NUCLEO-U3C5ZIQ

MB2222 -U3C5ZIQ

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Sheet 12: External Debug Interface

U_Top
Top.SchDoc

HW2
STICKER PRODUCT
N/A

HW1
PCB
MB2222

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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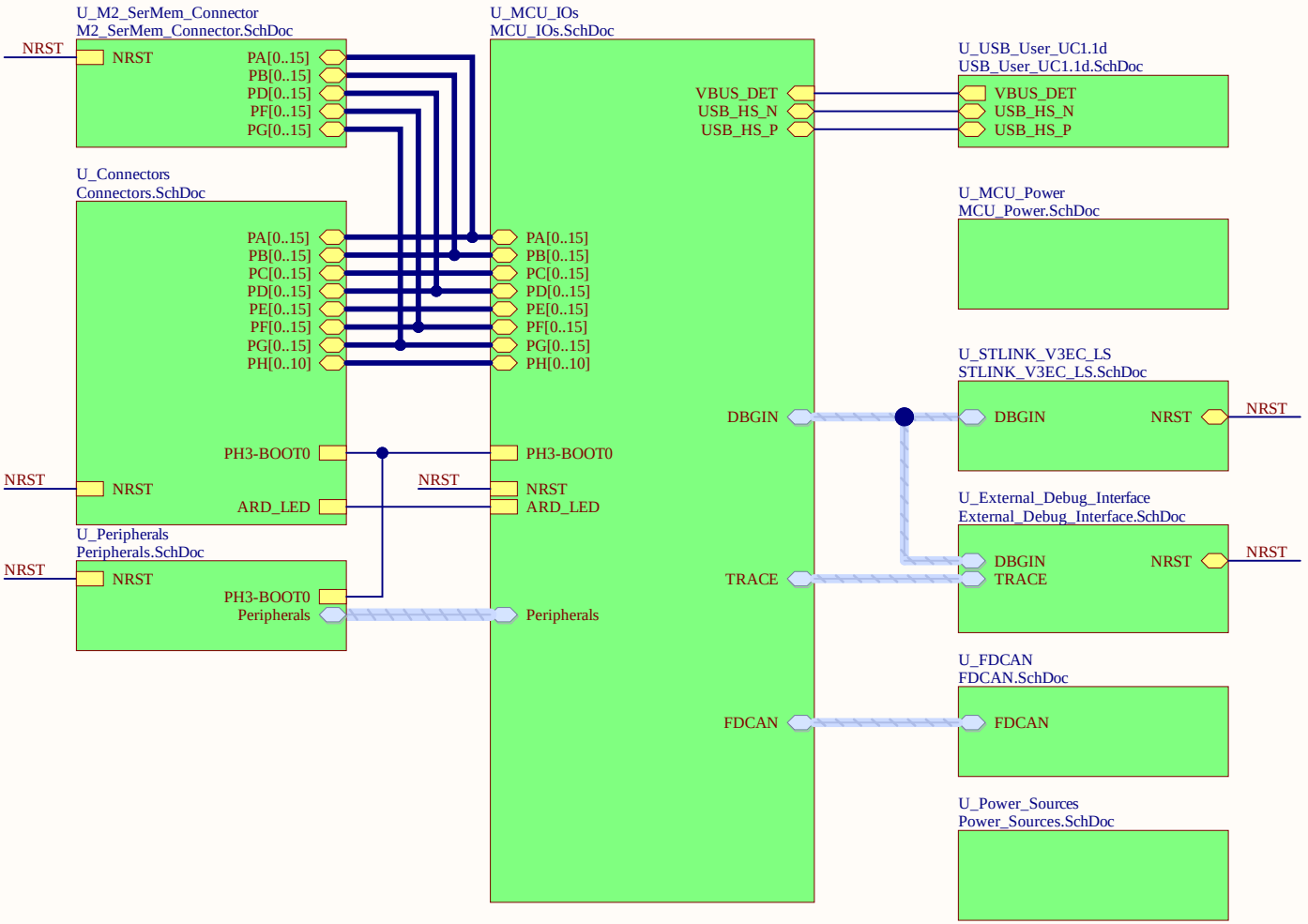
Title: **Project Overview**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
Revision: B-03		Reference: MB2222
Size: A4	Date: 9-Sep-2025	Sheet: 1 of 12



FID HW9
FID HW10
FID HW11
FID HW12

Title: **Top**		
Project: **NUCLEO-U3C5ZIQ**		
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MCU IOs

HARNESS

DBGIN
- MCO — DBGIN.MCO
- SWDIO — DBGIN.SWDIO — PA13
- SWO — DBGIN.SWO — PB3
- SWCLK — DBGIN.SWCLK — PA14
- JTDI — DBGIN.JTDI — PA15
- VCP_TX — DBGIN.VCP_TX — PA9
- VCP_RX — DBGIN.VCP_RX — PA10

TRACE
- CLK — PE2
- D0 — PE3
- D1 — PE4
- D2 — PE5
- D3 — PE6

Peripherals
- LED1 — SB61 — ARD_LED
- SB60 — DNF — PE12
- LED2 — PE14
- LED3 — PF8
- USER — PC13

FDCAN
- TX — FDCAN.TX — PB9
- RX — FDCAN.RX — PB8
- STBY — FDCAN.STBY — PD7

PA[0..15] — PA[0..15]
PB[0..15] — PB[0..15]
PC[0..15] — PC[0..15]
PD[0..15] — PD[0..15]
PE[0..15] — PE[0..15]
PF[0..15] — PF[0..15]
PG[0..15] — PG[0..15]
PH[0..10] — PH[0..10]
VBUS_DET — PF12
USB_HS_P — USB_HS_P
USB_HS_N — USB_HS_N
NRST — NRST

U1A

MCU_IOs (A,B,C)

PA0	33	PA0	PC0	26	PC0
PA1	34	PA1	PC1	27	PC1
PA2	35	PA2	PC2	28	PC2
PA3	36	PA3	PC3	29	PC3
PA4	39	PA4			
PA5	40	PA5			
PA6	41	PA6	PC6	96	PC6
PA7	42	PA7	PC7	97	PC7
PA8	100	PA8	PC8	98	PC8
PA9 — SB30 — DBGIN.VCP_TX	101	PA9	PC9	99	PC9
PA10 — SB26 — DBGIN.VCP_RX	102	PA10	PC10	111	PC10
PA11 — SB25 — USB_HS_N	103	PA11	PC11	112	PC11
PA12 — SB23 — USB_HS_P	104	PA12	PC12	113	PC12
PA13 — SB24 — DBGIN.SWDIO	105	PA13 (JTMS/SWDIO)	PC13	7	PC13
PA14 — SB15 — DBGIN.SWCLK	109	PA14 (JTCK/SWCLK)			
PA15 — SB14 — DBGIN.JTDI	110	PA15 (JTDI)			
PB0	43	PB0	PC14-OSC32_IN (PC14)	8	OSC32_IN
PB1	44	PB1	PC15-OSC32_OUT (PC15)	9	OSC32_OUT
PB2	45	PB2			
PB3 — SB17 — DBGIN.SWO	132	PB3 (JTDO/TRACESWO)			
PB4	133	PB4 (NJTRST)			
PB5	134	PB5	PH0-OSC_IN (PH0)	23	OSC_IN
PB6	135	PB6	PH1-OSC_OUT (PH1)	24	OSC_OUT
PB7	136	PB7			
PB8 — SB27 — FDCAN.RX	138	PB8	NRST (NRST)	25	NRST
PB9 — SB28 — FDCAN.TX	139	PB9			
PB10	66	PB10	PH3-BOOT0 (PH3)	137	PH3-BOOT0
PB11	67	PB11			
PB13	74	PB13			
PB14	75	PB14			
PB15	76	PB15			

STM32U3C5ZIT6Q

U1B

MCU_IOs (D,E,F,G)

PD0	114	PD0	PF0	10	PF0
PD1	115	PD1	PF1	11	PF1
PD2	116	PD2	PF2	12	PF2
PD3	117	PD3	PF3	13	PF3
PD4	118	PD4	PF4	14	PF4
PD5	119	PD5	PF5	15	PF5
PD6	122	PD6	PF6	18	PF6
PD7 — SB42 — FDCAN.STBY	123	PD7	PF7	19	PF7
PD8	77	PD8	PF8	20	PF8
PD9	78	PD9	PF9	21	PF9
PD10	79	PD10	PF10	22	PF10
PD11	80	PD11	PF11	46	PF11
PD12	81	PD12	PF12	47	PF12
PD13	82	PD13	PF13	50	PF13
PD14	85	PD14	PF14	51	PF14
PD15	86	PD15	PF15	52	PF15
PE0	140	PE0	PG0	53	PG0
PE1	141	PE1	PG1	54	PG1
PE2	1	PE2	PG2	87	PG2
PE3	2	PE3	PG3	88	PG3
PE4	3	PE4	PG4	89	PG4
PE5	4	PE5	PG5	90	PG5
PE6	5	PE6	PG6	91	PG6
PE7	55	PE7	PG7	92	PG7
PE8	56	PE8	PG8	93	PG8
PE9	57	PE9	PG9	124	PG9
PE10	60	PE10	PG10	125	PG10
PE11	61	PE11			
PE12	62	PE12	PG12	126	PG12
PE13	63	PE13	PG13	127	PG13
PE14	64	PE14	PG14	128	PG14
PE15	65	PE15	PG15	131	PG15

