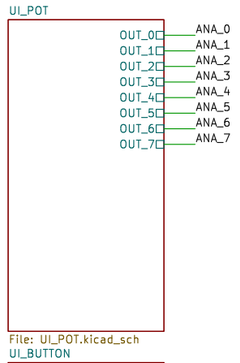
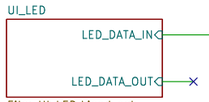
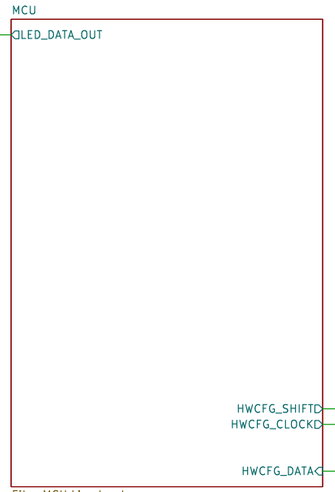
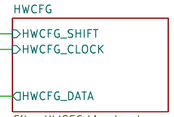
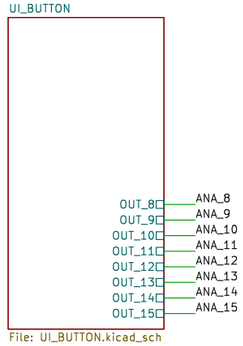
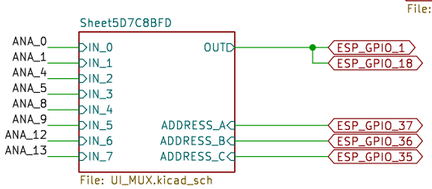


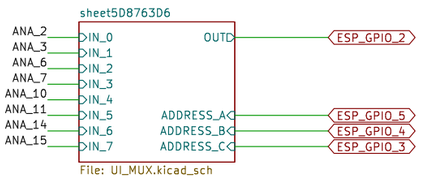












Common Sheets:
500 GRID
600 USB_POWER
700 MCU

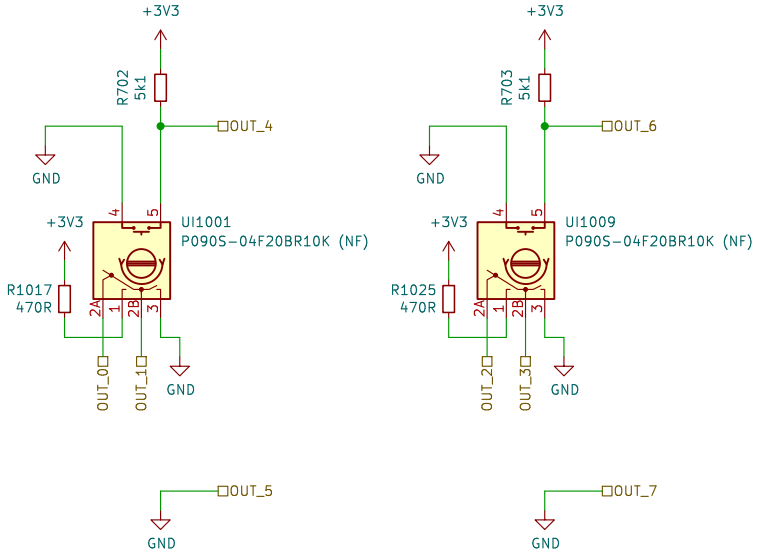
Module Specific:
800 HWCFG
900 LED
1000 UI

Sheet: /
File: PCBA-TEK2.kicad_sch

Title:

Size: A3 | Date: | **Rev:**
KiCad E.D.A. 8.0.6 | Id: 1/10

1000



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Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 2/10

