

NUCLEO144_Q (int-SMPS)

MB1549

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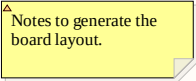
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U_MB1549_Top
MB1549_Top.SchDoc



Legend

- General comment such as function title, configuration, ...
- Text to be added to silkscreen.
- Warning text.



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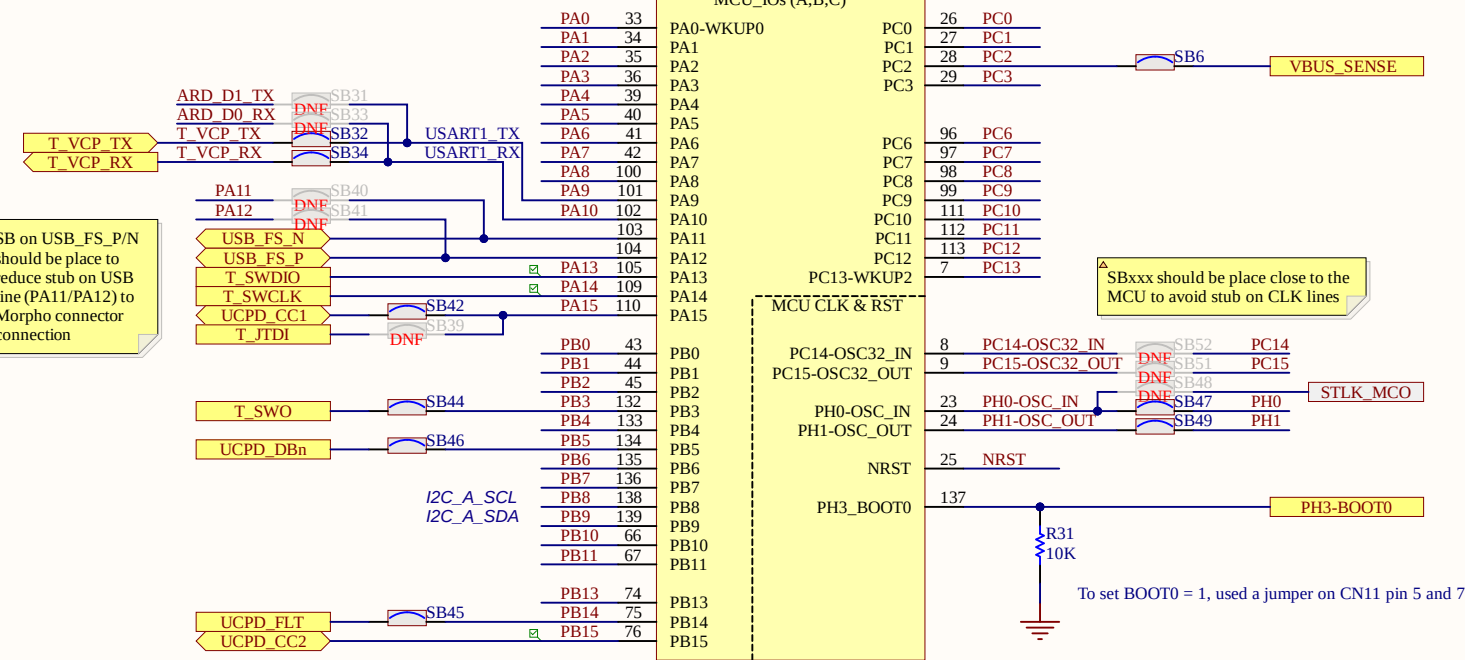
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Title: Project overview		
Project: NUCLEO144_Q (int-SMPS)		
Variant: U575ZIQ		
Revision: C-02	Reference: MB1549	
Size: A4	Date: 26-May-21	Sheet: 1 of 8



