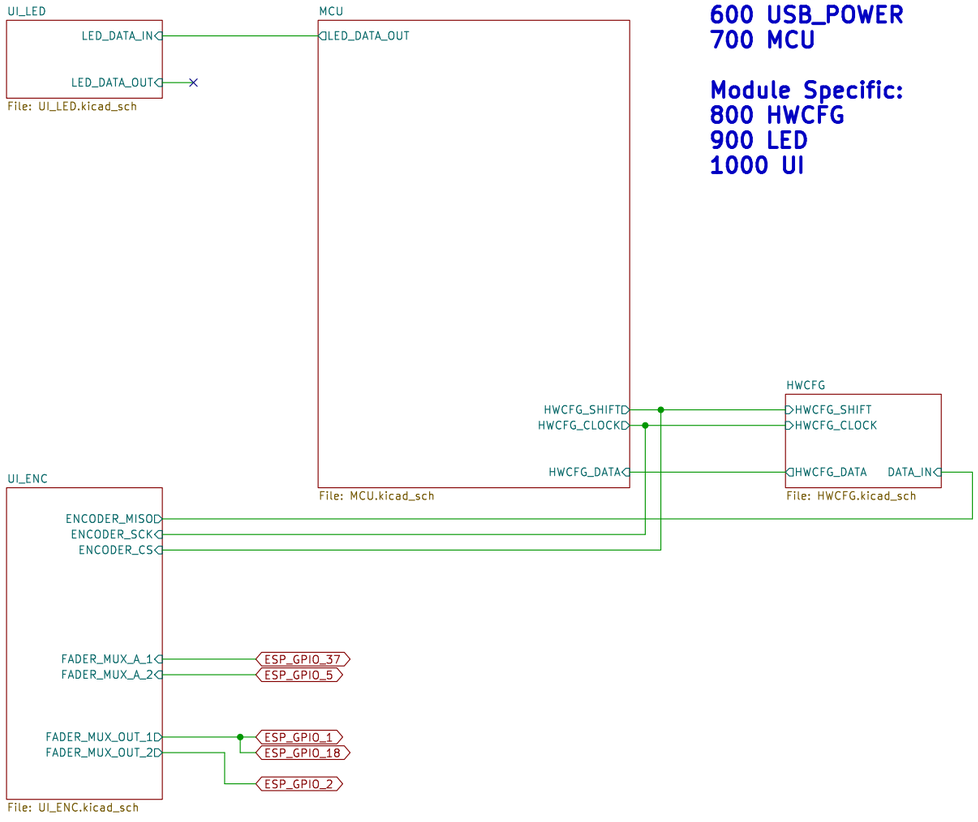
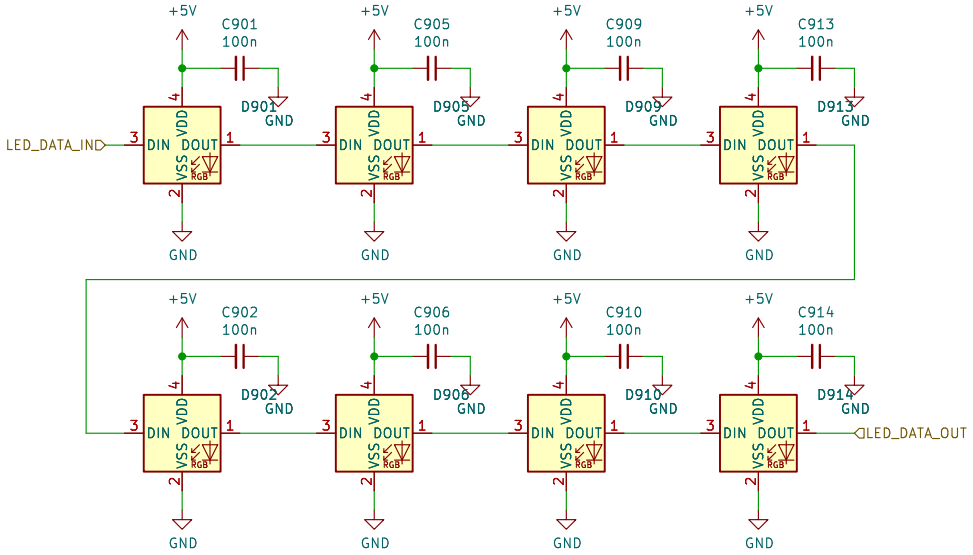


