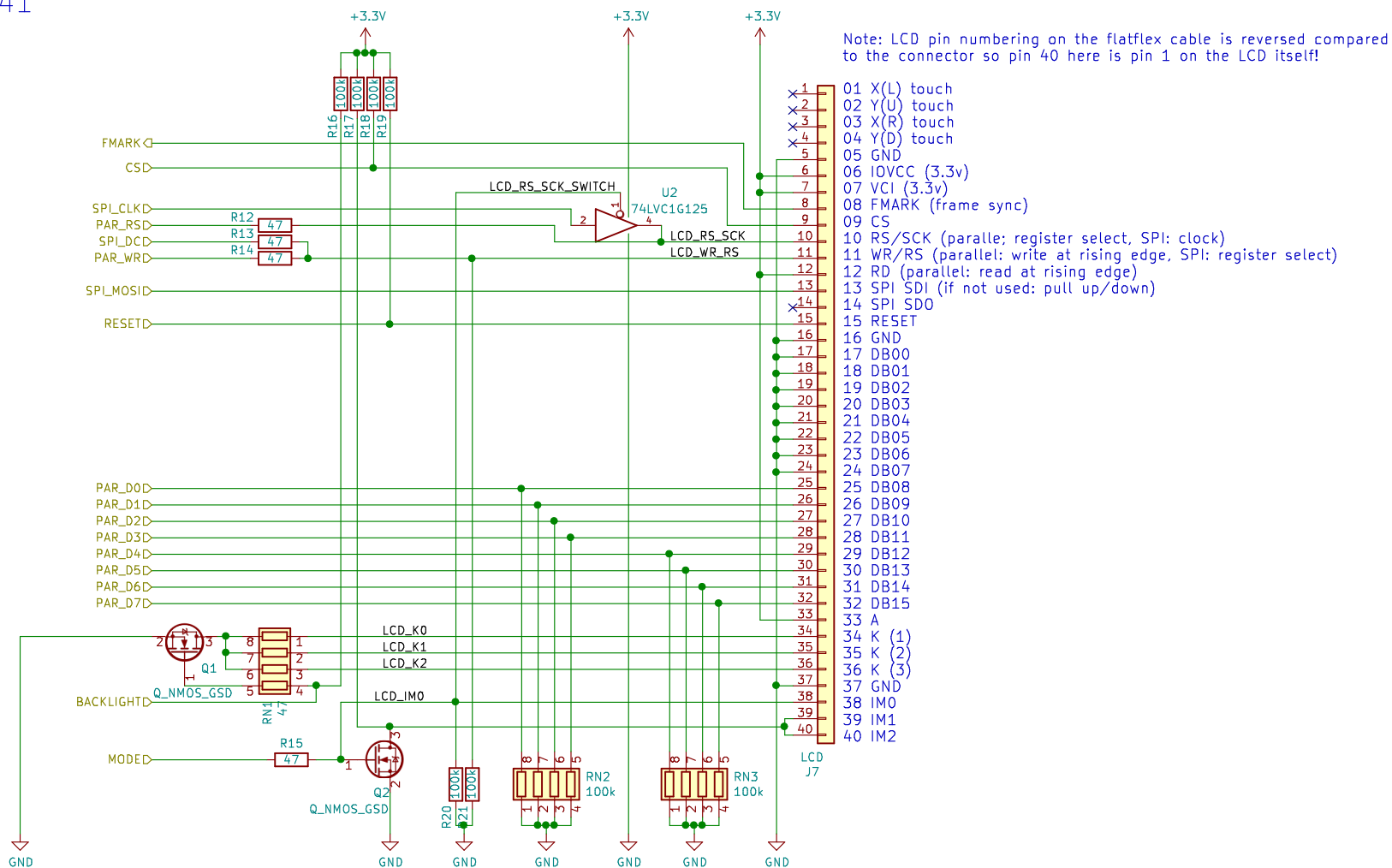


LCD
Type: Z240IT008
Controller: ILI9341
Size: 2.4 inch



SPI: IM0 = 0, IM1 = 1, IM2 = 1
PAR: IM0 = 1, IM1 = 0, IM2 = 0