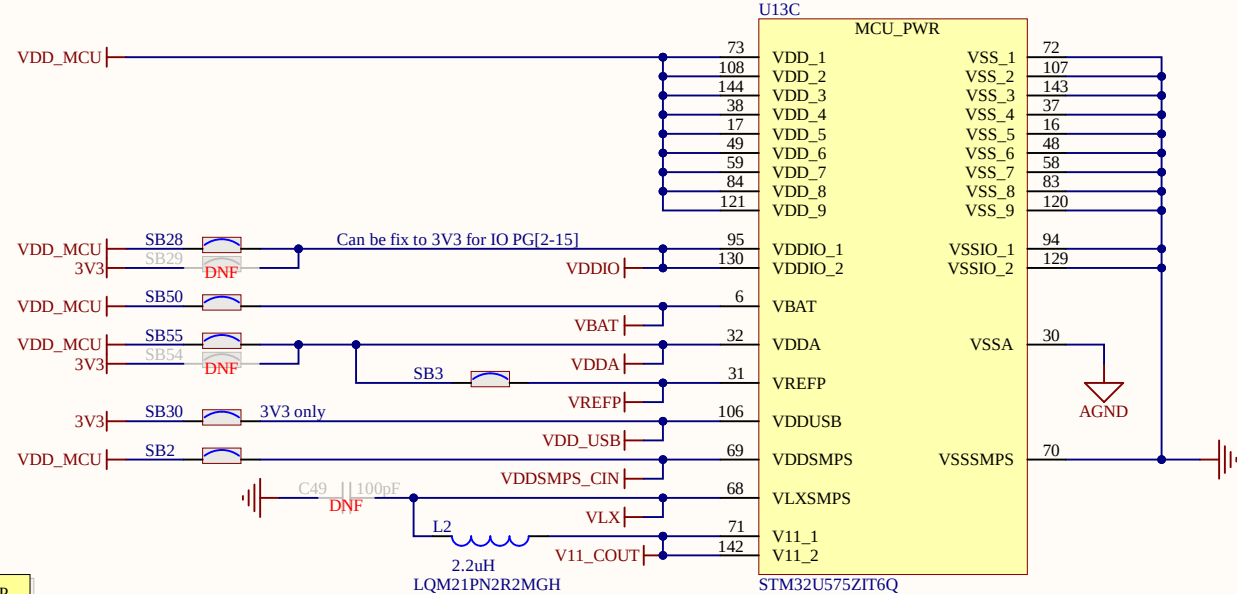
MCU IO CLK and RST



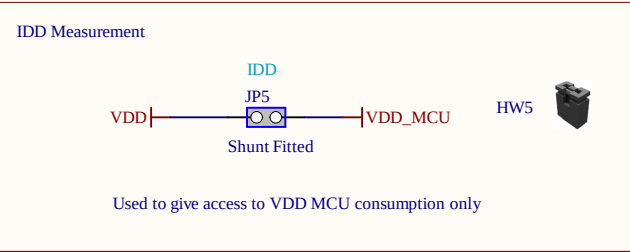
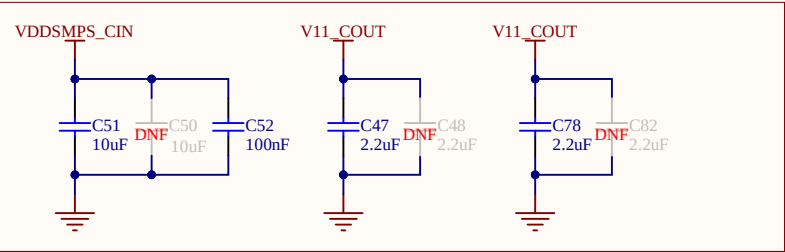
MCU PWR SUPPLIES

Operating range: 1V71<VDD<3V6
Operating range: 1V08<VDDIO<3V6 (only for IO PG[2:15])
Operating range: 1V65<VBAT<3V6
Operating range: 1V62<VDDA<3V6
Operating range: 1V62<VREF<3V6 (depend of VDDA)
Operating range: 1V71<VDDSMPS<3V6

