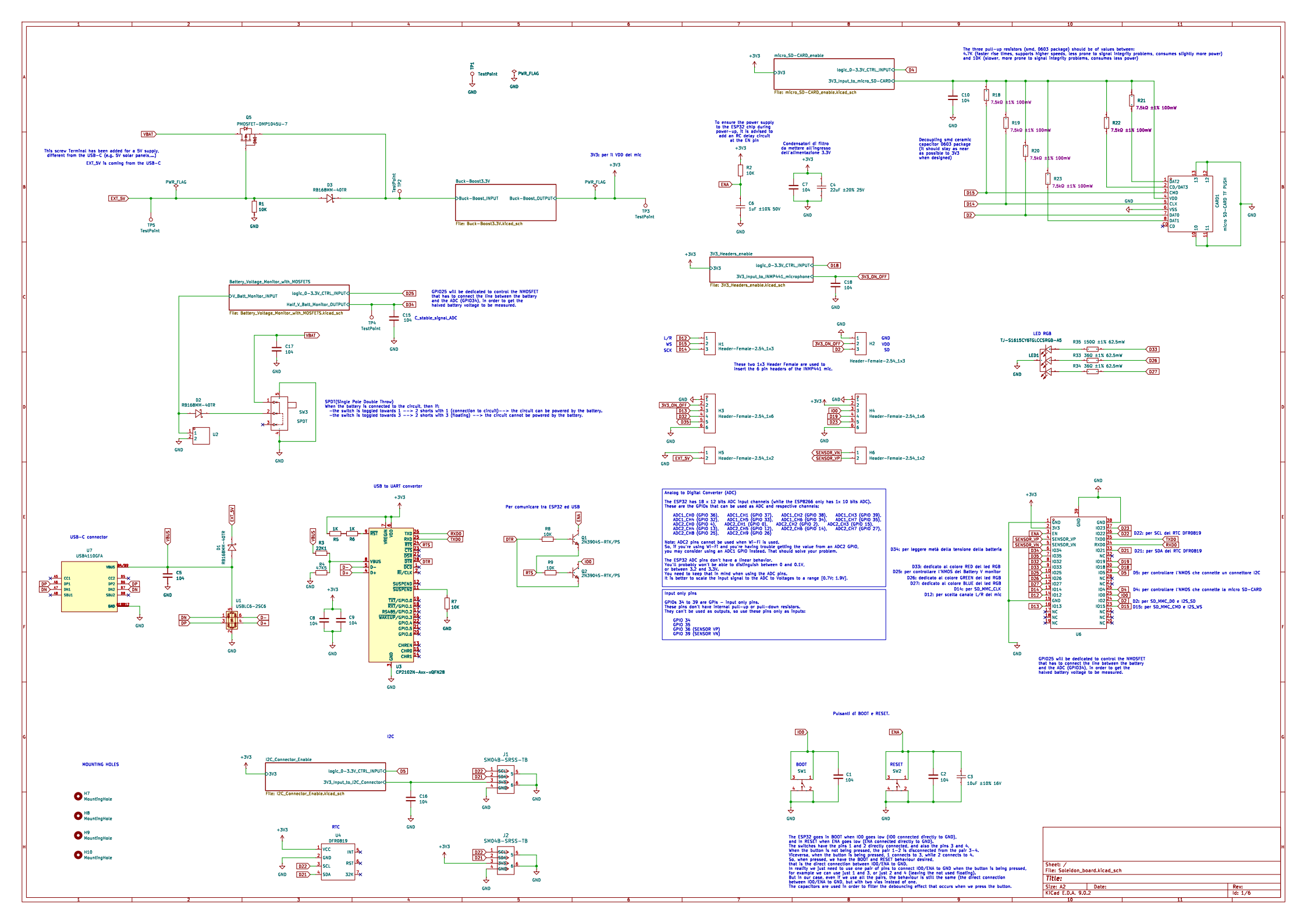
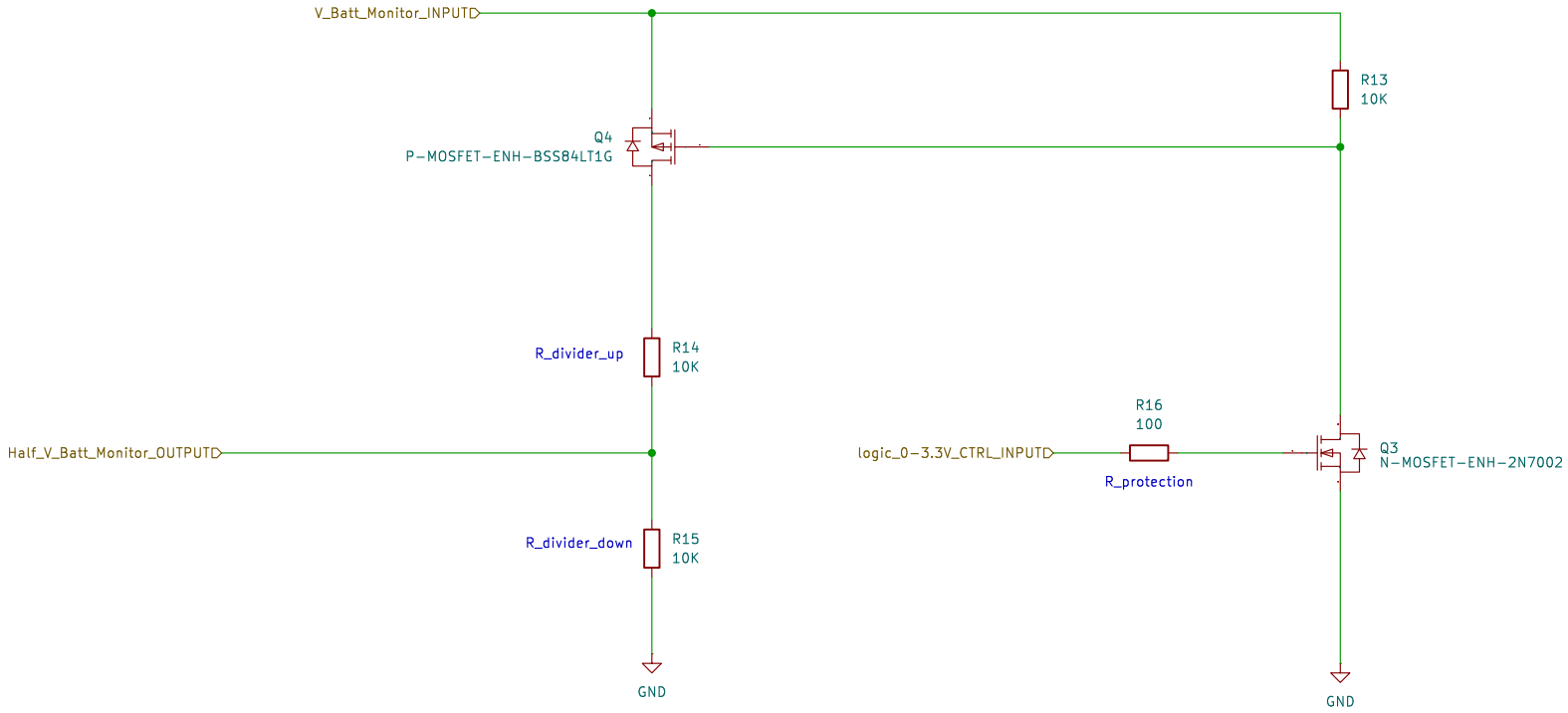
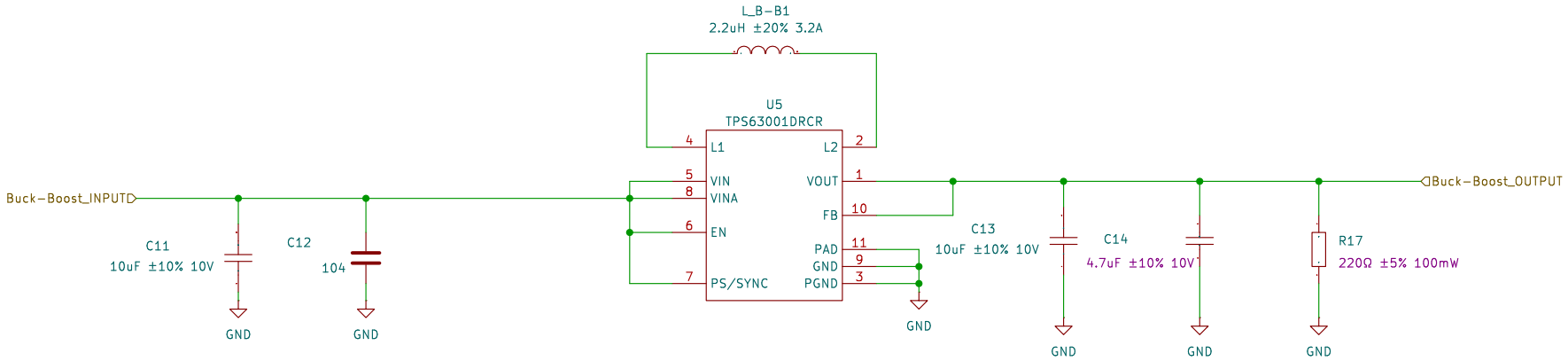

This screw Terminal has been added for a 5V supply, different from the USB-C (e.g. 5V solar panels,...)
EXT_5V is coming from the USB-C
Q5
PMOSFET-DMP1045U-7
D3
RB168MM-40TR
R1
10K
Buck-Boost3.3V
Buck-Boost_INPUT
Buck-Boost_OUTPUT
File: Buck-Boost3.3V.kicad_sch
3V3: per il VDD del mic
To ensure the power supply to the ESP32 chip during power-up, it is advised to add an RC delay circuit at the EN pin
Condensatori di filtro da mettere all'ingresso dell'alimentazione 3.3V
R2
10K
C6
1uF ±10% 50V
C7
104
