USB_C_Receptacle_USB2.0_16P

esp32-s3 is spi master
miso - master in, slave out
mosi - master out, slave in

J1
Conn_01x08

Channel #1

- 8 — GNDA
- 7
- 6
- 5 — +3.3VA
- 4
- 3
- 2 — GNDA
- 1

~
J2 Emg_pad
J3 Emg_pad
J4 Emg_pad
J6 Emg_pad

J8 Emg_pad

adc_8

+3.3VA   +3.3V

IN1PF
IN1NF
IN2PF
IN2NF
IN3P
IN3N
IN4P
IN4N
RLD

3.3VA   3.3V   clksel

cs
sclk
drdy
dout
din
start
reset
clk
pwdn

File: adc_8.kicad_sch

cpu_wroom_esp32

+3.3V

3.3V

fspi_cs0
fspi_clk

fspi_miso
fspi_mosi
start
reset
clk
pwdn

bat_mon

File: cpu_wroom_esp32.kicad_sch

GND
C55   10pF

D+ — R30 — 20
D- — R31 — 20

C56   10pF
GND

R14   5.1k
R15   5.1k

GND

B8 — SBU2
A8 — SBU1

B6 — D+
A6 — D+
B7 — D-
A7 — D-

B5 — CC2
A5 — CC1

A4 — VBUS

A1 — GND
S1 — SHIELD

J7

power_supply

BAT_MON

BAT

VUSB/2.1A

+3.3va — +3.3VA
+3.3v — +3.3V

File: power_supply.kicad_sch

Battery Connector JC2
J5
2
1
GND
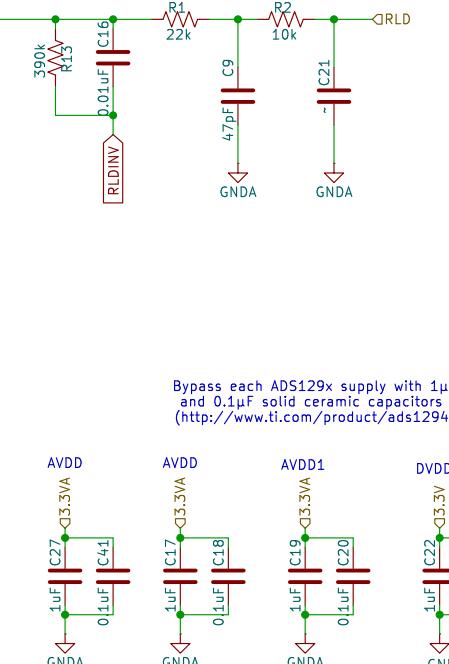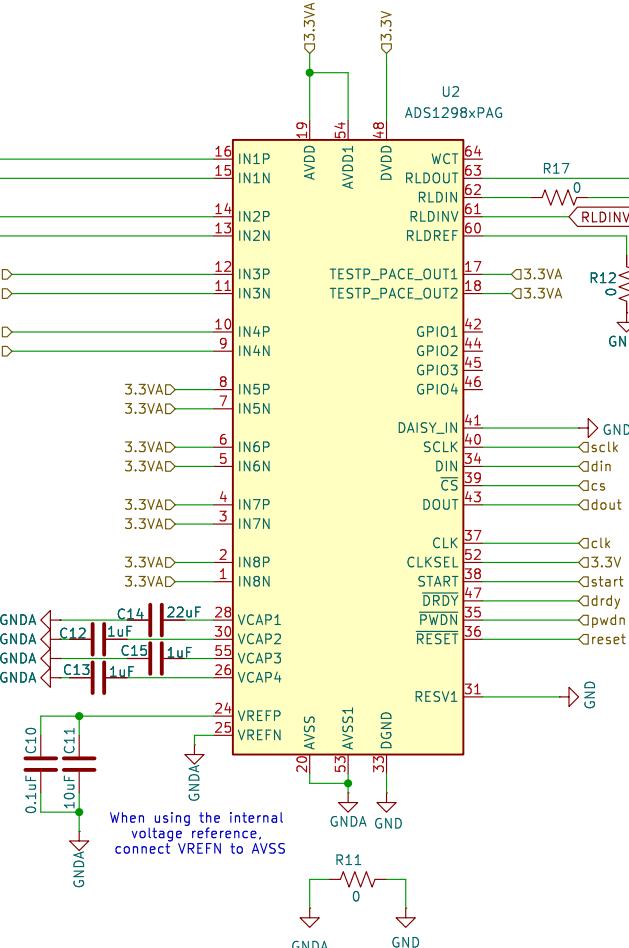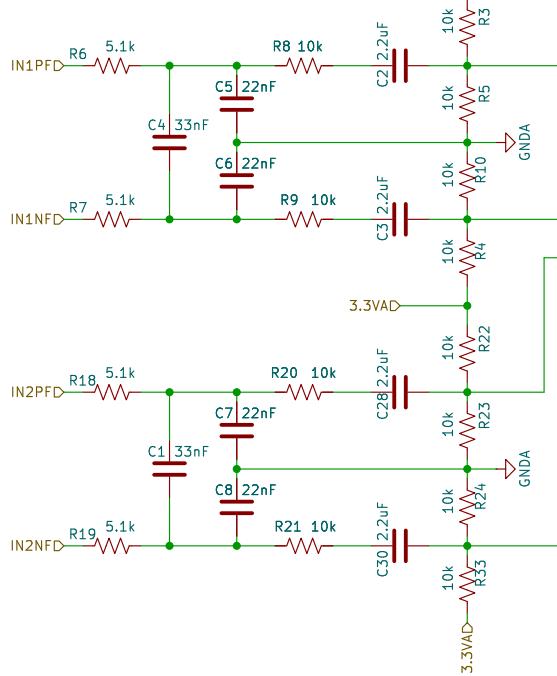
CPU: ESP32-S3 WROOM
4(8) ADC channels based on ADS1298
MIREA
Sheet: /
File: myocell_s3.kicad_sch
Title: MYOCELL_S3: EMG ADC board
Size: A4   Date: 2025-12-24   Rev: Rev 01
KiCad E.D.A. 9.0.3   Id: 1/4

