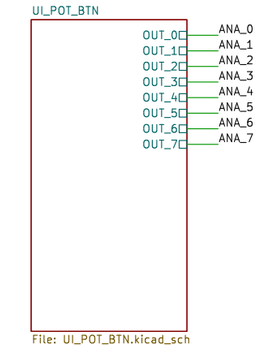

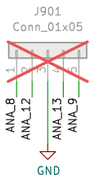

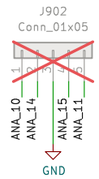

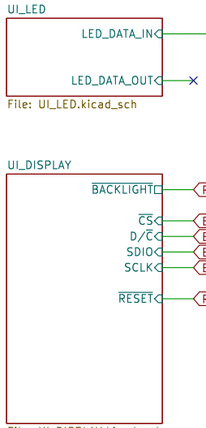

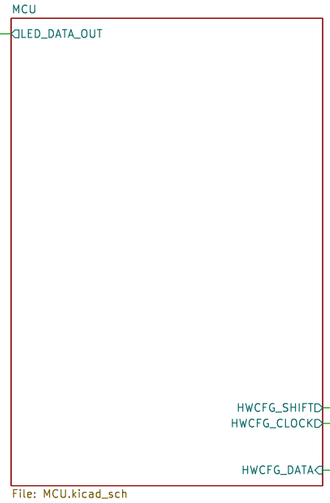

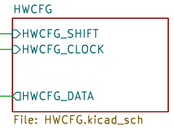

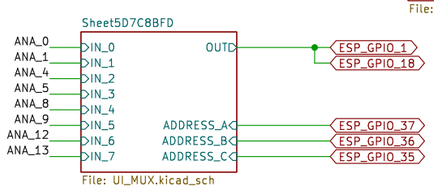

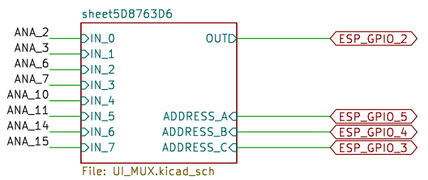

Common Sheets:
500 GRID
600 USB_POWER
700 MCU

Module Specific:
800 HWCFG
900 LED
1000 UI

Sheet: /
File: PCBA-TEK1.kicad_sch

Title:

Size: A3 | Date: | **Rev:**
KiCad E.D.A. 8.0.3 | Id: 1/11

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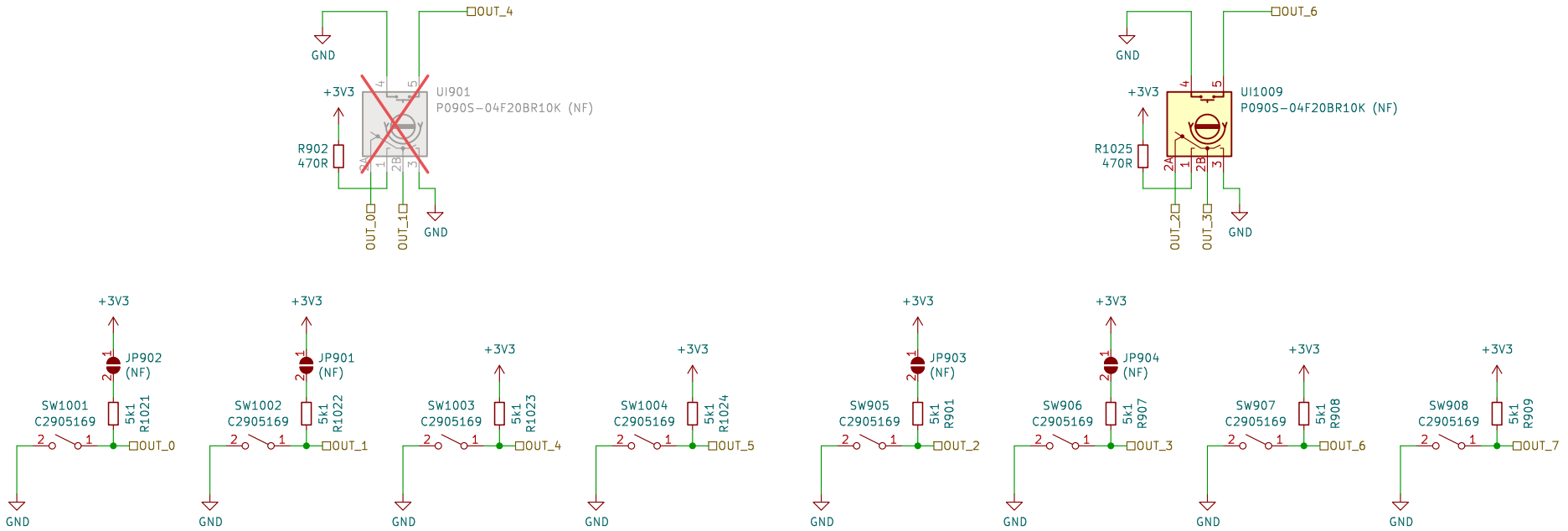

