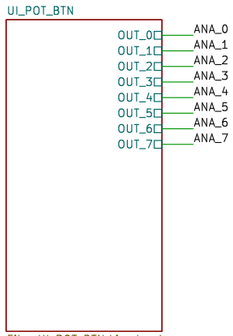
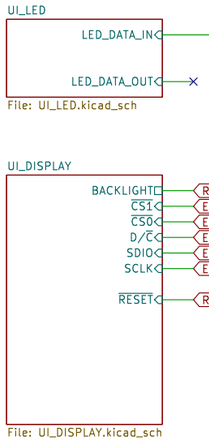
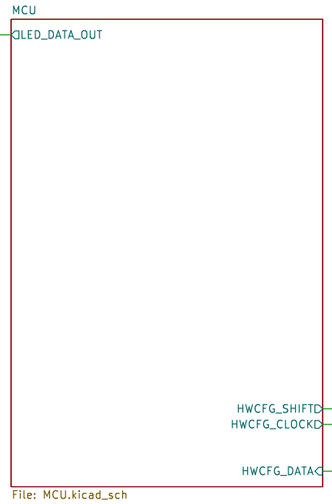


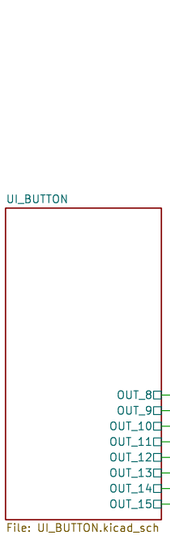


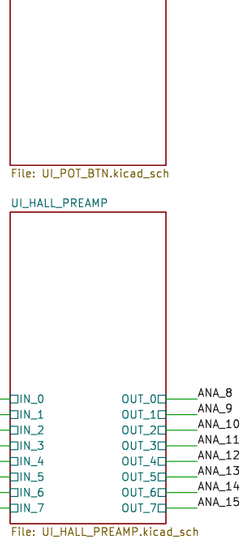


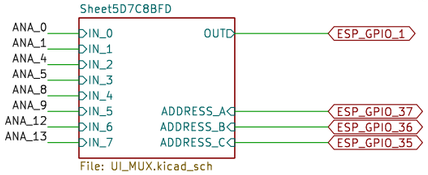


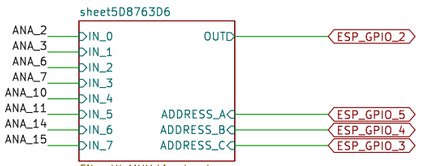







**Common Sheets:**
**500 GRID**
**600 USB_POWER**
**700 MCU**

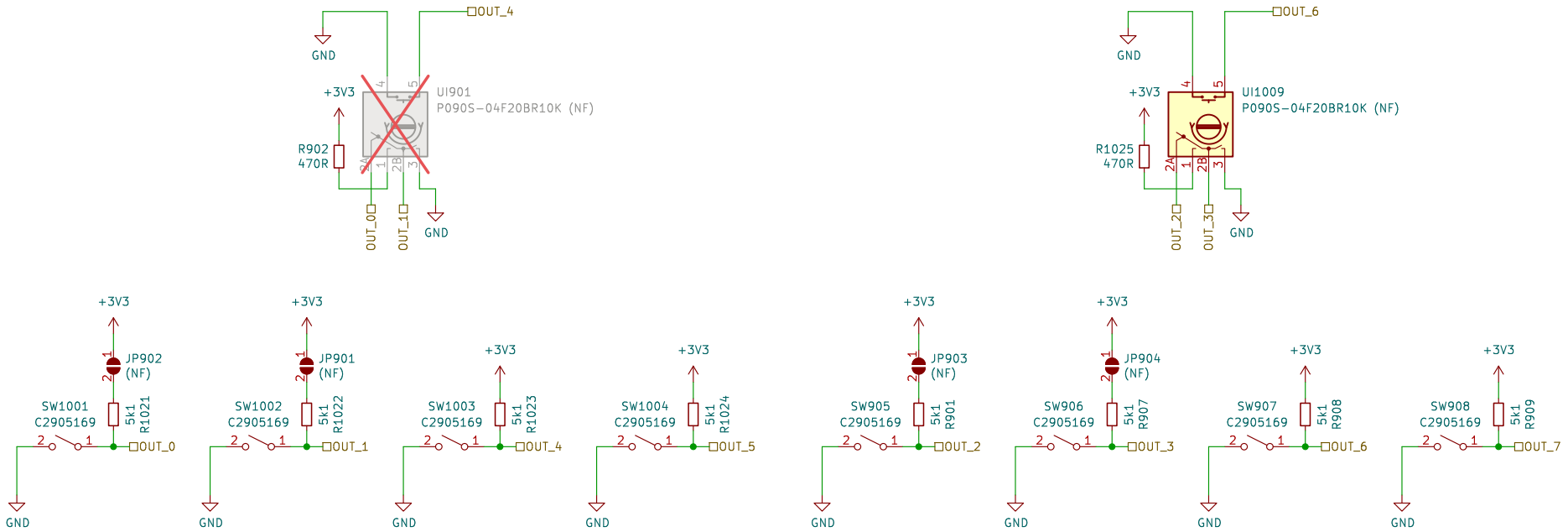
**Module Specific:**
**800 HWCFG**
**900 LED**
**1000 UI**

