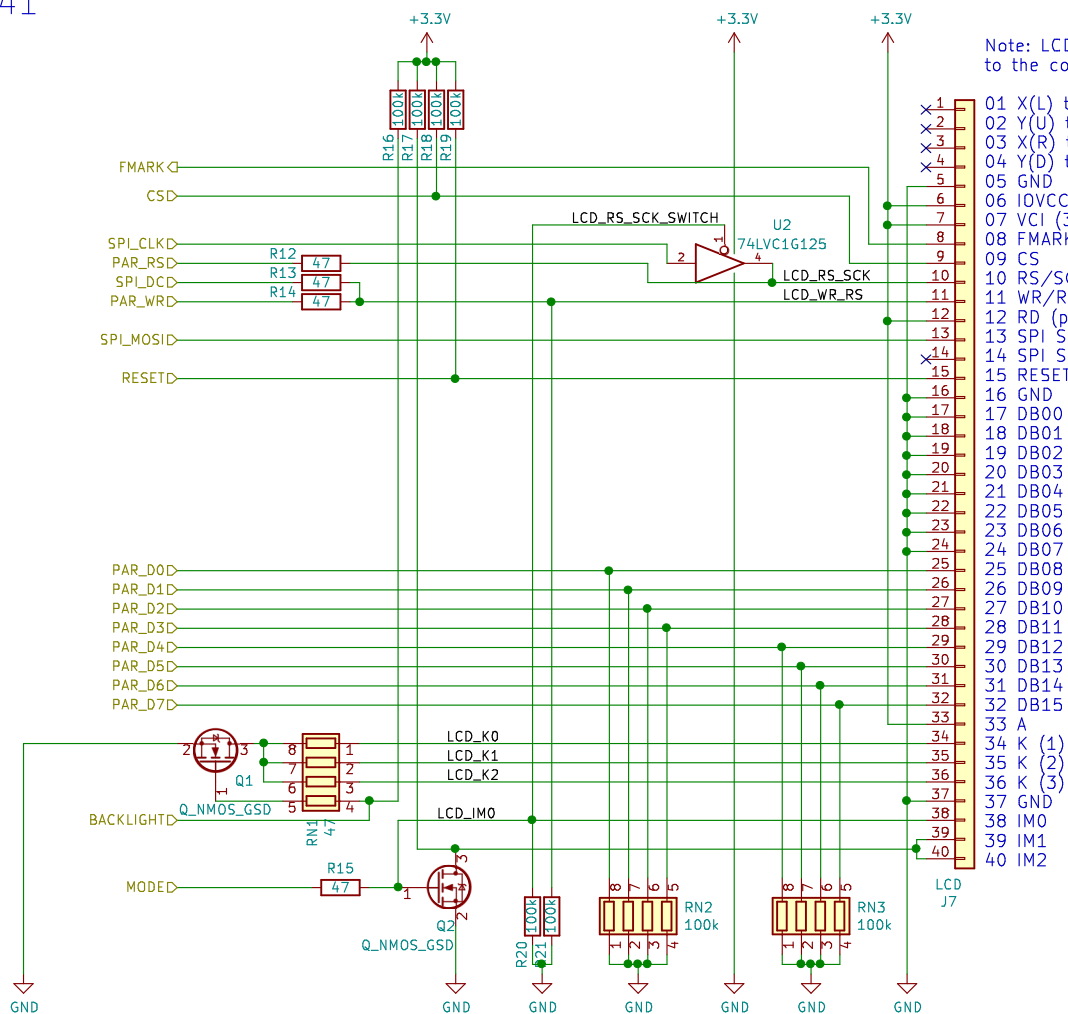


LCD
Type: Z240IT008
Controller: ILI9341
Size: 2.4 inch



Note: LCD pin numbering on the flatflex cable is reversed compared to the connector so pin 40 here is pin 1 on the LCD itself!

