Nucleo-64 SMPS

MB1841

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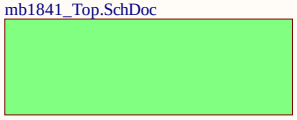
U_mb1841_Top
mb1841_Top.SchDoc



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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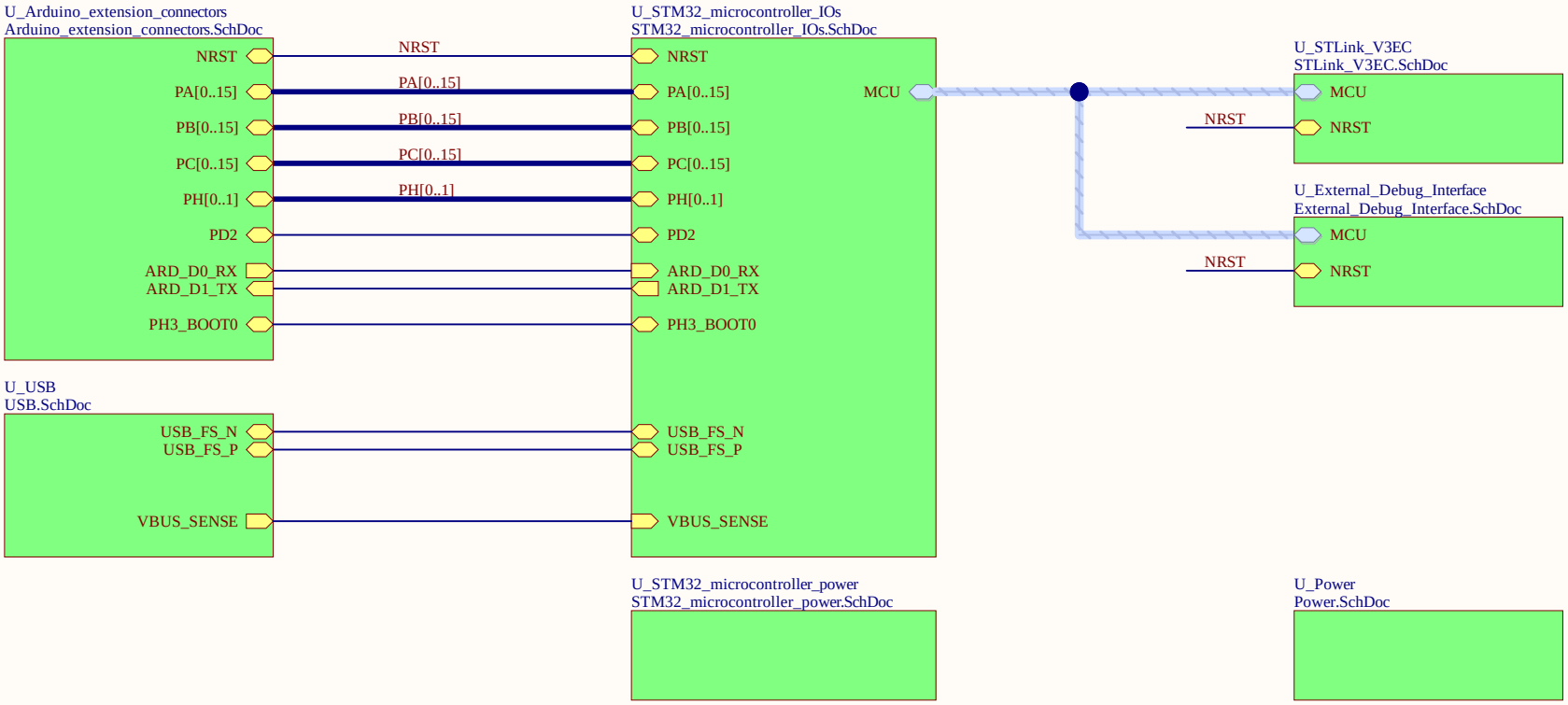
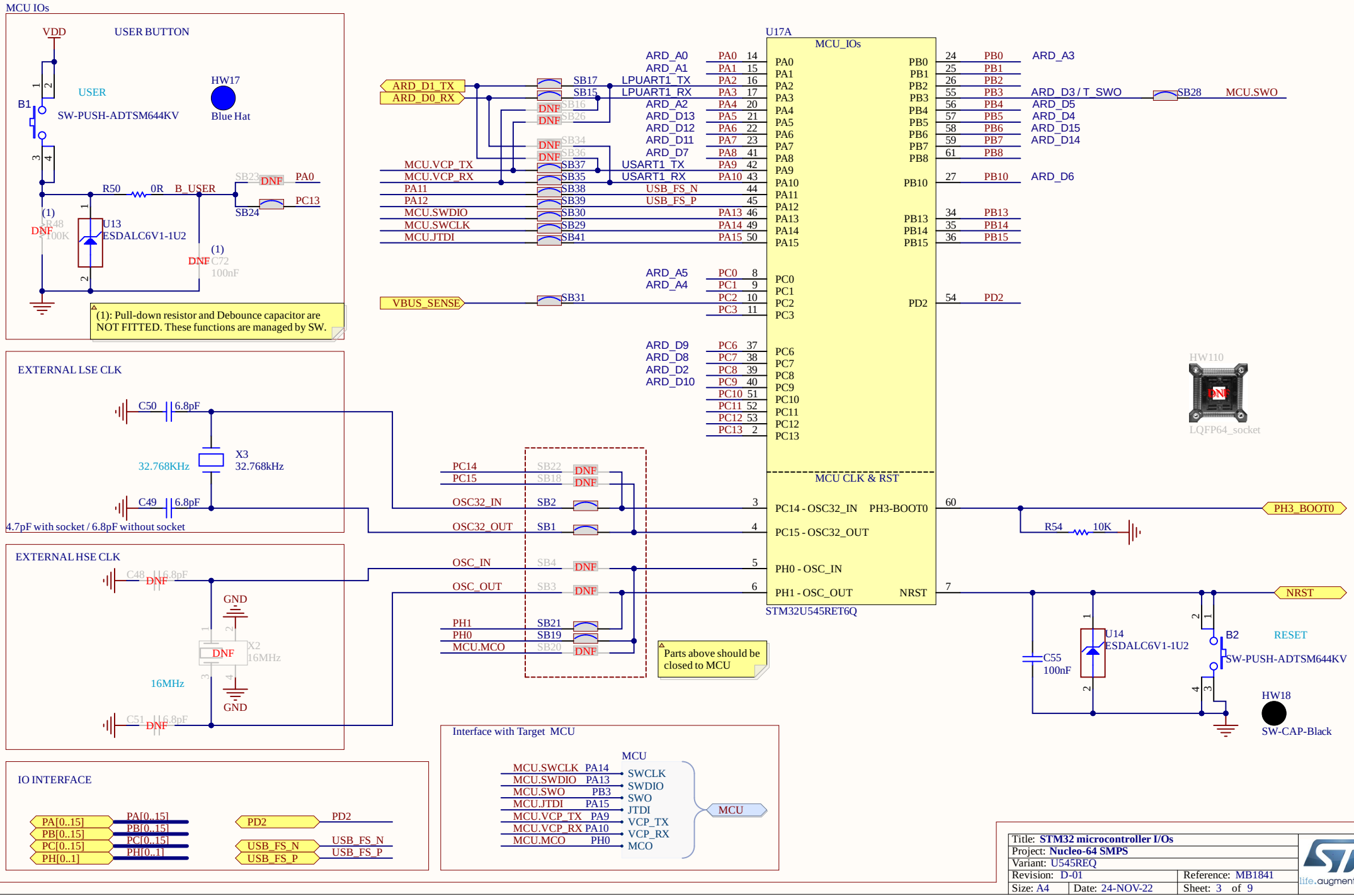
Title: **Project overview**			
Project: **Nucleo-64 SMPS**			
Variant: U545REQ			
Revision: D-01		Reference: MB1841	
Size: A4	Date: 24-NOV-22	Sheet: 1 of 9	