Sheet: /
File: PCBA-VSNX.kicad_sch

**Title:**

Size: A3 | Date: | **Rev:**
KiCad E.D.A. 8.0.6 | Id: 1/20

# 1000

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File: UI_POT_BTN.kicad_sch

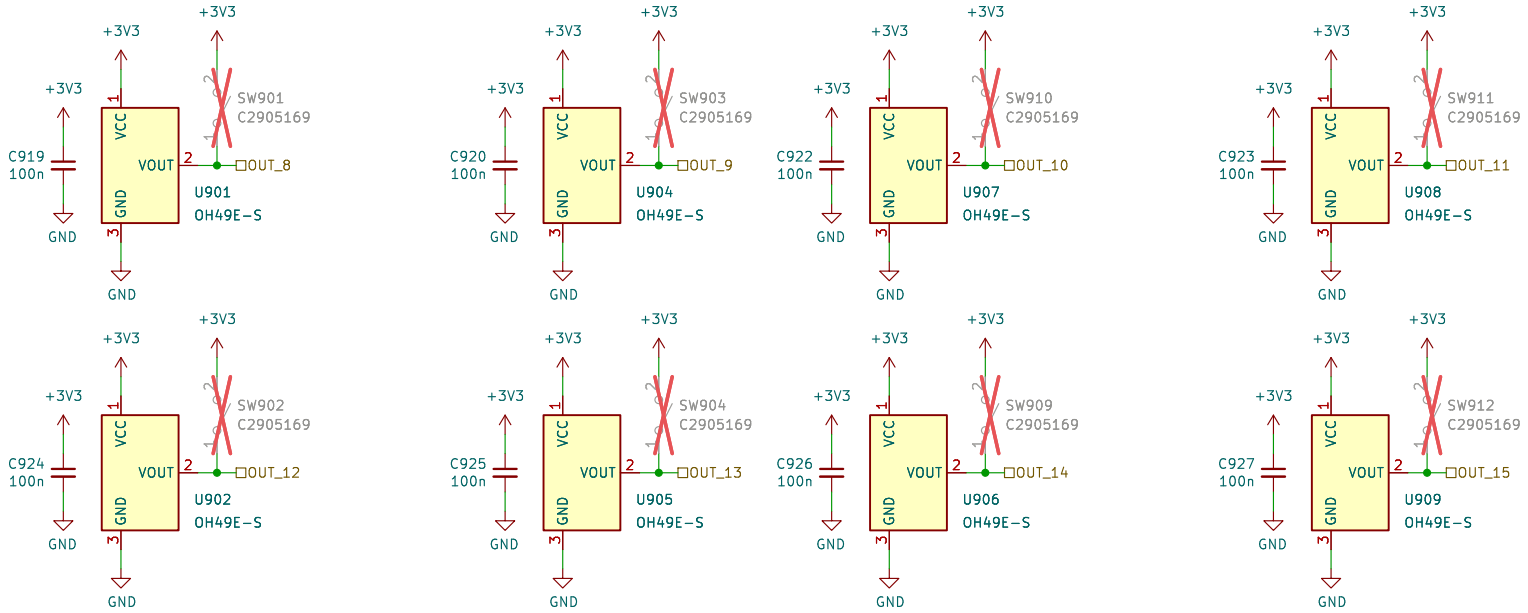
**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 2/20 |

# 1000

Simulation:

http://tinyurl.com/y229mty4

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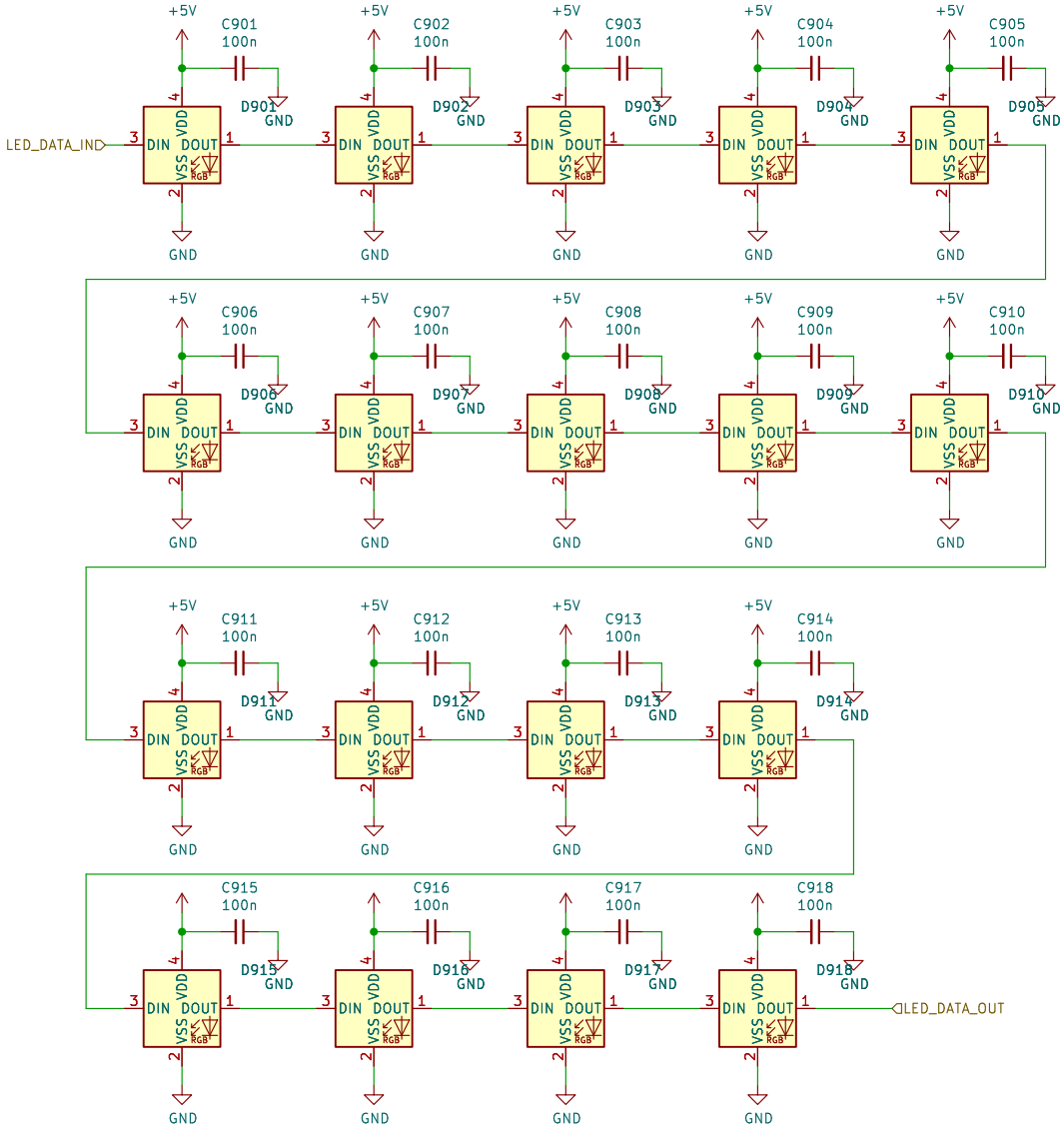
File: UI_BUTTON.kicad_sch

**Title:**

Size: A4 | Date: | **Rev:**

KiCad E.D.A. 8.0.6 | Id: 3/20

# 900

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| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 4/20 |

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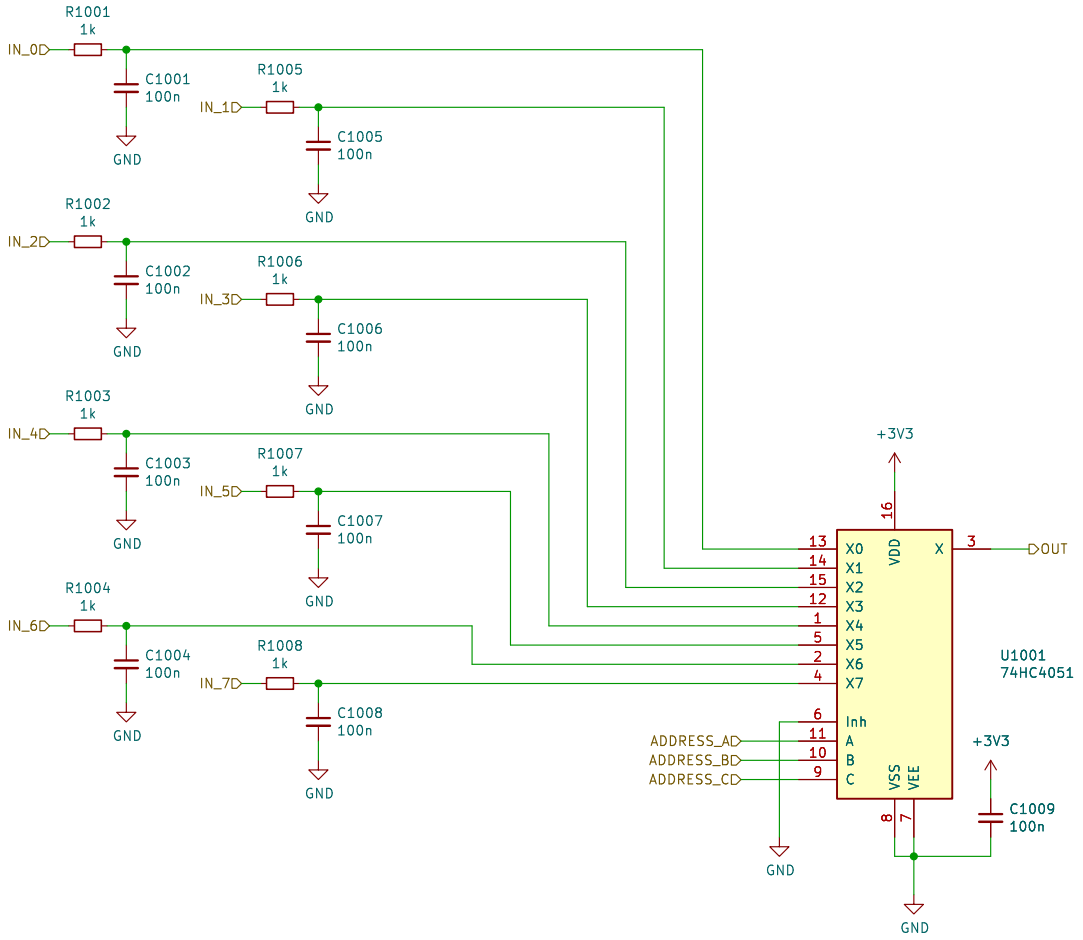