Common Sheets:
500 GRID
600 USB_POWER
700 MCU

Module Specific:
800 HWCFG
900 LED
1000 UI

Sheet: /		
File: EF44.kicad_sch		
Title:		
Size: A3	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 1/11

900



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Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 4/11

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

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

1.8nH LQG15HS1N8S02D
3.9pF GJM1555C1H3R9WB01D
1.8pF GJM1555C1H1R8BB01D

U704 ESP32-S3FN8
CHIP_PU, LNA_IN, VDD3P3, VDD3P3_RTC, VDD_SPI, VDD3P3_CPU, VDDA1, VDDA2
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
GPIO19 D-
GPIO20 D+
GPIO21 LED_DATA_OUT
GPIO26 SPICS1
GPIO27 SPIHD
GPIO28 SPIWP
GPIO29 SPICS0
GPIO30 SPICLK
GPIO31 SPIQ
GPIO32 SPID
GPIO33 ESP_GPIO_33
GPIO34 ESP_GPIO_34
GPIO35 ESP_GPIO_35
GPIO36 ESP_GPIO_36
GPIO37 ESP_GPIO_37
GPIO38 MAP_MODE
GPIO39 MTCK
GPIO40 MTDO
GPIO41 MTDI
GPIO42 MTMS
GPIO43 U0TXD
GPIO44 U0RXD
GPIO45 ESP_GPIO_45
GPIO46 ESP_GPIO_46
GPIO47 ESP_GPIO_47
GPIO48 ESP_GPIO_48
XTAL_P XTAL_N
ESP32_XTAL Y701
C748 10p C750 10p

LCSC:
TXM40M0004322HBCE00OT
S3240000091040JY

ESP_GPIO_47 ESP_GPIO_48 ESP_GPIO_34 ESP_GPIO_33
TP706 TP707 TP708 TP709 TP710 TestPoint

Programming Interface

RP_UART0_TX RP_UART0_RX U0TXD U0RXD
1k R733
TMS TCK TDO TDI
(NF) J702

Mapmode switch

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

R701 5k1 C757 100n 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

U703 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
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 GRID_EAST_TX
GPIO8 GRID_SOUTH_RX
GPIO9 TP701 TestPoint
GPIO10 TP702 TestPoint
GPIO11 TP703 TestPoint
GPIO12 TP704 TestPoint
GPIO13 TP705 TestPoint
GPIO14 RP_SPIO_RX
GPIO15 RP_SPIO_CS
GPIO16 RP_SPIO_SCK
GPIO17 RP_SPIO_TX
GPIO18 RP_INTERRUPT
GPIO19 GRID_NORTH_TX
GPIO20 GRID_EAST_RX
GPIO21 GRID_SYNC_1
GPIO22 GRID_EAST_TX
GPIO23 GRID_SOUTH_RX
GPIO24 GRID_NORTH_RX
GPIO25 GRID_SYNC_2
GPIO26_ADC0 GPIO27_ADC1 GPIO28_ADC2 GPIO29_ADC3

GRID Connector

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

sheet5D85C9EA
GRID_SYNC_1 GRID_WEST_TX GRID_WEST_RX GRID_SYNC_2 → GRID_WEST_SYNC_1 GRID_WEST_TX GRID_WEST_RX GRID_WEST_SYNC_2
GRID_SYNC_1 GRID_SOUTH_TX GRID_SOUTH_RX GRID_SYNC_2 → GRID_SOUTH_SYNC_1 GRID_SOUTH_TX GRID_SOUTH_RX GRID_SOUTH_SYNC_2
GRID_SYNC_1 GRID_EAST_TX GRID_EAST_RX GRID_SYNC_2 → GRID_EAST_SYNC_1 GRID_EAST_TX GRID_EAST_RX GRID_EAST_SYNC_2
GRID_SYNC_1 GRID_NORTH_TX GRID_NORTH_RX GRID_SYNC_2 → GRID_NORTH_SYNC_1 GRID_NORTH_TX GRID_NORTH_RX GRID_NORTH_SYNC_2