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Sheet: /LCD/

File: lcd.sch

Title: MCH2022 badge – LCD

Size: A4

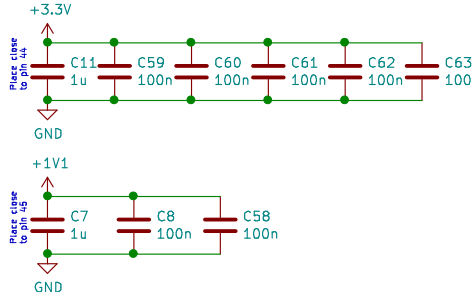
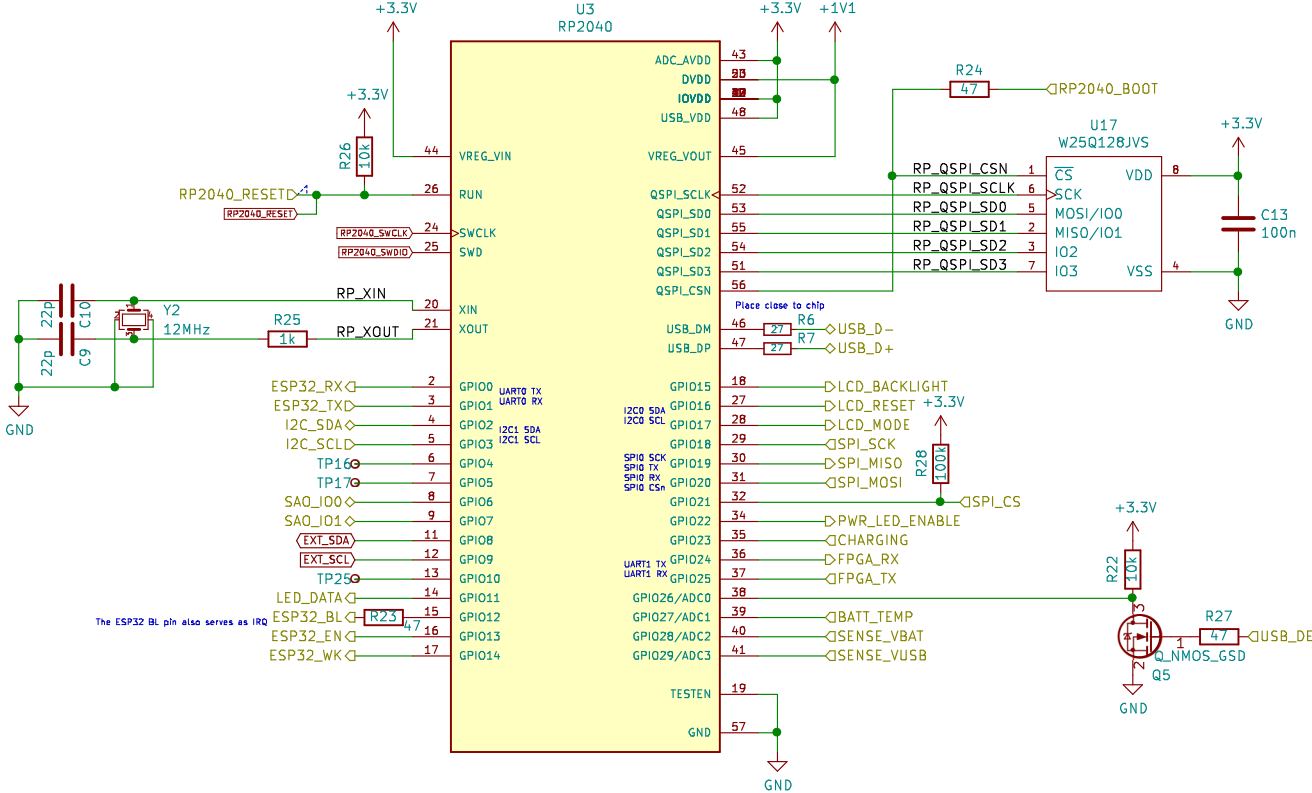
Date: 2021-12-19