- 1 X(L) touch
- 2 Y(U) touch
- 3 X(R) touch
- 4 Y(D) touch
- 5 GND
- 6 IOVCC (3.3v)
- 7 VCI (3.3v)
- 8 FMARK (frame sync)
- 9 CS
- 10 RS/SCK (parallel; register select, SPI; clock)
- 11 WR/RS (parallel: write at rising edge, SPI: register select)
- 12 RD (parallel: read at rising edge)
- 13 SPI SDI (if not used: pull up/down)
- 14 SPI SDO
- 15 RESET
- 16 GND
- 17 DB00
- 18 DB01
- 19 DB02
- 20 DB03
- 21 DB04
- 22 DB05
- 23 DB06
- 24 DB07
- 25 DB08
- 26 DB09
- 27 DB10
- 28 DB11
- 29 DB12
- 30 DB13
- 31 DB14
- 32 DB15
- 33 A
- 34 K (1)
- 35 K (2)
- 36 K (3)
- 37 GND
- 38 IM0
- 39 IM1
- 40 IM2

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

BADGE.TEAM

Sheet: /LCD/

File: lcd.sch

Title: MCH2021 badge - LCD

Size: A4 Date: 2021-11-14

KiCad E.D.A. kicad 5.1.10

Rev: 3

Id: 2/9

STM32 microcontroller

The ESP32 BL pin also serves as IRQ

if using hardware time and the aproach of DMA > Timer Output
compare register you will need bridge pb15 and pb11 so we can
select or spi or tim

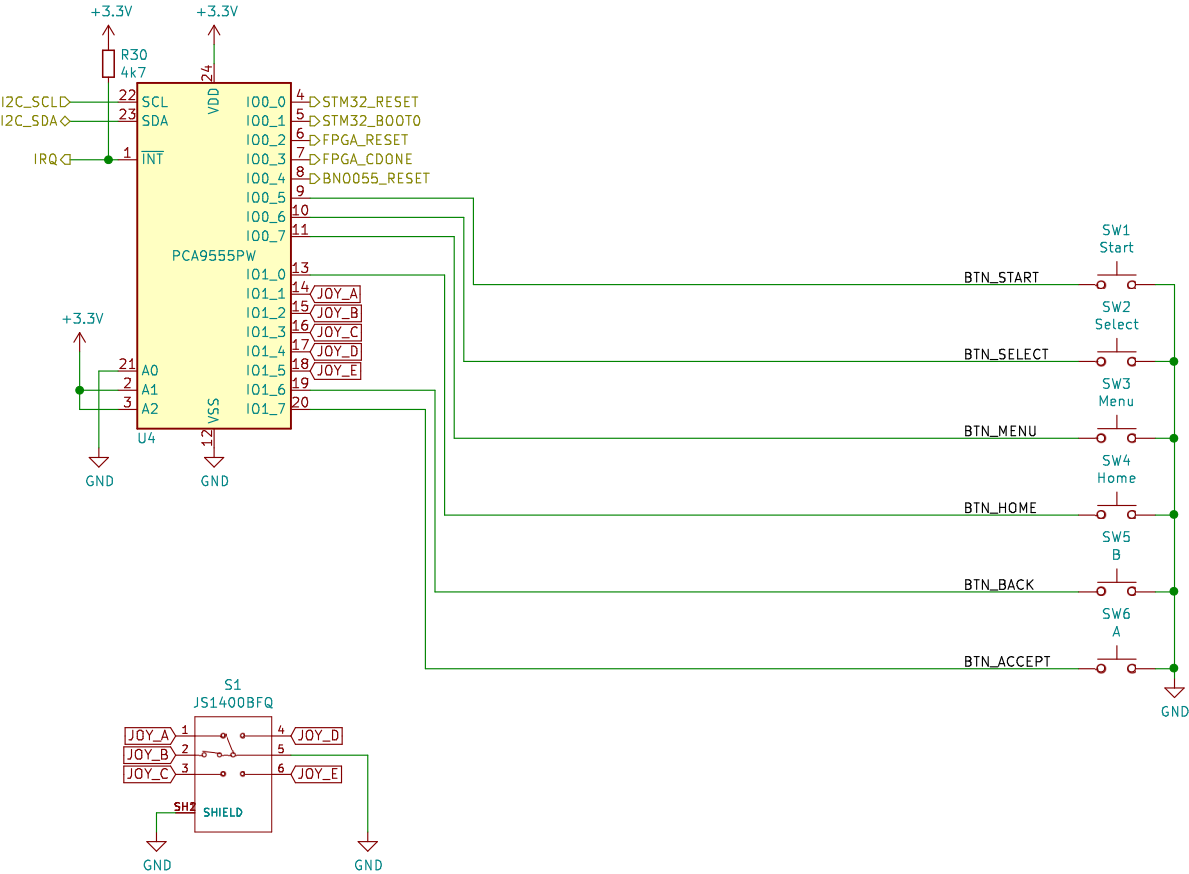
BADGE.TEAM
Sheet: /STM32/
File: stm32.sch
Title: MCH2021 badge – STM32 microcontroller
Size: A4 Date: 2021-11-14 Rev: 3
KiCad E.D.A. kicad 5.1.10 Id: 3/9