life.augmented



Title: **Top hierarchical view**			
Project: **Nucleo-64 SMPS**			
Variant: U545REQ			
Revision: D-01		Reference: MB1841	
Size: A4	Date: 24-NOV-22	Sheet: 2 of 9	

life.augmented



Title: **STM32 microcontroller I/Os**		
Project: **Nucleo-64 SMPS**		
Variant: U545REQ		
Revision: D-01	Reference: MB1841	
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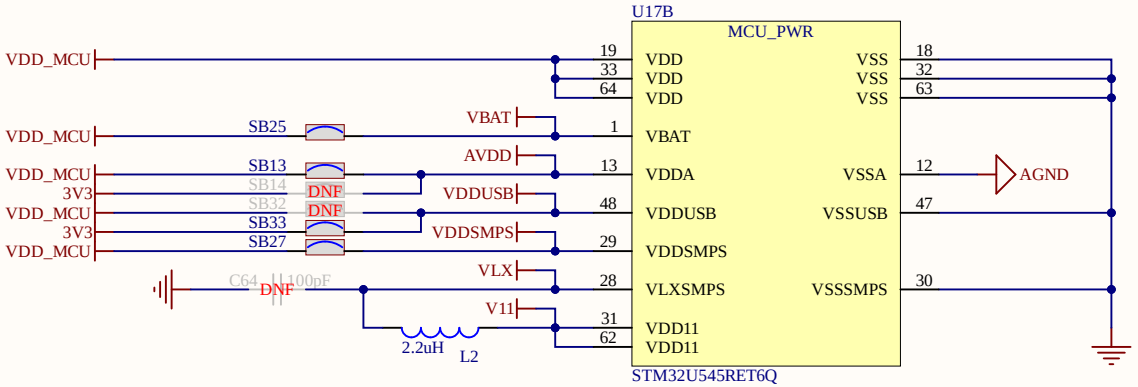
life.augmented