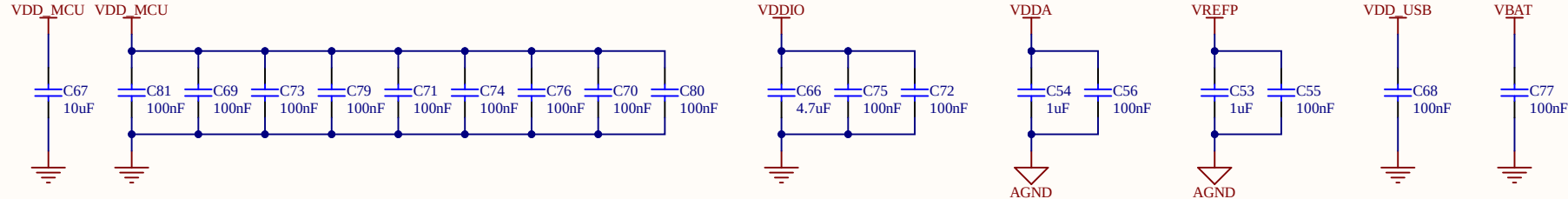
Operating range: 3V0<VDDUSB<3V6



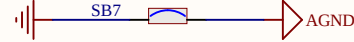
△ "CIN" and "COUT" should be as closed as possible to the LQFP associated pad. COUT 10μF should be place near L4. Or 1 couple of capacitors per pad (4.7μF / 100nF)



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



△ For more detail about decap, please refer to AN5373



EXTENSION CONNECTORS, MCU INTERFACES

3V3 SB18 DNP
1V8 SB16 DNP
VDD SB17

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..3] PH[0..3]
NRST NRST
PH3-BOOT0 PH3-BOOT0

MORPHO CONNECTOR LEFT SIDE

CN11

Pin	Signal	Pin	Signal
1	PC10	2	PC11
3	PC12	4	PD2
5	VDD	6	
7	PH3-BOOT0	8	
9	PF6	10	
11	PF7	12	
13	PA13	14	NRST
15	PA14	16	
17	PA15	18	3V3
19		20	5V
21	PB7	22	
23	PC13	24	
25	PC14	26	
27	PC15	28	
29	PH0	30	PA0
31	PH1	32	PA1
33		34	PA4
35	PC2	36	SB65
37	PC3	38	PC1
39	PD4	40	PC0
41	PD5	42	PD3
43	PD6	44	PG2
45	PD7	46	PG3
47	PE3	48	PE2
49		50	PE4
51	PF1	52	PE5
53	PF0	54	PF2
55	PD1	56	PF8
57	PD0	58	PF9
59	PG0	60	PG1
61	PE1	62	
63	PG9	64	PE6
65	PG12	66	PG15
67		68	PG10
69	PD9	70	PG13

Power Connections:

- VDD: Pin 5
- VBAT: Pin 33
- 5V_EXT: Pin 8
- IOREF: Pin 14
- 3V3: Pin 18
- 5V: Pin 20
- VIN: Pin 24

Other Connections:

- PH3-BOOT0: Pin 7
- NRST: Pin 14
- PA0: Pin 30
- PA1: Pin 32
- PA4: Pin 34
- PC0: Pin 38
- PC1: Pin 36
- PD3: Pin 42
- PG2: Pin 44
- PG3: Pin 46
- PE2: Pin 48
- PE4: Pin 50
- PE5: Pin 52
- PF2: Pin 54
- PF8: Pin 56
- PF9: Pin 58
- PG1: Pin 60
- PE6: Pin 62
- PG15: Pin 64
- PG10: Pin 66
- PG13: Pin 68

Notes:

- SB65 to avoid stub of ADC A3 signals
- DNF (Do Not Fit) for pins 28, 26, 67, 69, 70