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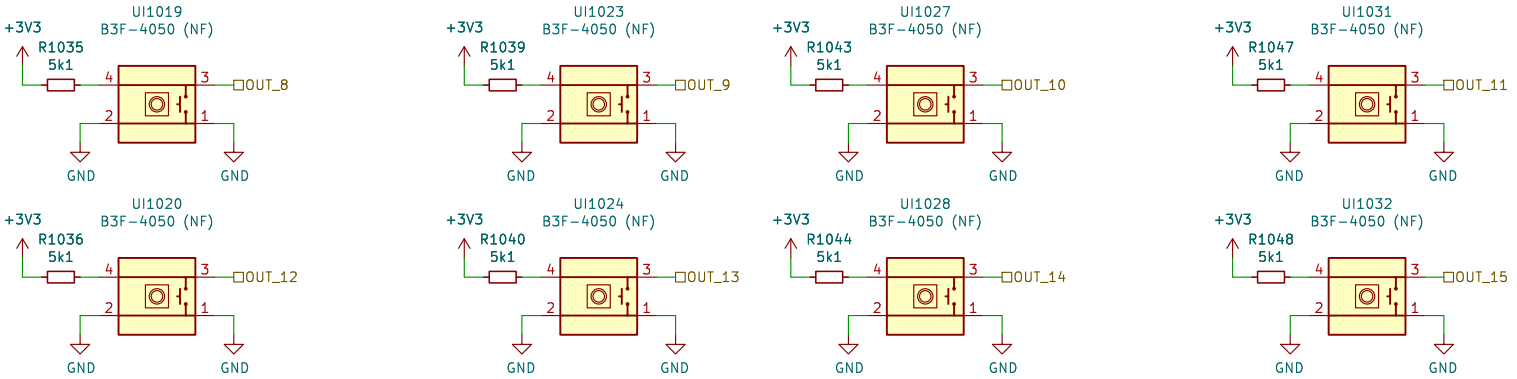
Simulation:

http://tinyurl.com/y229mty4



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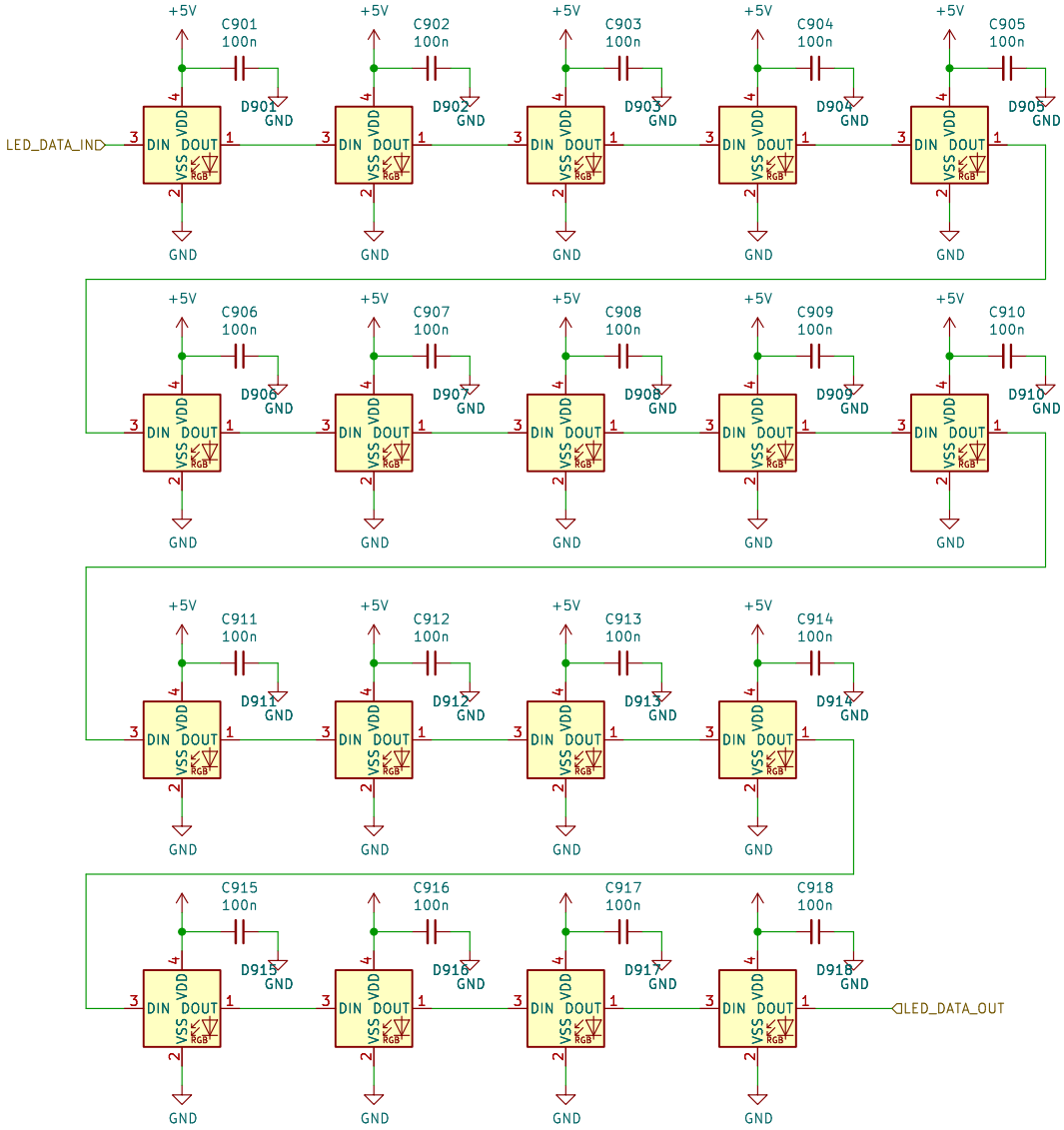
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 3/10