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Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 2/11

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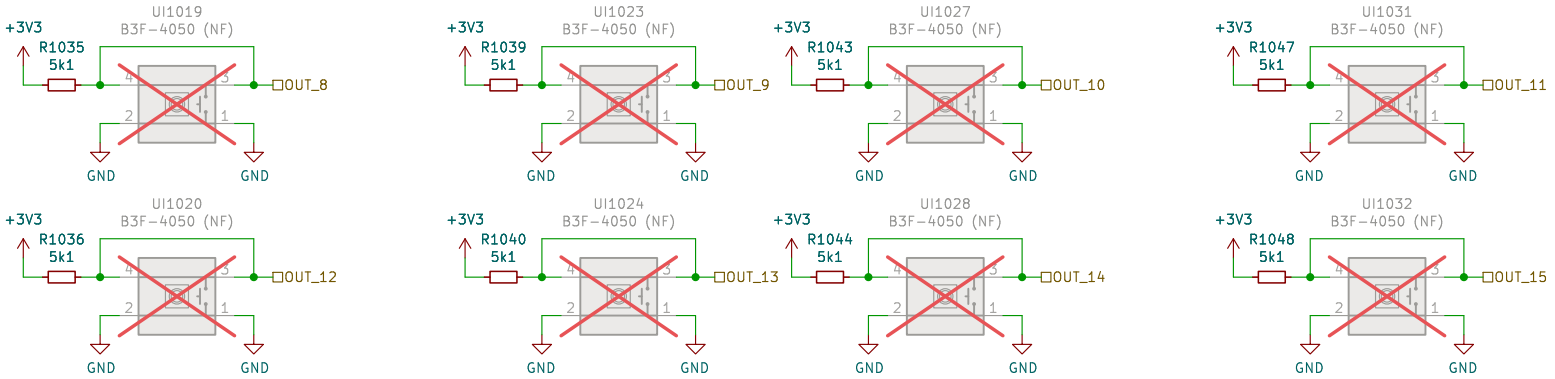
Simulation:

http://tinyurl.com/y229mty4



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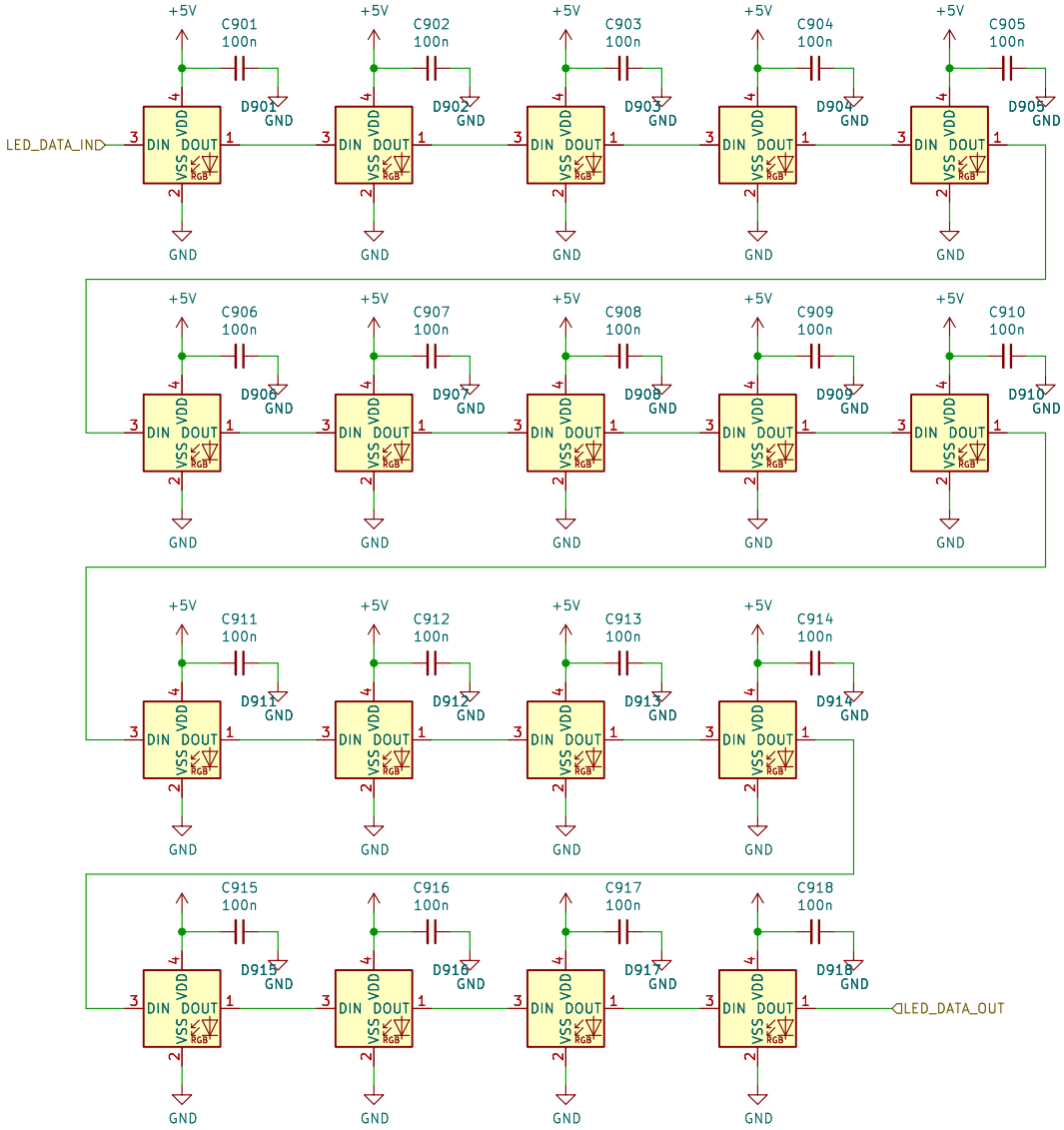
KiCad E.D.A. 8.0.3		Id: 3/11