Header 35x2

CN13

GND

HW25

ZIO CONNECTOR ARDUINO UNO V3 COMPATIBLE

Arduino Uno compatible

Arduino Uno compatible

PA2 & PB0 shared with QSPI

PA2 & PB0 shared with Arduino_ADC

PE12, PE14, PE15 shared between TIMER for MOTOR-CONTROL and QSPI

MORPHO CONNECTOR RIGHT SIDE

SB19/SB22 to avoid stub of SDMMC signals

The diagram shows the pin connections for the Morpho connector right side. The pins are numbered 1 to 70. The connections are as follows:

- PC9 to SB22 (1), PB8 (3), PB9 (5), and PA5 (9)
- PA6 (13), PA7 (15), PB6 (17), PC7 (19), PA9 (21), PA8 (23), PB10 (25), PB4 (27), PB5 (29), PB3 (31), PA10 (33), PA2 (35), and PA3 (37)
- PD13 (41), PD12 (43), PD11 (45), PE10 (47), PE12 (49), PE14 (51), PE15 (53), PE13 (55), PF13 (57), PF12 (59), and PG14 (61)
- PD10 (65), SB73 (67), and PG4 (69)
- 2 to SB19 (4), PC6 (6), PD8 (10), PA12 (12), PA11 (14), PB11 (18), PB2 (22), PB1 (24), PB15 (26), PB14 (28), PB13 (30), PF5 (36), PF4 (38), PE8 (40), PF10 (42), PE7 (44), PD14 (46), PD15 (48), PF14 (50), PE9 (52), PE11 (54), PF3 (56), PF15 (58), PF11 (62), PE0 (64), SB72 (66), PG5 (68), and PG6 (70)

Component values and connections:

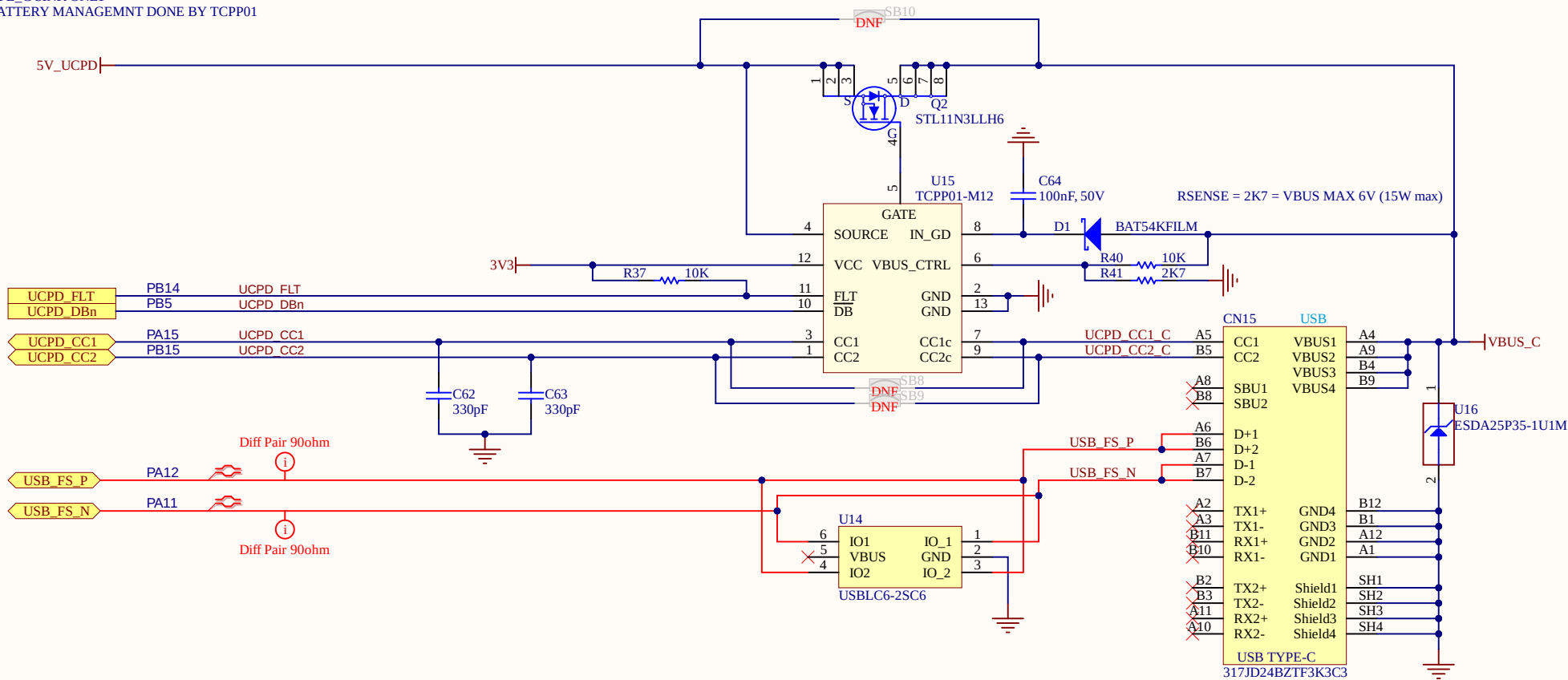
- 5V_USB_STLK to PC6 (6)
- AGND to PB13 (30) and PF5 (36)
- PG8 to SB72 (66)
- HW26 to PG6 (70)