900



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KiCad E.D.A. 8.0.6		Id: 4/10

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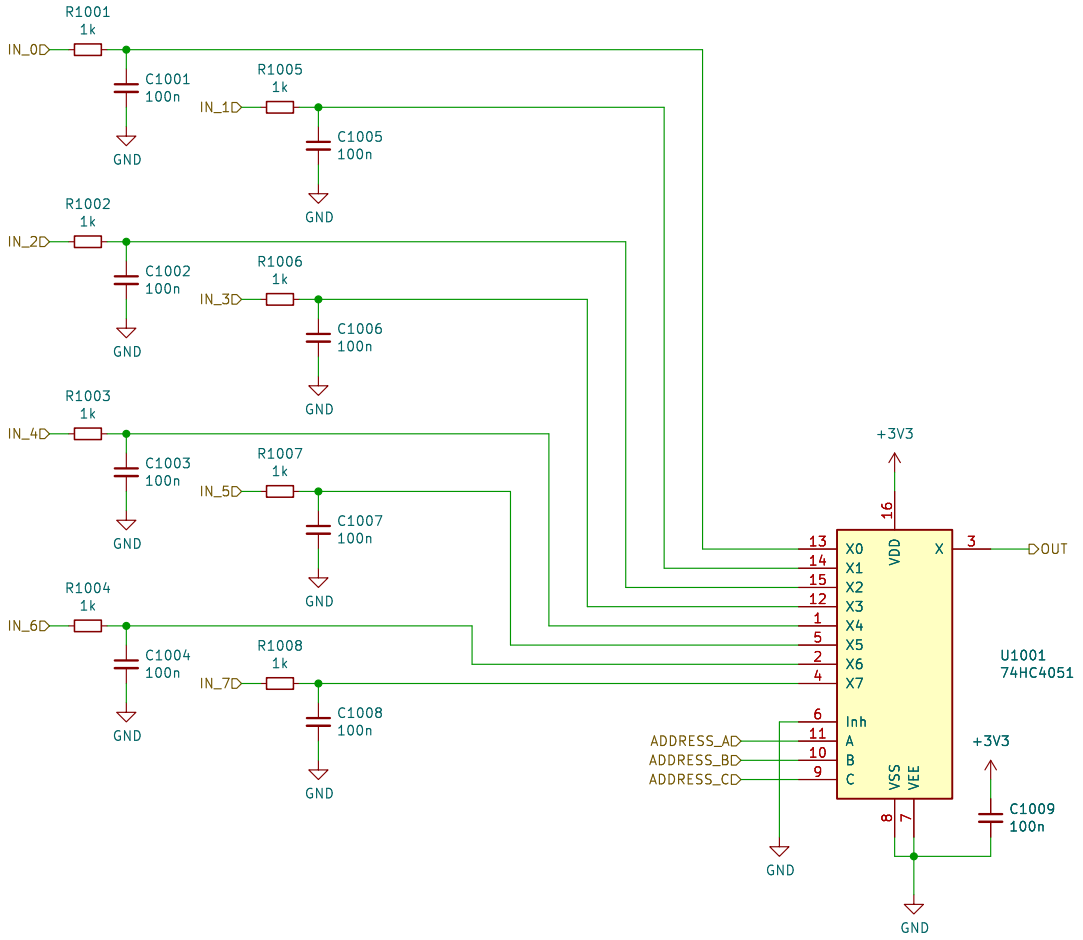