STM32U3C5ZIT6Q

HW3 — DNF — LQFP144_socket

32.768 kHz LSE
- DNF — SB1 — PC14 — LSE
- OSC32_IN — R1 0R — C38 1.5pF
- X2 32.768KHz
- OSC32_OUT — R2 0R — C45 1.5pF
- DNF — SB2 — PC15

16MHz HSE
- DNF — SB5 — DBGIN.MCO
- SB3 — PH0 — HSE
- OSC_IN — R3 DNF 0R — C55 6.2pF DNF
- X3 16MHz
- OSC_OUT — R4 DNF 0R — C59 6.2pF DNF
- SB4 — PH1

Title: **MCU IOs**		
Project: **NUCLEO-U3C5ZIQ**		
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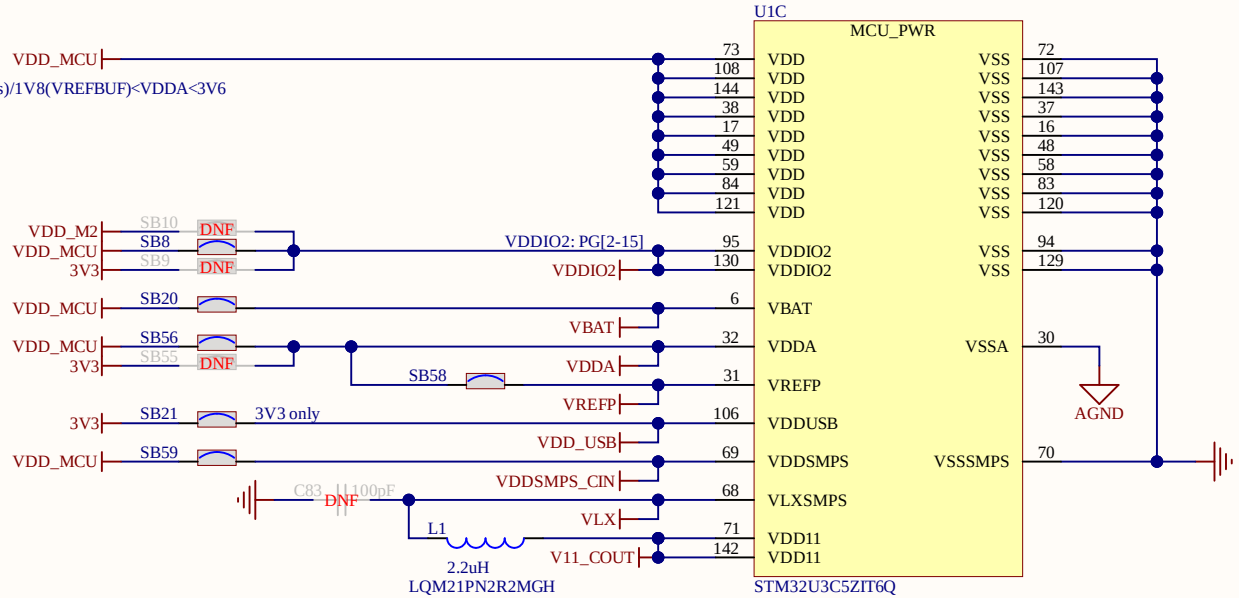
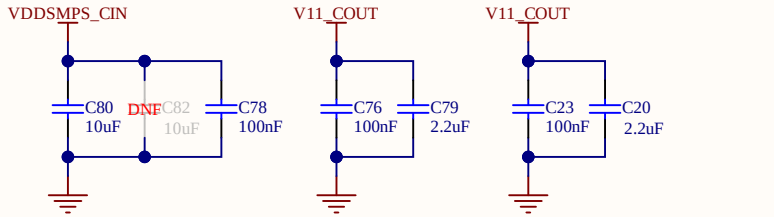
MCU POWER SUPPLY

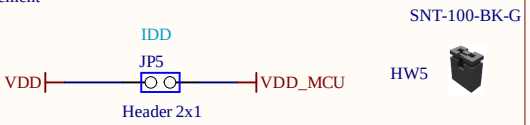
Operating range: 1V71<VDD<3V6
Operating range: 1V08<VDDIO2<3V6(only for IO PG[2:15])
Operating range: 1V65<VBAT<3V6
Operating range: 1V58(COMPs)/1V6(DACs,OPAMP)/1V62(ADCs)/1V8(VREFBUF)<VDDA<3V6
Operating range: 1V58<VREF<3V6(depend of VDDA)
Operating range: 1V71<VDDSMPS<3V6

Operating range: 3V0<VDDUSB<3V6



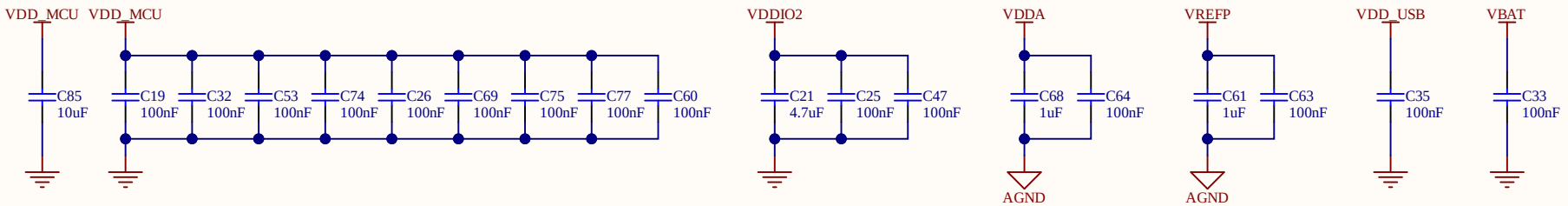


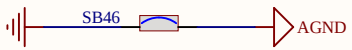
IDD Measurement



Used to give access to VDD MCU consumption only

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





Title: **STM32 microcontroller power**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
Revision: B-03		Reference: MB2222
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CONNECTORS

VDD — SB6 — IOREF

PA[0..15] — PA[0..15]
PB[0..15] — PB[0..15]
PC[0..15] — PC[0..15]
PD[0..15] — PD[0..15]
PE[0..15] — PE[0..15]
PF[0..15] — PF[0..15]
PG[0..15] — PG[0..15]
PH[0..10] — PH[0..10]

ARD_LED — PA5
PH3-BOOT0 — PH3-BOOT0
NRST — NRST

COLOR LEGEND

MORPHO SPECIFICATION
ARDUINO SPECIFICATION
STM32 ALTERNATE FUNCTION
STM32 IO PORT
~~FUNCTION NOT AVAILABLE~~

ST MORPHO CONNECTOR LEFT SIDE

CN7 — Header 19x2

PC10	SDIO_DAT2/~~I2S_CK~~		1 2	4	SDIO_DAT3/~~I2S_SDI~~	PC11
PC12	SDIO_CLK/ ~~I2S_SDO~~	3	3 4	6	5V_EXT (2)	
	VDD	5	5 6	8	GND	5V_EXT
PH3-BOOT0	BOOT0	7	7 8	10	GPIO	PD1
PF6	GPIO	9	9 10	12	IOREF	
PF7	GPIO	11	11 12	14	NRST	NRST
PA13	SWDIO	13	13 14	16	3V3	
PA14	SWCLK	15	15 16	18	5V	
PA15	JTDI/TIMy_H1/~~I2S_WS~~	17	17 18	20	GND	
	GND	19	19 20	22	GND	
PD13	GPIO	21	21 22	24	VIN	
PC13	WKUP	23	23 24	26	GPIO	PD5
PC14	LSE_IN	25	25 26	28	ADC	PA0
PC15	LSE_OUT	27	27 28	30	ADC	PA1
PH0	HSE_IN	29	29 30	32	ADC/DAC	PA4
PH1	HSE_OUT	31	31 32	34	ADC	PB0
	VBAT	33	33 34	36	ADC	PC1
	VBAT		35 36	38	ADC	PC0
PC2	ADC/SPIB_MISO	35	37 38			
PC3	ADC/SPIB_MOSI	37				