Header 35x2

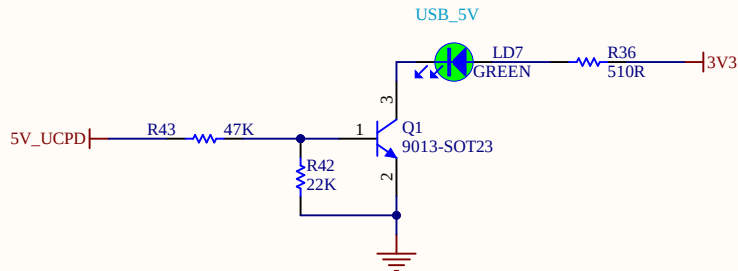
Warning: DNF (Do Not Fit) for pins 6, 18, 36, and 38.

USB_TYPE_C CONNECTOR

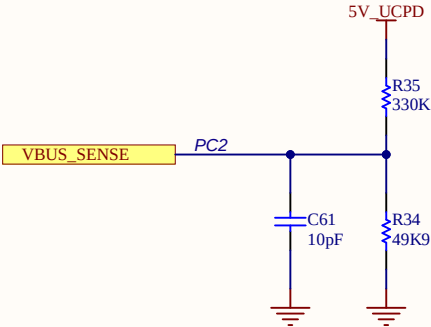
USB_TYPE_C SINK ONLY
DEAD BATTERY MANEMNT DONE BY TCPPO1