C4
22uF ±20% 25V
The three pull-up resistors (smd, 0603 package) should be of values between: 4.7K (faster rise times, supports higher speeds, less prone to signal integrity problems, consumes slightly more power) and 10K (slower, more prone to signal integrity problems, consumes less power)
micro_SD-CARD_enable
logic_0-3.3V_CTRL_INPUT
3V3_input_to_micro_SD-CARD
File: micro_SD-CARD_enable.kicad_sch
C10
104
R18
7.5kΩ ±1% 100mW
R19
7.5kΩ ±1% 100mW
R20
7.5kΩ ±1% 100mW
R21
7.5kΩ ±1% 100mW
R22
7.5kΩ ±1% 100mW
R23
7.5kΩ ±1% 100mW
Decoupling smd ceramic capacitor 0603 package (It should stay as near as possible to 3V3 when designed)
CARD1
micro SD-CARD TF PUSH
Battery_Voltage_Monitor_with_MOSFETS
V_Batt_Monitor_INPUT
Half_V_Batt_Monitor_OUTPUT
File: Battery_Voltage_Monitor_with_MOSFETS.kicad_sch
GPIO25 will be dedicated to control the NMOSFET that has to connect the line between the battery and the ADC (GPIO34). In order to get the halved battery voltage to be measured.
C15
104
C_stable_signal_ADC
C17
104
D2
RB168MM-40TR
U2
SW3
SPDT
SPDT(Single Pole Double Throw)
When the battery is connected to the circuit, then if:
-the switch is toggled towards 1 --> 2 shorts with 1 (connection to circuit)--> the circuit can be powered by the battery.