KiCad E.D.A. kicad 5.1.10

Rev: 3.1415

Id: 2/9

RP2040 microcontroller



TP9 RP204Q_SWDIO
TP14  RP204Q_SWCLK

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Sheet: /RP2040/

File: rp2040.sch

Title: MCH2022 badge – RP2040 microcontroller

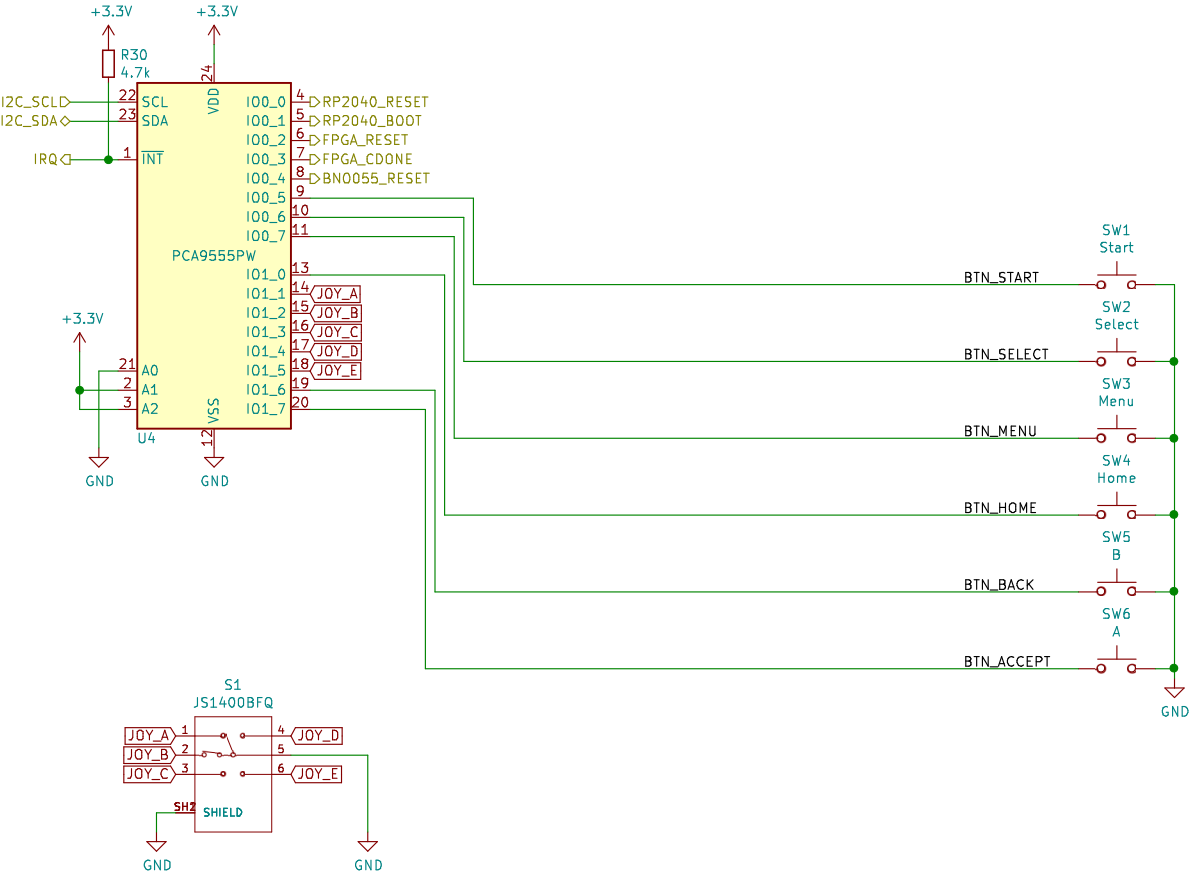
Size: A4	Date: 2021-12-19
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Rev: 3.1415