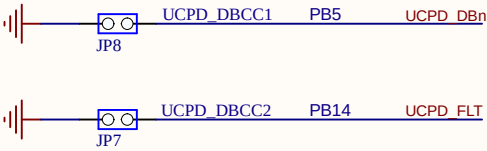
5V_USB_LED



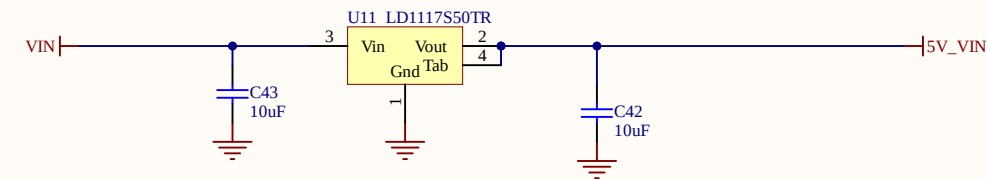
VBUS SENSE



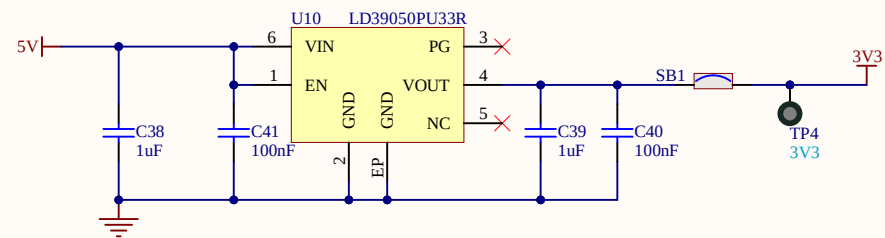
RESERVED FOR DEBUG
DEAD BATTERY MANAGEMENT BY MCU



BOARD PWR: VIN / 5V (output current depend of VIN range)

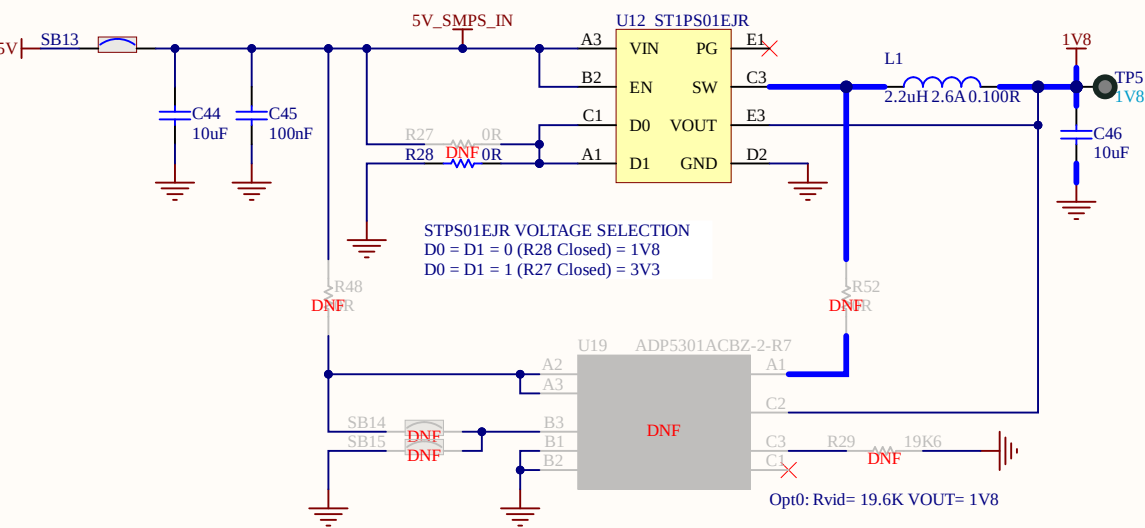


3V3 POWER SOURCE / 500mA



1V8 POWER SOURCE / 400mA

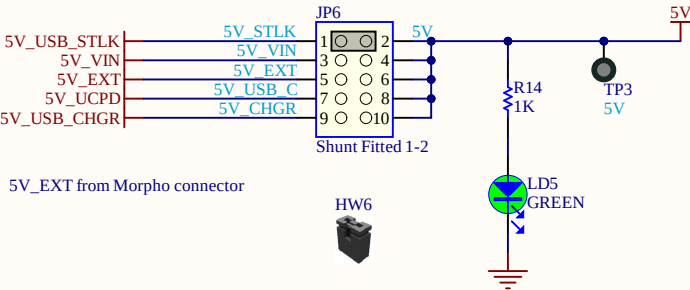
ONLY ONE DEVICE TO BE USED U7 or U101



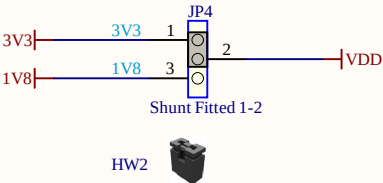
STPS01EJR VOLTAGE SELECTION
D0 = D1 = 0 (R28 Closed) = 1V8
D0 = D1 = 1 (R27 Closed) = 3V3