if using hardware time and the aproach of DMA > Timer Output
compare register you will need bridge pb15 and pb11 so we can
select or spi or tim

BADGE.TEAM
Sheet: /STM32/
File: stm32.sch
Title: MCH2021 badge – STM32 microcontroller
Size: A4 Date: 2021-11-14 Rev: 3
KiCad E.D.A. kicad 5.1.10 Id: 3/9

Id: 3/9

I2C I/O expander



+3.3V
C14
100n
GND

BADGE.TEAM

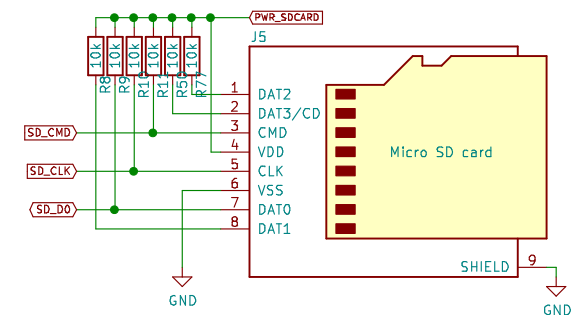
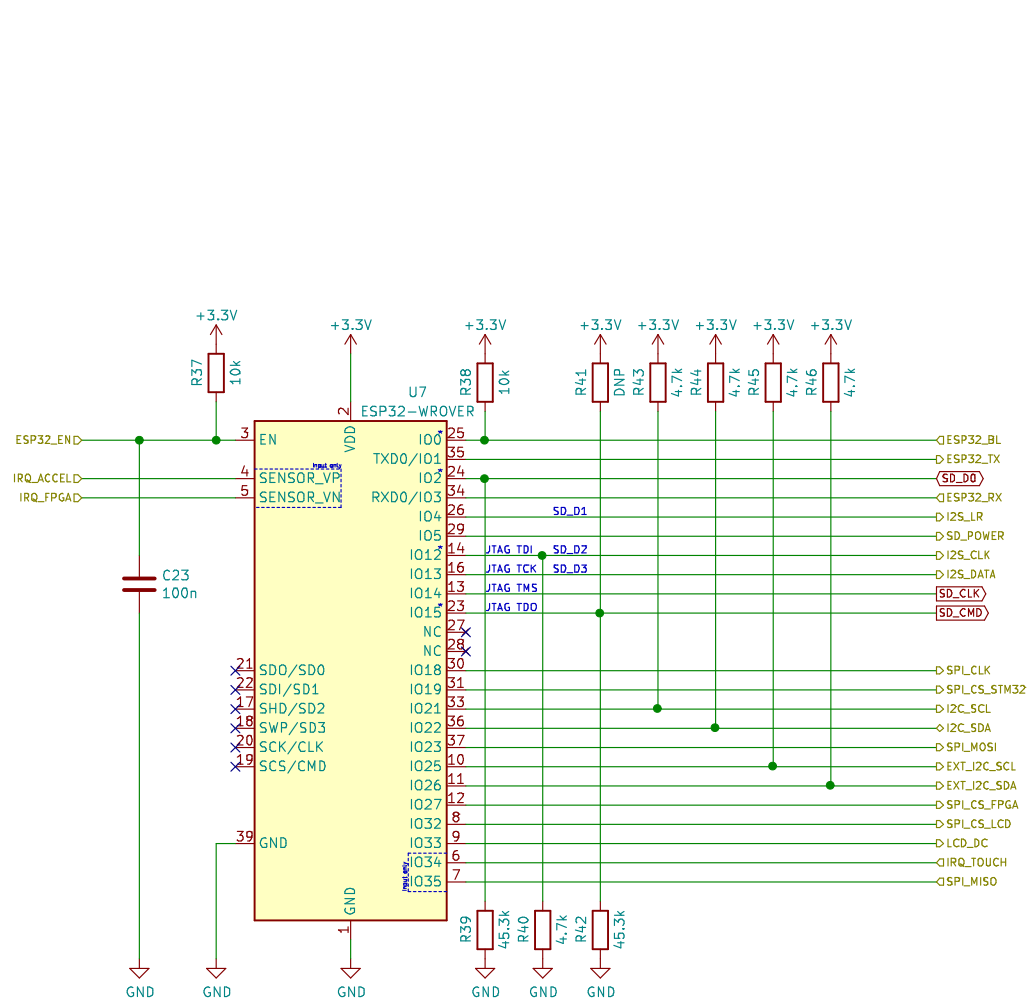
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File: buttons.sch