3V3 IOREF VIN 5V
5V
R17 1K

CN6 — Socket 8x1

1	
2	IOREF
3	NRST
(3) 4	3V3
(3) 5	5V
6	GND
7	GND
(1) 8	VIN

CN8 — Socket 6x1

1	A0
2	A1
3	A2
4	A3
5	A4
6	A5

ARDUINO V3

Operating range: 3V < VCC < 3.6V

ST MORPHO CONNECTOR RIGHT SIDE

VREFP
DNF SB62
C84 100nF

CN5 — Socket 10x1

SCL/D15	10
SDA/D14	9
AREF	8
GND	7
SCK/D13	6
MISO/D12	5
PWM/MOSI/D11	4
PWM/CS/D10	3
PWM/D9	2
IO/D8	1

CN9 — Socket 8x1

IO/D7	8
PWM/D6	7
PWM/D5	6
IO/D4	5
PWM/D3	4
IO/D2	3
TX/D1	2
RX/D0	1

CN10 — Header 19x2

PC9	SDIO_DAT1		1 2	4	SDIO_DAT0	PC8
PB6	I2C_SCL	3	3 4	6	GPIO	PD15
PB7	I2C_SDA	5	5 6	8	5V_STLK (3)	
	AREF (2)	7	7 8	10	GPIO	PB11
PA5	SPIA_SCK	11	9 10	12	USB_DP	PA12
PA6	SPIA_MISO	13	11 12	14	USB_DM	PA11
PA7	SPIA_MOSI	15	13 14	16	TIMx_BKIN	PE15
PD14	SPIA_NSS	17	15 16	18	ADC	PA2
PC7	GPIO	19	17 18	20	GND	
PE11	TIMx_VH	21	19 20	22	GPIO	PB2
PA8	TIMx_UH	23	21 22	24	GPIO	PB1
PB10	TIMy_H3	25	23 24	26	TIMx_WL	PB15
PC6	TIM_CUR-REF	27	25 26	28	TIMx_VL	PB14
ARD_D4	GPIO/WKUP	29	27 28	30	TIMx_UL/SPIB_SCK	PB13
ARD_D3	SWO/TIMy_H2	31	29 30	32	AGND	
PE13	TIMx_WH	33	31 32	34	ADC	PA3
PD8	UART3_TX	35	33 34	36	GPIO/UART3_RTS	PD12
PD9	UART3_RX	37	35 36	38	GPIO/UART3_CTS	PD11
			37 38			

ARD_D4 — SB65 DNF — SB66 — PB5 PE10
ARD_D3 — SB63 DNF — SB64 — PB3 PE9

SB64, SB66 ON, ARD_D3 and ARD_D4 support ADF.
SB63, SB65 ON, ARD_D3 supports WAKE UP.
ARD_D3 supports SWO/Moto control TIM.

CN11 — Header 16x2 — DNF

PE2		1	2			PE3
PE5		3	4			PE6
PE4		5	6			
PF2	SB73	7	8	SB75		PF0
		9	10	SB74		PF1
		11	12	SB71		PF4
PF5	SB70	13	14	SB72		PF3
PF9		15	16			PA9
		17	18			PA10
PD0		19	20			PE1
PD4		21	22			
PF13		23	24			PF12
PG1	SB69	25	26	SB68		PG0
PD6		27	28			PD7
PB9		29	30			
PB8		31	32			

CN12 — Header 16x2 — DNF

PE0		1	2			PD3
PF10		3	4			PF8
PE14		5	6			PD10
PE10		7	8			PE12
PE8		9	10			PE9
PF15		11	12			PE7
PF11		13	14			PF14
PG8	SB29	15	16			
PG5	SB47	17	18	SB40		PG7
PG3	SB52	19	20	SB44		PG6
PG15	SB16	21	22	SB49		PG4
		23	24	SB54		PG2
PG13	SB19	25	26	SB13		PG9
PG14	SB18	27	28			
		29	30	SB11		PG10
		31	32	SB12		PG12

CN15 — GND — BOTTOM LEFT

CN16 — GND — BOTTOM RIGHT

(1): VIN (NUCLEO INPUT) WARNING voltage applied to 7V < VIN < 12V
(2): 5V_EXT, AREF (NUCLEO INPUT)
(3): 5V, 3V3, IOREF, 5V_STLK (NUCLEO OUTPUT, SHIELD INPUT)

Title: **Connectors**		
Project: **NUCLEO-U3C5ZIQ**		
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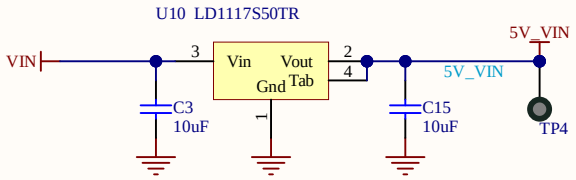
POWER SOURCES

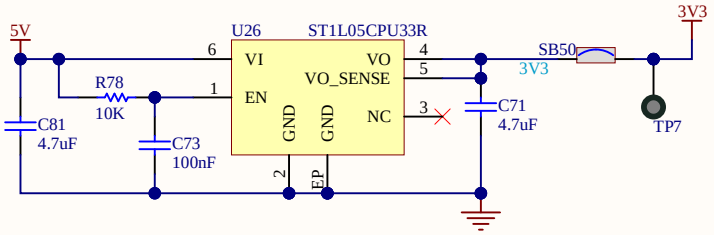
VIN / 5V PWR/ 800mA

Operating range: 7V < VIN < 12V



3V3 PWR/ 1.3A

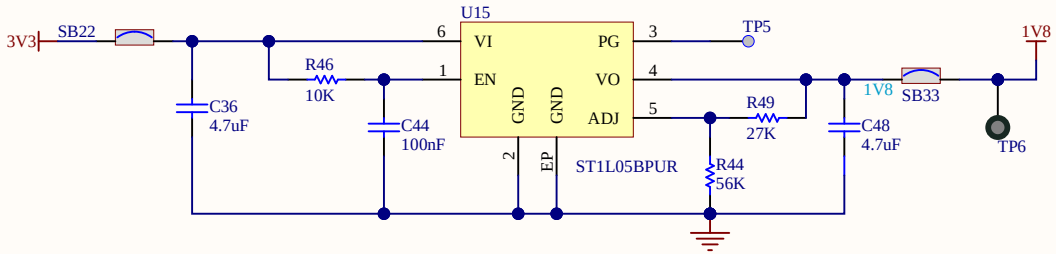
Operating range: 4.5V < VI < 5.5V



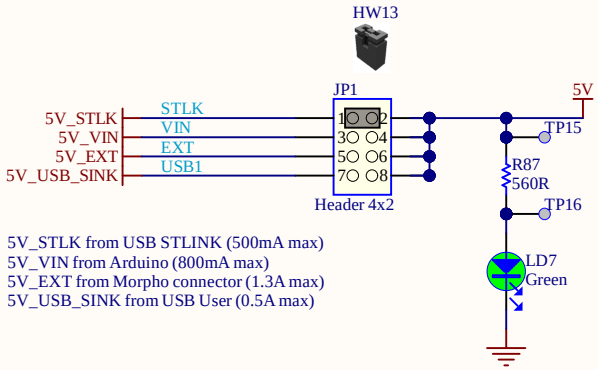
1V8 PWR/ 1.3A

Operating range: 3V < VI < 5.5V

Vout=1.22(1+27K/56K)*

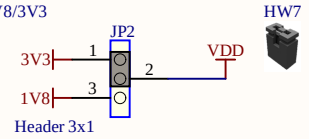


5V PWR SELECTION



5V_STLK from USB STLINK (500mA max)
5V_VIN from Arduino (800mA max)
5V_EXT from Morpho connector (1.3A max)
5V_USB_SINK from USB User (0.5A max)

VDD SELECTION 1V8/3V3



GND HEADERS

Title: **Power Sources**		
Project: **NUCLEO-U3C5ZIQ**		
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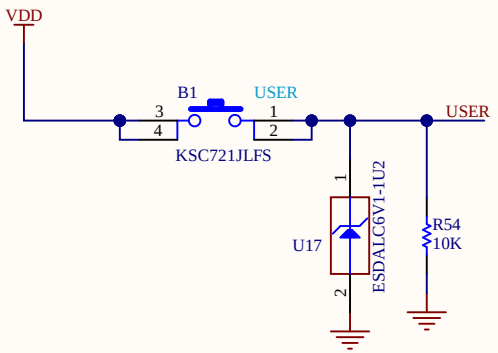
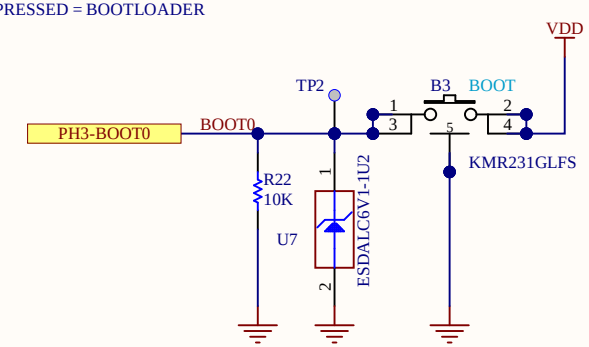
PERIPHERALS