900



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KiCad E.D.A. 8.0.3		Id: 4/11

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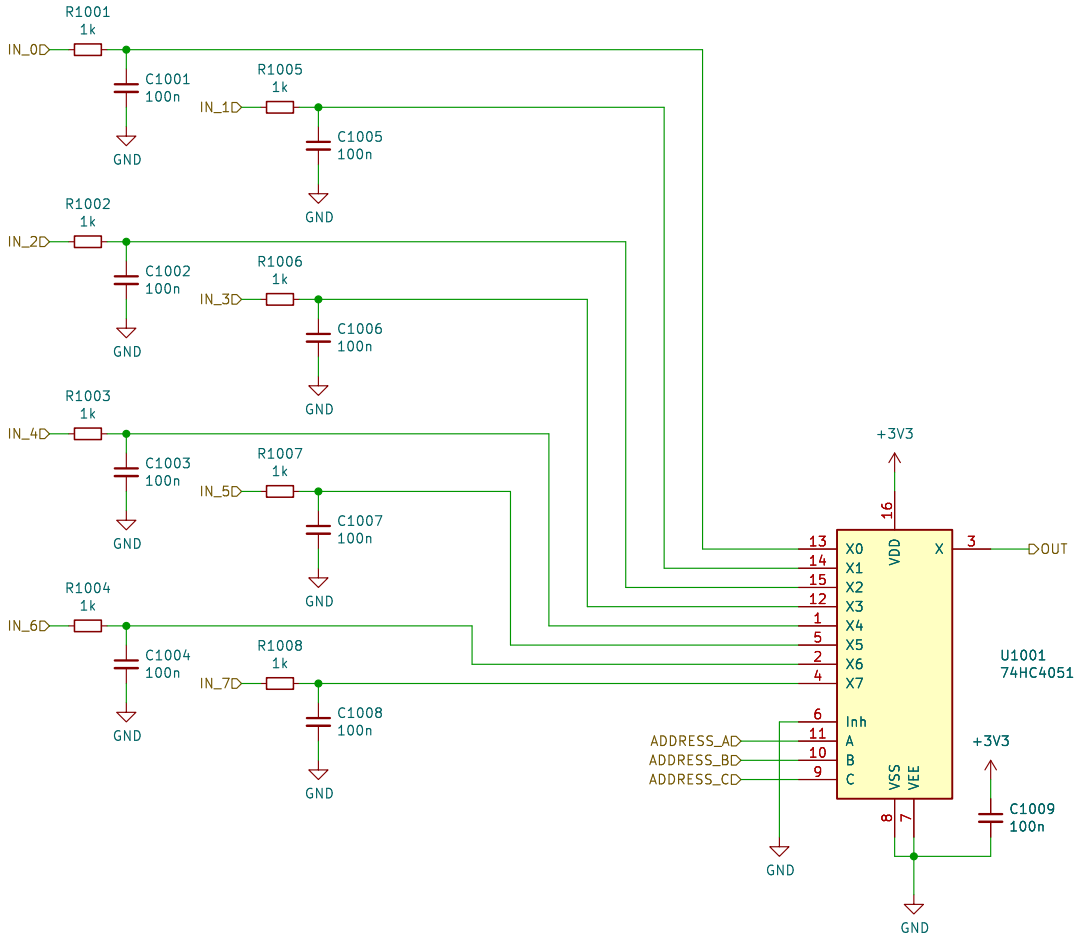

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Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 5/11