IN1PF R6 5.1k R8 10k C2 2.2uF 10k R5 10k R3 3.3VA
C5 22nF
C4 33nF C6 22nF GNDA
IN1NF R7 5.1k R9 10k C3 2.2uF 10k R10
10k R4 3.3VAD

IN2PF R18 5.1k R20 10k C28 2.2uF 10k R22
C7 22nF
C1 33nF C8 22nF GNDA 10k R23
IN2NF R19 5.1k R21 10k C30 2.2uF 10k R24
10k R33 3.3VAD

U2
ADS1298xPAG

3.3VA 3.3V
AVDD AVDD1 DVDD
19 54 48

16 IN1P   WCT 64
15 IN1N   RLDOUT 63   R17 0
14 IN2P   RLDIN 62
13 IN2N   RLDINV 61   RLDINV
             RLDREF 60

12 IN3P   TESTP_PACE_OUT1 17 3.3VA
11 IN3N   TESTP_PACE_OUT2 18 3.3VA
                                R12 0
10 IN4P   GPIO1 42
9   IN4N   GPIO2 44   GNDA
                GPIO3 45
                GPIO4 46

3.3VAD 8 IN5P
3.3VAD 7 IN5N   DAISY_IN 41 GND
3.3VAD 6 IN6P   SCLK 40 sclk
3.3VAD 5 IN6N   DIN 34 din
3.3VAD 4 IN7P   CS 39 cs
3.3VAD 3 IN7N   DOUT 43 dout
3.3VAD 2 IN8P   CLK 37 clk
3.3VAD 1 IN8N   CLKSEL 52 3.3V
                     START 38 start
GNDA C14 22uF 28 VCAP1 DRDY 47 drdy
GNDA C12 1uF 30 VCAP2 PWDN 35 pwdn
GNDA C15 1uF 55 VCAP3 RESET 36 reset
GNDA C13 1uF 26 VCAP4
                       RESV1 31 GND
        24 VREFP
        25 VREFN
C10 0.1uF C11 10uF
GNDA   GNDA
                AVSS AVSS1 DGND
                20   53   33
GNDA
                     GNDA GND

When using the internal
voltage reference,
connect VREFN to AVSS

R11
0
GNDA   GND

R1 22k   R2 10k   RLD
390k R13 C16 0.01uF
RLDINV
C9 47pF   C21 ~
GNDA   GNDA

Bypass each ADS129x supply with 1µF
and 0.1µF solid ceramic capacitors
(http://www.ti.com/product/ads1294)

AVDD 3.3VA   AVDD 3.3VA   AVDD1 3.3VA   DVDD 3.3V
C27 1uF C41 0.1uF C17 1uF C18 0.1uF C19 1uF C20 0.1uF C22 1uF C23 0.1uF
GNDA   GNDA   GNDA   GND