MCU PWR SUPPLIES

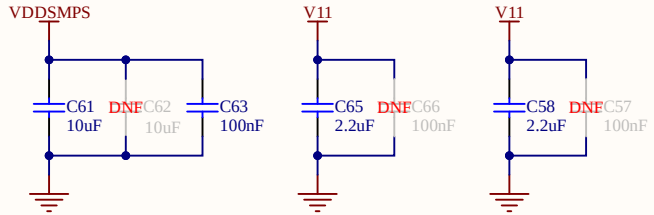
Operating range: 1V71<VDD<3V6
Operating range: 1V65<VBAT<3V6
Operating range: 1V62<VDDA<3V6
Operating range: 1V71<VDDSMPS<3V6

Operating range: 3V0<VDDUSB<3V6

VDDUSB on 3V3 instead of VDD_MCU to be 1V8 compatible



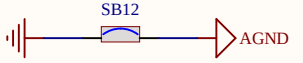
Decoupling capacitors have to be as close as possible from the MCU pins.



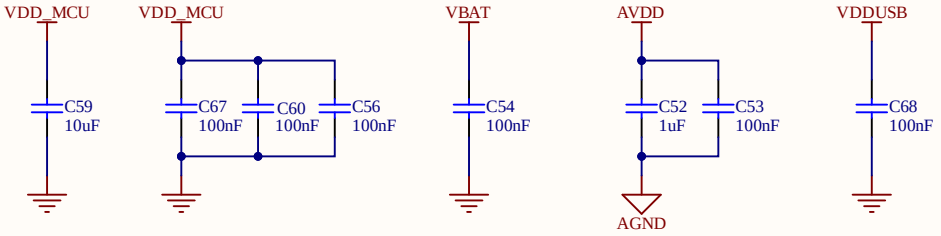
IDD Measurement

Used to give access to VDD MCU consumption only

GND / AGND



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



Title: **STM32 microcontroller power**		
Project: **Nucleo-64 SMPS**		
Variant: U545REQ		
Revision: D-01		Reference: MB1841
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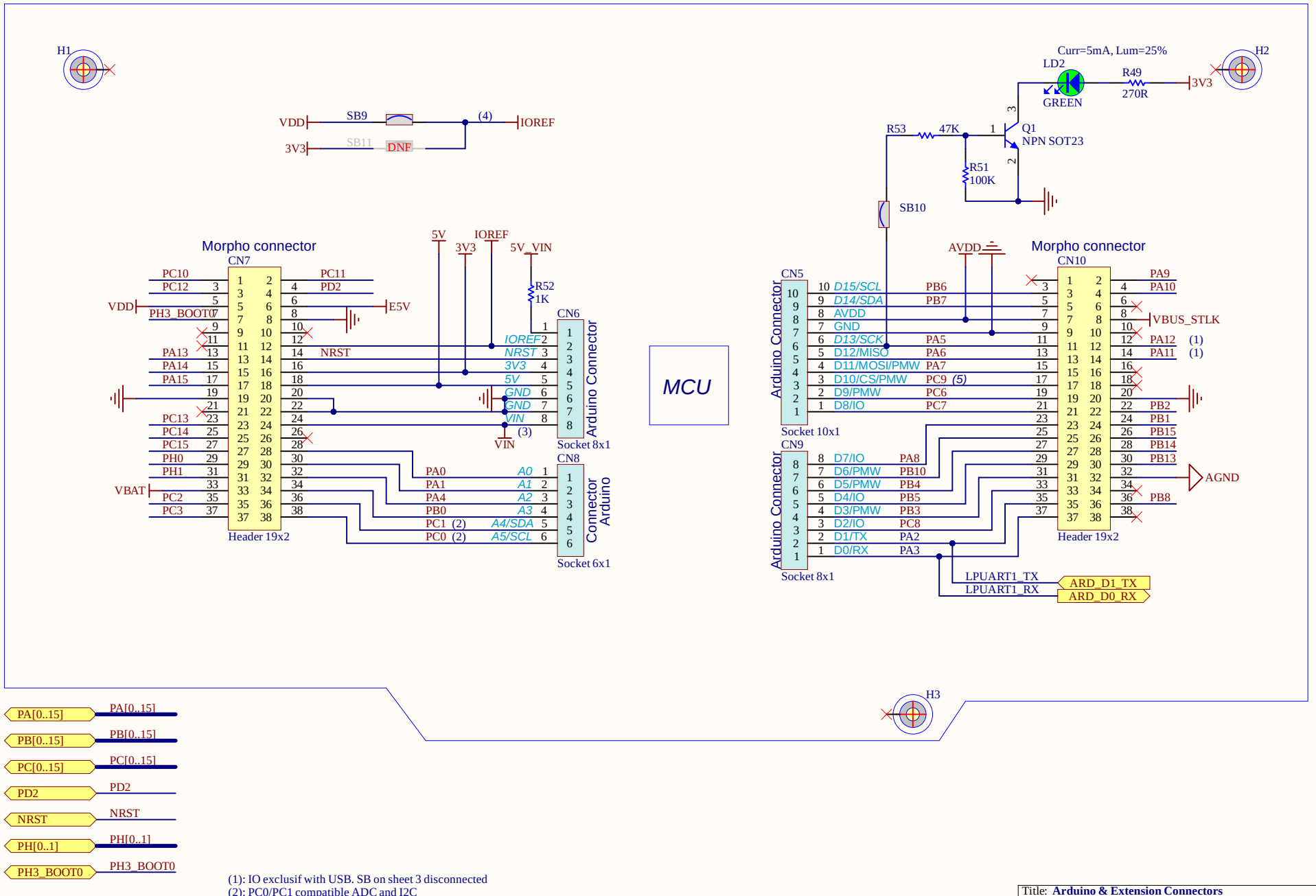
life.augmented