KiCad E.D.A. kicad 5.1.10

Id: 3/9

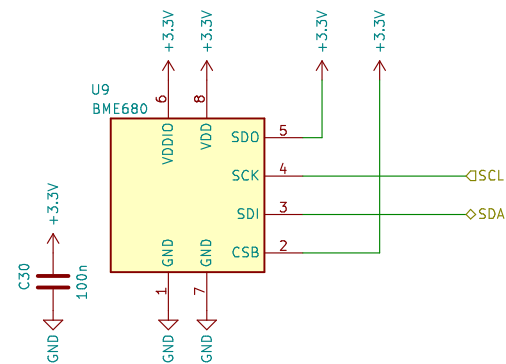
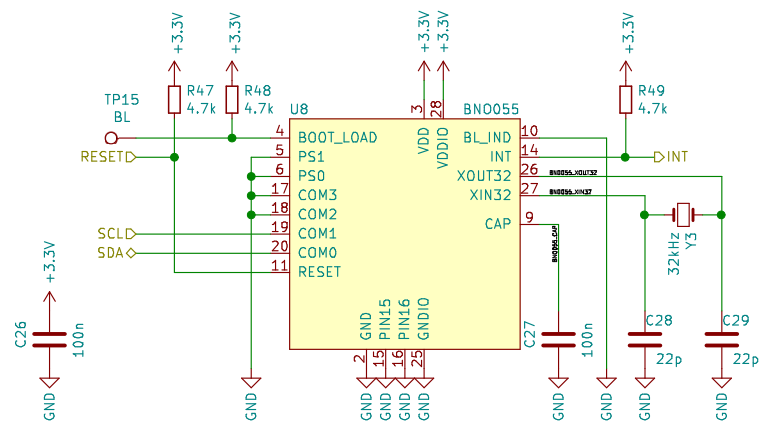
I2C I/O expander



The diagram shows two capacitors, C24 and C25, connected in parallel to a +3.3V supply and ground. C24 is a 100nF capacitor and C25 is a 10uF capacitor. The +3.3V supply is indicated by a red arrow pointing up to the positive terminal of each capacitor. The ground connection is indicated by a red arrow pointing down to the negative terminal of each capacitor, labeled GND.



BOSCH BN0055 & BME680 SENSORS



BADGE.TEAM

Sheet: /BOSCH/

File: bosch.sch

Title: MCH2022 badge – BOSCH

Size: A4

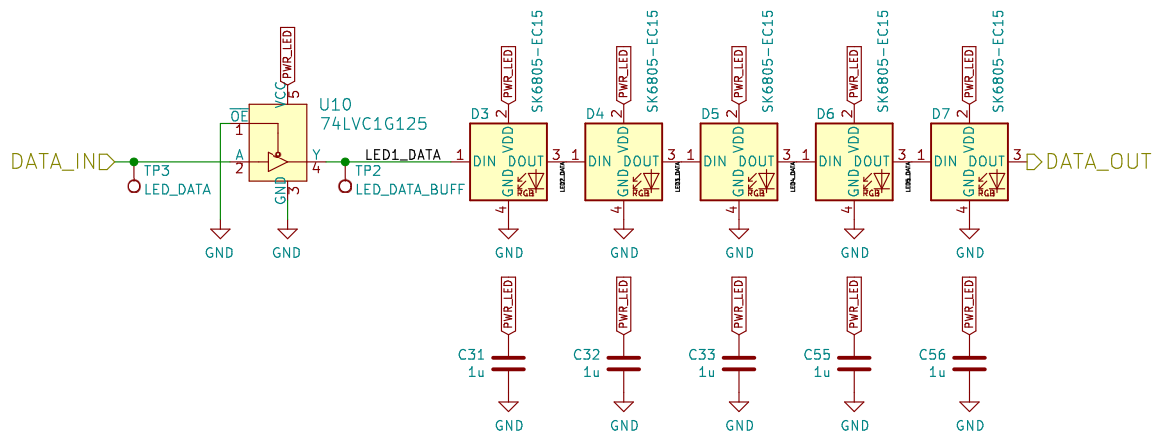
Date: 2021-12-19

KiCad E.D.A. kicad 5.1.10

Rev: 3.1415

Id: 6/9

WS2812B LEDs



BADGE.TEAM

Sheet: /LED/
File: led.sch

Title:

Size: A4
KiCad E.D.A. kicad 5.1.10

Date: 2021-12-19

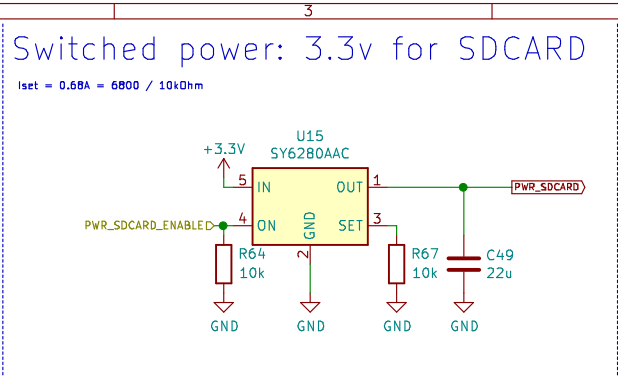
Rev: 3.1415

Id: 7/9

Battery & battery charger

The diagram illustrates a battery and battery charger circuit. The central component is the XT4054K421MR-G IC (U13), which is a yellow rectangle with pins 1 through 5. The IC has three main output pins: PROG (pin 1), VSS VDD (pin 2), and VBAT (pin 3). The circuit includes two USB inputs (VUSB) connected to the IC via capacitors C34 (10uF) and C37 (100nF). A resistor R56 (2k) is connected between the VBAT pin and ground. A resistor R62 (2k) is connected between the VBAT pin and a +3.3V supply. A resistor R76 (10k) is connected between the BATT_TEMP pin and ground. A capacitor C42 (10uF) is connected between the +3.3V supply and ground. The BATT_TEMP pin is also connected to a LiPo BT1 battery. The IC is labeled with 'PROG', 'VSS VDD', and 'STAT'. The output of the IC is labeled 'CHARGING'.

CHARGING is an open-drain output that gets pulled low when the charger is active (charging the battery)

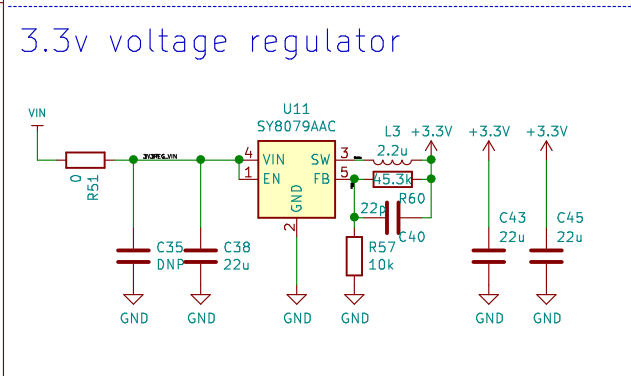


Note:
All control signals are hierarchical labels while all power rails are global

Power switch

The diagram illustrates a power switch circuit. It features a power switch (SW7) controlled by a microcontroller (U14, SY6280AAC). The switch is connected to a load (R63, 10k) and a power source (VIN). The MOSFET (Q4, Q_NMOS_GSD) is used to switch the load. The circuit includes several resistors (R53, R54, R55, R59) and a diode (D9, PSB3D40V1H) for protection. The power source is connected to the load through a diode. The microcontroller's output (U14, OUT) is connected to the MOSFET's gate (Q4, G). The MOSFET's source is connected to ground (GND). The MOSFET's drain is connected to the load (R63, 10k) and the power source (VIN). The load is connected to ground (GND) through a resistor (R59, 100k). The power source is connected to ground (GND) through a resistor (R53, 100k). The microcontroller's output (U14, OUT) is connected to the MOSFET's gate (Q4, G). The MOSFET's source is connected to ground (GND). The MOSFET's drain is connected to the load (R63, 10k) and the power source (VIN). The load is connected to ground (GND) through a resistor (R59, 100k). The power source is connected to ground (GND) through a resistor (R53, 100k).