-the switch is toggled towards 3 --> 2 shorts with 3 (floating) --> the circuit cannot be powered by the battery.
3V3_Headers_enable
logic_0-3.3V_CTRL_INPUT
3V3_input_to_INMP441_microphone
3V3_ON_OFF
File: 3V3_Headers_enable.kicad_sch
C18
104
H1
Header-Female-2.54_1x3
H2
Header-Female-2.54_1x3
These two 1x3 Header Female are used to insert the 6 pin headers of the INMP441 mic.
LED RGB
TJ-S1615CY6TGLCCSRGB-A5
R35 150Ω ±1% 62.5mW
R33 360 ±1% 62.5mW
R34 360 ±1% 62.5mW
H3
Header-Female-2.54_1x6
H4
Header-Female-2.54_1x6
H5
Header-Female-2.54_1x2
H6
Header-Female-2.54_1x2
USB-C connector
U7
USB4110GFA
D1
RB168MM-40TR
C5
104
U1
USBLC6-2SC6
USB to UART converter
R3
22K1
R4
47K5
R5
1K
R6
1K
C8
104
C9
104
U3
CP2102N-Axx-xQFN28
R7
10K
Per comunicare tra ESP32 ed USB
R8
10K
R9
10K
Q1
2N3904S-RTK/PS
Q2
2N3904S-RTK/PS
Analog to Digital Converter (ADC)
The ESP32 has 18 x 12 bits ADC input channels (while the ESP8266 only has 1x 10 bits ADC).
These are the GPIOs that can be used as ADC and respective channels:
ADC1_CH0 (GPIO 36), ADC1_CH1 (GPIO 37), ADC1_CH2 (GPIO 38), ADC1_CH3 (GPIO 39),
ADC1_CH4 (GPIO 32), ADC1_CH5 (GPIO 33), ADC1_CH6 (GPIO 34), ADC1_CH7 (GPIO 35),
ADC2_CH0 (GPIO 4), ADC2_CH1 (GPIO 0), ADC2_CH2 (GPIO 2), ADC2_CH3 (GPIO 15),
ADC2_CH4 (GPIO 13), ADC2_CH5 (GPIO 12), ADC2_CH6 (GPIO 14), ADC2_CH7 (GPIO 27),
ADC2_CH8 (GPIO 25), ADC2_CH9 (GPIO 26)
Note: ADC2 pins cannot be used when Wi-Fi is used.
So, if you're using Wi-Fi and you're having trouble getting the value from an ADC2 GPIO, you may consider using an ADC1 GPIO instead. That should solve your problem.
The ESP32 ADC pins don't have a linear behavior.
You'll probably won't be able to distinguish between 0 and 0.1V, or between 3.2 and 3.3V.
You need to keep that in mind when using the ADC pins.
It is better to scale the input signal to the ADC to Voltages to a range [0.7V; 1.9V].
D34: per leggere metà della tensione della batteria
D33: dedicato al colore RED dei led RGB
D25: per controllare l'NMOS del Battery V monitor
D26: dedicato al colore GREEN dei led RGB
D27: dedicato al colore BLUE dei led RGB
D14: per SD_MMC_CLK
D12: per scelta canale L/R dei mic
U6
Input only pins
GPIOs 34 to 39 are GPIs – input only pins.
These pins don't have internal pull-up or pull-down resistors.
They can't be used as outputs, so use these pins only as inputs:
GPIO 34
GPIO 35
GPIO 36 (SENSOR VP)
GPIO 39 (SENSOR VN)
D23: per SCL dei RTC DFR0819
D22: per SCL dei RTC DFR0819
D21: per SDA dei RTC DFR0819
D19
D18
D5: per controllare l'NMOS che connette un connettore I2C
D4: per controllare l'NMOS che connette la micro SD-CARD
D2: per SD_MMC_D0 e I2S_SD
D15: per SD_MMC_CMD e I2S_WS
GPIO25 will be dedicated to control the NMOSFET that has to connect the line between the battery and the ADC (GPIO34). In order to get the halved battery voltage to be measured.