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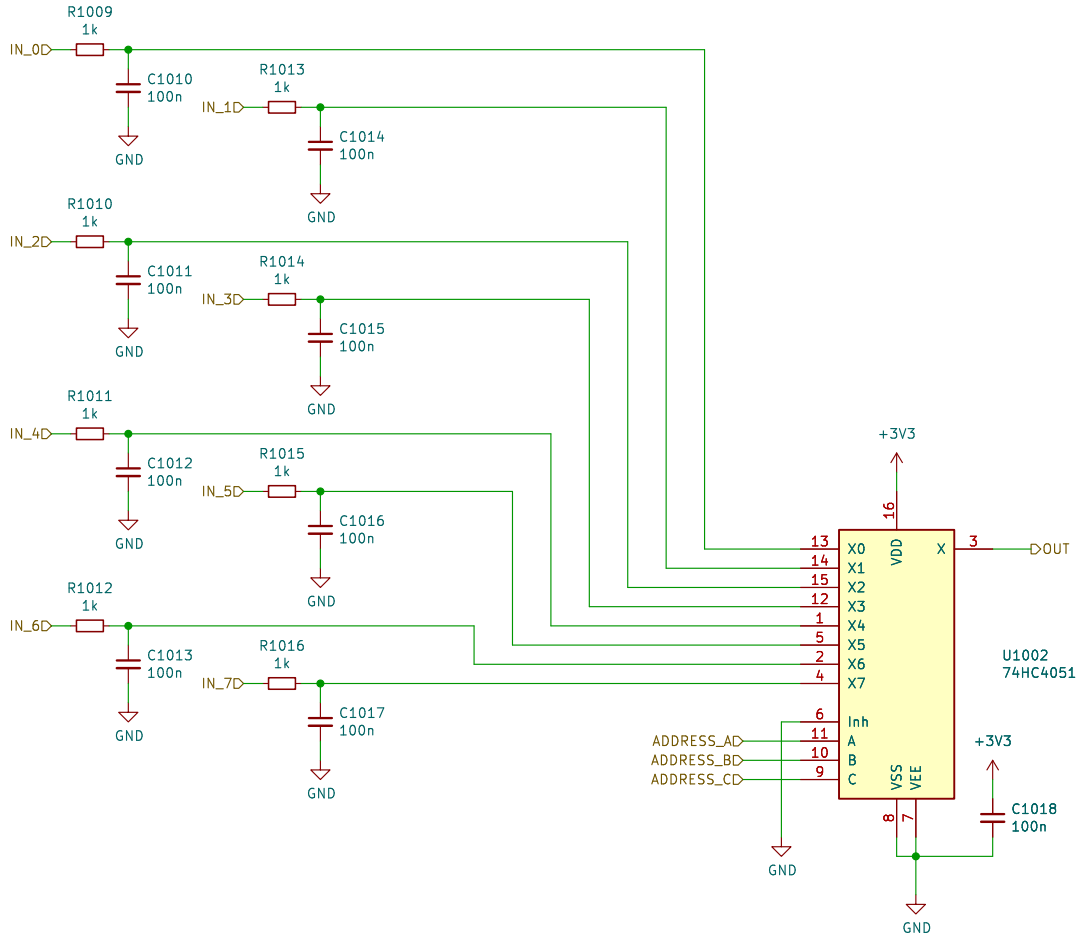
| File: UI_MUX.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 5/20 |

# 1000




| | | |
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| File: UI_MUX.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 6/20 |