https://static.chipdip.ru/lib/687/DOC011687749.pdf
Analog filter
ADS1298RECG-FE
ECG Front-End
Performance Demonstration Kit
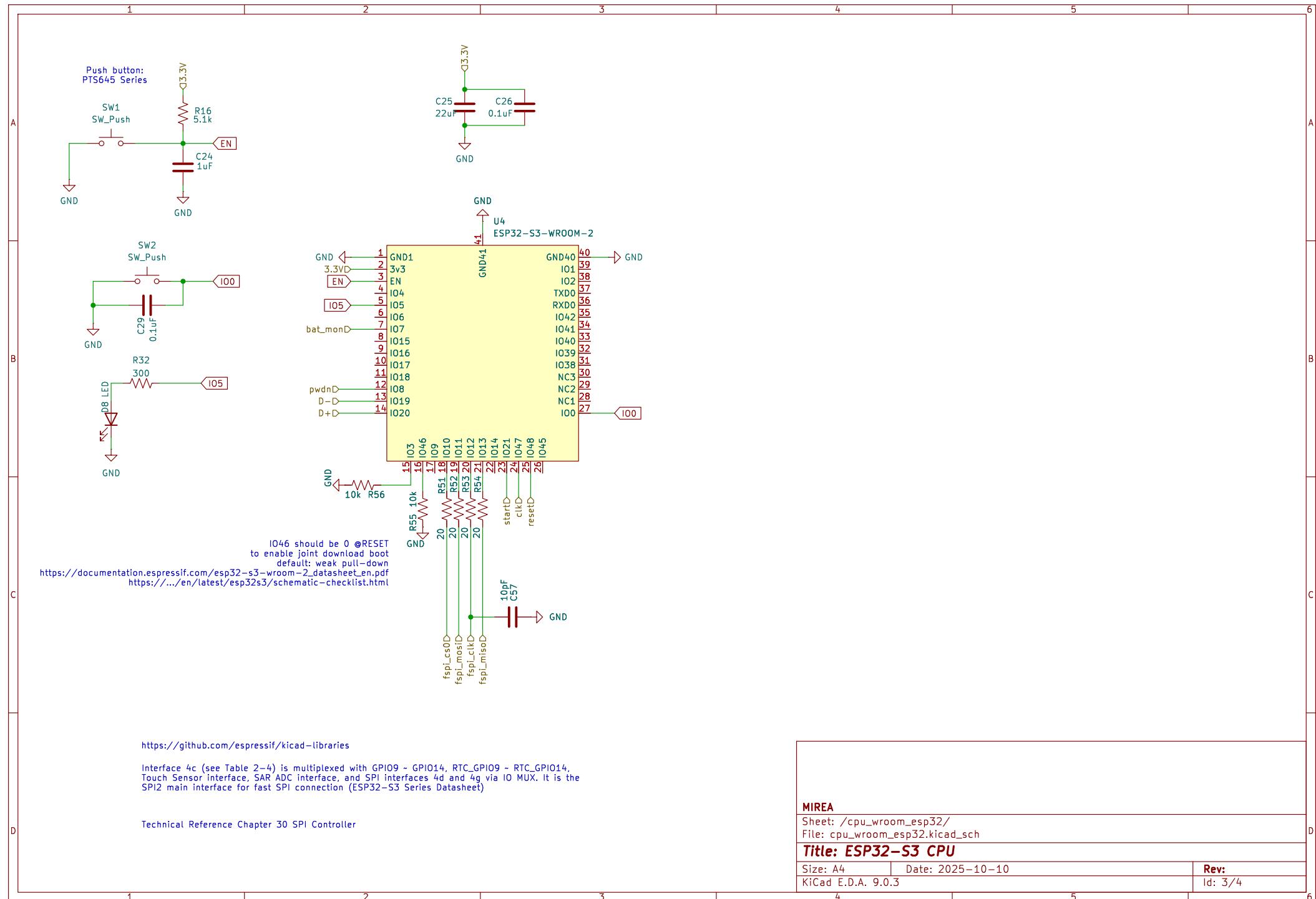
Connect unused pins to AVDD (Analog supply)
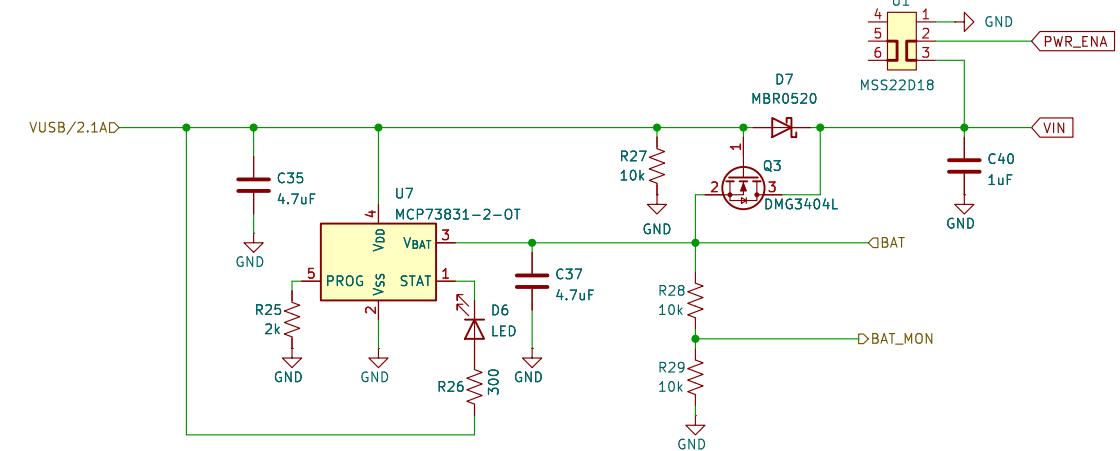(http://www.ti.com/product/ads1294)