File: GRID.kicad_sch

J799 Conn_01x02

QSPI Flash memory

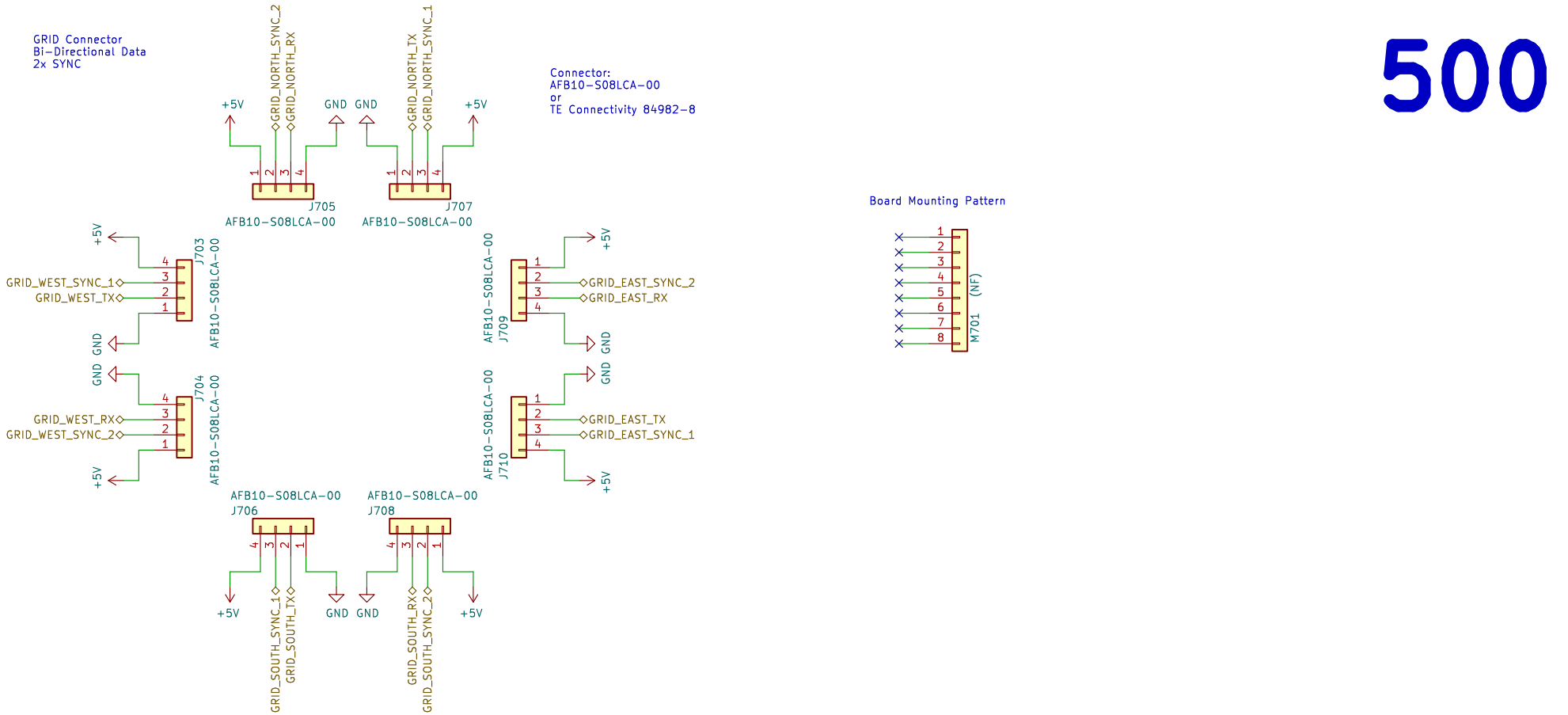
This memory can be accessed throgh the QSPI interface of the MCU. Can be used for configuration, static data or program execution.