Pulsanti di BOOT e RESET.
BOOT
SW1
RESET
SW2
C1
104
C2
104
C3
10uF ±10% 16V
The ESP32 goes in BOOT when IO0 goes low (IO0 connected directly to GND),
and in RESET when ENA goes low (ENA connected directly to GND).
The switches have the pins 1 and 2 directly connected, and also the pins 3 and 4.
When the button is not being pressed, the pair 1-2 is disconnected from the pair 3-4.
Viceversa, when the button is being pressed, 1 connects to 3, while 2 connects to 4.
So, when pressed, we have the BOOT and RESET behaviour desired.
that is the direct connection between IO0/ENA to GND.
In reality we just need to use one pair of pins to connect IO0/ENA to GND when the button is being pressed,
for example we can use just 1 and 3, or just 2 and 4 (leaving the not used floating).
But in our case, even if we use all the pairs, the behaviour is still the same (the direct connection
between IO0/ENA to GND, but with two vias instead of one.
The capacitors are used in order to filter the debouncing effect that occurs when we press the button.
I2C
I2C_Connector_Enable
logic_0-3.3V_CTRL_INPUT
3V3_input_to_I2C_Connector
File: I2C_Connector_Enable.kicad_sch
C16
104
J1
SM04B-SRSS-TB
J2
SM04B-SRSS-TB
RTC
U4
DFR0819
32K
MOUNTING HOLES
H7
MountingHole
H8
MountingHole
H9
MountingHole
H10
MountingHole
Sheet: /
File: Soleidon_board.kicad_sch
Title:
Size: A2
Date:
Rev:
KiCad E.D.A. 9.0.2
Id: 1/6



Sheet: /Battery_Voltage_Monitor_with_MOSFETS/		
File: Battery_Voltage_Monitor_with_MOSFETS.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.2		Id: 2/6