(1): IO exclusif with USB. SB on sheet 3 disconnected
(2): PC0/PC1 compatible ADC and I2C
(3): WARNING voltage applied to VIN <12V
(4): 1V8< VDD <3V3: Default ARDUINO-UNO-V3 only 3V3
(5) Due to muxing constrainte, the SPI_NSS is not available as an alternate on this IO, so this pin is affected with an I/O function to do the Chip Select

Title: **Arduino & Extension Connectors**		
Project: **Nucleo-64 SMPS**		
Variant: U545REQ		
Revision: D-01		Reference: MB1841
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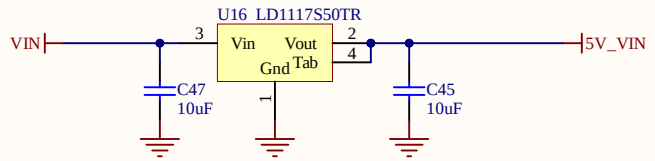
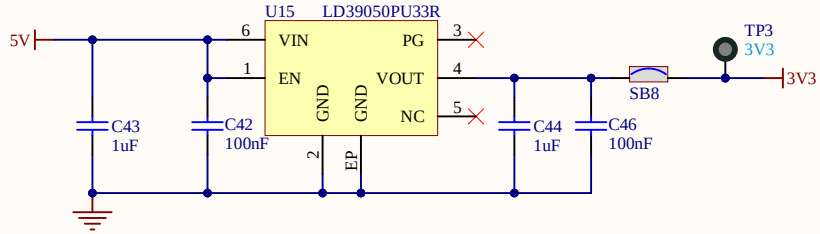
life.augmented