Switched power: Vin for LEDs

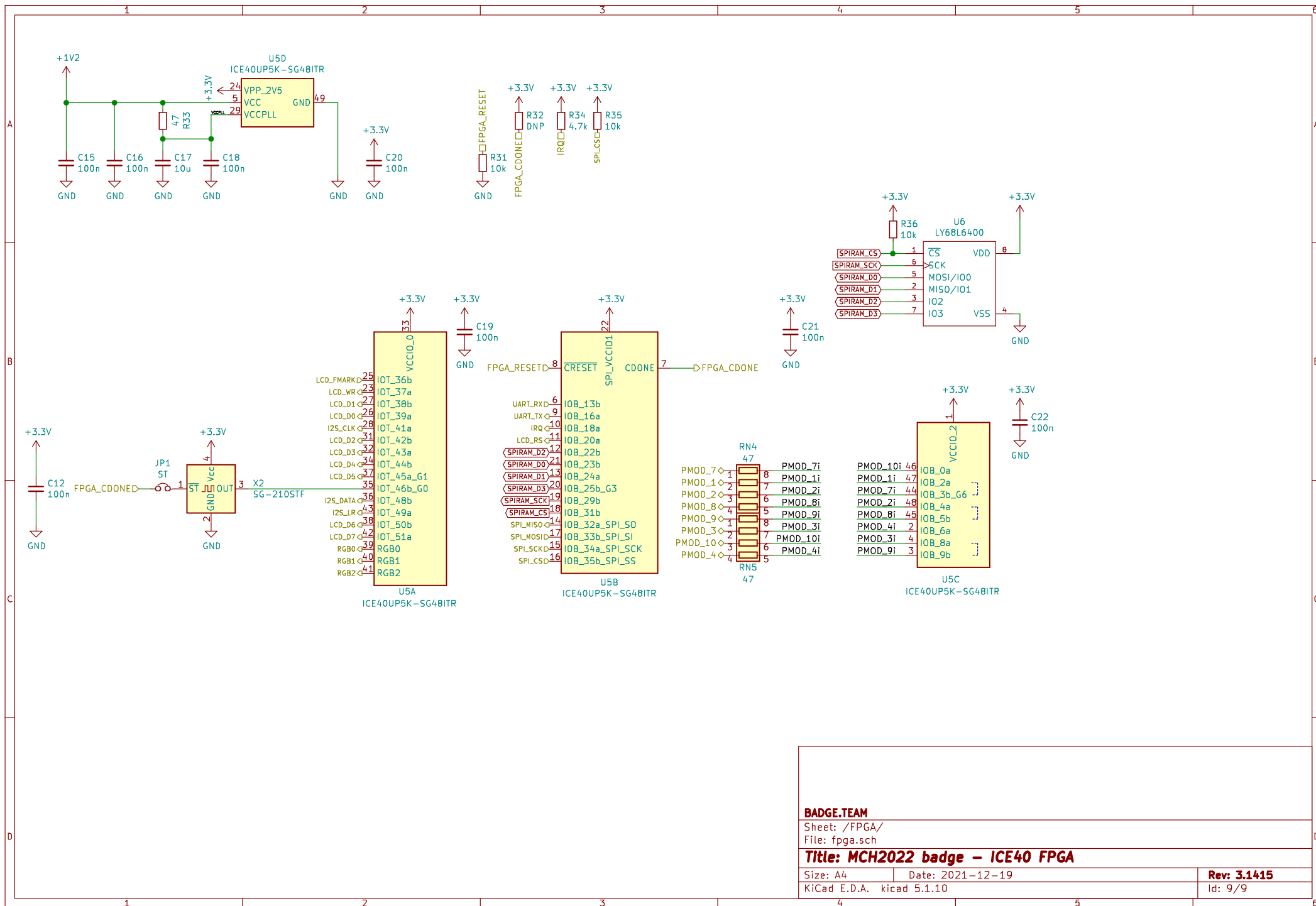


1.2v voltage regulator

Voltage sensing

The diagram illustrates a voltage sensing circuit. It features a resistor network labeled RN6 100k, which consists of five resistors connected in a ladder configuration. The input voltages VUSB and VBAT are connected to the top of the resistor network. The output voltages SENSE_VBAT and SENSE_VUSB are taken from the nodes between the resistors. Two capacitors, C48 (100n) and C50 (100n), are connected to ground from the output nodes. The ground connection is labeled GND.

Rev: 3.1415
Id: 8/9



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Sheet: /FPGA/
File: fpga.sch

Title: MCH2022 badge – ICE40 FPGA

Size: A4
Date: 2021-12-19
KiCad E.D.A. kicad 5.1.10

Rev: 3.1415
Id: 9/9