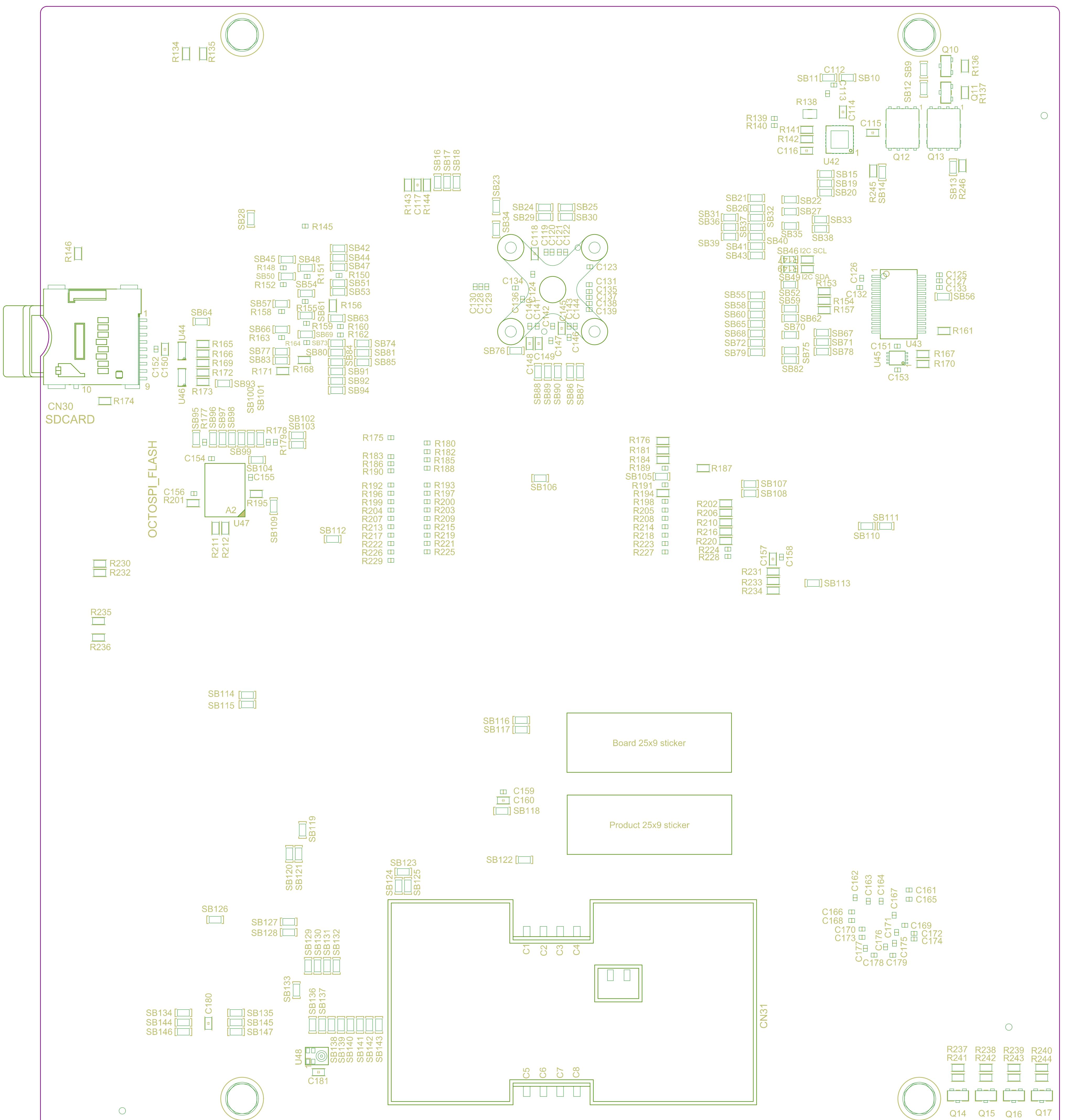
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Layer: M15-Bottom A

Gerber:







M15-Bottom Overlay Assembly

.GB15