USER BUTTON

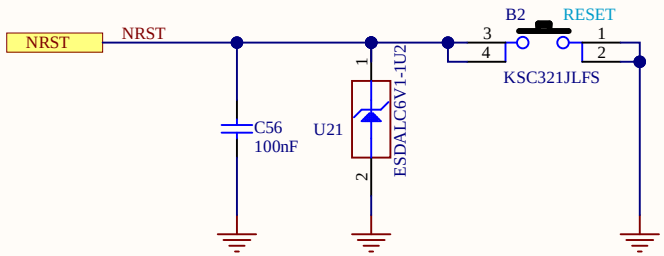


BOOT SELECT

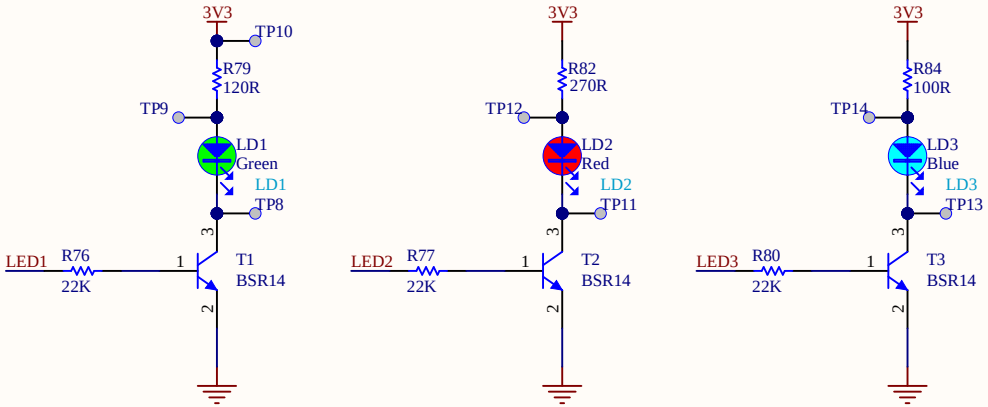
DEFAULT = INTERNAL FLASH
B3 PRESSED = BOOTLOADER



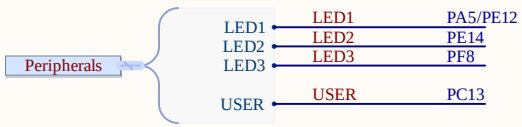
RESET



LEDs



Peripherals



Title: **Peripherals**		
Project: **NUCLEO-U3C5ZIQ**		
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M2 SERIAL-MEMORY CONNECTOR

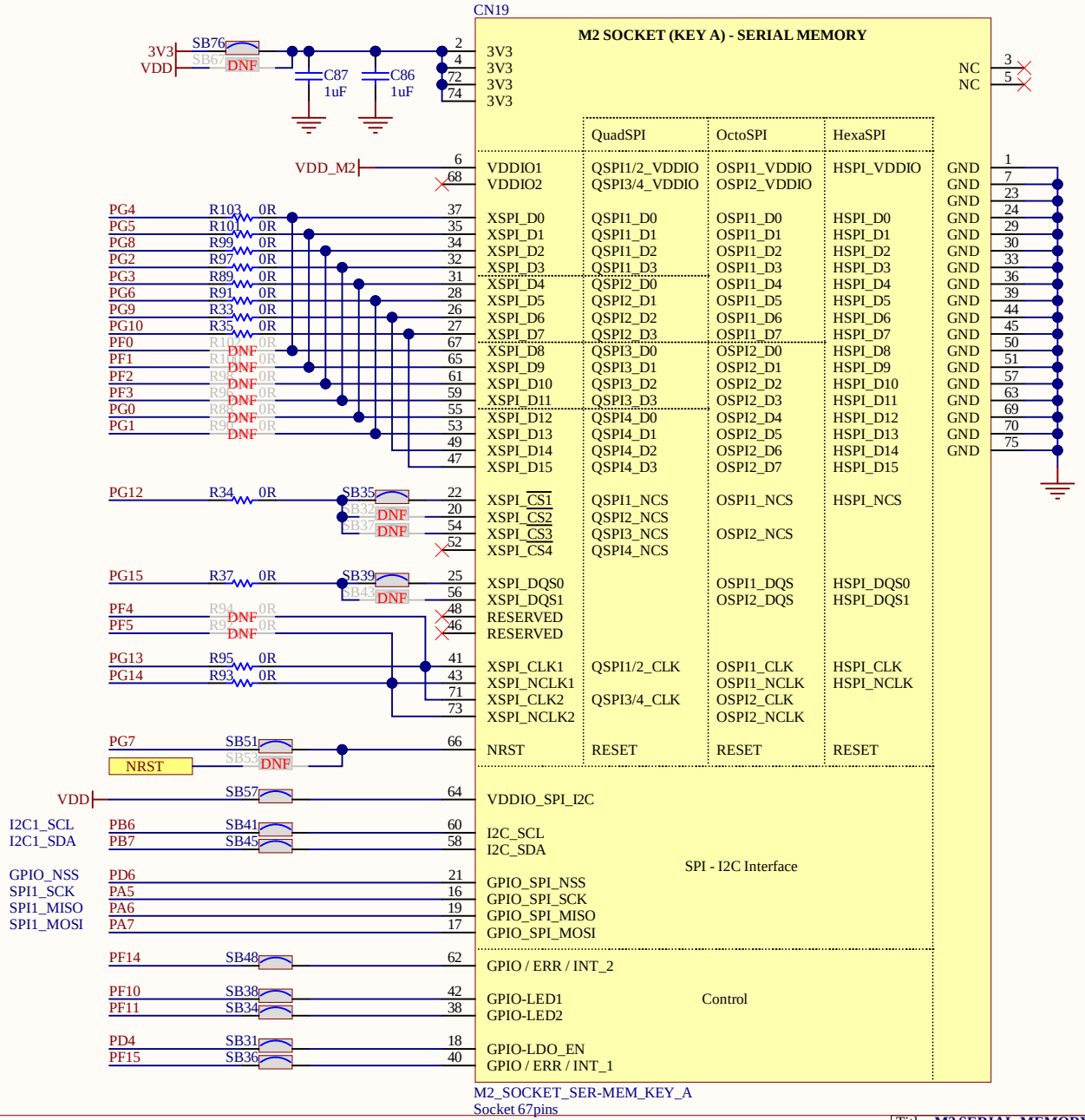
3V3 / Max current budget 500mA

PA[0..15] PA[0..15]
PB[0..15] PB[0..15]
PD[0..15] PD[0..15]
PF[0..15] PF[0..15]
PG[0..15] PG[0..15]

OctoSPI configuration:

	U3C5ZIQ	U5
D0	PG4	PF0
D1	PG5	PF1
D2	PG8	PF2
D3	PG2	PF3
D4	PG3	PG0
D5	PG6	PG1
D6	PG9	PG9
D7	PG10	PG10
CLK	PG13	PF4
NCLK	PG14	PF5

HW6
S001-00001-A42-R



Title: **M2 SERIAL-MEMORY CONNECTOR**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
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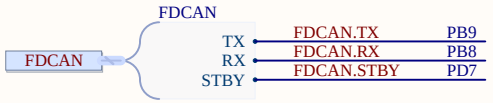
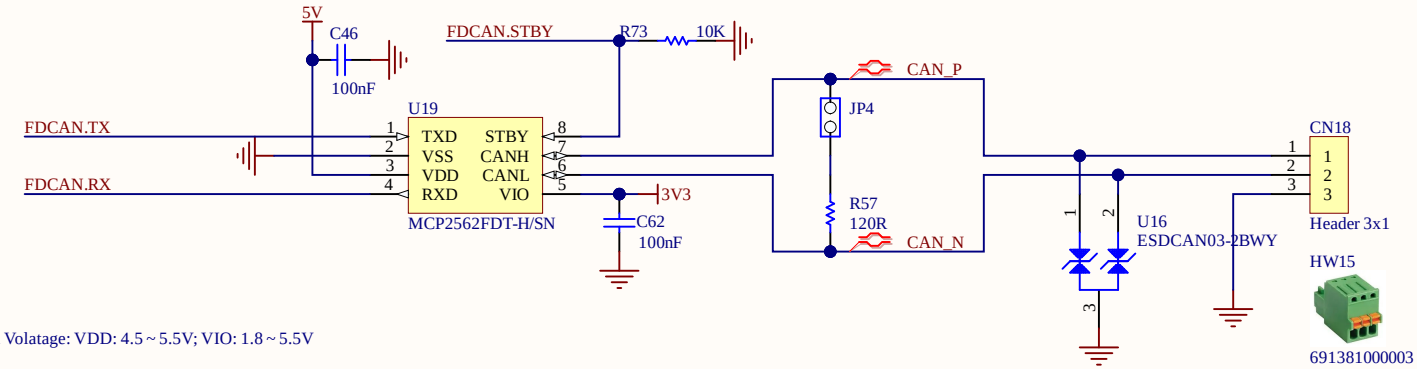
Size: A4	Date: 9-Sep-2025	Sheet: 8 of 12