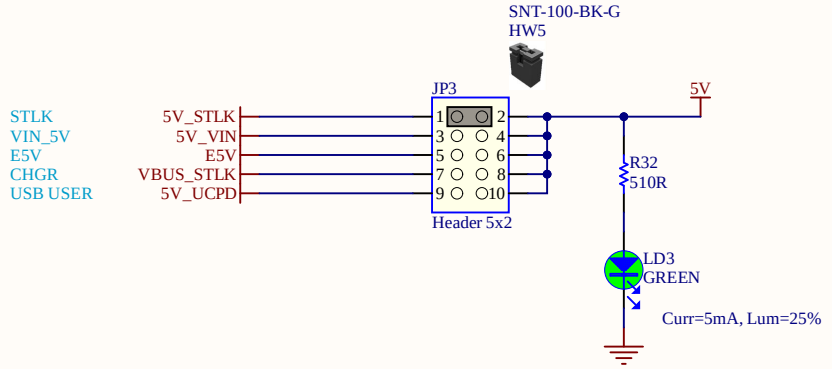
VIN / 5V PWR



3V3 PWR : 500mA

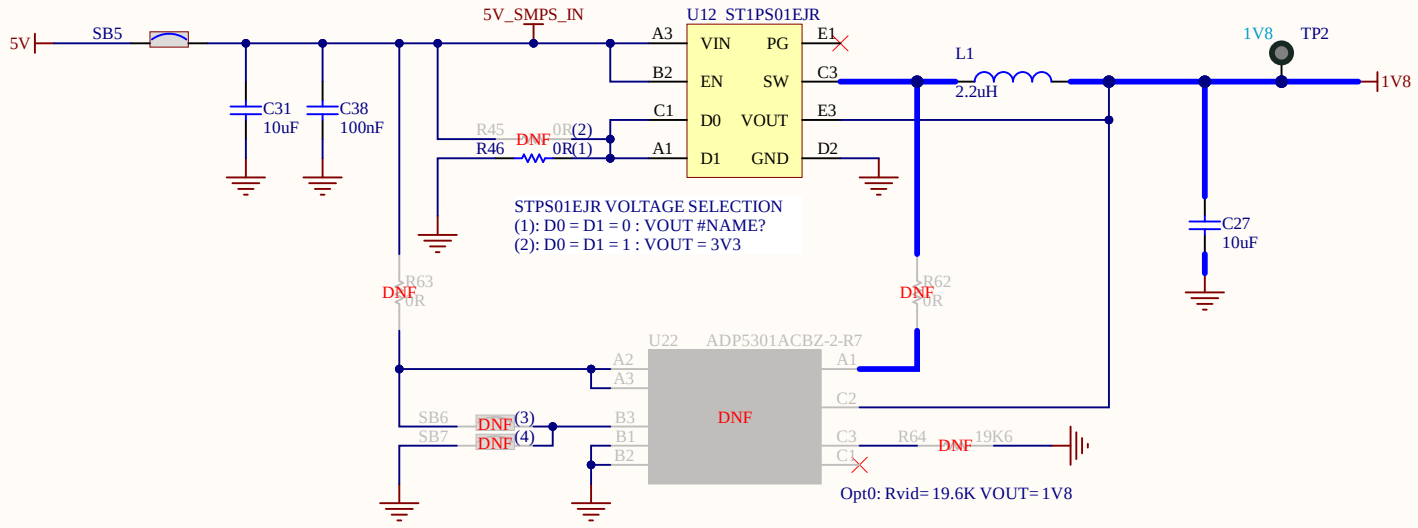


5V PWR SELECTION

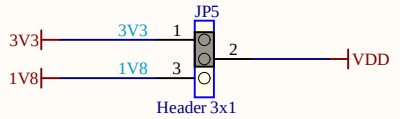


STLK (5V_STLK): 5V from USB-STLINK CONNECTOR WITH VOLTAGE AND CURRENT PROTECTION
VIN (5V_VIN): 5V from ARDUINO VIN (7-12V) WITH VOLTAGE REGULATION TO 5V
E5V (E5V): 5V from MORPHO CONNECTOR
CHGR (VBUS_STLK): 5V from USB-STLINK CONNECTOR WITHOUT VOLTAGE AND CURRENT PROTECTION. CAN BE USED WITH WALL CHARGER.
USB USER (5V_UCPD): 5V from USB USER CONNECTOR

1V8 PWR : 400mA

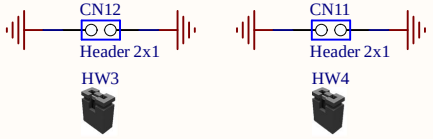


VDD_SELECTION AND CURRENT MEASUREMENT



VDD table	JP5
VDD = 3V3	[1-2]
VDD = 1V8	[2-3]

GND



Title: **Power**		
Project: **Nucleo-64 SMPS**		
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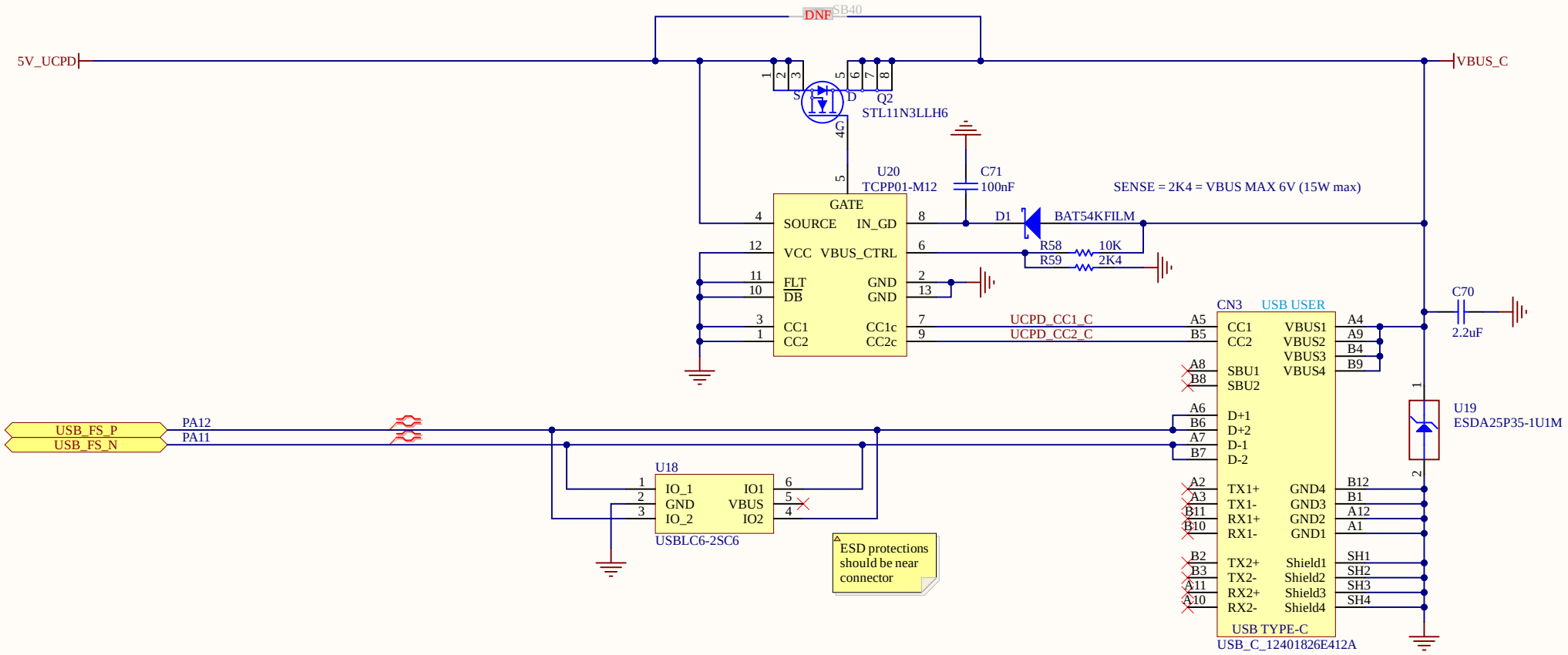
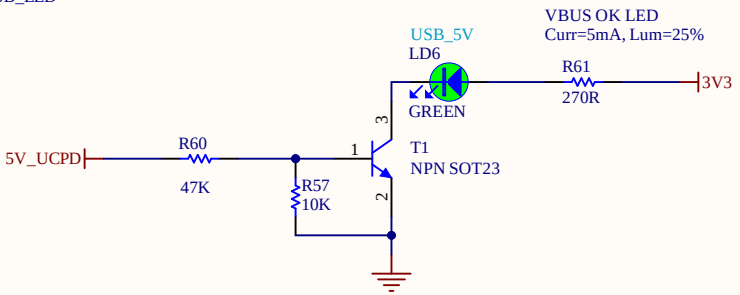
USB USER