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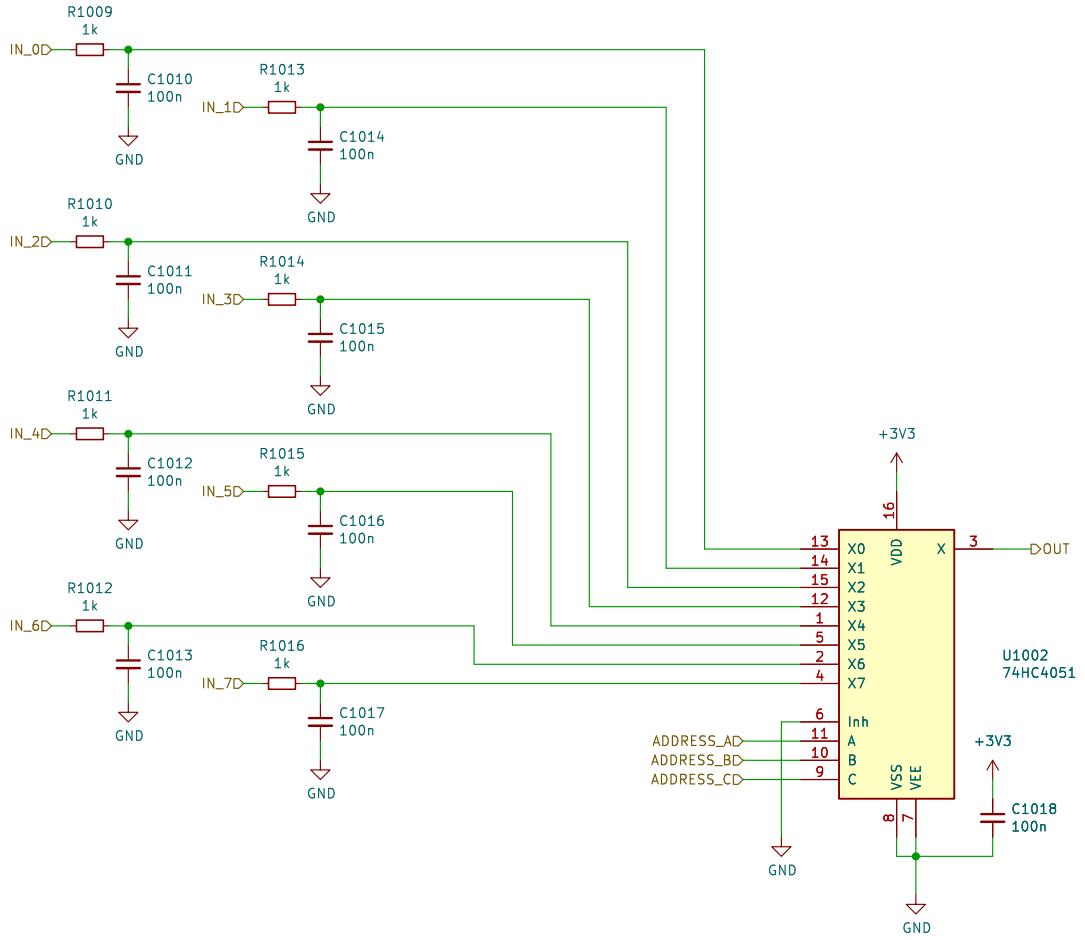

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File: UI_MUX.kicad_sch

Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 6/11

700

Sheet60F06FE1

USB_DP
USB_DN
USB_DATA_P
USB_DATA_N

File: USB_POWER.kicad_sch

+3V3 GZ2012D601TF L702 PWR_FLAG

C743 10u
C746 1u
C747 100n
C749 100n
C751 100n
C752 100n
C753 10n
C754 1u

GND

+3V3 VDD_SPI +3V3 +3V3

J701 C5137195
L701 1n8
U.FL-R-SMT-1(80)
ESP_LNA
C739 3p9
C742 1p8

1.8nH LQG15HS1N8S02D
3.9pF GJM1555C1H3R9WB01D
1.8pF GJM1555C1H1R8BB01D

ESP32-S3FN8

ESP_RESET	4	CHIP_PU	
ESP_LNA	1	LNA_IN	
USB_DN	25	GPIO19	D-
USB_DP	26	GPIO20	D+
SPICS1	28	GPIO26	SPICS1
SPIHD	30	GPIO27	SPIHD
SPIWP	31	GPIO28	SPIWP
SPICS0	32	GPIO29	SPICS0
SPICLK	33	GPIO30	SPICLK
SPIQ	34	GPIO31	SPIQ
SPID	35	GPIO32	SPID
	2	VDD3P3	
	3	VDD3P3	
	20	VDD3P3_RTC	
	29	VDD_SPI	
	46	VDD3P3_CPU	
	55	VDDA1	
	56	VDDA2	
	57	GND	
* GPIO0	5	ESP_BOOT0	
GPIO1	6	ESP_GPIO_1	
GPIO2	7	ESP_GPIO_2	
* GPIO3	8	ESP_GPIO_3	
GPIO4	9	ESP_GPIO_4	
GPIO5	10	ESP_GPIO_5	
GPIO6	11	RP_SPIO_RX	
GPIO7	12	RP_SPIO_CS	
GPIO8	13	RP_SPIO_TX	
GPIO9	14	RP_SPIO_SCK	
GPIO10	15	HWCFG_SHIFT	
GPIO11	16	HWCFG_CLOCK	
GPIO12	17	HWCFG_DATA	
GPIO13	18	RP_SWDIO	
GPIO14	19	RP_SWCLK	
GPIO15	21	RP_CLK	
GPIO16	22	ESP_GPIO_16	
GPIO17	23	RP_INTERRUPT	
GPIO18	24	ESP_GPIO_18	
GPIO21	27	LED_DATA_OUT	
GPIO33	38	ESP_GPIO_33	
GPIO34	39	ESP_GPIO_34	
GPIO35	40	ESP_GPIO_35	
GPIO36	41	ESP_GPIO_36	
GPIO37	42	ESP_GPIO_37	
GPIO38	43	MAP_MODE	
TCK	44	GPIO39	MTCK
TDO	45	GPIO40	MTDO
TDI	47	GPIO41	MTDI
TMS	48	GPIO42	MTMS
U0TXD	49	GPIO43	U0TXD
U0RXD	50	GPIO44	U0RXD
	54	XTAL_P	
	53	XTAL_N	
* GPIO45	51	ESP_GPIO_45	
* GPIO46	52	ESP_GPIO_46	
GPIO47	37	ESP_GPIO_47	
GPIO48	36	ESP_GPIO_48	