Title:

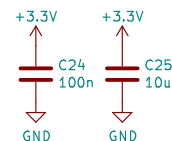
Size: A4
Date: 2021-11-14
KiCad E.D.A. kicad 5.1.10

Rev: 3
Id: 4/9

ESP32 microcontroller



* Bootstrapping pins
 IO 0: Low for UART DL mode, pull high for normal boot
 IO 2: Pull down to select UART DL mode when GPIO 0 is LOW
 IO 12: Selects internal flash/ram voltage. Pull-up for 1.8v, pull-down for 3.3v
 IO 15: Pull down for silent bootloader



BADGE.TEAM

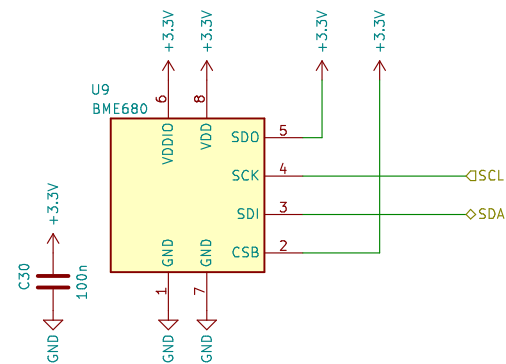
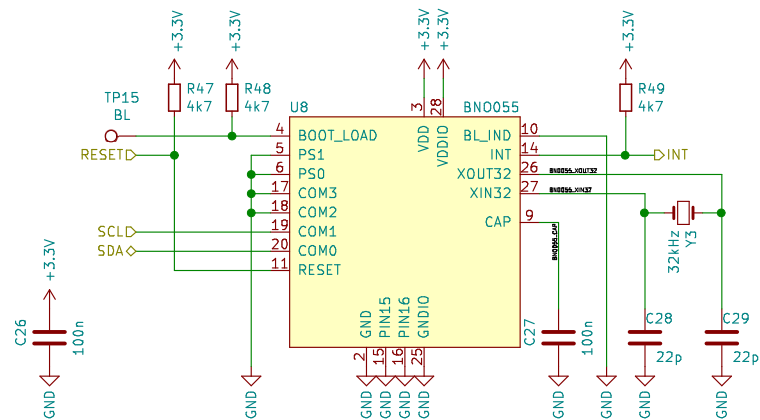
Sheet: /ESP32/
 File: esp32.sch