# 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

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
CHIP_PU
LNA_IN
GPIO19 D-
GPIO20 D+
GPIO26 SPICS1
GPIO27 SPIHD
GPIO28 SPIWP
GPIO29 SPICS0
GPIO30 SPICLK
GPIO31 SPIQ
GPIO32 SPID
XTAL_P
XTAL_N
GPIO39 MTCK
GPIO40 MTDO
GPIO41 MTDI
GPIO42 MTMS
GPIO43 U0TXD
GPIO44 U0RXD
GPIO0 ESP_BOOT0
GPIO1 ESP_GPIO_1
GPIO2 ESP_GPIO_2
GPIO3 ESP_GPIO_3
GPIO4 ESP_GPIO_4
GPIO5 ESP_GPIO_5
GPIO6 RP_SPIO_RX
GPIO7 RP_SPIO_CS
GPIO8 RP_SPIO_TX
GPIO9 RP_SPIO_SCK
GPIO10 HWCFG_SHIFT
GPIO11 HWCFG_CLOCK
GPIO12 HWCFG_DATA
GPIO13 RP_SWDIO
GPIO14 RP_SWCLK
GPIO15 RP_CLK
GPIO16 ESP_GPIO_16
GPIO17 RP_INTERRUPT
GPIO18 ESP_GPIO_18
GPIO21 LED_DATA_OUT
GPIO33 ESP_GPIO_33
GPIO34 ESP_GPIO_34
GPIO35 ESP_GPIO_35
GPIO36 ESP_GPIO_36
GPIO37 ESP_GPIO_37
GPIO38 MAP_MODE
GPIO45 ESP_GPIO_45
GPIO46 ESP_GPIO_46
GPIO47 ESP_GPIO_47
GPIO48 ESP_GPIO_48
VDD3P3 VDD3P3 VDD3P3_RTC VDD_SPI VDD3P3_CPU VDDA1 VDDA2 GND
U704

40MHz Y701
C748 10p
C750 10p

LCSC:
TXM40M0004322HBCEO00T
S3240000091040JY

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

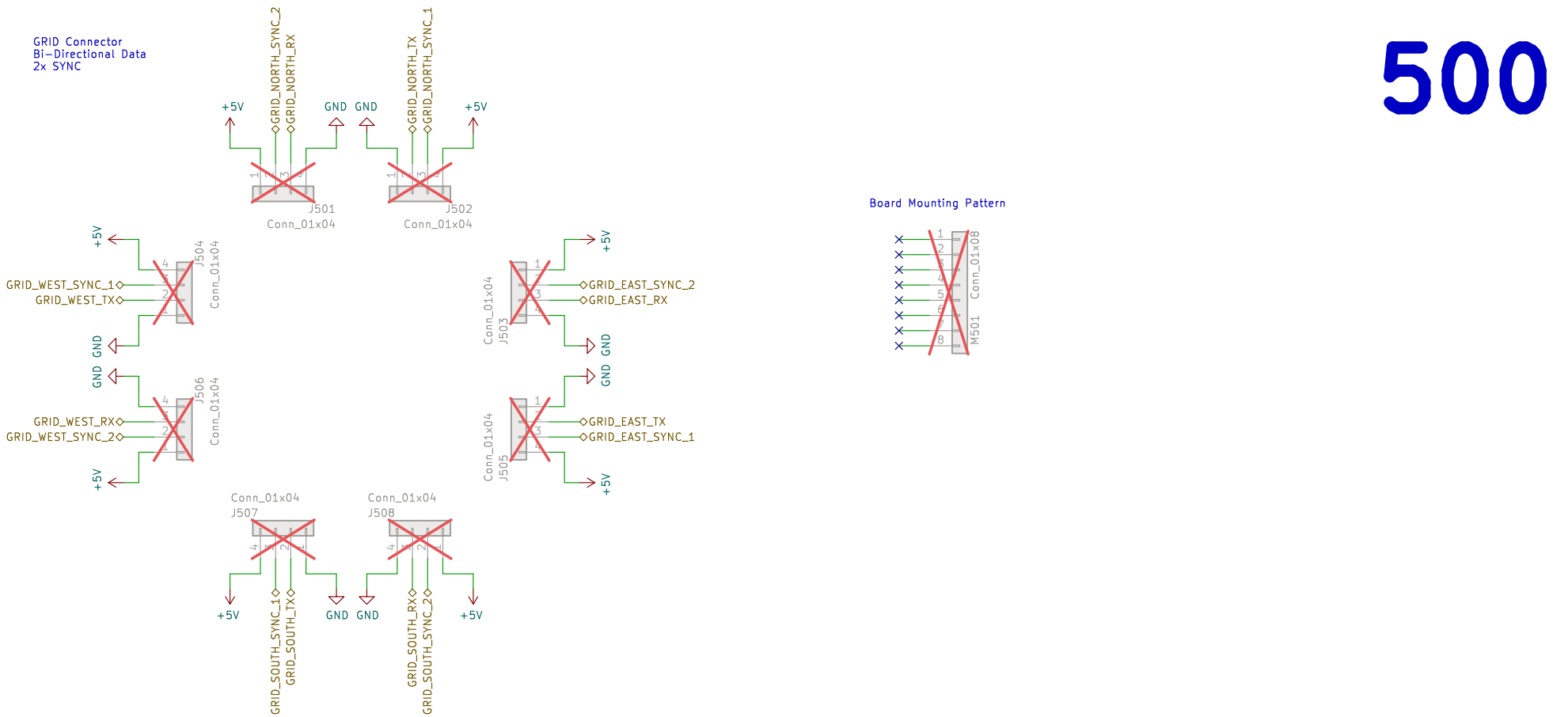
+1V1 +3V3
C731 100n
C732 100n
C733 1u
C734 1u
C735 100n
C736 100n
C737 100n
C738 100n
C740 100n
C741 100n
C744 100n
C745 100n
R729 5k1
RP_RUN
RP2040
RUN
USB_DP
USB_DM
QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK
XIN
XOUT
SWCLK
SWD
TESTEN
VREG_VOUT DVDD IOVDD USB_VDD ADC_AVDD VREG_IN GND
GPIO0 RP_UART0_TX
GPIO1 RP_UART0_RX
GPIO2 GRID_SOUTH_TX
GPIO3 GRID_WEST_RX
GPIO4 GRID_SYNC_2
GPIO5 GRID_WEST_TX
GPIO6 GRID_NORTH_RX
GPIO7
GPIO8
GPIO9
GPIO10 RP_GPIO_10
GPIO11 RP_GPIO_11
GPIO12 TP701 TestPoint
GPIO13 TP702 TestPoint
GPIO14 TP703 TestPoint
GPIO15 TP704 TestPoint
GPIO16 RP_SPIO_RX
GPIO17 RP_SPIO_CS
GPIO18 RP_SPIO_SCK
GPIO19 RP_SPIO_TX
GPIO20
GPIO21
GPIO22 RP_INTERRUPT
GPIO23 GRID_NORTH_TX
GPIO24 GRID_EAST_RX
GPIO25 GRID_SYNC_1
GPIO26_ADC0 GRID_EAST_TX
GPIO27_ADC1 GRID_SOUTH_RX
GPIO28_ADC2
GPIO29_ADC3
U703