40MHz Y701
C748 10p
C750 10p

LCSC:
TXM40M0004322HBCEO00T
S3240000091040JY

U704

Programming Interface

RP_UART0_TX
RP_UART0_RX
U0TXD
U0RXD
1k R733
TMS
TCK
TDO
TDI
Conn_02x05_Odd_Even
J702

Mapmode switch

This pusbutton is acessible through the housing, activates USB bootloader.

+3V3 +3V3
R701 5k1
100n C757
R736 1k
SW701 C255807
MAP_MODE
Internal Pull-up

+3V3
R735 5k1
SW702 C2905169
ESP_RESET
C758 1u

SW703 C2905169
ESP_BOOT0

C731 100n
C732 100n
C733 1u
+1V1
C734 1u
+3V3
C735 100n
C736 100n
C737 100n
C738 100n
C740 100n
C741 100n
C744 100n
C745 100n
R729 5k1
RP_RUN

RP_RUN	26	RUN	
USB_DP	47	USB_DP	
USB_DM	46	USB_DM	
QSPI_SS	56	QSPI_SS	
QSPI_SD0	53	QSPI_SD0	
QSPI_SD1	55	QSPI_SD1	
QSPI_SD2	54	QSPI_SD2	
QSPI_SD3	51	QSPI_SD3	
QSPI_SCLK	52	QSPI_SCLK	
RP_CLK	20	XIN	
	21	XOUT	
RP_SWCLK	24	SWCLK	
RP_SWDIO	25	SWD	
	19	TESTEN	
	57	GND	
	45	VREG_VOUT	
	23	DVDD	
	1	IOVDD	
	48	USB_VDD	
	43	ADC_AVDD	
	44	VREG_IN	
	2	GPIO0	RP_UART0_TX
	3	GPIO1	RP_UART0_RX
	4	GPIO2	GRID_SOUTH_TX
	5	GPIO3	GRID_WEST_RX
	6	GPIO4	GRID_SYNC_2
	7	GPIO5	GRID_WEST_TX
	8	GPIO6	GRID_NORTH_RX
	9	GPIO7	
	11	GPIO8	
	12	GPIO9	
	13	GPIO10	RP_GPIO_10
	14	GPIO11	RP_GPIO_11
	15	GPIO12	TP701 TestPoint
	16	GPIO13	TP702 TestPoint
	17	GPIO14	TP703 TestPoint
	18	GPIO15	TP704 TestPoint
	27	GPIO16	RP_SPIO_RX
	28	GPIO17	RP_SPIO_CS
	29	GPIO18	RP_SPIO_SCK
	30	GPIO19	RP_SPIO_TX
	31	GPIO20	
	32	GPIO21	
	34	GPIO22	RP_INTERRUPT
	35	GPIO23	GRID_NORTH_TX
	36	GPIO24	GRID_EAST_RX
	37	GPIO25	GRID_SYNC_1
	38	GPIO26_ADC0	GRID_EAST_TX
	39	GPIO27_ADC1	GRID_SOUTH_RX
	40	GPIO28_ADC2	
	41	GPIO29_ADC3	

U703
RP2040

GRID Connector

Connector arrays for the interface boards on all four sides of the module.

sheet5D85C9EA

GRID_SYNC_1	GRID_WEST_SYNC_1
GRID_WEST_TX	GRID_WEST_TX
GRID_WEST_RX	GRID_WEST_RX
GRID_SYNC_2	GRID_WEST_SYNC_2
GRID_SYNC_1	GRID_SOUTH_SYNC_1
GRID_SOUTH_TX	GRID_SOUTH_TX
GRID_SOUTH_RX	GRID_SOUTH_RX
GRID_SYNC_2	GRID_SOUTH_SYNC_2
GRID_SYNC_1	GRID_EAST_SYNC_1
GRID_EAST_TX	GRID_EAST_TX
GRID_EAST_RX	GRID_EAST_RX
GRID_SYNC_2	GRID_EAST_SYNC_2
GRID_SYNC_1	GRID_NORTH_SYNC_1
GRID_NORTH_TX	GRID_NORTH_TX
GRID_NORTH_RX	GRID_NORTH_RX
GRID_SYNC_2	GRID_NORTH_SYNC_2