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

Sheet: /MCU/
File: MCU.kicad_sch

Title:

Size: A3	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 7/11



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

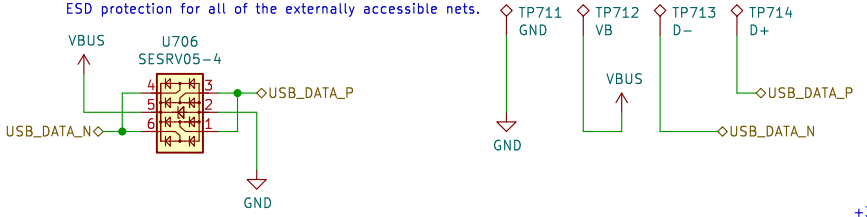
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 8/11

600

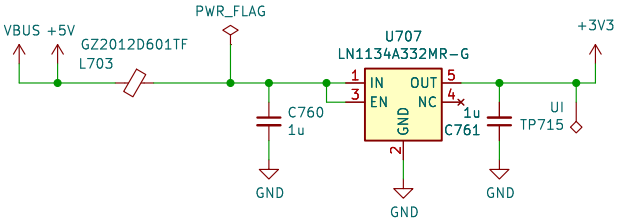
ESD Diodes

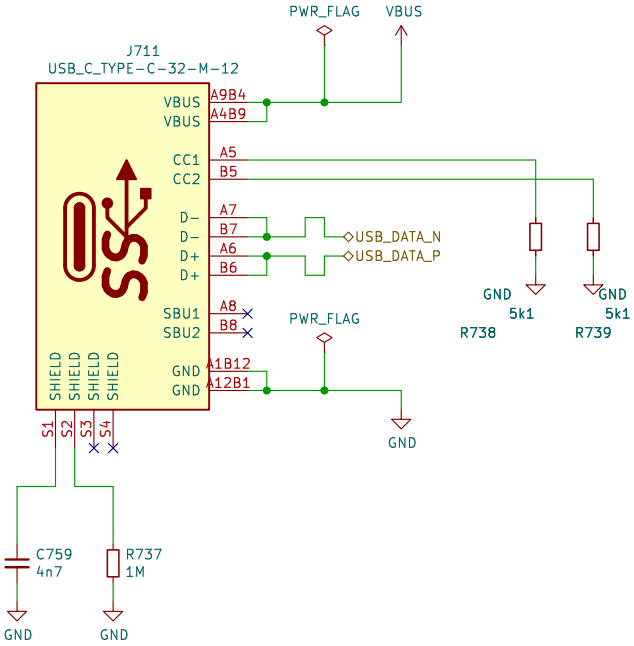
ESD protection for all of the externally accessible nets.



+3V3 LDO Regulators

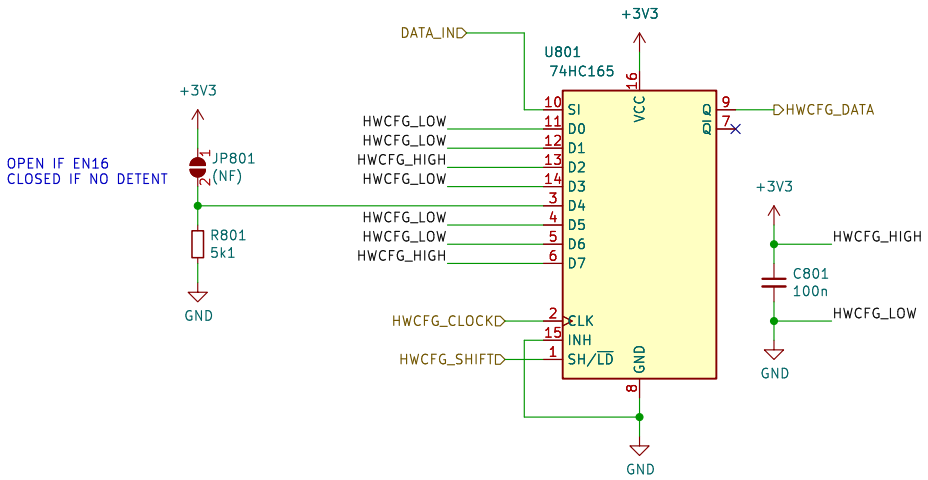
Regulators for generating independent power rails for the microcontroller and the user interface.