This Buck-Boost (TPS63001DRCR) is an efficient converter (up to 96%),
and can convert either the 5V coming from the USB,
or eventually the 3-3.6V coming from the batteries,
to fixed 3.3V necessary for the esp32.



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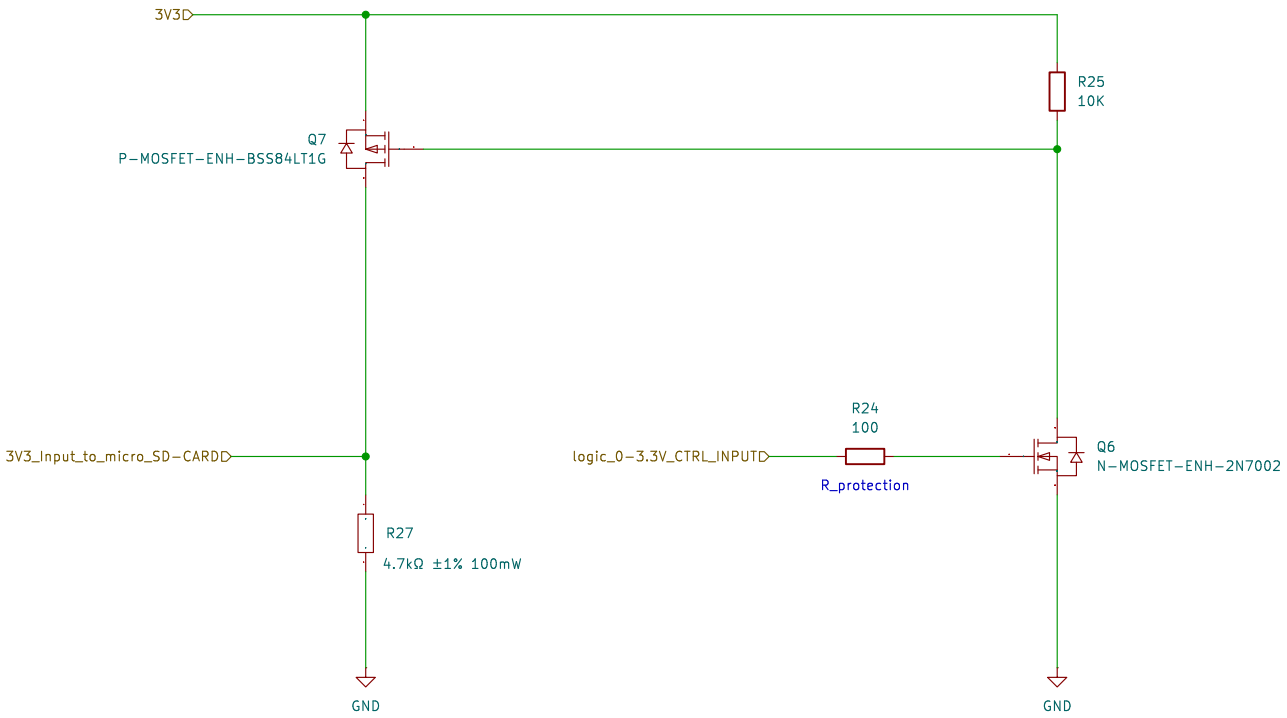
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.2		Id: 3/6



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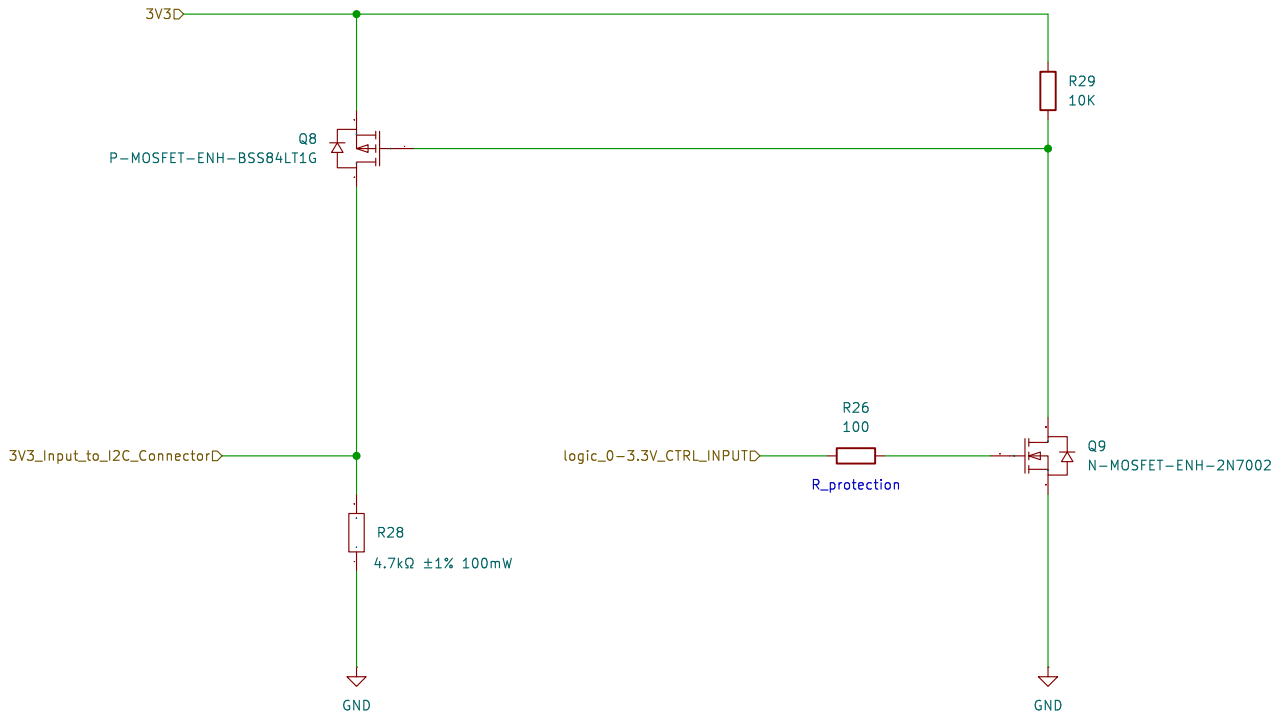
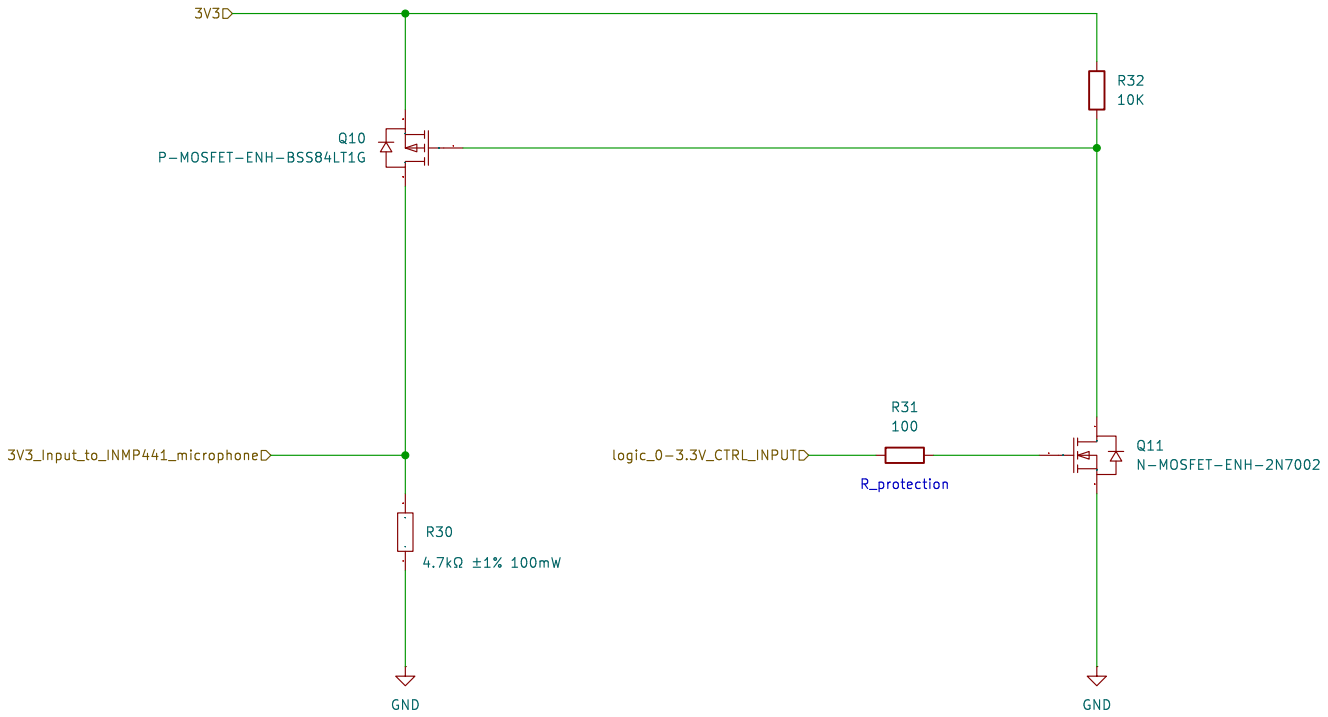
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.2		Id: 4/6



Sheet: /I2C_Connector_Enable/		
File: I2C_Connector_Enable.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.2		Id: 5/6



Sheet: /3V3_Headers_enable/		
File: 3V3_Headers_enable.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.2		Id: 6/6