File: GRID.kicad_sch

VDD_SPI
R904 5k1
SPICS1
VDD_SPI
U903
ESP-PSRAM32

SPICLK	6	SCLK	
SPIHD	7	SIO3	
SPIWP	3	SIO2	
SPID	5	SI/SIO	
SPIQ	2	SO/SIO	
	1	CE	
	8	VCC	
	4	VSS	

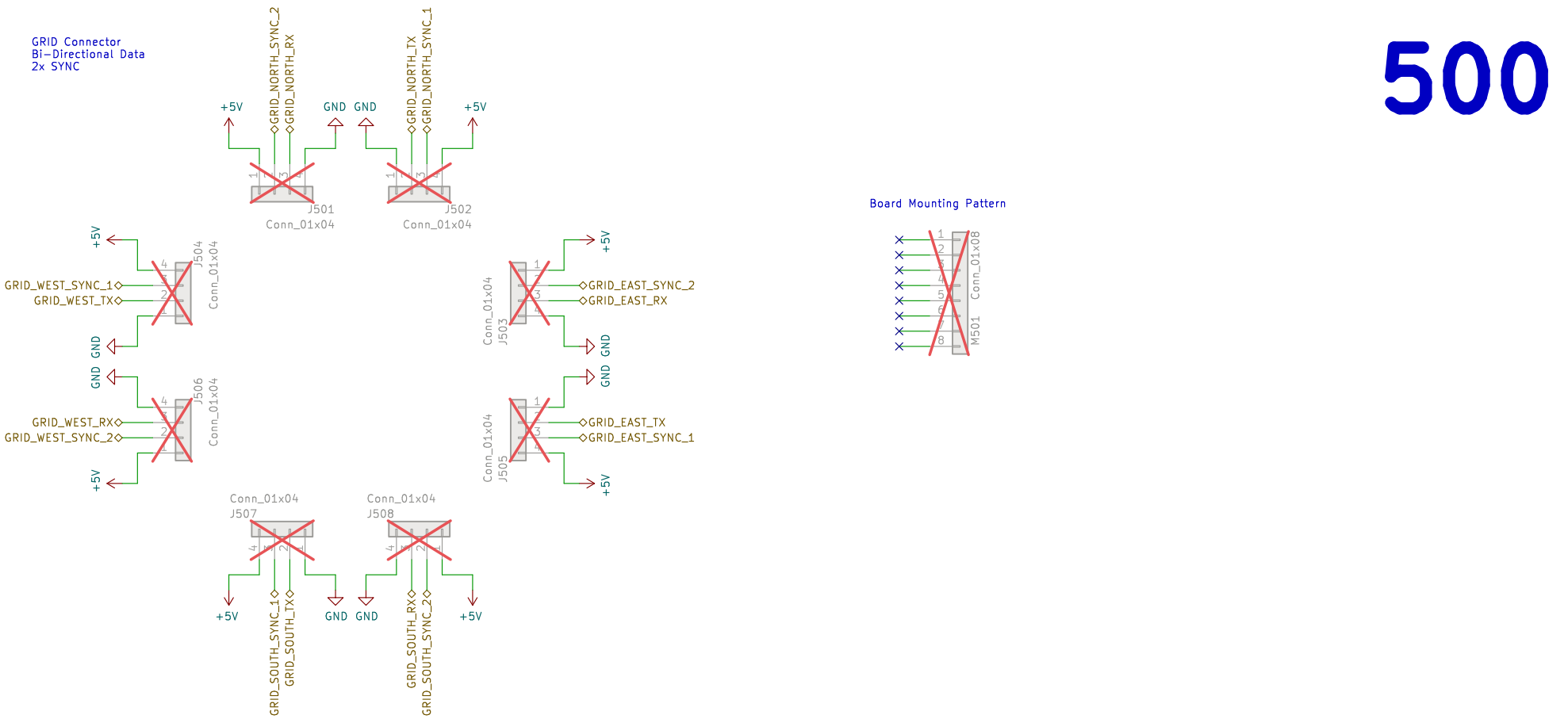
C921 100n
J799 Conn_01x02

QSPI Flash memory

This memory can be accessed throgh the QSPI interface of the MCU. Can be used for configuration, static data or program execution.