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
U903 ESP-PSRAM32
CE SCLK SIO3 SIO2 SI/SIO SO/SIO VCC VSS
SPICLK SPIHD SPIWP SPID SPIQ
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.
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. 8.0.6 Id: 7/20

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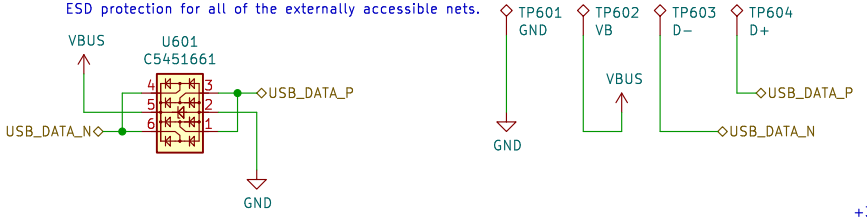
|---|---|---|
| Sheet: /MCU/sheet5D85C9EA/ | | |
| File: GRID.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 8/20 |

# 600

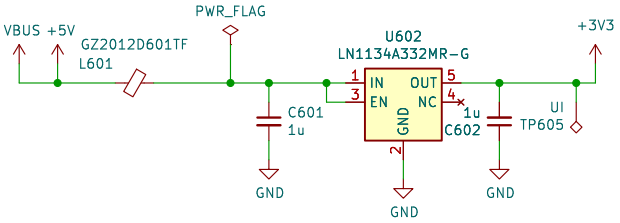
ESD Diodes

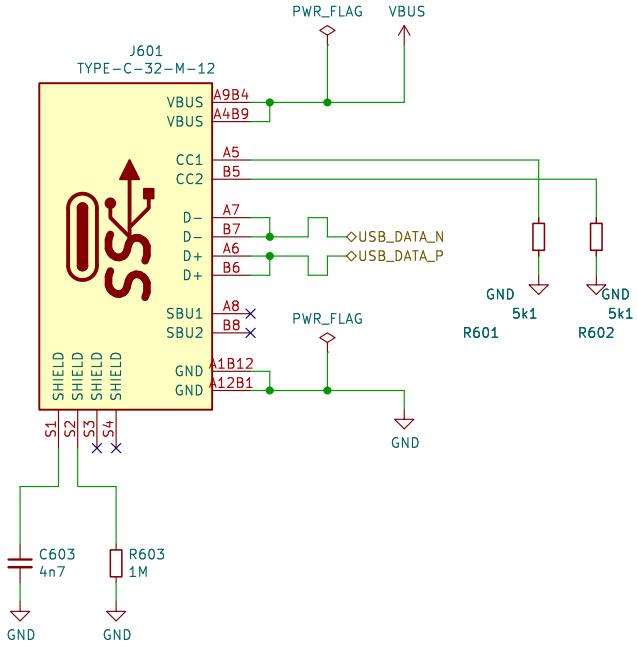
ESD protection for all of the externally accessible nets.