CAN FD

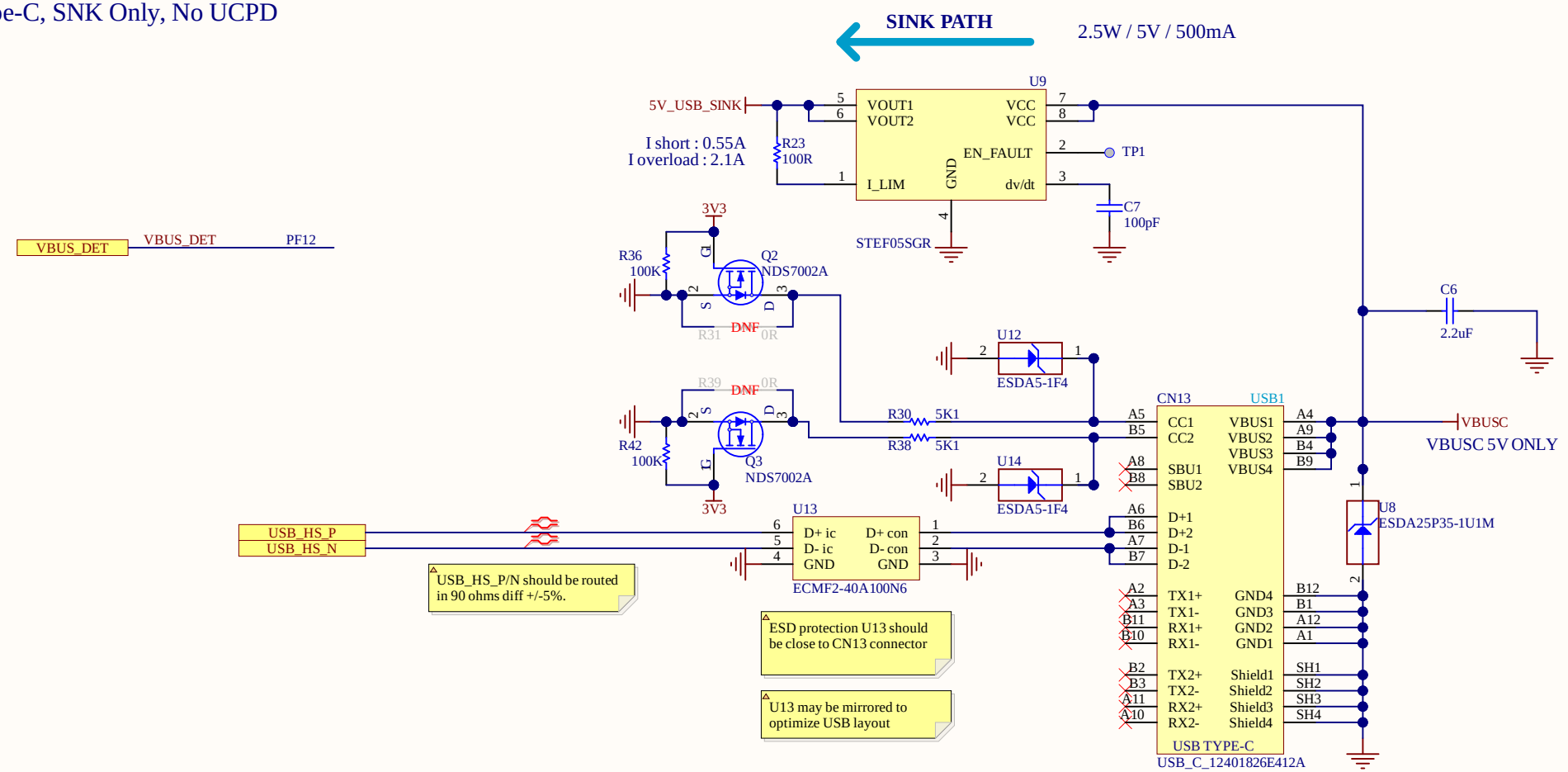




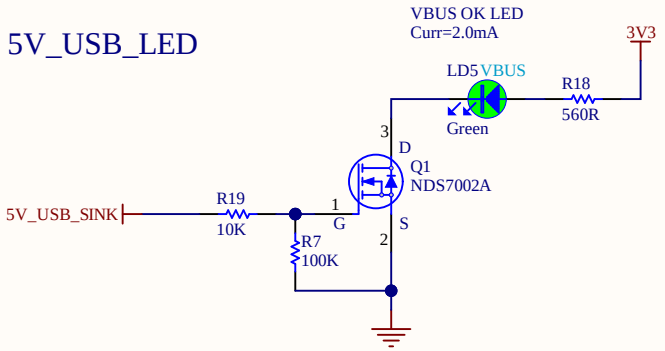
Operation Volatage: VDD: 4.5 ~ 5.5V; VIO: 1.8 ~ 5.5V

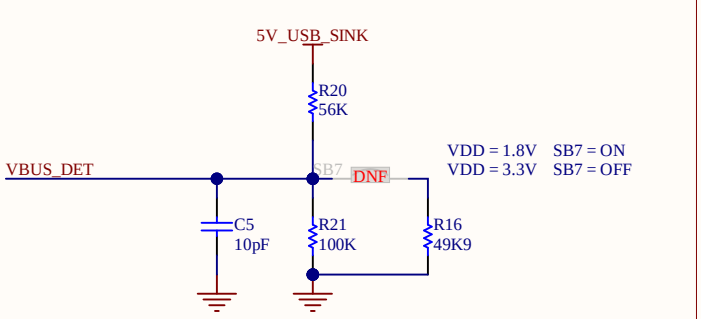
Title: **FDCAN**			
Project: **NUCLEO-U3C5ZIQ**			
Variant: U3C5ZIQ			
Revision: B-03		Reference: MB2222	
Size: A4	Date: 9-Sep-2025	Sheet: 9 of 12	

USB Type-C, SNK Only, No UCPD



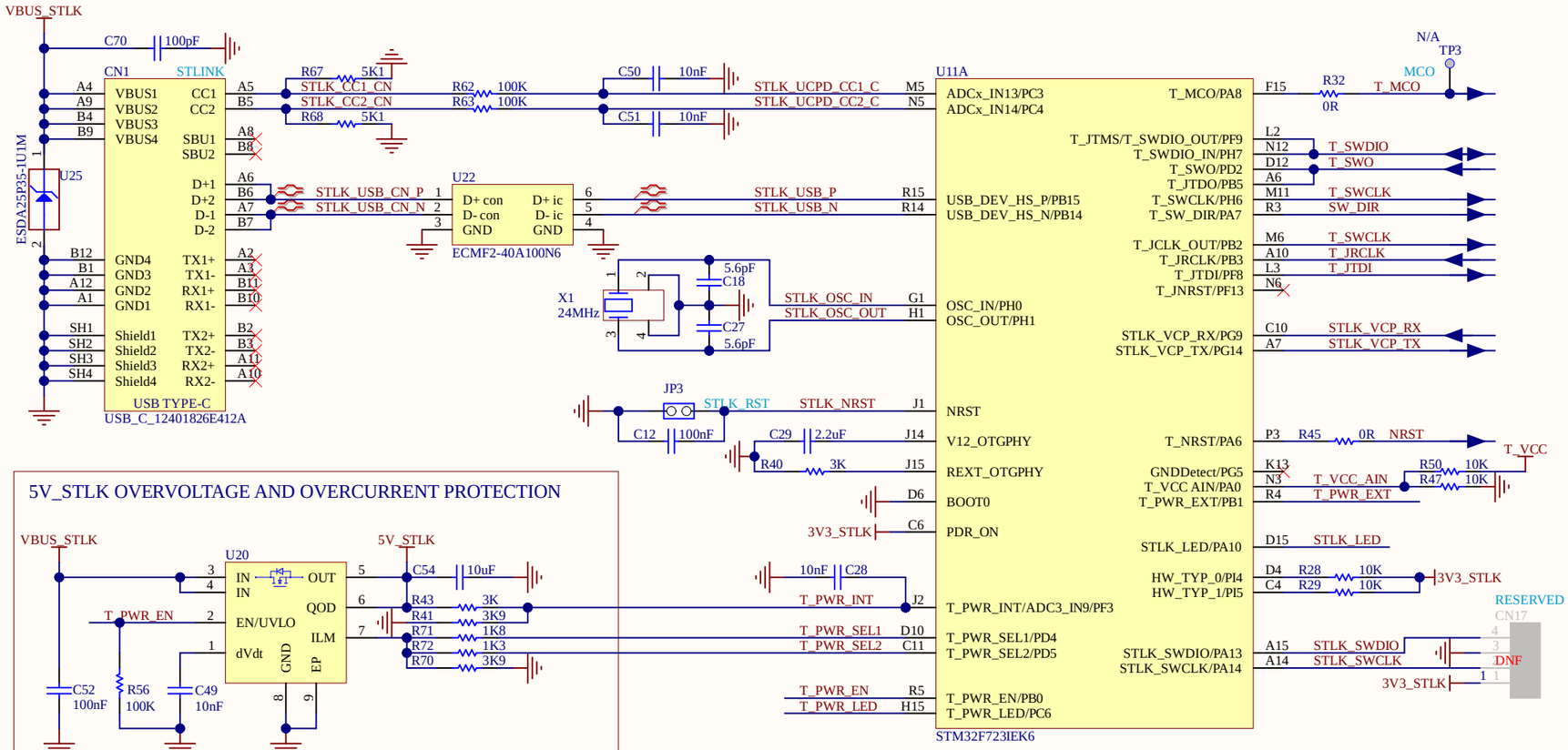
5V_USB_LED





Title: **USB User**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
Revision: B-03		Reference: MB2222
Size: A4	Date: 9-Sep-2025	Sheet: 10 of 12