VDD_SPI VDD_SPI
R734 5k1
U705
W25Q64JVSSIQ
SPICS0
SPICLK
SPID
SPIQ
SPIWP
SPIHD
C755 1u
C756 100n

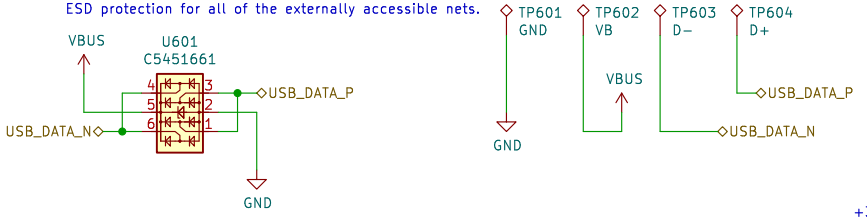
Sheet: /MCU/
File: MCU.kicad_sch
Title:
Size: A3 Date: Rev:
KiCad E.D.A. 8.0.3 Id: 7/11


GRID Connector
Bi-Directional Data
2x SYNC
+5V
GRID_NORTH_SYNC_2
GRID_NORTH_RX
GND GND
GRID_NORTH_TX
GRID_NORTH_SYNC_1
+5V
J501
Conn_01x04
J502
Conn_01x04
+5V
GRID_WEST_SYNC_1
GRID_WEST_TX
GND
J504
Conn_01x04
GND
GRID_WEST_RX
GRID_WEST_SYNC_2
+5V
J506
Conn_01x04
Conn_01x04
J503
+5V
GRID_EAST_SYNC_2
GRID_EAST_RX
GND GND
Conn_01x04
J505
GND
GRID_EAST_TX
GRID_EAST_SYNC_1
+5V
Conn_01x04
J507
Conn_01x04
J508
+5V
GND GND
+5V
GRID_SOUTH_SYNC_1
GRID_SOUTH_TX
GRID_SOUTH_RX
GRID_SOUTH_SYNC_2
Board Mounting Pattern
M501
Conn_01x08
500
Sheet: /MCU/sheet5D85C9EA/
File: GRID.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 8.0.3
Id: 8/11

600

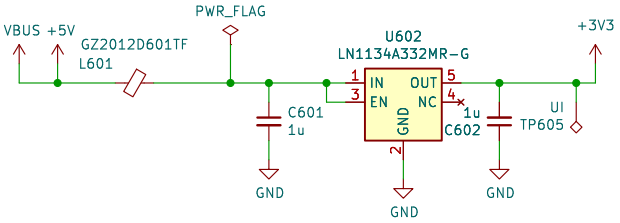
ESD Diodes

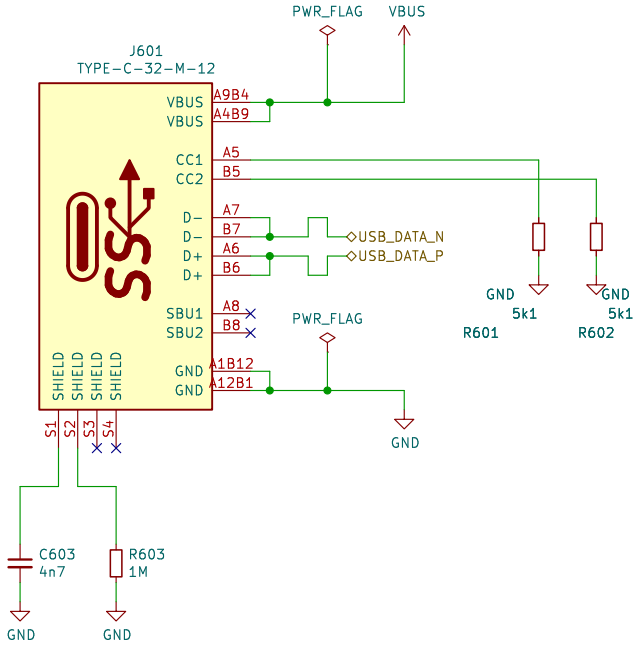
ESD protection for all of the externally accessible nets.



+3V3 LDO Regulators

Regulators for generating independent power rails for the microcontroller and the user interface.





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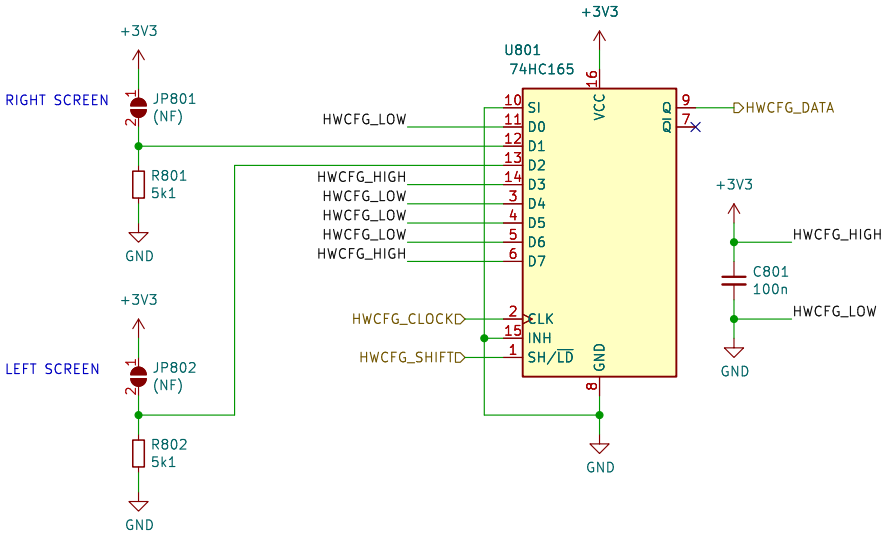
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 9/11

800



Board Identification

Grid firmware can identify the hardware and the board revision thorugh a 3 wire serial interface using one or more shift register as read only memory. The content of the memory is defined by pulling the inputs high or low through pcb traces or solderable configuration jumpers.