USB_TYPE_C SINK ONLY: 2.5W 5V/500mA

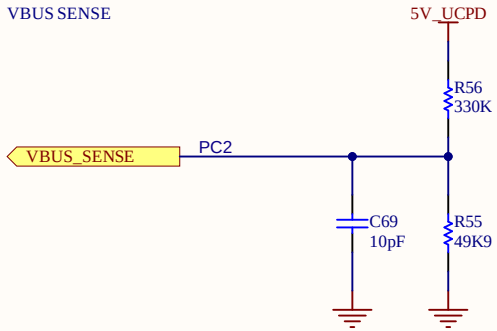
TCPP01 USED AS OVER VOLTAGE PROTECTION



5V_USB_LED



VBUS SENSE



Title: **USB USER**		
Project: **Nucleo-64 SMPS**		
Variant: U545REQ		
Revision: D-01		Reference: MB1841
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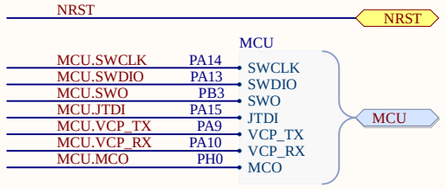
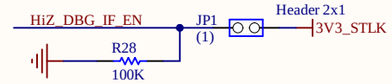
STLINK-V3EC