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Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 5/10

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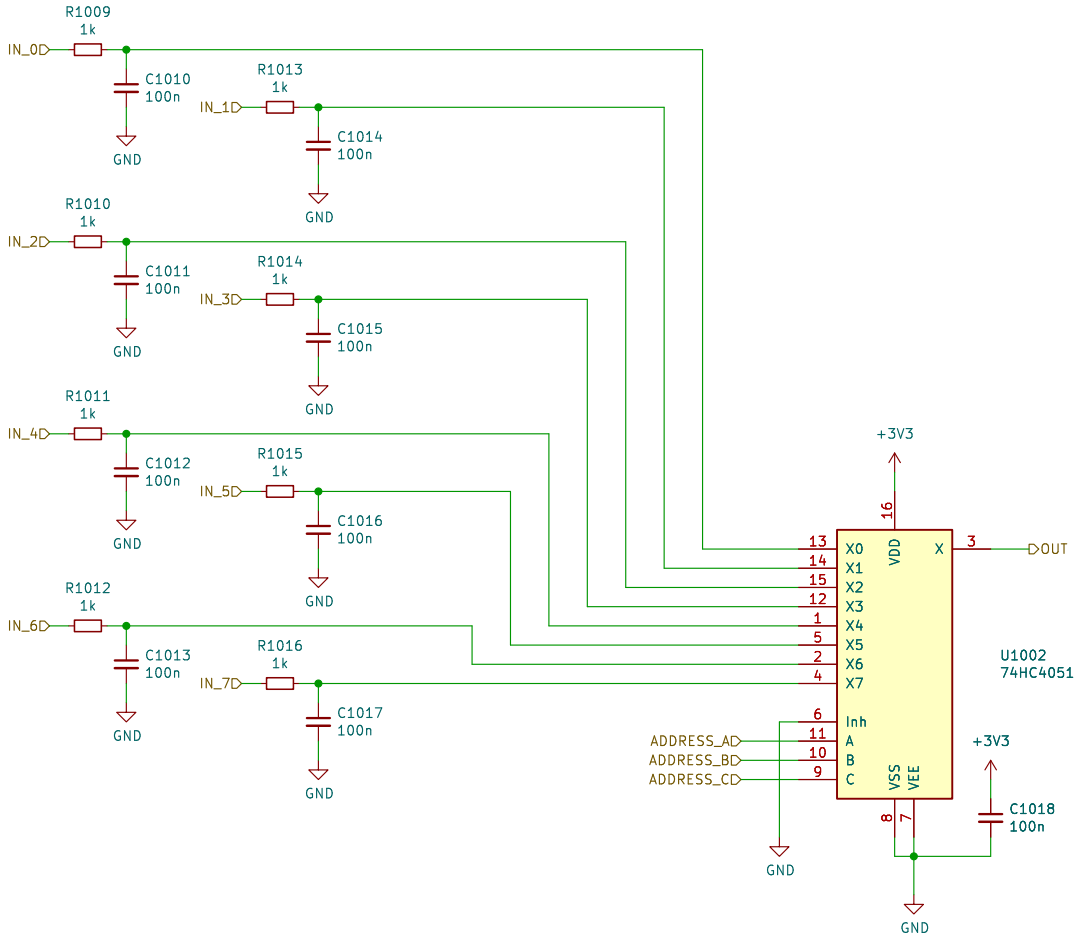