STLINK-V3EC



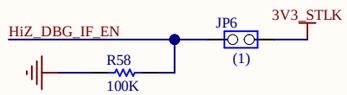
5V_STLK OVERVOLTAGE AND OVERCURRENT PROTECTION

5V_STLK OVERCURRENT PROTECTION MANAGEMENT

	T_PWR_SEL2/PD5	T_PWR_SEL1/PD4
PowerDefault.SNK *(current limit: 550mA)*	Hi-Z	Hi-Z
Power1.5.SNK *(current limit: 1.66A)*	Hi-Z	0
Power3.0.SNK *(current limit: 3.2A)*	0	0

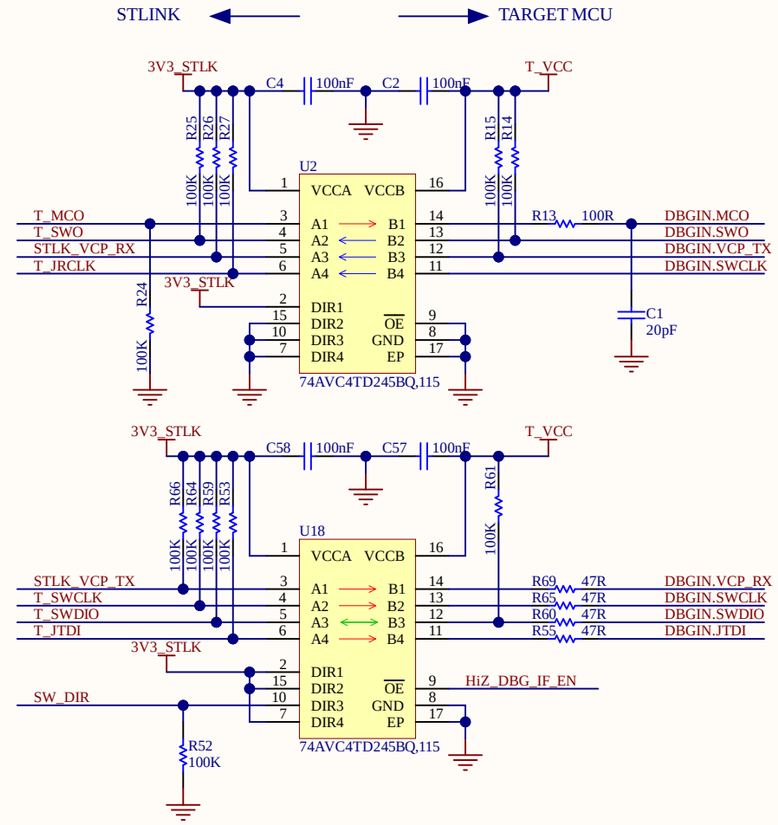
Hi-Z = IO set in high impedance

EXTERNAL DEBUGGER SELECTION

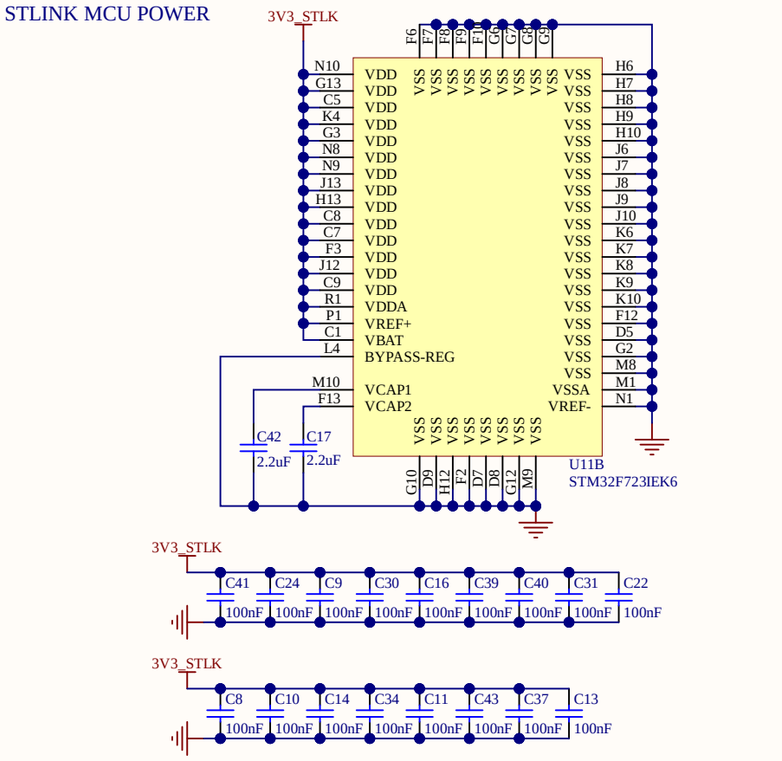


(1): NOT FITTED FOR DEBUG WITH INTERNAL STLINK (DEFAULT)
(1): FITTED FOR DEBUG WITH EXTERNAL DEBUGER
Or Output STLINK IOs isolated (Hi-Z)

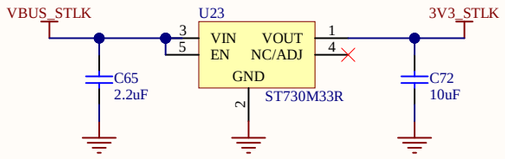
VOLTAGE LEVEL SHIFTER



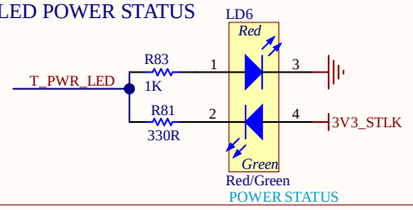
STLINK MCU POWER



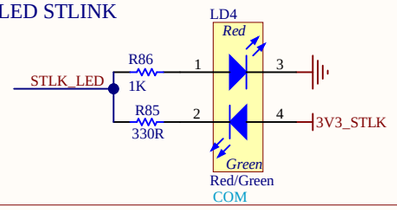
ST-LINK POWER (3V3/300mA)



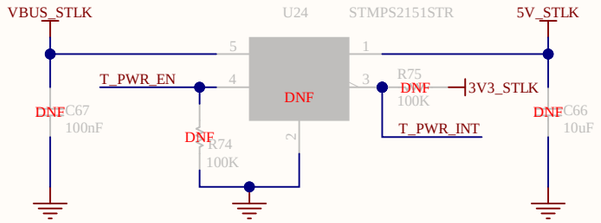
LED POWER STATUS



LED STLINK

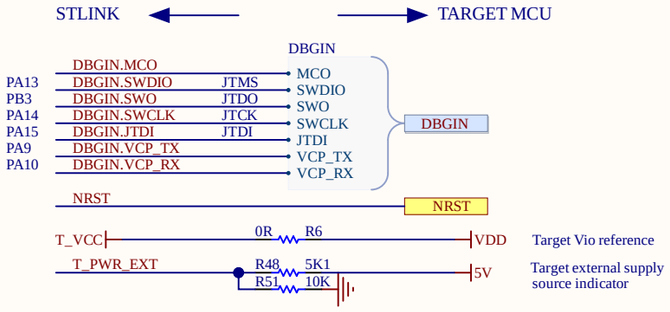


STMPS2151STR is backup of the TPS259535DSG



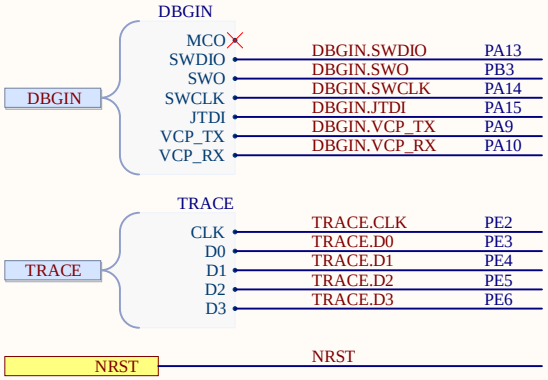
DNF

INTERFACE WITH TARGET MCU

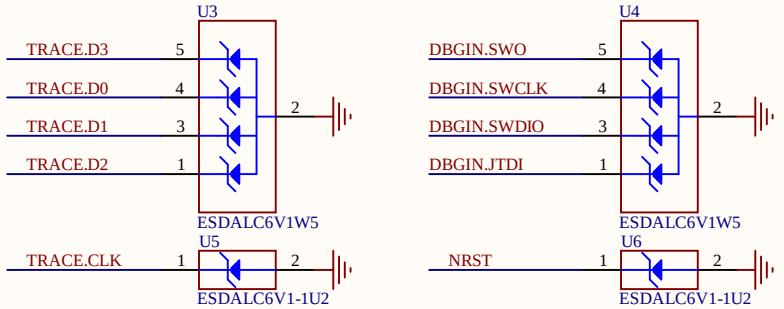


Title: **STLINK-V3EC**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
Revision: B-03		Reference: MB2222
Size: A3	Date: 9-Sep-2025	Sheet: 11 of 12