Interface with Target MCU

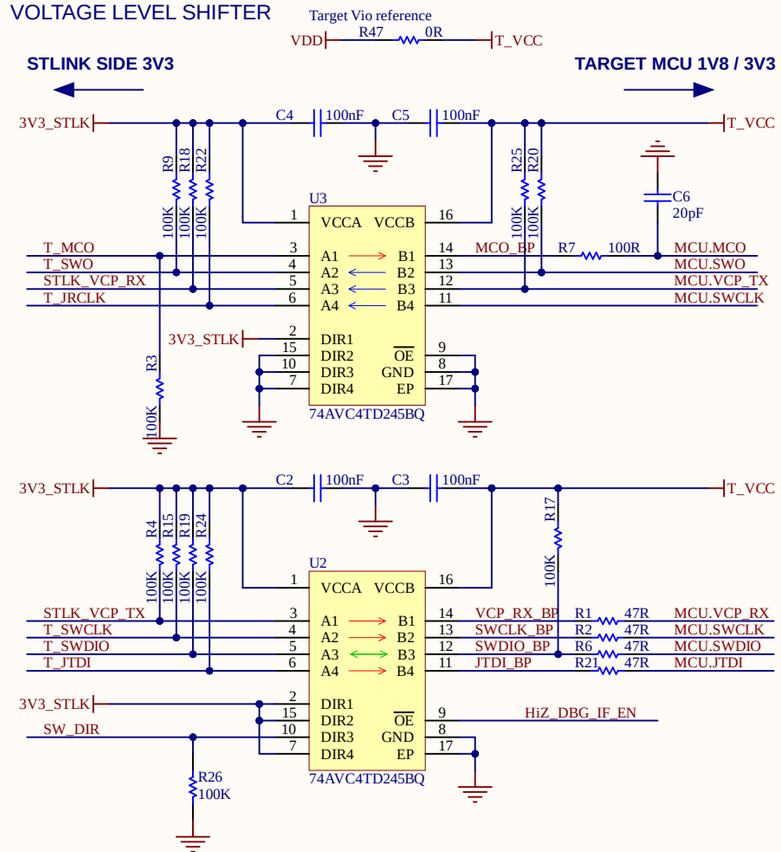


DEBUGGER SELECTION

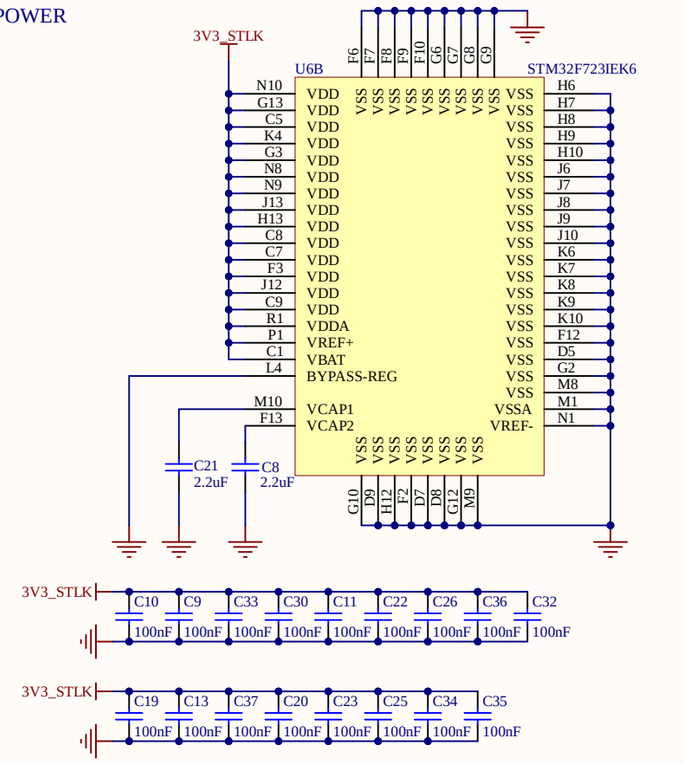


(1): NOT FITTED FOR DEBUG WITH INTERNAL STLINK (DEFAULT)
(1): FITTED FOR DEBUG WITH EXTERNAL DEBUGER
Or Output STLINK IOs isolated (Hight-Z) by driving the Level Shifter NOE pin

VOLTAGE LEVEL SHIFTER



STLINK POWER



5V ST-LINK PROTECTION WITH POWER DELIVERY MANAGEMENT

ST-LINK POWER (3V3/300mA)

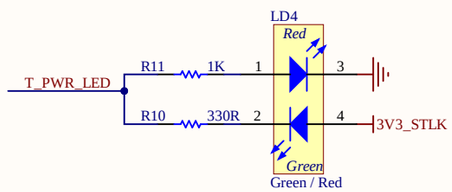
5V ST-LINK PROTECTION LEGACY BACK-UP / 500mA

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

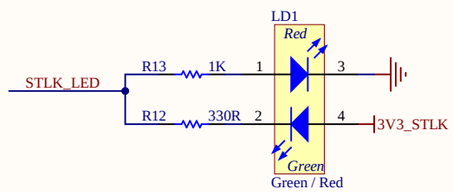
Hi-Z = IO set in high impedance

POWER STATUS LED



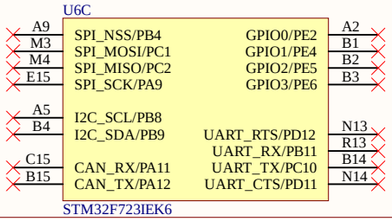
Green / Red

LED STLINK



Green / Red

STLINK UNUSED PART



STM32F723IEK6

BACK-UP FOR CONFIGURATION WITHOUT LS

Main schematic

Title: **STLINK-V3EC**	
Project: **Nucleo-64 SMPS**	
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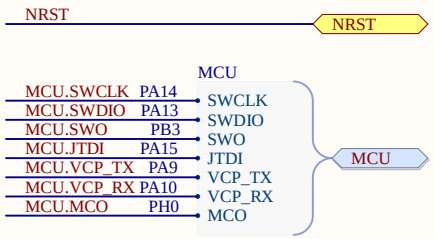
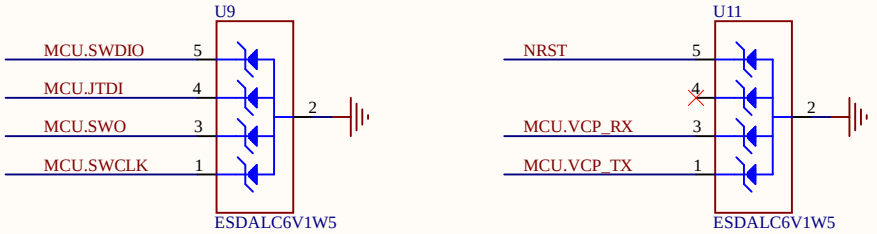
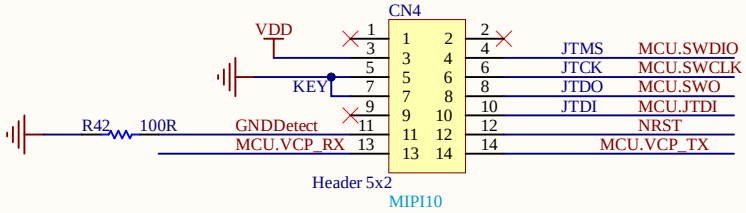
EXTERNAL DEBUGER INTERFACE