+3V3 LDO Regulators

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

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| File: USB_POWER.kicad_sch | | |
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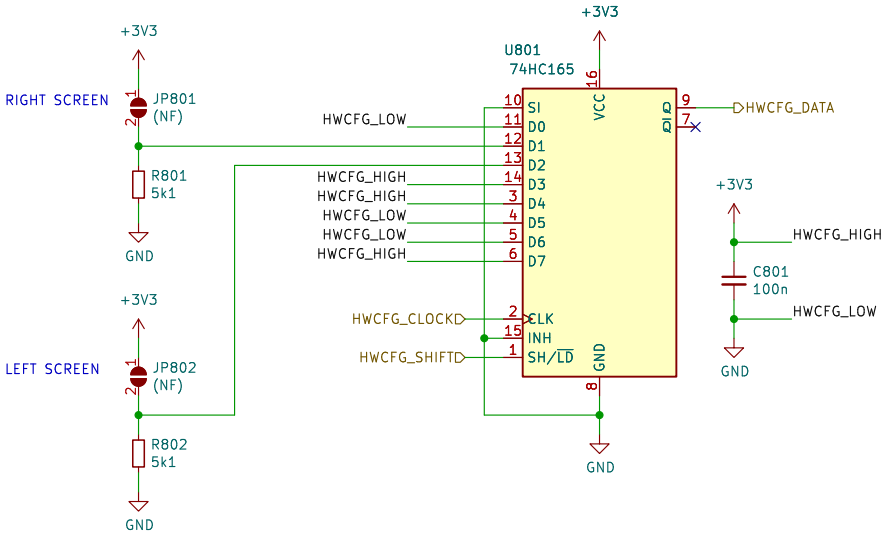
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 9/20 |

# 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):

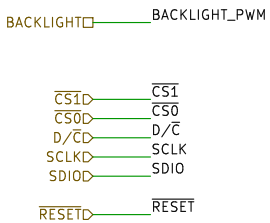
Po16 0000
Bo16 0001
PBF4 0010
EN16 0011
...

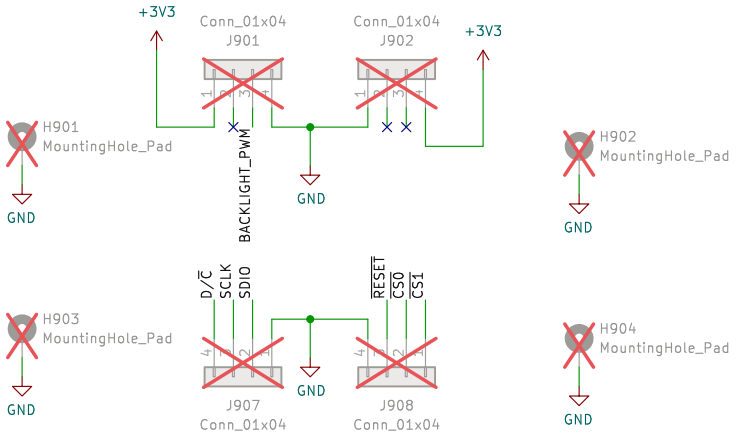
Revision Codes (D7–D4):

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: 10/20 |

# 1000





Sheet: /UI_DISPLAY/
File: UI_DISPLAY.kicad_sch

**Title:**

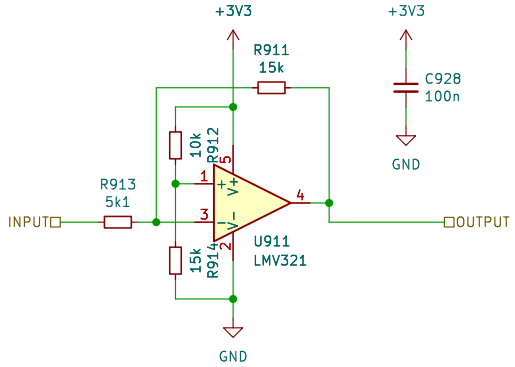
| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 11/20 |

simulation


Sheet: /UI_HALL_PREAMP/
File: UI_HALL_PREAMP.kicad_sch

**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 12/20 |

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File: INVERT_AND_OFFSET.kicad_sch

**Title:**

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|---|---|---|
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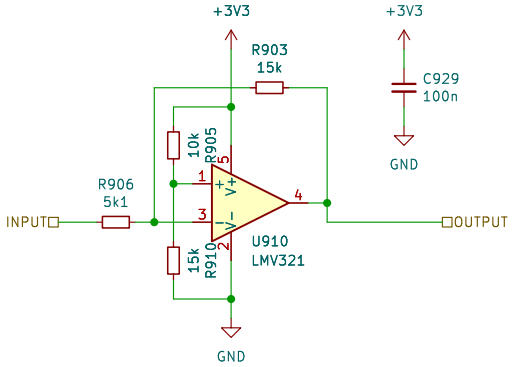