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Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 6/10

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

+3V3 VDD_SPI +3V3 +3V3

GND

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+	
SPIHD	28	GPIO26 SPICS1	
SPIWP	30	GPIO27 SPIHD	
SPICS0	31	GPIO28 SPIWP	
SPICLK	32	GPIO29 SPICS0	
SPIQ	33	GPIO30 SPICLK	
SPID	34	GPIO31 SPIQ	
	35	GPIO32 SPID	
40MHz Y701	54	XTAL_P	
	53	XTAL_N	
TCK	44	GPIO39 MTCK	
TDO	45	GPIO40 MTDO	
TDI	47	GPIO41 MTDI	
TMS	48	GPIO42 MTMS	
U0TXD	49	GPIO43 U0TXD	
U0RXD	50	GPIO44 U0RXD	
	57	GND	

VDD3P3 2, VDD3P3 3, VDD3P3_RTC 20, VDD_SPI 29, VDD3P3_CPU 46, VDDA1 55, VDDA2 56

* 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
*GPIO45	51	ESP_GPIO_45
*GPIO46	52	ESP_GPIO_46
GPIO47	37	ESP_GPIO_47
GPIO48	36	ESP_GPIO_48

U704

LCSC: TXM40M0004322HBCEO00T
S3240000091040JY

C748 10p
C750 10p

ESP_GPIO_47 TP706 TestPoint
ESP_GPIO_48 TP707 TestPoint
ESP_GPIO_34 TP708 TestPoint
ESP_GPIO_33 TP709 TestPoint
TP710 TestPoint

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.

R701 5k1
100n C757
R736 1k
SW701 C255807
MAP_MODE

Internal Pull-up

R735 5k1
SW702 C2905169
ESP_RESET
C758 1u

SW703 C2905169
ESP_BOOT0

+1V1 +3V3

C731 100n
C732 100n
C733 1u
C734 1u
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	

VREG_VOUT 45, DVDD 23, IOVDD 1, USB_VDD 48, ADC_AVDD 43, VREG_IN 44

GPIO0	2	RP_UART0_TX
GPIO1	3	RP_UART0_RX
GPIO2	4	GRID_SOUTH_TX
GPIO3	5	GRID_WEST_RX
GPIO4	6	GRID_SYNC_2
GPIO5	7	GRID_WEST_TX
GPIO6	8	GRID_NORTH_RX
GPIO7	9	
GPIO8	11	
GPIO9	12	
GPIO10	13	
GPIO11	14	
GPIO12	15	TP701 TestPoint
GPIO13	16	TP702 TestPoint
GPIO14	17	TP703 TestPoint
GPIO15	18	TP704 TestPoint
GPIO16	27	RP_SPIO_RX
GPIO17	28	RP_SPIO_CS
GPIO18	29	RP_SPIO_SCK
GPIO19	30	RP_SPIO_TX
GPIO20	31	
GPIO21	32	
GPIO22	34	RP_INTERRUPT
GPIO23	35	GRID_NORTH_TX
GPIO24	36	GRID_EAST_RX
GPIO25	37	GRID_SYNC_1
GPIO26_ADC0	38	GRID_EAST_TX
GPIO27_ADC1	39	GRID_SOUTH_RX
GPIO28_ADC2	40	
GPIO29_ADC3	41	