ADP5301 MODE SELECTION
SYNC/MODE = 1 (SB14 Closed) = HYSTERESIS MODE 50mA
SYNC/MODE = 0 (SB15 Closed) = PWM MODE 500mA

5V PWR SELECTION
MAX CURRENT 500mA WHEN USING POWER INPUT 5V_USB_STLK



VDD_MCU_SELECTION AND CURRENT MEASUREMENT



VDD table	JP4
VDD = 3V3	[1-2]
VDD = 1V8	[2-3]

[illegible]

The schematic shows the connection between the ST-Link V3E SWD interface and the target device's JTAG pins. The target device has pins N10 through L4 on the left side and H6 through N1 on the right side. The ST-Link V3E SWD interface has pins F6 through G9 at the top and G10 through M9 at the bottom.

- VDD Connections:** Pins N10, G13, C5, K4, G3, N8, N9, J13, H13, C8, C7, F3, J12, C9, R1, P1, and C1 are connected to the 3V3_STLK supply voltage.
- VSS Connections:** Pins F6, F7, F8, F9, F10, G6, G7, G8, G9, H6, H7, H8, H9, H10, J6, J7, J8, J9, J10, K6, K7, K8, K9, K10, F12, D5, G2, M8, M1, and N1 are connected to ground.
- BYPASS-REG:** Pin L4 is connected to pin M10.
- VCAP1 and VCAP2:** Pin F13 is connected to pin M10.
- VREF+ and VREF-:** Pin C1 is connected to pin M10. Pin P1 is connected to pin M10.
- ST-Link V3E SWD Interface:** Pins G10 through M9 are connected to the ST-Link V3E SWD interface.

The circuit includes several components: a 10K resistor (R21) connected to the 3V3_STLK supply, two 2.2uF capacitors (C12 and C13) connected to the 3V3_STLK supply, and a 10K resistor (R21) connected to the 3V3_STLK supply.

Diagram illustrating the connections for the MIPI10 on the STDC14 footprint. The connections are as follows:

- Pin 1: T_VCP_RX
- Pin 2: T_SWDIO
- Pin 3: T_SWCLK
- Pin 4: T_SWO
- Pin 5: T_JTDI
- Pin 6: T_NRST
- Pin 7: T_VCP_TX
- Pin 8: T_VCP_TX
- Pin 9: T_VCP_TX
- Pin 10: T_VCP_TX
- Pin 11: T_VCP_RX
- Pin 12: KEY
- Pin 13: VDD
- Pin 14: T_VCP_TX

Specific constraints for T_SWDIO and T_SWCLK (must be same length and must be Shielded).

Pin attributions on ESD can be swapped for layout optimisation

LD_BICOLOR_CMS

The diagram illustrates the PCB layout for a USB Micro-B connector. Key components and features include:

- 5V_USB_CHGR**: A 5V USB charging pin connected to a network of components.
- C6**: A 100pF capacitor connected to pin 1 of U4.
- U4**: An ESDA7P60-1U1M ESD protection diode.
- Capacitor close to pin 1**: A note indicating the placement of capacitor C6.
- USB**: Multiple USB connectors (USB1, USB2, USB3, USB4) connected to the USB_DEV, HS, CN, N, and P pins.
- U3**: An ECMF02-2AMX6 component connected to the USB_DEV, HS, CN, N, and P pins.
- Matched Net Lengths**: A constraint applied to the USB_DEV, HS, CN, N, and P nets, with a tolerance of 2.5mm and impedance constraints of Min = 85.00 and Max = 95.00.
- USB_uB_105017-0001**: The USB Micro-B connector component.