Title: MCH2021 badge – ESP32 microcontroller

Size: A4 Date: 2021-11-14
 KiCad E.D.A. kicad 5.1.10

Rev: 3
 Id: 5/9

BOSCH BN0055 & BME680 SENSORS



BADGE.TEAM

Sheet: /BOSCH/

File: bosch.sch

Title: MCH2021 badge – BOSCH

Size: A4

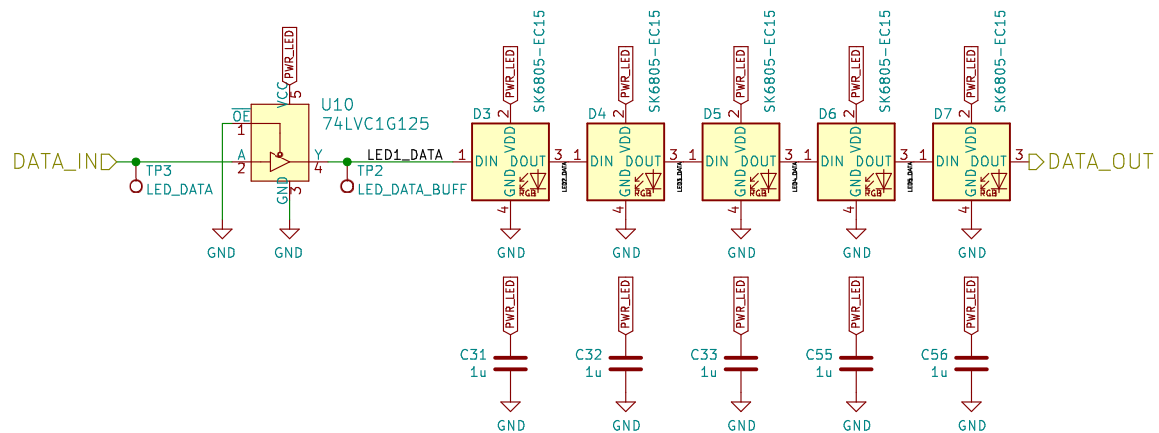
Date: 2021-11-14

KiCad E.D.A. kicad 5.1.10

Rev: 3

Id: 6/9

WS2812B LEDs



BADGE.TEAM

Sheet: /LED/
File: led.sch

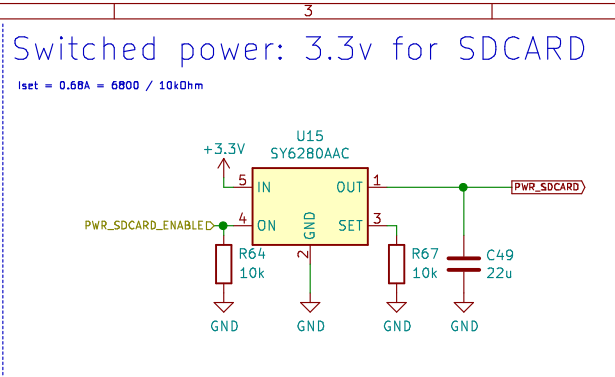
Title:

Size: A4	Date: 2021-11-14
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Size: A4	Date: 20
KiCad E.D.A.	kicad 5.1.10

Rev: 3

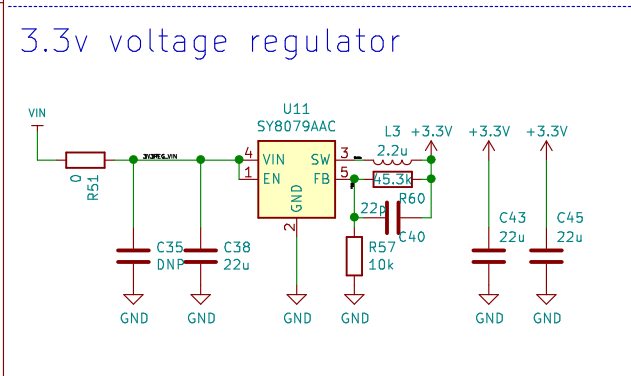
Id: 7/9

[illegible]

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

[illegible]

Switched power: Vin for LEDs



3.3v voltage regulator for RTC backup

1.2v voltage regulator

Voltage sensing

The diagram illustrates a voltage sensing circuit using an RN6 100k resistor network. The network is connected to VUSB and VBAT inputs. The output of the network is connected to SENSE_VBAT and SENSE_VUSB, which are then connected to the ADC inputs of the microcontroller. The circuit also includes two 100nF capacitors (C48 and C50) connected to ground to filter the sensed voltages.

Rev: 3
Id: 8/9