TP705 TestPoint

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

J799 Conn_01x02

QSPI Flash memory

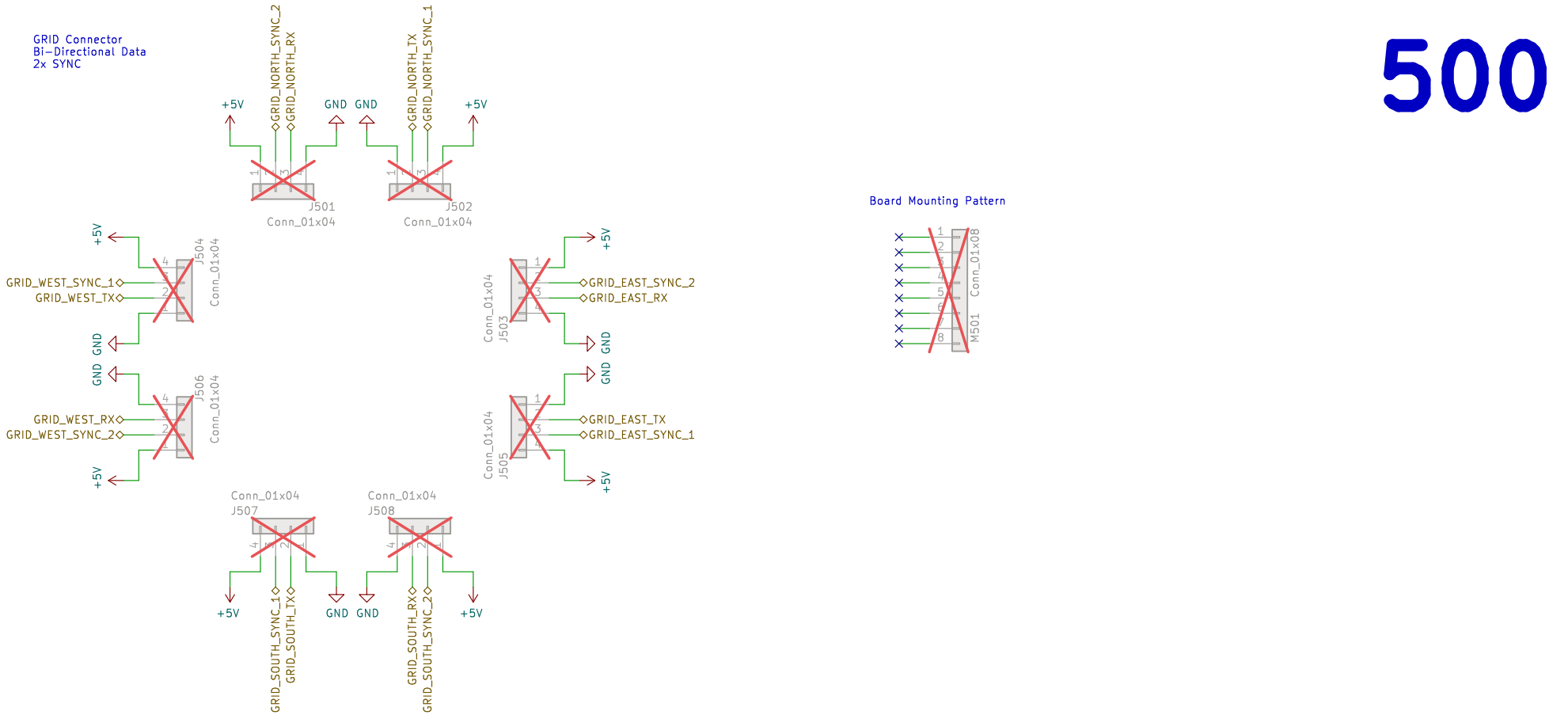
This memory can be accessed throgh the QSPI interface of the MCU. Can be used for configuration, static data or program execution.