4b'Model + 4b'Revision + nb'Reserved (Multiple shift registers)

D0: MODEL (LSB)
D1: MODEL
D2: MODEL
D3: MODEL (MSB)
D4: REVISION (LSB)
D5: REVISION
D6: REVISION
D7: REVISION (MSB)

Model Codes (D3–D0):

Po16 0000
Bo16 0001
PBF4 0010
EN16 0011
...

Revision Codes (D7–D4):

RevA 0000
RevB 0001
RevC 0010
RevD 0011
...

Sheet: /HWCFG/		
File: HWCFG.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 10/11

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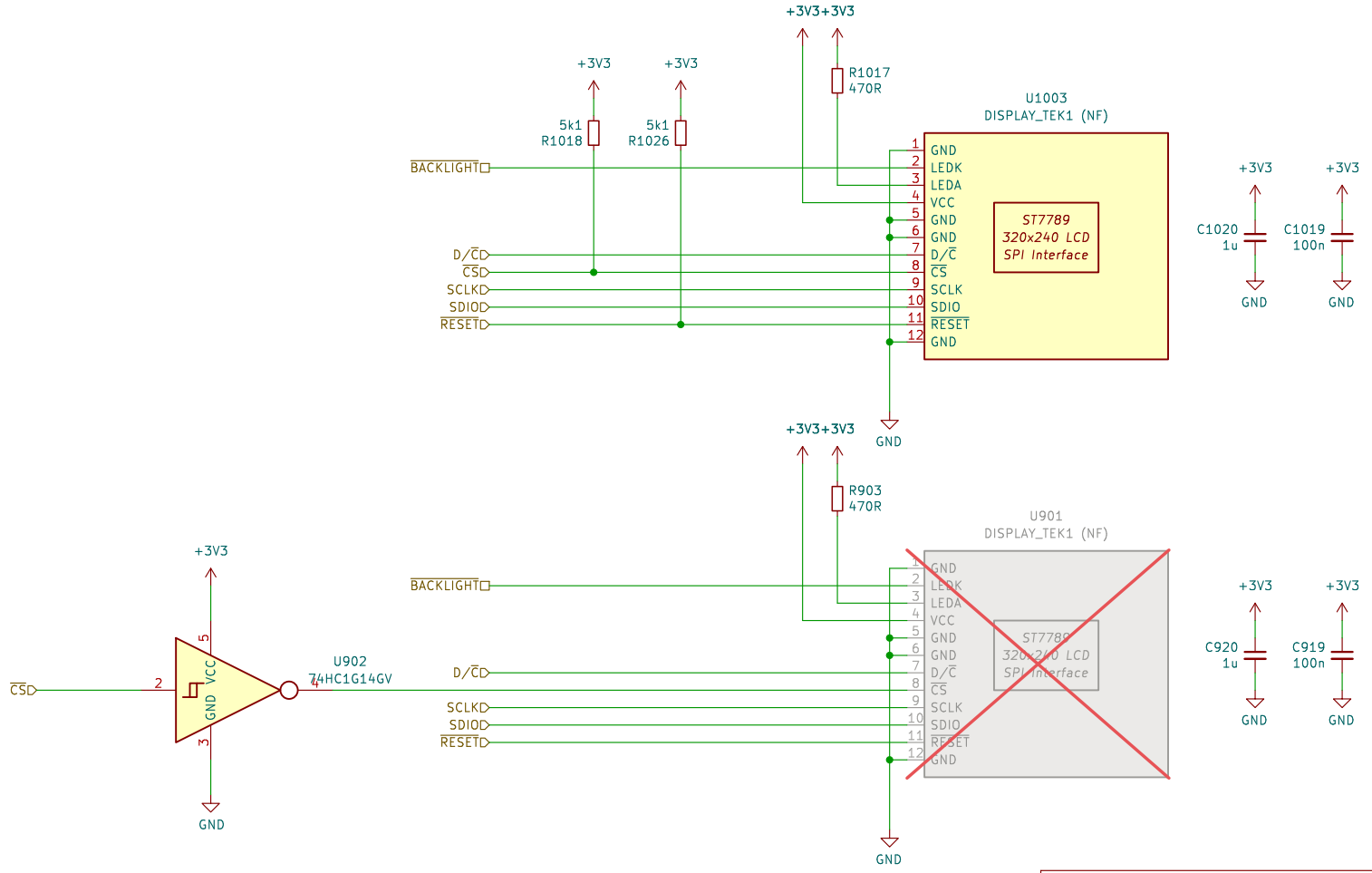

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Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.3		Id: 11/11