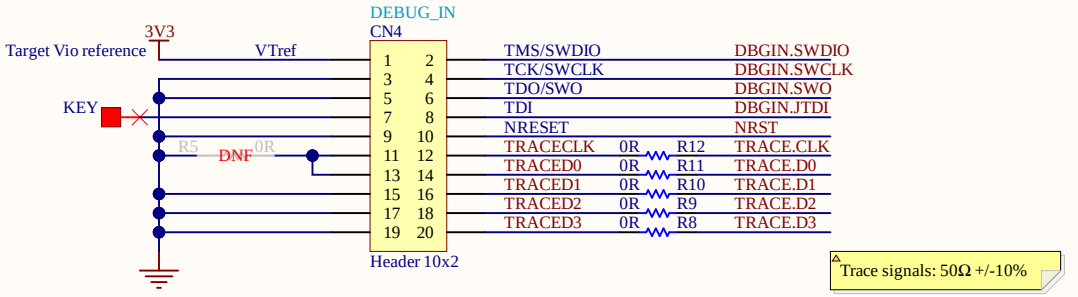
External Debug Interface



ESD PROTECTIONS

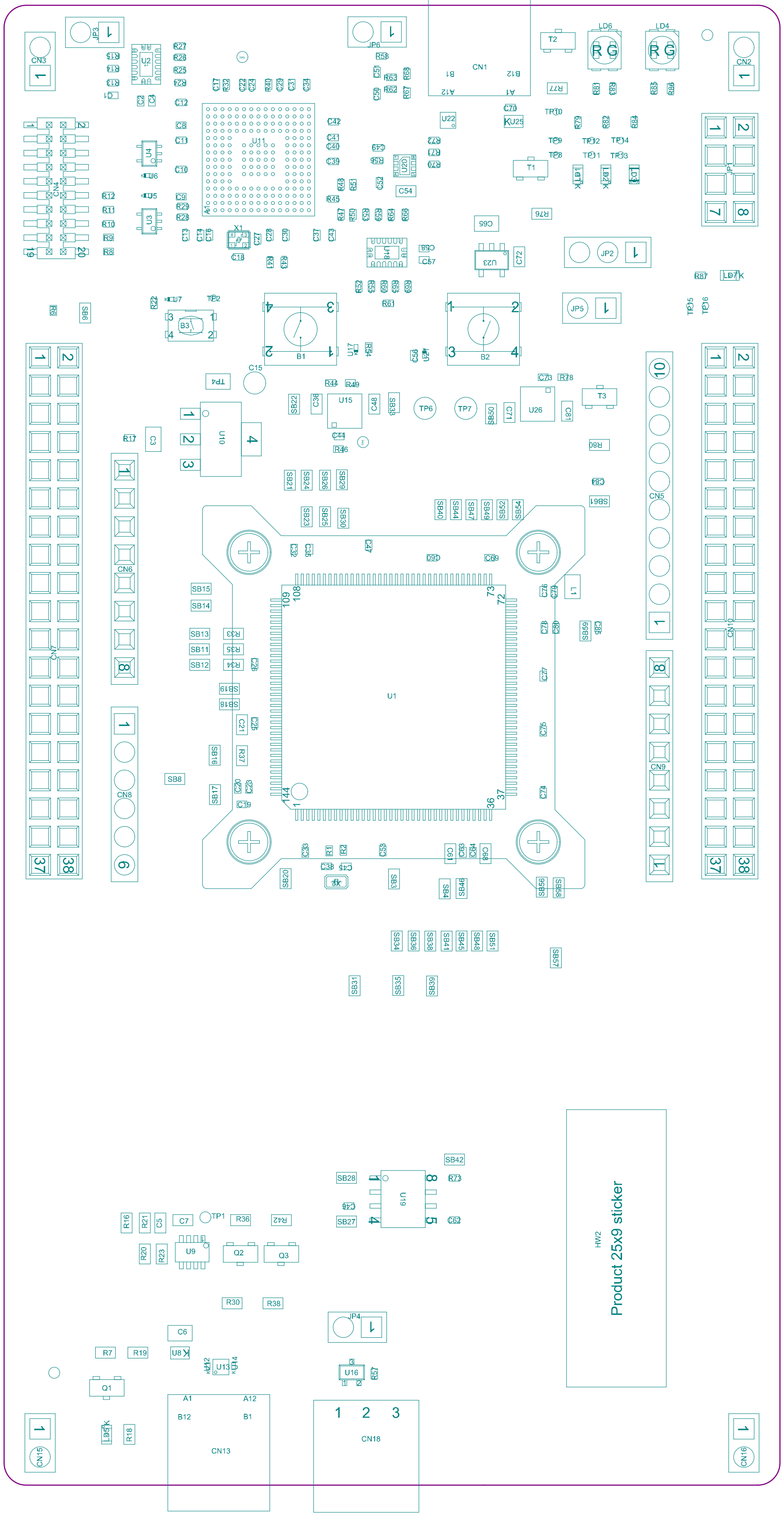


MIPI-20 CONNECTOR



Specific constraints for MCU.SWDIO and MCU.SWCLK (must be same length and must be Shielded).

Title: **External Debug Interface**		
Project: **NUCLEO-U3C5ZIQ**		
Variant: U3C5ZIQ		
Revision: B-03		Reference: MB2222
Size: A4	Date: 9-Sep-2025	Sheet: 12 of 12



Project: NUCLEO-U3C5ZIQ	
Layer: M14-Top Assembly	Gerber: .GM14
Variant: U3C5ZIQ	MB2222
Date: 9-Sep-2025	Rev: B

HW6

R89 R91 R93 R95 R97 R99 R101 R103

SB66

SB64

SB68 SB69 SB70 SB71 SB72 SB73 SB74 SB75

C87 SB76

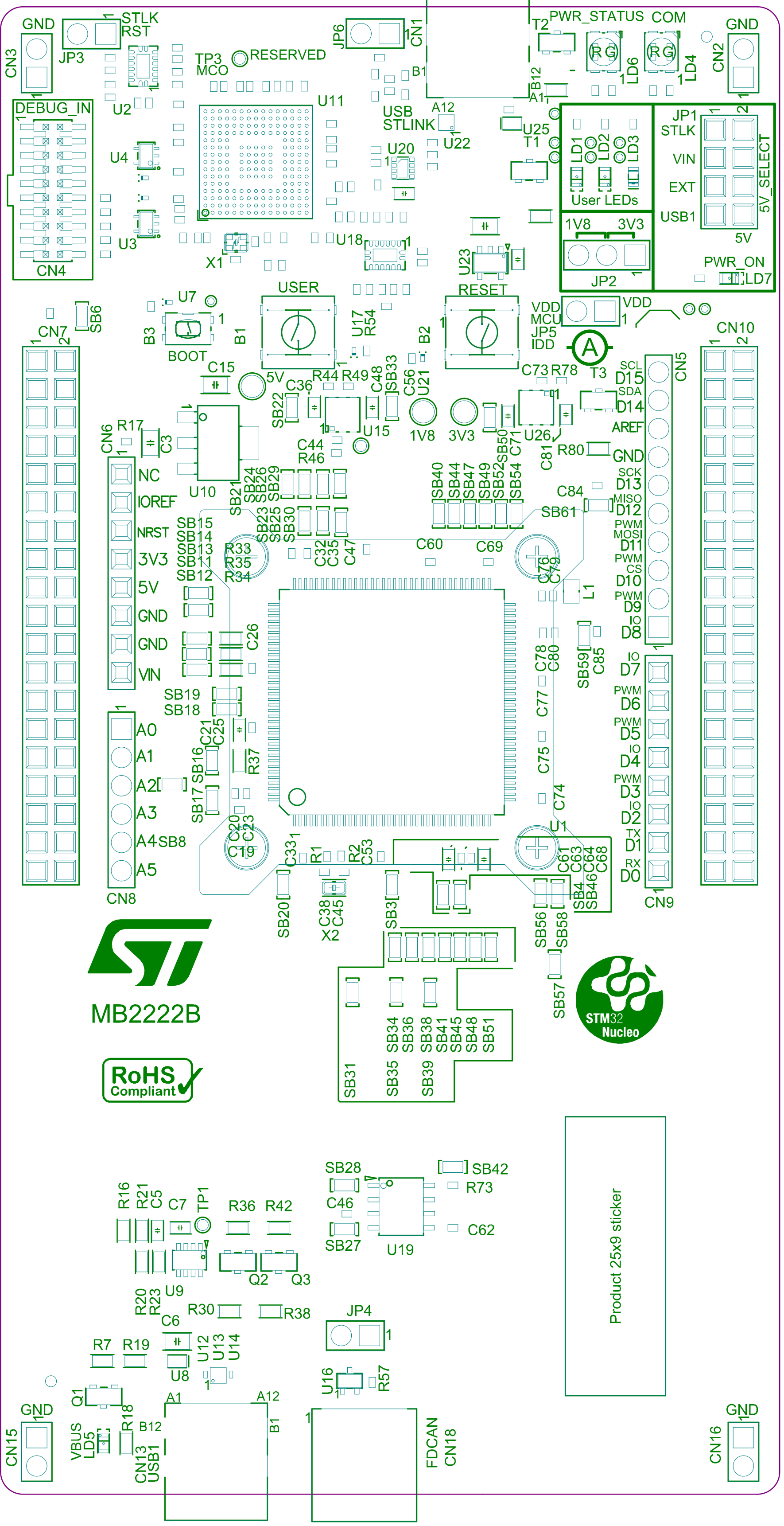
C86

74 2

CN19

75 1

Project: NUCLEO-U3C5ZIQ	
Layer: M15-Bottom Assembly	Gerber:.GM15
Variant: U3C5ZIQ	MB2222
Date: 9-Sep-2025	Rev: B