R734 5k1
U705 W25Q64JVSSIQ

SPICS0	1	CS
SPIQ	2	DO(IO1)
SPIWP	3	IO2
GND	4	GND
SPID	5	DI(IO0)
SPICLK	6	CLK
SPIHD	7	IO3
	8	VCC

C755 1u
C756 100n

Sheet: /MCU/			
File: MCU.kicad_sch			
Title:			
Size: A3	Date:		**Rev:**
KiCad E.D.A. 8.0.6			Id: 7/10



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Sheet: /MCU/sheet5D85C9EA/
File: GRID.kicad_sch

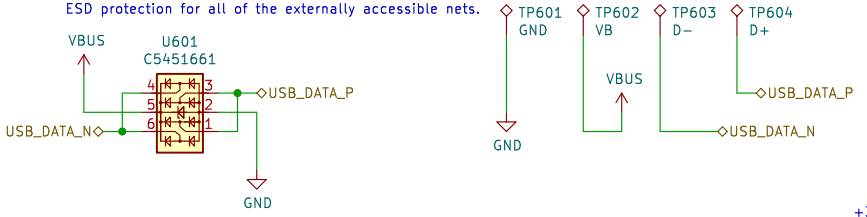
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 8/10

600

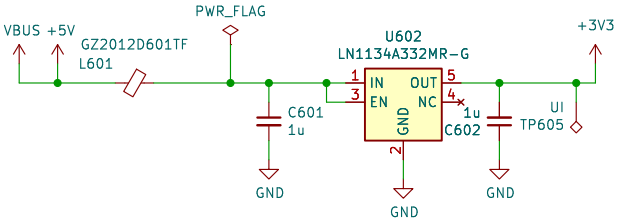
ESD Diodes

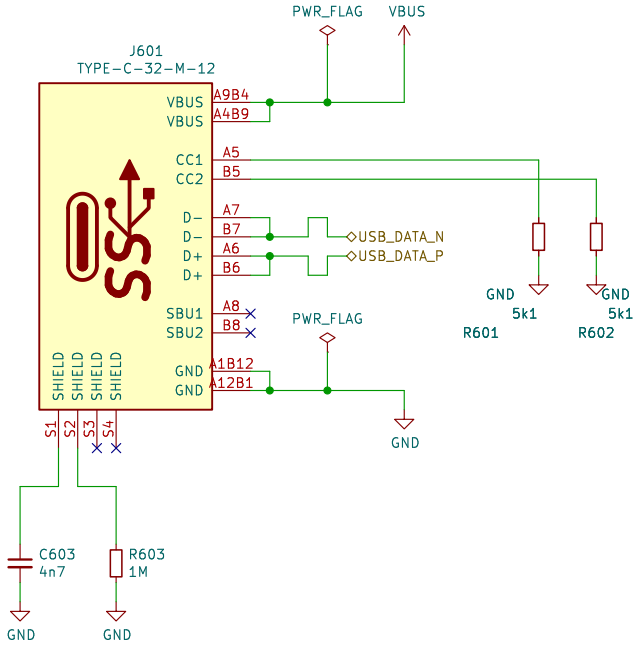
ESD protection for all of the externally accessible nets.



+3V3 LDO Regulators

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





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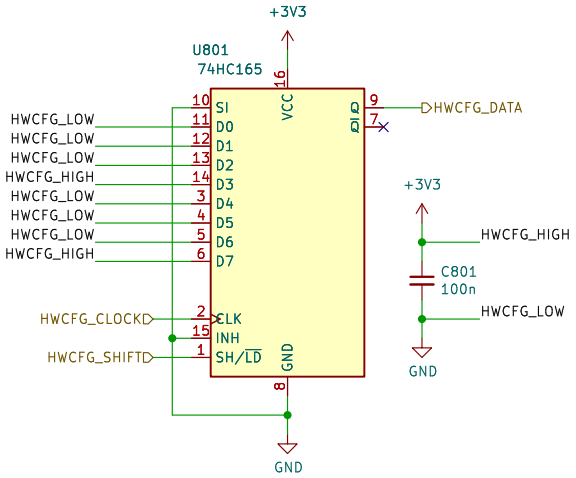
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 9/10

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. 8.0.6		Id: 10/10