Sheet: /adc_8/
File: adc_8.kicad_sch
Title: 8 channel ADC
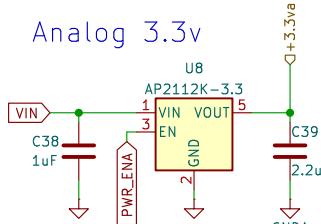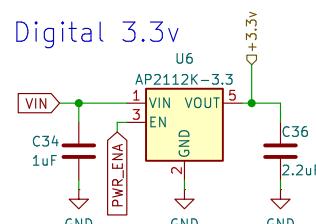Size: A4   Date: 2024-10-17   Rev:
KiCad E.D.A. 9.0.3   Id: 2/4

Push button:
PTS645 Series

3.3V

SW1
SW_Push

R16
5.1k

EN

C24
1uF

GND

GND

3.3V

C25
22uF

C26
0.1uF

GND

SW2
SW_Push

I00

C29
0.1uF

GND

R32
300

D8 LED

I05

GND

GND

U4
ESP32-S3-WROOM-2

Pin	Name		Name	Pin
1	GND1	GND41 41	GND40	40 GND
2	3v3		IO1	39
3	EN		IO2	38
4	IO4		TXD0	37
5	IO5		RXD0	36
6	IO6		IO42	35
7	IO7		IO41	34
8	IO15		IO40	33
9	IO16		IO39	32
10	IO17		IO38	31
11	IO18		NC3	30
12	IO8		NC2	29
13	IO19		NC1	28
14	IO20		IO0	27

GND
3.3V
EN
I05

bat_mon

pwdn
D-
D+

I00

GND

GND   R56   10k

R55   10k

R51 R52 R53 R54
20   20   20   20

IO3 IO46 IO9 IO10 IO11 IO12 IO13 IO14 IO21 IO47 IO48 IO45
15   16   17   18   19   20   21   22   23   24   25   26

start
clk
reset

GND

10pF
C57

GND

fspi_cs0
fspi_mosi
fspi_clk
fspi_miso

IO46 should be 0 @RESET
to enable joint download boot
default: weak pull-down
https://documentation.espressif.com/esp32-s3-wroom-2_datasheet_en.pdf
https://.../en/latest/esp32s3/schematic-checklist.html

https://github.com/espressif/kicad-libraries

Interface 4c (see Table 2-4) is multiplexed with GPIO9 ~ GPIO14, RTC_GPIO9 ~ RTC_GPIO14,
Touch Sensor interface, SAR ADC interface, and SPI interfaces 4d and 4g via IO MUX. It is the
SPI2 main interface for fast SPI connection (ESP32-S3 Series Datasheet)

Technical Reference Chapter 30 SPI Controller

U1
4
5
6
1 GND
2 PWR_ENA
3
MSS22D18

VUSB/2.1A

C35
4.7uF
GND

U7
MCP73831-2-OT
4 VDD
VBAT 3
5 PROG
VSS
STAT 1
2
GND
GND

R25
2k
GND

D6
LED

R26
300

C37
4.7uF
GND

D7
MBR0520

R27
10k
GND

Q3
DMG3404L
1
2
3

C40
1uF
GND

VIN

BAT

R28
10k

BAT_MON

R29
10k
GND

Fast charge current regulation can be scaled by placing
a programming resistor (RPROG) from the PROG input
to VSS. The program resistor and the charge current
are calculated using the following equation
(MCP73831/2: https://static.chipdip.ru/lib/283/DOC012283193.pdf)
$I_{REG} = 1000V / R_{PROG}$

Digital 3.3v
+3.3v
U6
AP2112K-3.3
VIN
1 VIN
VOUT 5
3 EN
GND
2
C34
1uF
PWR_ENA
C36
2.2uF
GND
GND
GND

Analog 3.3v
+3.3va
U8
AP2112K-3.3
VIN
1 VIN
VOUT 5
3 EN
GND
2
C38
1uF
PWR_ENA
C39
2.2uF
GND
GND
GNDA