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**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
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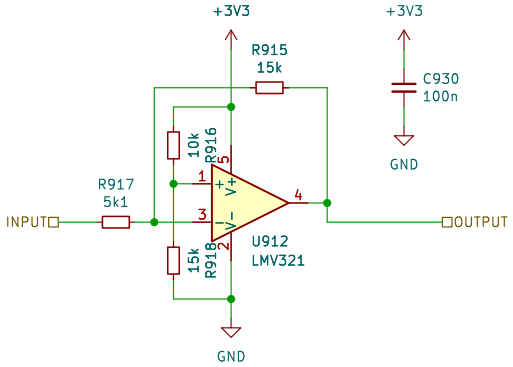
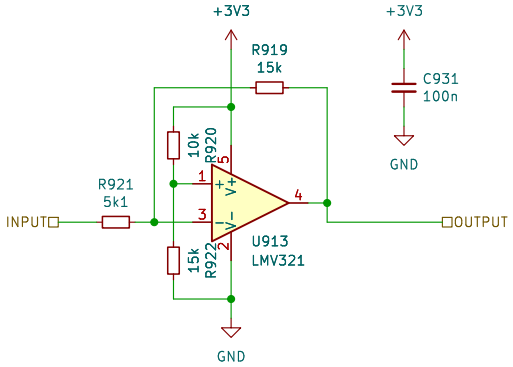



Sheet: /UI_HALL_PREAMP/INVERT_AND_OFFSET2/
File: INVERT_AND_OFFSET.kicad_sch

**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 15/20 |




| | | |
|---|---|---|
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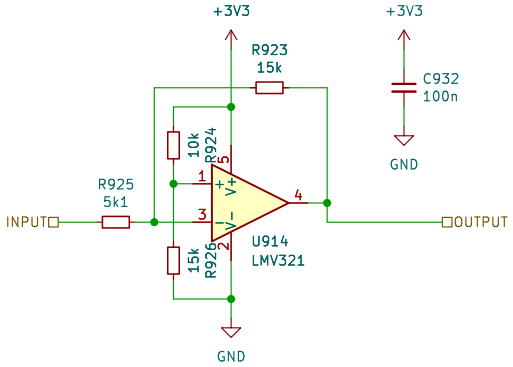
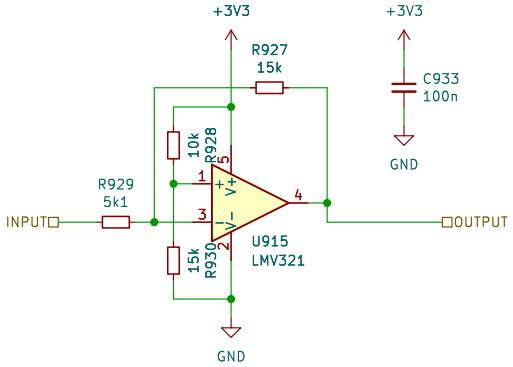
| File: INVERT_AND_OFFSET.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 16/20 |




Sheet: /UI_HALL_PREAMP/INVERT_AND_OFFSET4/
File: INVERT_AND_OFFSET.kicad_sch

**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 17/20 |

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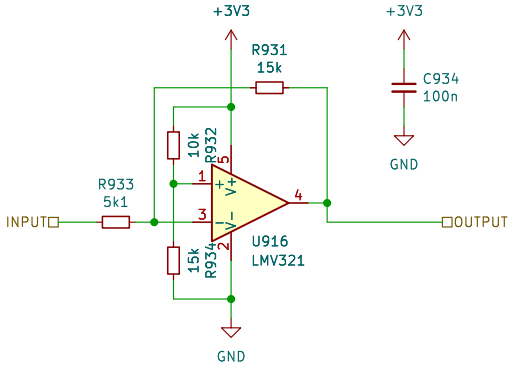
File: INVERT_AND_OFFSET.kicad_sch

**Title:**

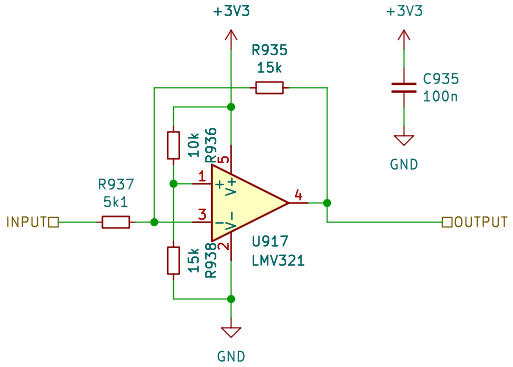
| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 18/20 |




Sheet: /UI_HALL_PREAMP/INVERT_AND_OFFSET6/
File: INVERT_AND_OFFSET.kicad_sch

**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 8.0.6 | | Id: 19/20 |




| | | |
|---|---|---|
| Sheet: /UI_HALL_PREAMP/INVERT_AND_OFFSET7/ | | |
| File: INVERT_AND_OFFSET.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 8.0.6 | | Id: 20/20 |