Sheet: /MCU/Sheet60F06FE1/		
File: USB_POWER.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		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)

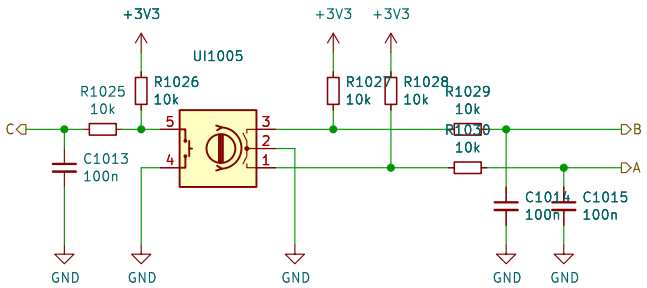
Model Codes (D3–D0):

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. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 10/11



Sheet: /UI_ENC/ENCODER_0/		
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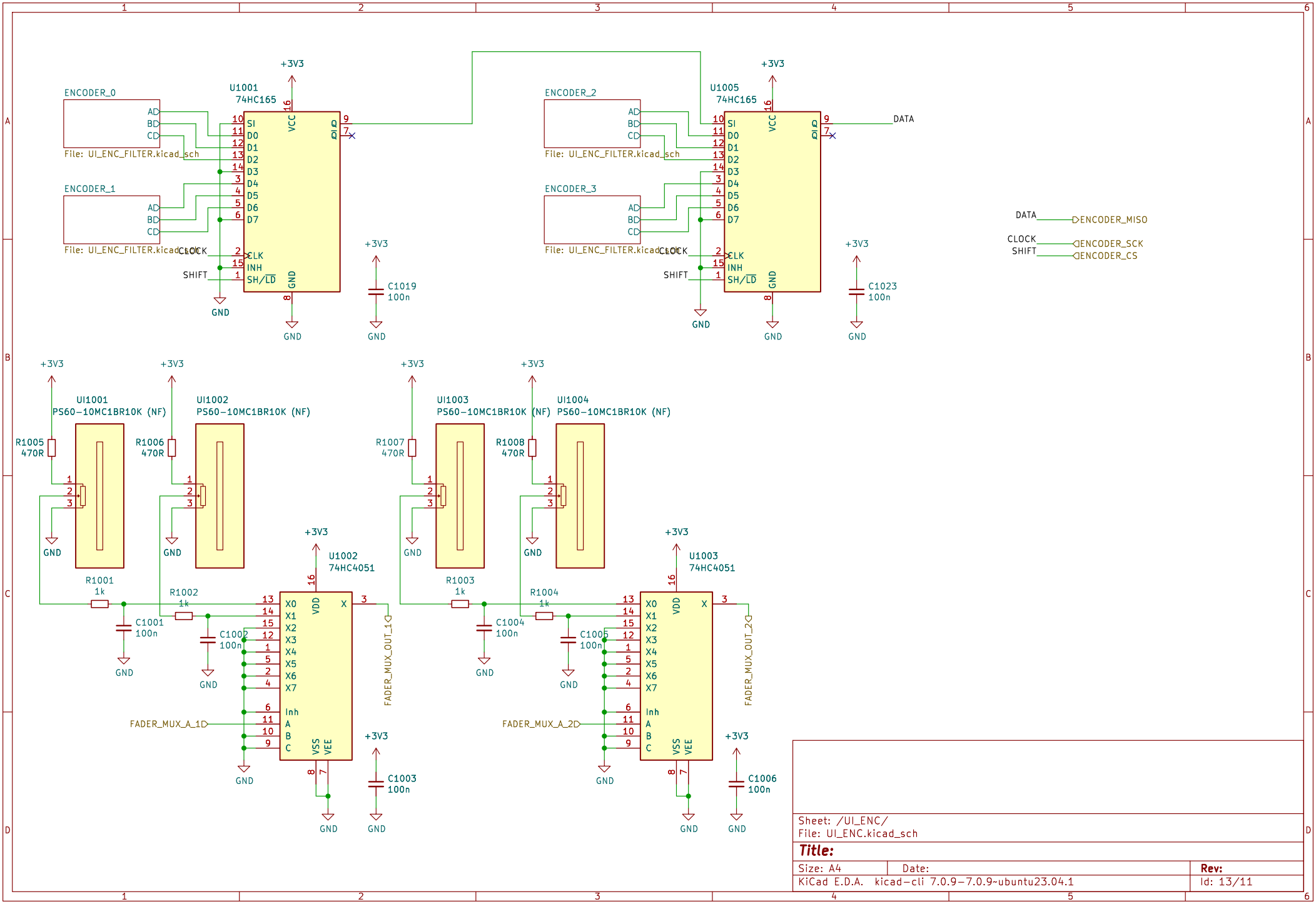
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 11/11