MB2222B
RoHS Compliant
STM32 Nucleo
Product 25x9 sticker
Top Overlay
Mid-Overlay
Bot-Overlay
.GTO
.GM1
.GBO
GND
STLK RST
JP3
CN3
DEBUG_IN
CN4
JP6
CN1
TP3 MCO
RESERVED
U2
U4
U3
U11
X1
U18
U20
USB STLINK
A12
U22
B1
B12
A1
U25
T1
T2
PWR_STATUS
COM
LD6
LD4
GND
CN2
LD1
LD2
LD3
User LEDs
JP1
STLK
VIN
EXT
USB1
5V
5V_SELECT
1V8
3V3
JP2
PWR_ON
LD7
U23
RESET
USER
U7
BOOT
B3
B1
U17
R54
B2
VDD MCU
JP5
IDD
VDD
CN7
SB6
CN10
C15
5V
R44
R49
C48
SB33
C56
U21
C36
SB22
U15
1V8
3V3
C73
R78
T3
SCL
D15
SDA
D14
CN5
AREF
GND
SCK
D13
MISO
D12
PWM
MOSI
D11
PWM
CS
D10
PWM
D9
IO
D8
IO
D7
PWM
D6
PWM
D5
IO
D4
PWM
D3
IO
D2
TX
D1
RX
D0
CN9
C44
R46
U26
SB50
C71
C81
R80
C84
SB61
SB40
SB44
SB47
SB49
SB52
SB54
CN6
R17
C3
NC
IOREF
NRST
3V3
5V
GND
GND
VIN
U10
SB21
SB24
SB26
SB29
SB23
SB25
SB30
SB15
SB14
SB13
SB11
SB12
R33
R35
R34
C32
C35
C47
C60
C69
C76
C79
L1
C26
SB19
SB18
C21
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SB16
R37
SB17
C20
C19
C23
SB8
A0
A1
A2
A3
A4
A5
CN8
C33
R1
R2
C53
SB20
C38
C45
X2
SB3
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SB58
SB57
C61
C63
C64
C68
SB4
SB46
C74
C75
C77
C78
C80
SB59
C85
SB31
SB34
SB36
SB38
SB41
SB45
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SB35
SB39
SB28
SB42
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C46
C62
SB27
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R16
R21
C5
C7
TP1
R36
R42
Q2
Q3
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R23
U9
R30
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C6
JP4
R7
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U12
U13
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U8
U16
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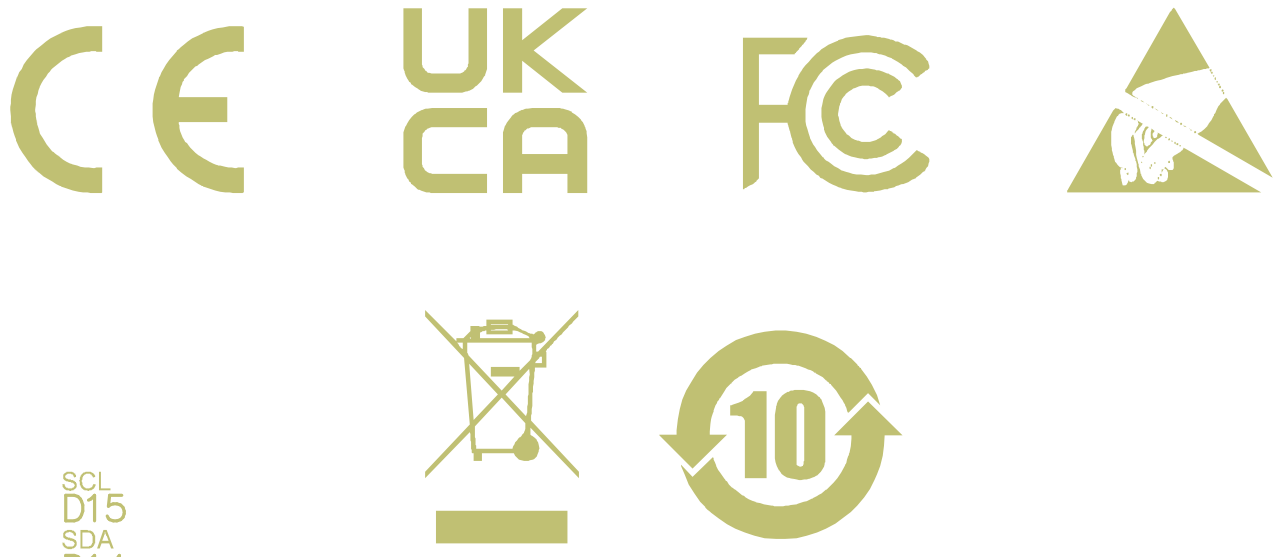
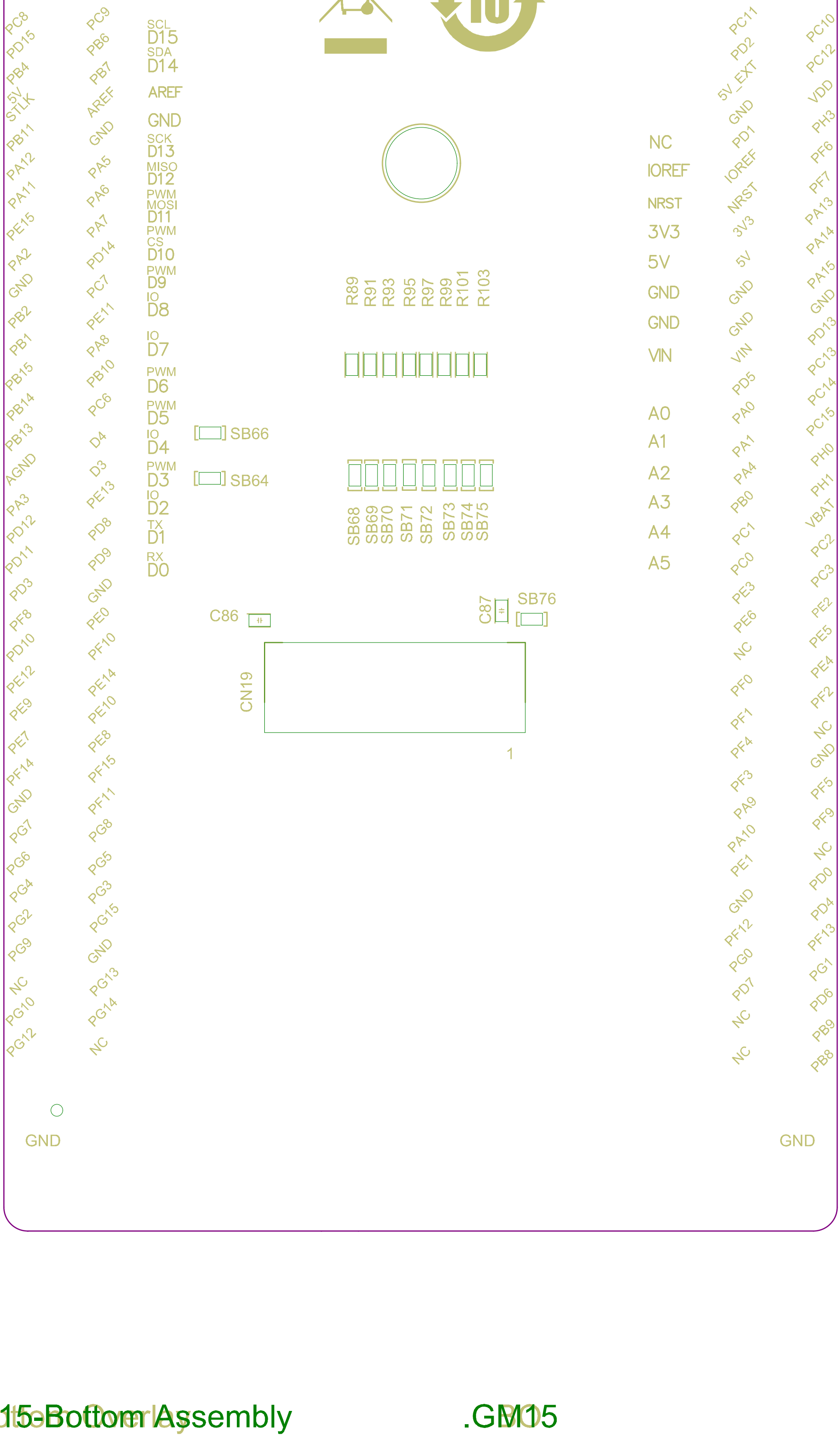
CN18
CN15
CN16
GND





M15-Bottom Assembly .GM15