ESD PROTECTIONS



STDC14 RECEIVER



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

Title: **External Debuger Interface**		
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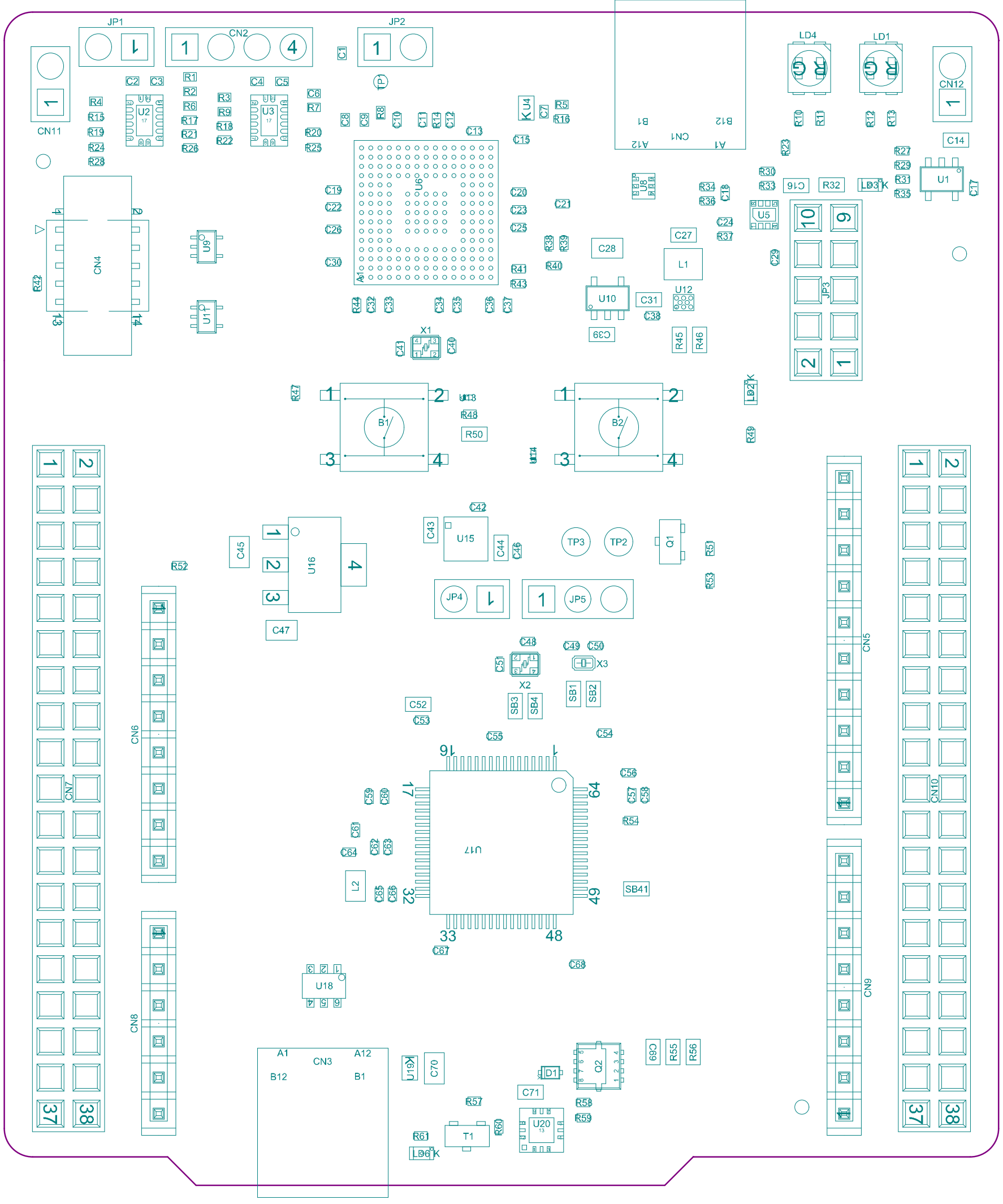
life.augmented



Project: Nucleo-64 SMPS	
Layer: M14-Top Assembly	Gerber: .GM14
Variant: [No Variations]	MB1841
Date: 24-NOV-22	Rev: D

R102
R103
R104
R105
R106
R107
R108
R109

K
D100
R100
K
D101
R62
U22
SB5
R63
R64
SB6
SB7
SB8
SB9
SB10
SB11
SB12
SB13
SB14
SB15
SB16
SB17
SB26
C72
SB25
SB22
SB18
SB19
SB20
SB21
SB23
SB24
SB27
SB28
SB29
SB30
SB31
SB32
SB33
SB39
SB38
SB34
SB35
SB36
SB37
SB40

Project: Nucleo-64 SMPS	
Layer: M15-Bottom Assembly	Gerber:.GM15
Variant: [No Variations]	MB1841
Date: 24-NOV-22	Rev: D