Sheet: /UI_ENC/		
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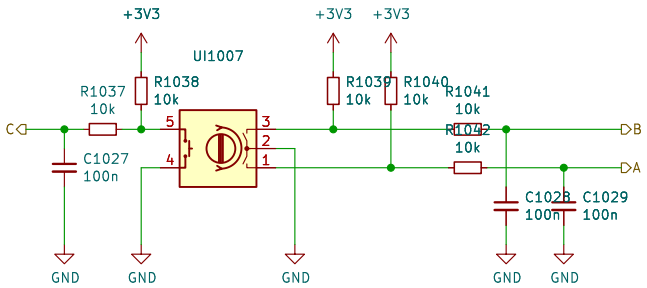
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 13/11



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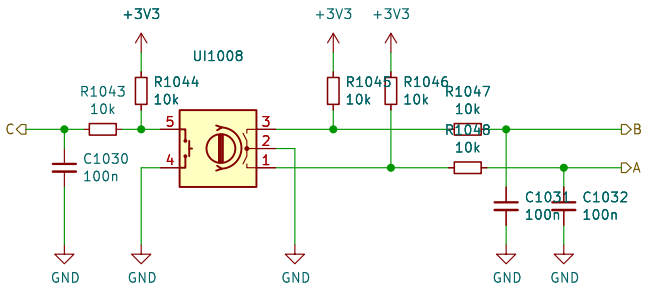
File: UI_ENC_FILTER.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 14/11



Sheet: /UI_ENC/ENCODER_1/		
File: UI_ENC_FILTER.kicad_sch		
Title:		
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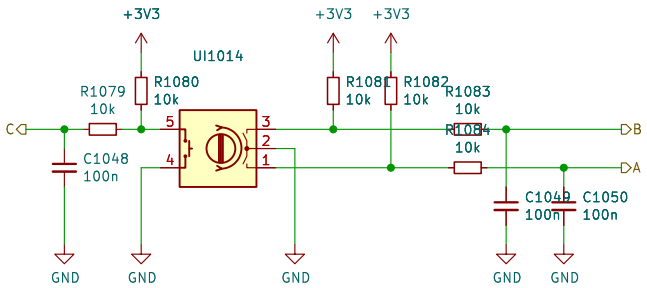
KiCad E.D.A. kicad-cli 7.0.9-7.0.9~ubuntu23.04.1		Id: 15/11



Sheet: /UI_ENC/ENCODER_2/		
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